



MARK PESTRELLA, Director

**COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS**

"To Enrich Lives Through Effective and Caring Service"

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IN REPLY PLEASE
REFER TO FILE

June 30, 2026

The Honorable Board of Supervisors
County of Los Angeles
383 Kenneth Hahn Hall of Administration
500 West Temple Street
Los Angeles, California 90012

Dear Supervisors:

**SERVICE CONTRACT
TRANSPORTATION CORE SERVICE AREA
AWARD OF SERVICE CONTRACT
LOS ANGELES COUNTY ADVANCED TRAFFIC MANAGEMENT SYSTEM PHASE III
(ALL SUPERVISORIAL DISTRICTS)
(3-VOTES)**

**CIO RECOMMENDATION: APPROVE (X) APPROVE WITH MODIFICATION ()
DISAPPROVE ()**

SUBJECT

Public Works is seeking Board approval to award a service contract to Kimley-Horn and Associates, Inc., for Los Angeles County Advanced Traffic Management System Phase III to be implemented throughout Los Angeles County.

IT IS RECOMMENDED THAT THE BOARD:

1. Find that the project is exempt from the California Environmental Quality Act for the reasons stated in this Board letter.
2. Award and delegate authority to the Director of Public Works or his designee to execute a contract with Kimley-Horn and Associates, Inc., for Phase III of the Los Angeles County Advanced Traffic Management System. The contract will be for a period of 6 years with four 1-year renewal options for a maximum potential contract term of 10 years and a maximum potential contract sum of \$2,919,400. The contract will be subject to the additional extension provisions specified below.

3. Delegate authority to the Director of Public Works or his designee to renew the contract for each additional renewal option period if, in the opinion of the Director of Public Works or his designee, Kimley-Horn and Associates, Inc. has successfully performed during the previous contract period and the services are still required; to approve and execute amendments to incorporate necessary changes within the scope of work; and to suspend and/or terminate the contract for convenience if it is in the best interest of the County to do so.
4. Delegate authority to the Director of Public Works or his designee to authorize additional services and extend the contract expiration date as necessary to complete those additional services, provided that the services: (1) were not previously unforeseen, (2) are related to a previously assigned scope of work on a given work order, and (3) are necessary for the completion of that given work order.
5. Delegate authority to the Director of Public Works or his designee to annually increase the contract amount by up to an additional 10 percent of the annual contract sum as pool dollars, which is included in the maximum potential contract sum for unforeseen additional work within the scope of the contract if required, and to adjust the annual contract sum for each option year over the term of the contract to allow for a cost-of-living adjustment in accordance with County policy and the terms of the contract.

PURPOSE/JUSTIFICATION OF RECOMMENDED ACTION

The purpose of the recommended actions is to award a contract to upgrade and maintain the County's Advanced Traffic Management System (ATMS) within the unincorporated County communities and contract cities. The County has previously implemented Intelligent Transportation System projects throughout these areas with the ATMS serving as the central component. This system enables remote monitoring and control of traffic signals and Intelligent Transportation System infrastructure from locations such as traffic management centers, city halls, or maintenance yards. The new ATMS will upgrade the County's existing system and allow for continuous monitoring of traffic conditions and signal operations.

The scope of work includes setup, configuration, integration, training, and knowledge transfer to County staff to support ongoing operations. The County will host the system environment for testing, training, and production use. The Los Angeles County constituents will benefit from improved travel times along key corridors and more responsive traffic signal timing.

Implementation of Strategic Plan Goals

These recommendations support the County Strategic Plan. North Star 3, Realize Tomorrow's Government Today, Focus Area Goal A, Communication and Public Access, Strategy i, Customer Service, Focus Area Goal F, Flexible and Efficient Infrastructure, Strategy ii, Modernize Infrastructure, evaluate our current IT infrastructure and capital projects, and address identified needs to replace or modernize legacy/obsolete infrastructure and to leverage technological advancements that increase visibility, accessibility, and ease of use for residents by contracting the contractor that has the specialized expertise to provide these services accurately, efficiently, timely, and in a responsive manner.

FISCAL IMPACT/FINANCING

The service contract amount is \$2,654,000 plus 10 percent of the contract sum in pool dollars for unforeseen additional work within the scope of the contract and cost-of-living adjustments in

accordance with the contract. The contract's initial term is for 6 years, commencing upon execution by both parties with four additional 1-year renewal options, for a maximum potential contract term of 10 years and an estimated maximum potential contract sum of \$2,919,400. This amount is based on the hourly rates quoted by the contractor and Public Works' estimated annual utilization of the contractor's services. The County may also authorize an extension of time to the contract's maximum potential term, not-to-exceed 180 days, with no additional funding. Adjustments will be made to the annual contract sum for each option year over the term of the contract to allow for an annual cost-of-living adjustment in accordance with County policy and the terms of the contract.

Funding for the first year of this service, estimated at \$926,000, is available in various Public Works funds, primarily in the Proposition C Local Return Fund (CN9 – Services and Supplies) and the Measure R Local Return Fund (CN5 - Services and Supplies) Fiscal Year 2025-26 Budgets. When the need arises for services under the contract, financing the required services will be from the appropriate fund source. The total annual expenditure for this service, however, will not exceed the contract amount approved by the Board. Funds to finance the contract's optional years and 10 percent additional funding in pool dollars for contingencies will be requested through the annual budget process.

FACTS AND PROVISIONS/LEGAL REQUIREMENTS

County Counsel has reviewed the contract as to form, which is substantially similar to the enclosed draft agreement (Enclosure A). The recommended contract with Kimley-Horn and Associates, Inc., was solicited on an open-competitive basis and is in accordance with applicable Federal, State, and County requirements. The expiration of the contract is subject to the following conditions: Where services for a given project have been authorized in writing by the County but are not completed by the contractor prior to the stated expiration date, the expiration date will be extended solely to allow for the completion of such services.

A standard service contract was used that contains terms and conditions in compliance with the Board's ordinances, policies, and programs. Enclosure B reflects the proposers' utilization participation and Community Business Enterprise program information. Data regarding the proposers' minority participation is on file with Public Works. The contractor was selected upon final analysis and consideration without regard to race, creed, gender, or color.

The Chief Information Officer has reviewed this request and recommends approval. The Chief Information Officer Analysis is enclosed (Enclosure C).

ENVIRONMENTAL DOCUMENTATION

The proposed project is exempt from the California Environmental Quality Act. The modification of existing traffic signal systems, installation of new traffic signal systems, and maintenance of existing roadway traffic signal controller firmware, with no expansion in use, is within the class of projects that have been determined not to have a significant effect on the environment, which meets the criteria set forth in Section 15301 of the California Environmental Quality Act Guidelines and Class 1(x) 4, 5, and 22 of the County's Environmental Document Reporting Procedures and Guidelines, Appendix G.

In addition, based on the proposed project records, it will comply with all applicable regulations, and there are no cumulative impacts, unusual circumstances, damages to scenic highways, listings on hazardous waste site lists compiled pursuant to California Government Code Section 65962.5, or indications that it may cause a substantial adverse change in the significance of a historical resource

that would make the exemption inapplicable.

CONTRACTING PROCESS

On October 2, 2024, a notice of the Request for Proposals (RFP) was placed on the County's "Doing Business With Los Angeles County" website (Enclosure D), "Do Business With Public Works" website, and X (formerly Twitter). In addition, advertisements were placed in the Los Angeles Daily Journal, Los Angeles Sentinel, La Opinión, Malibu Times, The Daily Breeze, The Signal, World Journal, Daily Commerce, Press Telegram, and Pasadena Star News. Also, Public Works informed 1,677 Local Small Business Enterprises, 171 Disabled Veteran Business Enterprises, 177 Social Enterprises, 942 Community Business Enterprises, 1,385 Community-Based Organizations. Additionally, the Department of Economic Opportunity conducted a focused outreach and informed 219 related businesses about this business opportunity. Sixty-three firms subsequently downloaded the RFP, and 6 firms participated in the optional proposers' conference.

On November 21, 2024, 3 proposals were received. One proposal was disqualified for failure to meet the minimum requirements of the RFP. The remainder of the proposals were evaluated by an evaluation committee consisting of staff from Public Works and the Los Angeles Metro. The evaluation was based on criteria described in the RFP, which included the price, qualifications and experience, performance history/references, proposed work plan, and demonstration of proposed system, utilizing the informed averaging methodology for applicable criteria. Based on this evaluation, it is recommended that the contract be awarded to the highest rated, responsive, and responsible proposer, Kimley-Horn and Associates, Inc.

Public Works has evaluated and determined that the contracted services are required on an on-call and intermittent basis; therefore, Proposition A (Los Angeles County Code Chapter 2.121) and the Living Wage Program (Los Angeles County Code Chapter 2.201) do not apply to the contract.

The contract includes a cost-of-living adjustment provision, which is in accordance with Board Policy 5.070, Multi-Year Services Contract Cost-of-Living Adjustments.

IMPACT ON CURRENT SERVICES (OR PROJECTS)

The award of the contract will continue the services without disruption to the public and will not result in the displacement of any County employees as these services are presently contracted with the private sector.

CONCLUSION

Please return one adopted copy of this Board letter to Public Works, Traffic Safety and Mobility Division.

Respectfully submitted,



MARK PESTRELLA, PE

Director



Peter Loo

Chief Information Officer

MP:SK:jf

Enclosures

c: Chief Executive Office (Christine Frias)
County Counsel
Executive Office, Board of Supervisors

ENCLOSURE

**SERVICE CONTRACT
TRANSPORTATION CORE SERVICE AREA
AWARD OF SERVICE CONTRACT
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(3-VOTES)**

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DISAPPROVE ()**

This Board letter has large enclosures.
Click on the link below to access:

[Los Angeles County Advanced Traffic Management System Phase III \(Enc.-FTP Link\)](#)

Agreement



BY AND BETWEEN

LOS ANGELES COUNTY

PUBLIC WORKS

AND

KIMLEY-HORN AND ASSOCIATES, INC.

FOR

LOS ANGELES COUNTY ADVANCED TRAFFIC
MANAGEMENT SYSTEM PHASE III

(BRC0000494)

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THIS AGREEMENT is entered into this _____ day of _____, 2026 by and between the County of Los Angeles, a subdivision of the State of California, (hereinafter referred to as "County"), and Kimley-Horn and Associates, Inc., a North Carolina Corporation (hereinafter referred to as "Contractor") (hereinafter collectively also the "parties").

RECITALS

WHEREAS, Kimley-Horn and Associates, Inc. (hereinafter also "Kimley-Horn") is a contractor that has developed proprietary software systems, including the Advanced Traffic Management System (ATMS) known as "KITS"; and

WHEREAS, County desires to employ Contractor to deliver, implement, integrate, customize or modify and maintain the KITS software system in order to provide County with Phase III of an Advanced Traffic Control System (hereinafter "System" or "ATMS") for the benefit of County's Department of Public Works (hereinafter "Department"); and

WHEREAS, Contractor is qualified by reason of experience, preparation, equipment, organization, qualifications, technical competence, and staffing to provide to County the work contemplated by this Agreement; and

NOW THEREFORE, in consideration of the mutual promises, covenants and conditions set forth herein and for good and valuable consideration, County and Contractor agree as follows:

1. APPLICABLE DOCUMENTS

1.1 INTERPRETATION

The provisions of this document (hereinafter "Base Agreement"), along with Exhibits A, B, C, D, E, F, G, H, I, J, K, L, M, N, and O including all Attachments and Schedules thereto, whether attached hereto, and described in this Paragraph 1.1 below and incorporated herein by reference, collectively form and throughout and hereinafter are referred to as the "Agreement". In the event of any conflict or inconsistency in the definition or interpretation of any word, responsibility, schedule or the contents or description of any task, subtask, deliverable, service or other work, or otherwise, between this Base Agreement and the Exhibits, Attachments, and Schedules or between the Exhibits, Attachments, and Schedules, such conflict or inconsistency shall be resolved by giving precedence first to the Base Agreement, and then to the Exhibits, Attachments, and Schedules according to the following descending priority:

Exhibit A – Statement of Work

Attachment A.1 – Minimum System Requirements

Attachment A.2 – System Overview

Attachment A.3 – System Architecture

Attachment A.4 – Acceptance Certificate

Attachment A.5 – Baseline Interfaces & Participating Agencies

Attachment A.6 – I-210 CC System Interface Design Spec

Attachment A.7 – Third Party Software

Exhibit B – Schedule of Prices

Schedule B.1 – Schedule of Prices As Needed Services

Schedule B.2 - Additional Work Schedule

Exhibit C – System Maintenance

Exhibit D – Equal Employment Opportunity Certification

Exhibit E – Administration of Agreement

Exhibit F – Performance Requirements Summary

Exhibit G – Contractor Acknowledgement and Confidentiality Agreement

Exhibit H – Jury Service Ordinance

Exhibit I – Safely Surrendered Baby Law

Exhibit J – Defaulted Property Tax Reduction Program Ordinance

Exhibit K – County of Los Angeles Policy on Doing Business with Small Business

Exhibit L – Listing of Contractors Debarred in Los Angeles County

Exhibit M – County of Los Angeles Lobbyist Ordinance

Exhibit N – IRS Notice 1015

Exhibit O – Information Security and Privacy Requirements Exhibit

1.2 ENTIRE AGREEMENT

This Agreement constitutes the complete and exclusive statement of understanding between the parties and supersedes all previous and contemporaneous agreements, whether written or oral, and any and all communications and negotiations between the parties relating to the subject matter of this Agreement.

1.3 DEFINITIONS

The terms and phrases in this Paragraph 1.3 (Definitions) in quotes and with initial letter capitalized, where applicable, whether singular or plural, shall have the particular meanings set forth below whenever such terms are used in this Agreement.

1.3.1 Acceptance

The term "Acceptance" shall mean County's written approval of any tasks, subtasks, deliverables, services or other Work, including Acceptance Tests, provided by Contractor to County pursuant to this Agreement.

1.3.2 Acceptance Test

The term "Acceptance Test" shall mean any of the System acceptance tests conducted by County or Contractor, as applicable, under Exhibit A (Statement of Work).

1.3.3 Acceptance Test Report

The term "Acceptance Test Report" shall mean a report provided by Contractor to County demonstrating that the System has passed the applicable Acceptance Test(s), as required under Exhibit A (Statement of Work).

1.3.4 Additional Customizations

The term "Additional Customization(s)" shall mean configurations and any other customizations of Application Software, and related Documentation, that Contractor may provide following Go-Live upon County's request therefor as Software Modifications in accordance with Paragraph 7.3 (Additional Work), which will update Schedule B.2 (Additional Work Schedule). Once accepted and approved by County, Additional Customizations shall become part of, and be deemed, Application Software for the purpose of this Agreement.

1.3.5 Additional Hardware

The term "Additional Hardware" shall mean the hardware and other equipment, and related Documentation, that Contractor may provide as part of Additional Work following Go-Live upon County's request therefor as Additional Products in accordance with Paragraph 7.3 (Additional Work), which will update Schedule B.2 (Additional Work Schedule). Once accepted and approved by County, Additional Hardware shall become part of, and be deemed, System Hardware for the purpose of this Agreement.

1.3.6 Additional Interfaces

The term "Additional Interface(s)" shall mean Interfaces, and related Documentation, that Contractor may provide following Go-Live upon County's request therefor as Software Modifications in accordance with Paragraph 7.3 (Additional Work), which will update Schedule B.2 (Additional Work Schedule). Once accepted and approved by County, Additional Interfaces shall become part of, and be deemed, Application Software for the purpose of this Agreement.

1.3.7 Additional Products

The term "Additional Product(s)" shall mean any item of Additional Software or Additional Hardware, and related Documentation, that Contractor may provide as part of Additional Work following Go-Live upon County's request and approval.

1.3.8 Additional Software

The term "Additional Software" shall mean any additional Application Software, including additional licenses and/or applications, and related Documentation, that Contractor may provide following Go-Live upon County's request therefor in accordance with Paragraph 7.3 (Additional Work), which will update Schedule B.2 (Additional Work Schedule). Once accepted and approved by County, Additional Software shall become part of, and be deemed, Application Software for the purpose of this Agreement.

1.3.9 Additional Training

The term "Additional Training" shall mean the Training regarding the System, which Contractor may provide following Go-Live upon County's request therefor as Professional Services in accordance with Paragraph 7.3 (Additional Work), which will update Schedule B.2 (Additional Work Schedule).

1.3.10 Additional Work

The term "Additional Work" shall mean Programming Modifications, Professional Services, and/or Additional Products that may be provided by Contractor to County following Go-Live upon County's request and approval.

1.3.11 Advance Traffic Management System

Refer to "System".

1.3.12 Agreement

The term "Agreement" shall have the meaning specified in Paragraph 1.1 (Interpretation).

1.3.13 Amendment

The term "Amendment" shall have the meaning specified in Paragraph 4.3 (Amendments).

1.3.14 Annual Fees

The term "Annual Fee(s)" shall mean the annual portion of the Service Fees to be paid by County to Contractor for System Maintenance commencing at

the end of Final Acceptance in accordance with the terms of this Agreement, including Exhibit B (Project and Payment Schedule).

1.3.15 Application Software

The term "Application Software" shall mean all software, including Core Software, Programming Modifications, Third Party Products, Software Modifications and related Documentation, to be provided by Contractor to County or Participating Cities as part of the System in accordance with the terms of this Agreement.

1.3.16 Base Agreement

The term "Base Agreement" shall have the meaning specified in Paragraph 1.1 (Interpretation) above.

1.3.17 Baseline Application

The term "Baseline Application" shall mean the Core Software, Third Party Software, Baseline Customizations and Baseline Interfaces, and related Documentation, implemented by Contractor pursuant to this Agreement as part of the Implementation Services in order to meet the System Requirements.

1.3.18 Baseline Customizations

The term "Baseline Customization(s)" shall mean the customizations to the Core Application, and related Documentation, provided by Contractor upon County's election in order for the System to meet all of the System Requirements selected by County.

1.3.19 Baseline Interfaces

The term "Baseline Interface(s)" shall mean Interfaces, and related Documentation, provided by Contractor pursuant to this Agreement as part of the Baseline Application, which shall meet some or all of the System Requirements.

1.3.20 Board of Supervisors; Board

The terms "Board of Supervisors" and "Board" shall mean County's Board of Supervisors, which is the governing body of County.

1.3.21 Business Day

The term "Business Day" shall mean Monday through Friday, excluding County observed holidays.

1.3.22 Business Hours

The term "Business Hours" shall mean Monday through Friday from 7 a.m. to 6 p.m. Pacific Time (PT) during Business Days, as further specified in Section 1 (General) of Exhibit C (System Maintenance).

1.3.23 Change Notice

The term "Change Notice" shall have the meaning specified in Paragraph 4.2 (Change Notices).

1.3.24 Change Order

The term "Change Order" shall mean the Change Notice executed by the parties for acquisition of Additional Work under the Change Notice.

1.3.25 City

The term "City" shall mean any city specified in Section 1 (Project Scope) of Exhibit A (Statement of Work).

1.3.26 Client Application

The term "Client Application" shall mean the Application Software, if any, residing in the Client Environment.

1.3.27 Client Environment

The term "Client Environment" shall mean the client environment for the System provided by County in accordance with Contractor's specifications, including workstations, operating system software and web browsers that will be used by County Users to access the System.

1.3.28 COLA; Cost-of-Living Adjustment

The terms "COLA" and "Cost-of-Living Adjustment" shall have the meaning specified in Paragraph 10.7 (Cost of Living Adjustment).

1.3.29 Confidential Information

The term "Confidential Information" shall mean any data or information, in any format, and includes sensitive financial information, any County data and any other information otherwise deemed confidential by County or by Contractor or by applicable Federal, State, or local law, as further specified in Paragraph 21.1 (Confidential Information).

1.3.30 Consulting Services

The term "Consulting Services" shall mean Professional Services that Contractor may provide following Go-Live upon County's request therefor in

accordance with Paragraph 7.3 (Additional Work), which will update Schedule B.2 (Additional Work Schedule).

1.3.31 Contract Sum

The term "Contract Sum" shall mean the total monetary amount payable by County to Contractor hereunder, as set forth in Paragraph 10.1 (Maximum Contract Sum). The Contract Sum shall not be adjusted for any costs or expenses whatsoever of Contractor.

1.3.32 Contractor

The term "Contractor" shall have the meaning specified in the Recitals to the Agreement.

1.3.33 Contractor Key Personnel

The term "Contractor Key Personnel" shall have the meaning specified in Paragraph 3.1 (Contractor Key Personnel).

1.3.34 Contractor Key Staff

The term "Contractor Key Staff" shall have the meaning specified in Paragraph 3.3.2.

1.3.35 Contractor's Project Director; Contractor's PD

The terms "Contractor's Project Director" and "Contractor's PD" shall have the meaning specified in Paragraph 3.2.1 (Contractor's Project Director).

1.3.36 Contractor's Project Executive

The term "Contractor's Project Executive" shall be the person designated as such in Section 2 (Contractor Key Personnel) of Exhibit E (Administration of Agreement).

1.3.37 Contractor's Project Manager; Contractor's PM

The terms "Contractor's Project Manager" and "Contractor's PM" shall have the meaning specified in Paragraph 3.2.2 (Contractor's Project Manager).

1.3.38 Core Software

The term "Core Software" shall mean Contractor's pre-developed software and other tools, and related Documentation, provided by Contractor pursuant to this Agreement as part of System Software, which shall meet some or all of the System Requirements.

1.3.39 COTS

The term "COTS" shall mean Commercial Off-The-Shelf as it relates to software.

1.3.40 County

The term "County" shall mean the County of Los Angeles, California, including its Department of Public Works.

1.3.41 County Key Personnel

The term "County Key Personnel" shall have the meaning specified in Paragraph 2.1 (County Administration).

1.3.42 County Materials

The term "County Materials" shall have the meaning specified in Paragraph 19.1 (County Materials).

1.3.43 County Software

The term "County Software" shall mean any County software installed and utilized by County in its Client environment.

1.3.44 County's Project Director

The term "County's Project Director" shall have the meaning specified in Paragraph 2.2.1 (County's Project Director).

1.3.45 County's Project Manager

The term "County's Project Manager" shall have the meaning specified in Paragraph 2.2.2 (County's Project Manager).

1.3.46 County-Owned Customizations

The term "County-Owned Customizations" means the customizations developed by or on behalf of the Contractor for the benefit of County, which customizations the parties agree do not constitute an improvement, modification, or addition to existing Contractor proprietary software (other than developer tools or programs), and which is provided pursuant to a Change Order. Any customization that will become a County-Owned Customization pursuant to clause above shall be specifically identified as a County-Owned Customization in the applicable Change Order. Such County-Owned Customizations are and become a component of the System Software.

1.3.47 Customizations

The term "Customizations" shall mean customizations, configurations or other modifications to the Application Software, and related Documentation, which may be provided by Contractor during the term of the Agreement upon County's request and approval in order for the System to meet additional System Requirements.

1.3.48 Data Migration

The term "Data Migration" shall mean migration of Existing Data.

1.3.49 Day

The term "Day" shall mean calendar day and not Business Day.

1.3.50 Deficiency; Deficiencies

The terms "Deficiency" and "Deficiencies", whether singular or plural, shall mean any of the following: any malfunction, error or defect in the design, development, implementation, materials, and/or workmanship; any failure to meet or comply with or deviation from System Requirements, Specifications, County approved deliverables, any published and/or mutually agreed upon standards or any other representations or warranties by Contractor under the Agreement regarding the System; and/or any other problem which results in the System, or any component thereof, not performing in compliance with the provisions of this Agreement, including but not limited to the Specifications and System Requirements.

1.3.51 Deficiency Credits

The term "Deficiency Credit(s)" shall have the meaning specified in Section 4 (Deficiency Credits) of Exhibit C (System Maintenance).

1.3.52 Deliverable; deliverable

The terms "Deliverable" and "deliverable" shall mean items and/or services provided or to be provided by Contractor under this Agreement, including numbered Deliverable(s) in Exhibit A (Statement of Work).

1.3.53 Department; DPW; Public Works

The terms "Department", "DPW" and "Public Works" shall mean and refer to County's Department of Public Works.

1.3.54 Director

The term "Director" shall mean the Director of Public Works or designee.

1.3.55 Dispute Resolution Procedure

The term "Dispute Resolution Procedure" shall mean and refer to the provisions of Paragraph 56 (Dispute Resolution Procedure) describing the procedure for resolving the disputes arising under or with respect to this Agreement.

1.3.56 Documentation

The term "Documentation" shall mean any and all written and electronic materials provided or made available by Contractor under this Agreement, including, but not limited to, documentation relating to software specifications and functions, training course materials, Specifications including System Requirements, technical manuals, handbooks, flow charts, technical information, reference materials, user manuals, operating manuals, quick reference guides, FAQs, and all other instructions and reference materials relating to the capabilities, operation, installation and use of the System and/or applicable components.

1.3.57 Downtime

The term "Downtime" shall mean the period when the System or any System component is unavailable, whether scheduled or unscheduled, as further specified in Exhibit C (System Maintenance).

1.3.58 Due Date

The term "Due Date" shall mean the due date for the completion of any Deliverable in the Project Schedule.

1.3.59 Effective Date

The term "Effective Date" shall mean the date of execution of this Agreement by County and the authorized representative(s) of Contractor.

1.3.60 Existing Data

The term "Existing Data" shall mean the data of any of County's existing systems to be migrated and/or converted by Contractor as part of Implementation Services in accordance with Exhibit A (Statement of Work).

1.3.61 Extended Term

As used herein, the term "Extended Term" shall have the meaning specified in Paragraph 9.2 (Extended Term).

1.3.62 External Data

The term "External Data" shall mean the data of any of Interfaced Systems, exported from or migrated or imported into the System by an Interface or as part of Implementation Services.

1.3.63 Final Acceptance

The term "Final Acceptance" shall mean County's written approval of the System in accordance with the terms of this Agreement.

1.3.64 Final Acceptance Date

The term "Final Acceptance Date" shall mean the date of Final Acceptance.

1.3.65 Go-Live

The term "Go-Live" shall mean the point at which the System will be activated and in use in the live Production Environment by County, following County's approval.

1.3.66 Go-Live Date

The term "Go-Live Date" shall mean the date of Go-Live.

1.3.67 Hardware Upgrades

The term "Hardware Upgrade(s)" shall mean and include any additions to and/or replacements to the System Hardware, available or made available subsequent to Go-Live, in order to comply with specifications set forth in this Agreement.

1.3.68 Hosting Services

The term "Hosting Services" shall mean and include any services, including data storage, website, and application, provided by Contractor to County over the Internet as specified in Exhibit A (Statement of Work).

1.3.69 Hourly Labor Rates

The term "Hourly Labor Rates" means a fully burdened hourly rate, which includes a blended and allocated average of direct and indirect costs, overhead, administrative expenses and any and all other incidental expenses attributable to each personnel hour worked.

1.3.70 Implementation Cost

The term "Implementation Cost" shall mean the fees for the cost of Implementation Services, as specified in Exhibit B (Schedule of Prices).

1.3.71 Implementation Period

The term "Implementation Period" shall mean the period from the Effective Date of the Agreement through the Final Acceptance of the System by County.

1.3.72 Implementation Services

The term "Implementation Services" shall mean System Environment setup, System Software installation, data migration and/or conversion, Acceptance Tests, Training, and other Work to be provided by Contractor as part of the System implementation pursuant to Exhibit A (Statement of Work) up to and including Final Acceptance of the System.

1.3.73 Initial Term

The term "Initial Term" shall have the meaning specified in Paragraph 9.1 (Initial Term).

1.3.74 Interfaced System

The term "Interfaced System" shall mean any system interfaced with the System, including where County Software resides.

1.3.75 Interfaces

The term "Interface(s)" shall mean the set of software mechanisms, which may be provided by Contractor under this Agreement as part of Programming Modifications, which allow the transfer of electronic data and/or software commands between computer systems, networks, applications or modules, and related Documentation.

1.3.76 Key Deliverable

The term "Key Deliverable" shall mean a Deliverable marked as such on Exhibit A (Statement of Work) and Exhibit B (Schedule of Prices).

1.3.77 Level 1 Severity

The term "Level 1 Severity" shall have the meaning specified in Section 3 (Corrective Maintenance) of Exhibit C (System Maintenance).

1.3.78 Level 2 Severity

The term "Level 2 Severity" shall have the meaning specified in Section 3 (Corrective Maintenance) of Exhibit C (System Maintenance).

1.3.79 Level 3 Severity

The term "Level 3 Severity" shall have the meaning specified in Section 3 (Corrective Maintenance) of Exhibit C (System Maintenance).

1.3.80 License

The term "License" shall have the meaning specified in Paragraph 12.2 (License).

1.3.81 Major Version Release

The term "Major Version Release" shall mean and refer to a Software Update which increases the whole number of the current Application Software version or the first decimal number of the version.

1.3.82 Maximum Fixed Price

The term "Maximum Fixed Price" shall mean the maximum amount to be paid by County to Contractor for identified Deliverables listed under Exhibit A (Statement of Work) in accordance with the prices, rates, and other fees listed in Exhibit B (Schedule of Prices) or any Additional Work approved by County to be provided by Contractor in accordance with Paragraph 7.3 (Additional Work) of the Base Agreement.

1.3.83 Monthly Fee

The term "Monthly Fee" shall mean 1/12th of the Annual Fee.

1.3.84 Participating Cities

The term "Participating City" shall the same meaning as "City."

1.3.85 Phase

The term "Phase" shall have the meaning specified in Section 1 (Project Phases) of Exhibit A (Statement of Work).

1.3.86 Pool Dollars

The term "Pool Dollars" shall mean the amount allocated under this Agreement for the provision by Contractor of Additional Work, including Customizations, Professional Services, and Additional Products, approved by County in accordance with the terms of this Agreement.

1.3.87 Production Environment

The term "Production Environment" shall mean the System Environment set up by Contractor for Production Use of the System as part of Implementation Services pursuant to Exhibit A (Statement of Work).

1.3.88 Production Use

The term "Production Use" shall mean the actual use of the System in the Production Environment for the performance of County's operations commencing upon Go-Live.

1.3.89 Professional Services

The term "Professional Service(s)" shall mean Consulting services and/or training that Contractor may provide upon County's request and approval in the form of Additional Work in accordance with Paragraph 7.3 (Additional Work).

1.3.90 Programming Modifications

The term "Programming Modification(s)" shall mean the customizations and/or other programming modifications to the Application Software, including Customizations and Interfaces, and related Documentation, which may be provided by Contractor during the term of the Agreement upon County's request and approval for the System to meet existing or future System Requirements.

1.3.91 Project Schedule

The term "Project Schedule" shall mean the agreed upon timeline for the Tasks, Subtasks and Deliverables specified in Exhibit A (Statement of Work) and Exhibit B (Schedule of Prices).

1.3.92 Replacement Product

The term "Replacement Product" shall have the meaning set forth in Paragraph 14.3 (Continuous Product Support).

1.3.93 Scope of Additional Work

The term "Scope of Additional Work" shall mean the Additional Work agreed by the parties to be provided by the Contractor as Additional Work.

1.3.94 Security Requirements

The term "Security Requirements" shall mean and refer to the System security requirements specified in and agreed to by Contractor.

1.3.95 Server Application

The term "Server Application" shall mean the Application Software residing in the Server Environment.

1.3.96 Server Environment

The term "Server Environment" shall mean the architectural and operational environment for the System, and related Documentation, including server operating software and hardware.

1.3.97 Server Hardware

The term "Server Hardware" shall mean the hardware and other equipment, and related Documentation, including networking, provided by Contractor as part of the System.

1.3.98 Service Fees

The term "Service Fee(s)" shall mean and include the fees to be paid by County to Contractor for the provision of System Maintenance, including Maintenance Services and Support Services, in accordance with the terms of this Agreement, including Exhibit B (Project and Payment Schedule).

1.3.99 Services

The term "Services" shall mean Implementation Services, Maintenance Services, Support Services, any services that are part of Work or Additional Work, and any other services provided by Contractor under this Agreement.

1.3.100 Severity Level; Problem Severity Level

The terms "Severity Level" and "Problem Severity Level" shall have the meaning specified in Section 3 (Corrective Maintenance) of Exhibit C (System Maintenance).

1.3.101 Software Modifications

The term "Software Modification(s)" shall mean Programming Modifications, Software Updates, Additional Products, and any Replacement Products, and related Documentation, which may be provided by Contractor under the Agreement. Once accepted and approved by County, Software Modifications shall become part of, and be deemed, Application Software for the purpose of this Agreement.

1.3.102 Software Updates

The term "Software Update(s)" shall mean and include any additions to and/or replacements to the System Software, available or made available subsequent to Go-Live, and shall include all Application Software performance and functionality enhancement releases, new Version Releases, server software upgrades, improvements, interim updates, including fixes and patches, Deficiency corrections, and any other modifications to the Application Software consisting, including but not

limited to those required for the System to remain in compliance with applicable Federal and State laws and regulations and the terms of this Agreement, provided by Contractor in accordance with Exhibit C (System Maintenance) and Exhibit A (Statement of Work), including all Schedules and Attachments thereto.

1.3.103 Specifications

The term "Specification(s)" shall mean any or all of the following, as applicable:

- (1) All specifications, requirements and standards set forth in Attachment A.1 (Minimum System Requirements) and the Deliverables in Exhibit A (Statement of Work).
- (2) All System Performance Requirements and standards set forth in this Agreement, including, but not limited to, requirements for System Availability and Response Time identified in Exhibit C (System Maintenance).
- (3) The Documentation, to the extent not inconsistent with any of the foregoing in this definition.
- (4) All specifications identified as such by Contractor, including, but not limited to, the Project Schedule, but only to the extent: (i) not inconsistent with any of the foregoing in this Paragraph; and (ii) acceptable to County in its sole discretion.
- (5) All System Environment requirements and certifications provided by Contractor in accordance with this Agreement with respect to the System.
- (6) All requirements and/or specifications added to the System by Additional Work, including Customizations, Interfaces, and Additional Products, and any Software Updates.
- (7) All written and/or electronic materials furnished by or through Contractor regarding the Application Software or the System, including functionality, features, capacity, availability, response times, accuracy or any other performance or other System criteria or any element of the System or any System component.

1.3.104 State

The term "State" means the State of California.

1.3.105 Statement of Work; SOW

The terms "Statement of Work" and "SOW" shall mean the Work to be provided by Contractor pursuant to this Agreement identified in terms of Tasks, Subtasks and Deliverables in Exhibit A (Statement of Work).

1.3.106 System

The term "System" shall mean the combination of the software, hardware, networking and infrastructure for the operation of Application Software provided by Contractor, including but not limited to the System Environment, System Software, System Hardware, System Data, System Environment components and the products of any Additional Work that may be provided by Contractor to County upon County's request and approval in accordance with the terms of this Agreement.

1.3.107 System Data

The term "System Data" shall mean the data utilized by and/or stored in the System.

1.3.108 System Environment

The term "System Environment" shall mean the architectural and operational environment of the System, and related Documentation, including System Hardware and Third-Party Software.

1.3.109 System Hardware

The term "System Hardware" shall mean hardware, networking and other equipment provided by County or Contractor, as applicable, as part of the System Environment.

1.3.110 System Maintenance

The term "System Maintenance" shall mean Maintenance Services and Support Services provided by Contractor in accordance with Exhibit C (System Maintenance), as further specified in Paragraph 10.3 (System Maintenance).

1.3.111 System Requirements

The term "System Requirements" shall mean business, operational, technical and/or functional requirements relating to the operation or utilization of the System, as specified in Attachment A.1 (System Requirements).

1.3.112 System Software

The term "System Software" shall mean the software, including Application Software, County Software and Third Party Software, and related Documentation, provided by County or Contractor, as applicable, as part of the System in accordance with the terms of this Agreement.

1.3.113 Task; task; Subtask; subtask

The terms "Task", "task", "Subtask" and "subtask" shall mean one of the areas of work to be performed under this Agreement, including those identified as numbered Tasks and Subtasks in Exhibit A (Statement of Work).

1.3.114 Third Party Application

The term "Third Party Application" shall mean the portion of the Application Software provided by Contractor to County under this Agreement that is not proprietary to Contractor.

1.3.115 Third Party Products

The term "Third Party Product(s)" shall mean any products of third parties provided by Contractor to County or Participating Cities under this Agreement as part of the System, and related Documentation, to meet some of the System Requirements.

1.3.116 Third Party Software

The term "Third Party Software" shall mean any software of third parties provided by Contractor or County, as applicable, under this Agreement as part of the System, including those included in the System Environment and Application Software. Such Third Party Software is listed on Attachment A.7 (Third Party Software).

1.3.117 Training

The term "Training" shall mean training relating to the System to be provided by Contractor pursuant to this Agreement, including initial System training and any additional training that County may acquire as part of Professional Services.

1.3.118 User

The term "User" shall mean any person authorized by County to access or use the System pursuant to this Agreement.

1.3.119 Version Release

The term "Version Release" shall mean Contractor's Application Software version upgrade which may contain new software functionalities and features and/or system compatibilities.

1.3.120 Work

The term "Work" shall mean any and all tasks, subtasks, deliverables, services and other work provided, or to be provided, by or on behalf of Contractor pursuant to this Agreement, including System components, Implementation Services, System Maintenance and Additional Work. and as explained in the Statement of Work, including Software Modifications.

1.3.121 Work Day

The term "Work Day" shall mean any day of eight (8) working hours from 7:00 a.m. to 6:00 p.m. Pacific Time (PT), Monday through Thursday, excluding County observed holidays.

1.4 AMBIGUITIES OR DISCREPANCIES

Both parties have either consulted or had the opportunity to consult with counsel regarding the terms of this Contract and are fully cognizant of all terms and conditions. Should there be any uncertainty, ambiguity, or discrepancy in the terms or provisions hereof, or should any misunderstanding arise as to the interpretation to be placed upon any position hereof or the applicability of the provisions hereunder, neither party shall be deemed as the drafter of this Contract and the uncertainty, ambiguity, or discrepancy shall not be construed against either party.

2. ADMINISTRATION OF AGREEMENT – COUNTY

2.1 COUNTY ADMINISTRATION

All persons administering this Agreement on behalf of County and identified in this Paragraph 2.1 below (hereinafter "County Key Personnel") are listed in Section 1 (County Key Personnel) of Exhibit E (Administration of Agreement). Unless otherwise specified, reference to each of the persons listed in such Section 1 (County Key Personnel) of Exhibit E (Administration of Agreement) shall also include his/her designee. County will notify Contractor in writing of any change in the names and/or addresses of County Key Personnel.

No member of County Key Personnel is authorized to make any changes in any of the terms and conditions of this Agreement other than those specifically authorized under Paragraph 4 (Change Notices and Amendments).

2.2 COUNTY KEY PERSONNEL

2.2.1 County's Project Director

County's Project Director will be responsible for ensuring that the objectives of this Agreement are met. County's Project Director will have the right at all times to inspect any and all Work provided by or on behalf of Contractor.

2.2.2 County's Project Manager

County's Project Manager will be responsible for ensuring that the technical, business and operational standards and requirements of this Agreement are met. County's Project Manager will interface with Contractor's Project Manager on a regular basis. County's Project Manager will report to County's Project Director regarding Contractor's performance with respect to technical standards and functional performance. Unless specified otherwise, County's Project Manager shall be the designee of County's Project Director.

2.3 COUNTY PERSONNEL

All County personnel assigned to this Agreement shall be under the exclusive supervision of County. Contractor understands and agrees that all such County personnel are assigned only for the convenience of County. Contractor hereby represents that its price, Project Schedule, and performance hereunder are based solely on the work of Contractor's personnel, except as otherwise expressly provided in this Agreement.

2.4 APPROVAL OF WORK

All Tasks, Subtasks, Deliverables, and other Work provided by Contractor under this Agreement must have the written approval of County's Project Manager as described in this Paragraph 2.4. In no event, shall County be liable or responsible for any payment prior to such written approval. Furthermore, County reserves the right to reject any Work not approved by County.

3. ADMINISTRATION OF AGREEMENT – CONTRACTOR

3.1 CONTRACTOR ADMINISTRATION

All persons administering this Agreement on behalf of Contractor and identified in this Paragraph 3 below (hereinafter "Contractor Key Personnel") are listed in Section 2 (Contractor Key Personnel) of Exhibit E (Administration of Agreement). All staff employed by and/or on behalf of Contractor, including the persons listed in such Section 2 (Contractor Key Personnel) of Exhibit E (Administration of Agreement), shall be adults who are fully fluent in both spoken and written English. Contractor shall notify County in writing of any change in the names and/or addresses of Contractor Key Personnel.

3.2 CONTRACTOR KEY PERSONNEL

3.2.1 Contractor's Project Director

Contractor's Project Director shall be responsible for Contractor's performance of all its tasks, subtasks and other Work and ensuring Contractor's compliance with this Agreement. Contractor's Project Director shall meet and confer with County's Project Director as required by County. Such meetings shall be conducted via teleconference or at a time and place agreed to by County's Project Director and Contractor's Project Director.

3.2.2 Contractor's Project Manager

Contractor's Project Manager shall be responsible for Contractor's day-to-day activities as related to this Agreement and for reporting to County in the manner set forth in Paragraph 3.5 (Status Reports by Contractor). Contractor's Project Manager shall interface with County's Project Manager on a regular basis to review project progress and discuss project coordination. Such meetings shall be conducted via teleconference or at a time and place agreed to by County's Project Director and Contractor's Project Director.

3.3 APPROVAL OF CONTRACTOR'S STAFF

3.3.1 In fulfillment of its responsibilities under this Agreement, Contractor shall utilize, and permit utilization of, only staff fully trained and experienced, and as appropriate, licensed or certified in the technology, trades, tasks, and subtasks required by this Agreement. Contractor shall supply sufficient staff to discharge its responsibilities hereunder in a timely and efficient manner.

3.3.2 County shall have the right to approve or disapprove each member, or proposed member, of Contractor's Project Director, Contractor's Project Manager and any staff providing Training or on-site Work to County under this Agreement or with access to any of County's sensitive information (hereinafter "Contractor Key Staff") prior to and during their performance of any Work hereunder, as well as so approving or disapproving any proposed deletions from or other changes in such Contractor Key Staff. County's Project Manager, in his/her reasonable discretion, may require replacement of any member of the Contractor Key Staff performing, or offering to perform, Work hereunder. Contractor shall provide County with a resume of each such proposed initial Contractor Key Staff member and a proposed substitute and an opportunity to interview such person prior to his/her performance of any Work hereunder.

3.3.3 In addition, Contractor shall provide to County's Project Director an executed Contractor Acknowledgement and Confidentiality Agreement (Exhibit G) for each member of the Contractor Key Staff performing Work under this Agreement on or immediately after the Effective Date, but in no

event later than the date such member of the Contractor Key Staff first performs Work under this Agreement.

- 3.3.4 Contractor shall, to the maximum extent possible, take all necessary steps to ensure continuity over time of the membership of the group constituting the Contractor Key Staff. Contractor shall promptly fill any Contractor Key Staff vacancy with personnel having qualifications at least equivalent to those of the Contractor Key Staff member(s) being replaced.
- 3.3.5 In the event Contractor should ever need to remove any member of the Contractor Key Staff from performing Work under this Agreement, Contractor shall provide County with notice at least fifteen (15) days in advance, except in circumstances in which such notice is not possible, and shall work with County on a mutually agreeable transition plan so as to provide an acceptable replacement and ensure project continuity. Should County be dissatisfied with any member of the Contractor Key Staff during the term of the Agreement, Contractor shall replace such person with another to County's satisfaction.
- 3.3.6 Contractor shall supply sufficient staff to discharge its responsibilities hereunder in a timely and efficient manner.
- 3.3.7 All staff employed by and on behalf of the Contractor shall be adults who are legally eligible to work under the laws of the United States of America and the state of California. All Contractor Key Personnel and all other members of the Contractor's staff who have direct contact with County (either by telephone, electronic or written correspondence, or in person) shall be fully fluent in both spoken and written English.

3.4 BACKGROUND AND SECURITY INVESTIGATIONS

- 3.4.1 Each of Contractor's staff performing Work under this Agreement, who is in a designated sensitive position, as determined by County in County's sole discretion, shall undergo and pass a background investigation to the satisfaction of County as a condition of beginning and continuing to perform Work under this Agreement. Such background investigation must be obtained through fingerprints submitted to the California Department of Justice to include State, local and federal-level review, which may include, but shall not be limited to, criminal conviction information. The fees associated with the background investigation shall be at the expense of Contractor, regardless of whether the member of Contractor's staff passes or fails the background investigation.

If a member of Contractor's staff does not pass the background investigation, County may request that the member of Contractor's staff be removed immediately from performing Work under the Agreement. Contractor shall comply with County's request at any time during the term of the Agreement. County will not provide to Contractor or

to Contractor's staff any information obtained through the County's background investigation.

3.4.2 County may immediately, in its sole discretion, deny or terminate facility access to any of Contractor's staff, including subcontractor's staff, who do not pass such background investigation(s) to the satisfaction of County and/or whose background or conduct is incompatible with County's facility access.

3.4.3 Disqualification, if any, of Contractor's staff, including subcontractor's staff, pursuant to this Paragraph 3.4 shall not relieve Contractor of its obligation to complete all Work in accordance with the terms and conditions of this Agreement.

3.5 STATUS REPORTS BY CONTRACTOR

In addition to any reports required elsewhere pursuant to this Agreement including the Statement of Work, in order to control expenditures and to ensure the reporting of all Work provided by Contractor, Contractor shall provide to County's Project Manager, as frequently as requested by County's Project Manager, but in no event more frequently than monthly, written reports which shall include, at a minimum, the following information:

- (1) Tasks accomplished since the last meeting.
- (2) A review of any incomplete Tasks and the reasons why they are not completed.
- (3) An outline of the Tasks anticipated to be accomplished in the next monthly period.
- (4) A list and status of outstanding issues, Deliverables, and Invoices as required by this Agreement.
- (5) Any Project risks or problems identified as part of the implementation process.
- (6) Tracking of all issues and their resolution.

3.6 RULES AND REGULATIONS

During the time when Contractor's employees, subcontractors or agents are at County facilities, such persons shall be subject to the applicable rules and regulations of County facilities. It is the responsibility of Contractor to acquaint such persons, who are to provide Work, with such rules and regulations. In the event that County determines that an employee, subcontractor or agent of Contractor has violated any applicable rule or regulation, County shall notify Contractor, and Contractor shall undertake such remedial or disciplinary measures as Contractor determines appropriate. If the reported violation is not thereby corrected, then Contractor shall permanently withdraw its employee, subcontractor or agent from the provision of Work upon receipt of written notice from County that:

- (i) such employee, subcontractor or agent has violated such rules or regulations;

or (ii) such employee's, subcontractor's or agent's actions, while on County premises, indicate that the employee, subcontractor or agent may adversely affect the provision of Work. Upon removal of any employee, subcontractor or agent, Contractor shall immediately replace the employee, subcontractor or agent and continue uninterrupted Work hereunder.

3.7 CONTRACTOR'S STAFF IDENTIFICATION

3.7.1 Contractors shall provide each member of the staff assigned to this Agreement staff a visible photo identification badge. While on duty or when entering a County facility or its grounds, shall prominently display the photo identification badge on the upper part of the body. The format and content of the badge is subject to County's approval prior to Contractor implementing the use of the badge.

3.7.2 Contractor shall notify County within one (1) Business Day when staff is terminated from work under this Agreement. Contractor is responsible to retrieve and immediately destroy the staff's County-specified photo identification badge at the time of removal from Work under this Agreement.

3.7.3 If County requests the removal of Contractor's staff, Contractor shall be responsible to retrieve and immediately destroy Contractor staff's County photo identification badge at the time of removal from work under this Agreement.

4. CHANGES NOTICES AND AMENDMENTS

4.1 GENERAL

No representative of either County or Contractor, including those named in this Agreement, is authorized to make any changes in any of the terms, obligations, or conditions of this Agreement, except through the procedures set forth in this Paragraph 4. County reserves the right to change any portion of the Work required under this Agreement or to amend such other terms or conditions as may become necessary. All such changes shall be accomplished only as provided in this Paragraph 4.

4.2 CHANGE NOTICES

Except as otherwise provided in this Agreement, for any change requested by County which does not materially affect the Work or term, payments or any term or condition included in this Agreement, a negotiated written notice of such change (hereinafter "Change Notice") shall be prepared and executed by County's Project Director and Contractor's Project Director or Contractor' authorized representative(s). Consistent with the foregoing, the parties shall execute a Change Notice in the form of a Change Order for (i) any acquisition of Additional Work under the Agreement; (ii) changes to the Statement of Work or System Requirements, which do not materially impact the scope of Work; and (iii)

reallocating to the Pool Dollars available under the Agreement any savings resulting from revisions to the Statement of Work or System Requirements.

4.3 AMENDMENTS

Except as otherwise provided in the Agreement, for any change requested by County that materially affects the scope of Work, term, payments or any term or condition included in this Agreement, a negotiated written amendment shall be prepared and executed by Contractor, by its authorized representative(s), and County, by its Board of Supervisors or, if delegated by the Board, the Director.

Notwithstanding the foregoing, the Director, or designee, is specifically authorized to issue notices for exercising Agreement term extension options as provided in Paragraph 7.2 (Extended Term). Furthermore, the Director is specifically authorized to execute Amendments on behalf of County to (i) add and/or update terms and conditions as required by County's Board of Supervisors or the Chief Executive Office; and (ii) effect assignment of rights and/or delegation of duties as required under Paragraph 20 (Prohibition against Assignment and Delegation).

5. PROJECT SCHEDULE

Changes to the Project Schedule shall be made upon mutual agreement, in writing, by County's Project Director and Contractor's Project Director by Change Notice or otherwise, provided that County's Project Director's and Contractor's Project Director's agreement to alter the Project Schedule shall not prejudice either party's right to claim that such alterations constitute an Amendment to this Agreement that shall be governed by the terms of Paragraph 4.3 (Amendments) above.

6. BOARD ORDERS

Notwithstanding any other provision of this Paragraph 4 or Paragraph 22 (Termination/Suspension for Convenience), Director shall take all appropriate actions to carry out any orders of County's Board of Supervisors relating to this Agreement, which directly impact the Software or the budget allocated for the Software or the Agreement, and, for this purpose, Director is authorized: (i) to issue written notice(s) of partial or total termination of this Agreement pursuant to Paragraph 22 (Termination/Suspension for Convenience) without further action by County's Board of Supervisors and/or (ii) to prepare and execute Amendment(s) to this Agreement, which shall reduce the Work and the Contract Sum without further action by County's Board of Supervisors.

Such notices of partial or total termination shall be authorized under the following conditions:

- (1) Notices shall be in compliance with all applicable Federal, State and County laws, rules, regulations and ordinances, and publicly known guidelines and directives.
- (2) Director shall obtain the approval of County Counsel for any notice.

- (3) Director shall file a copy of all notices with the Executive Office of County's Board of Supervisors and County's Chief Executive Office within thirty (30) days after execution of each notice.

Such Amendments shall be authorized under the following conditions:

- (1) Amendments shall be in compliance with all applicable Federal, State, and County laws, rules, regulations and ordinances, and publicly known guidelines and directives.
- (2) County's Board of Supervisors has appropriated sufficient funds for purposes of such Amendments and this Agreement.
- (3) Director shall obtain the approval of County Counsel for any Amendment.
- (4) Director shall file a copy of all Amendments with the Executive Office of County's Board of Supervisors and County's Chief Executive Office within thirty (30) days after execution of each Amendment.

6.1 CHANGE ORDERS

Change Orders proposed or executed by the parties for acquisition of Additional Work or other changes to the Statement of Work allowable under the Agreement by Change Notice shall include, unless waived in writing by County's Project Director:

- (1) A quotation of a "not to exceed" Maximum Fixed Price for completion and delivery of the requested Work, including a proposed Task and Deliverable completion schedule and a monthly budget of anticipated expenditures (including labor expenses calculated using the Hourly Labor Rates for personnel time);
- (2) Staff level recommended for completion of the applicable Work;
- (3) Estimated personnel hours for completion of the requested Work;
- (4) To the extent Software Modifications are requested, functional Software specifications;
- (5) Final delivery date for completed Work, including any post-delivery acceptance period as may be applicable;
- (6) If applicable, a revised Task and Deliverable completion schedule under the SOW for the remaining Work (i.e., other than the Work requested under the Change Order);
- (7) A description and Contractor's cost of any applicable hardware, third party software, or other materials required to complete the requested Work; and

6.1.1 DURATION OF CHANGE ORDER PRICE QUOTATION

Contractor's quotations under the proposed Change Order, including the "not to exceed price" under Paragraph 4.6, shall be valid for ninety (90) days from the date of its submission.

6.1.2 CHANGE ORDER DISPUTE RESOLUTION

In the event the parties fail to agree on the amount to be paid by County for the Work requested pursuant to a Change Order, County may, upon notice to Contractor, elect to direct Contractor to commence performing such Work (and Contractor agrees to commence performing such Work) and resolve the dispute over amounts owed to Contractor in accordance with the Dispute Resolution Procedure. To give effect to the preceding sentence, however, County agrees to pay and will pay the undisputed portion of such fees in accordance with the procedures set forth in Paragraph 4.1 (General) and Paragraph 9 (Invoices and Payments).

6.1.3 CHANGE ORDER AUDIT

County is entitled to audit, in accordance with Paragraph 31 (Records and Audits), Contractor's compliance with Paragraph 4.6 (Change Order) with respect to the Work performed pursuant to any Change Order.

6.2 FACSIMILE/ELECTRONIC MAIL TRANSMISSION

Except for the parties' initial signatures to this Agreement, which must be provided in "original" form and not by facsimile, County and Contractor hereby agree to regard facsimile and electronic mail transmission representations of original signatures of authorized officials of each party, when appearing in appropriate places on the Change Notices prepared pursuant to this Paragraph 4 and received via communications facilities, as legally sufficient evidence that such original signatures have been affixed to Change Notices to this Agreement, such that the parties need not follow up facsimile/electronic mail transmissions of such documents by subsequent (non-facsimile) transmissions of "original" versions of such documents.

7. SCOPE OF WORK

In exchange for County's payment to Contractor of the applicable fees arising under the Agreement and invoiced by Contractor, Contractor shall (a) on a timely basis provide, complete, deliver and implement all Work set forth in this Agreement, including Exhibit A (Statement of Work) and Exhibit C (System Maintenance), Contractor shall perform all such tasks, subtasks, deliverables, services and other Work in accordance with Exhibit A (Statement of Work) with all Attachments thereto and Exhibit C (System Maintenance) with all Schedules thereto at the applicable rates and prices specified in Exhibit B (Schedule of Prices) with all Schedules thereto.

7.1 SYSTEM COMPONENTS

Contractor shall provide the License to all System Software, including, but not limited to, Application Software, Third Party Software including Third Party Products and all Software Modifications in order to meet the System Requirements as such may be revised during the term of the Agreement, all in accordance with the provisions of Paragraph 10 (Ownership and License) and the Agreement.

7.2 SYSTEM MAINTENANCE

Contractor shall provide County System Maintenance services relating to the maintenance and support of the System, including but not limited to Maintenance Services and Support Services, as provided in, and in accordance with, this Agreement, including Exhibit C (System Maintenance). System Maintenance obligations shall commence upon Go-Live and shall continue through the term of this Agreement.

7.3 ADDITIONAL WORK

Upon the written request of County's Project Director or designee and mutual agreement, Contractor shall provide to County Additional Work using Pool Dollars, including Programming Modifications, Professional Services and/or Additional Products, at the applicable pricing terms set forth in Exhibit B (Schedule of Prices). Programming Modifications shall only include those products and services relating to the requirements not reflected on the Effective Date in the Specifications or System Requirements, as determined by County's Project Director or designee.

Upon County's request and Contractor's agreement to provide the Additional Work, Contractor shall provide to County within ten (10) Business Days of such request, or such longer period as agreed to by the parties, a proposed Scope of Work and a quote for a Maximum Fixed Price calculated in accordance with the applicable pricing terms set forth in Exhibit B (Schedule of Prices), including Schedules B.1 (Schedule of Prices As Needed Services) and B.2 (Additional Work Schedule). Following agreement by the parties with respect to such Scope of Work and the Maximum Fixed Price, the parties shall execute a Change Order for such Additional Work in accordance with Paragraph 4.6 (Change Orders). Upon completion by Contractor, and approval by County in accordance with the terms of this Agreement, of such Additional Work, Schedule B.2 (Additional Work Schedule) shall be updated by County accordingly to add such items of Additional Work by Change Notice or otherwise by notice to Contractor.

7.4 STANDARD OF SERVICES

Contractor's services and other Work required by this Agreement shall during the term of the Agreement conform to reasonable commercial standards as they exist in Contractor's profession or field of practice. If Contractor's services or other work provided under this Agreement fail to conform to such standards, upon notice from County specifying the failure of performance, Contractor shall, at Contractor's sole expense, provide the applicable remedy as specified in this Agreement, including

Exhibit A (Statement of Work) and Exhibit C (System Maintenance). Contractor shall, at its own expense, correct any data in which (and to the extent that) errors have been caused by Contractor or malfunctions of the System or by any other tools introduced by Contractor into the System for the purpose of performing services or other Work under this Agreement or otherwise.

7.5 TESTING OF WORK

Contractor shall conduct all appropriate testing of the System before providing any Work hereunder, including Additional Work, to ensure the compliance with all System Requirements set forth in the Agreement, that the System is free of any Deficiencies and that the Additional Work meets the requirements of the applicable Scope of Additional Work. Such System tests shall test, among others, the System's functionality, integration and interfacing, volume endurance and user acceptance.

7.6 INTEGRATION/INTERFACING

From time to time, Contractor may be responsible for developing, and incorporating into the System, Software Modifications, including Programming Modifications and Additional Products, in the form of Additional Work. If such Software Modifications are to be integrated or interfaced with other software, equipment and/or systems provided by Contractor or at the direction of Contractor, the Software Modifications shall not be deemed Accepted by County until the Software Modifications and such other systems have been successfully integrated or interfaced and accepted by County in accordance with the terms of this Agreement. For example, if Contractor is to provide a System consisting of multiple modules or that includes enhancements to the System as part of the Additional Work, County's acceptance of the System, any individual module or enhancement shall not be final until County accepts all of the Software Modifications and modules or enhancements integrated or interfaced together as a complete System, including the operation of the System on all equipment required for its use in conformance with the terms of this Agreement. Contractor shall not obtain any ownership interest in any other systems merely because they were interfaced, integrated, or used with the System.

7.7 UNAPPROVED WORK

If Contractor provides any tasks, subtasks, deliverables, services, or other work to County other than those specified in this Agreement, or if Contractor provides such items requiring County's prior written approval without first having obtained such written approval, the same shall be deemed to be a gratuitous effort on the part of Contractor, and Contractor shall have no claim whatsoever against County therefor.

8. PROJECT SCHEDULE

8.1 PROJECT PLAN

Contractor shall implement the System in accordance with the Project Schedule, set forth in Exhibit B (Schedule of Prices).

8.2 KEY DELIVERABLES AND MILESTONES

Exhibit B (Schedule of Prices) shall specify certain Deliverables as Key Deliverables and/or Milestones, as determined by County. A Key Deliverable or a Milestone shall be deemed completed for purposes of this Paragraph 6.2 on the earliest date that all of the tasks, subtasks, deliverables, services, and other Work required for completion of such Key Deliverable or Milestone are completed and delivered to County, provided that all Work required for completion of such Key Deliverable or Milestone is thereafter approved in writing by County pursuant to Paragraph 2.4 (Approval of Work) without prior rejection by County or significant delay in County's approval thereof, which delay is the result of Contractor's failure to deliver such tasks, subtasks, deliverables, services, and other Work in accordance with the terms hereof. The determination of whether a Key Deliverable or Milestone has been so completed and so approved, and of the date upon which such Key Deliverable or Milestone was completed, shall be made by County's Project Director as soon as practicable in accordance with Paragraph 2.4 (Approval of Work) after County is informed by Contractor that such Key Deliverable or Milestone has been completed and is given all the necessary information, data and documentation to verify such completion.

9. TERM

9.1 INITIAL TERM

The term of this Agreement shall commence upon the Effective Date and shall expire six (6) years thereafter, unless sooner terminated or extended, in whole or in part, as provided in this Agreement (hereinafter "Initial Term").

9.2 EXTENDED TERM

At the end of the Initial Term, County may, at its sole option, extend this Agreement for four (4) additional years, one (1) year at a time, (hereinafter "Extended Term(s)"), subject to, among others, County's right to terminate earlier for convenience, non-appropriation of funds, default of Contractor, substandard performance of Contractor, non-responsibility of Contractor, and any other term or condition of the Agreement providing for early termination of the Agreement by County. County may exercise its option under this Paragraph 7.2 to extend the Agreement beyond the Initial Term by providing an advance written notice to Contractor no later than thirty (30) days prior to the expiration of the Initial Term. Should County elect not to exercise the extension option as specified in this Paragraph 7.2, this Agreement shall expire as of midnight at the end of the Initial Term. County maintains databases that track/monitor Contractor performance

history. Information entered into such databases may be used for a variety of purposes, including determining whether County will exercise an Agreement term extension option.

9.3 DEFINITION OF TERM

As used throughout this Agreement, the word "term" when referring to the term of the Agreement shall include the Initial Term and the Extended Term, to the extent County exercises any of its extension option pursuant to Paragraph 7.2 (Extended Term).

9.4 NOTICE OF EXPIRATION

Contractor shall notify County when this Agreement is within six (6) months from the expiration of the term. Upon occurrence of this event, Contractor shall send written notification to County's Project Director at the address set forth in Section 1 (County Key Personnel) of Exhibit E (Administration of Agreement).

10. CONTRACT SUM

10.1 MAXIMUM CONTRACT SUM

The Contract Sum under this Agreement shall be the total monetary amount payable by County to Contractor for supplying all the tasks, subtasks, deliverables, services, and other Work required or requested by County under this Agreement. All Work completed by Contractor must be approved in writing by County in accordance with Paragraph 2.4 (Approval of Work). If County does not approve work in writing, no payment shall be due Contractor for that Work. The Contract Sum, including all applicable taxes, authorized by County hereunder shall not exceed \$2,919,400, as further detailed in Exhibit B (Schedule of Prices), unless the Contract Sum is modified pursuant to a duly approved Amendment to this Contract by County's and Contractor's authorized representative(s) pursuant to Paragraph 4 (Change Notices and Amendments). The Contract Sum under this Agreement shall cover authorized payments for any and all Work provided by Contractor under the Agreement, including all System components, Implementation Services, System Maintenance and any Additional Work. Contractor acknowledges and agrees that the Maximum Contract Sum is an all-inclusive, not-to-exceed price, that is an agreed upon assessment of the amount to be paid by County to Contractor in exchange for Contractor to deliver to County, and County accepting, within the required delivery schedule. Notwithstanding any provision of this Agreement to the contrary, Contractor is not obligated to perform Work under Change Orders if Pool Dollars are not available to pay for such Work.

Contractor shall maintain a system of record keeping that will allow Contractor to determine when it has incurred seventy-five percent (75) of the Contract Sum, including the Pool Dollars expenditures, authorized for this Agreement. Upon occurrence of these events, Contractor shall provide written notification to County's Project Director at the address set forth in Section 1 (County Key Personnel) in Exhibit E (Administration of Agreement). Notwithstanding the foregoing,

Contractor's failure to provide such notification shall not constitute a material breach of this Agreement.

10.2 SYSTEM IMPLEMENTATION

10.2.1 Implementation Cost

County will reimburse Contractor for System Implementation by payment of the applicable Implementation Cost for providing System Environment specifications, System Software installation, data migration and/or conversion (if any), Acceptance Tests, and any other Work to be provided by Contractor as part of System Implementation pursuant to Exhibit A (Statement of Work). Implementation Cost will be paid by County to Contractor following Contractor's completion and County's approval of the Statement of Work Deliverables as set forth in Exhibit B (Schedule of Prices).

10.2.2 Credits to County

In an increasingly mobile society, it is critical to improve traffic flow through multiple jurisdictions within the County of Los Angeles in an effort to enhance mobility, relieve traffic congestion and increase air quality. To meet these goals, County is implementing a Countywide information exchange network that will provide continuous monitoring of traffic conditions and traffic signal operations, as well as enable traffic signal timing to be controlled and coordinated remotely to adjust to actual traffic conditions. It will also allow for the exchange of traffic data and information among different agencies within the County of Los Angeles. The System will communicate with the information exchange network and is being administered by County as the traffic control system for the unincorporated areas of the County of Los Angeles as well as certain agencies within the County. Because many agencies need to be brought online in a timely manner, time is of the essence to implement the System. Any delay in the completion and delivery of the System decreases the efficiency and value of both the System and the information exchange network. County and Contractor have identified the Key Deliverables set forth in the Project Schedule specified in Exhibit B (Schedule of Prices), Contractor's timely completion and delivery of which will ensure County receives, and is able to implement, the System in a timely fashion, and therefore improve mobility, relieve traffic congestion, and enhance air quality in the County of Los Angeles. If Contractor fails to complete and deliver such Key Deliverables by the dates set forth in such Project Schedule, it is mutually agreed that such delay increases the likelihood that Contractor will not complete and deliver the System in a timely manner, and, therefore, decreases County's ability to use the System to achieve its goals.

Contractor, therefore, agrees that delayed performance by Contractor will cause damages to County, which are uncertain and would be impracticable or extremely difficult to ascertain in advance. Contractor further agrees that,

in conformity with California Civil Code Section 1671, Contractor shall be liable to County for liquidated damages in the form of credits, as specified in Paragraph 8.2.2 below, as a fair and reasonable estimate of such damages. Any amount of such damages is not and shall not be construed as penalties and, when assessed, will be deducted from County's payment that is due.

For each and every occasion upon which a Key Deliverable has not been completed by Contractor within thirty (30) days after the date scheduled for completion thereof as set forth in such Project Schedule, other than as a result of delays caused by acts or omissions of County, and unless otherwise approved in writing by County's Project Manager or designee in his/her discretion, County shall be entitled to receive credit against any or all amounts due to Contractor under this Agreement or otherwise. All of the foregoing credits shall apply separately, and cumulatively, to each such Key Deliverable in the Project Schedule. Determination whether County shall assess credits due to it pursuant to this Paragraph 8.2.2 shall be made by County's Project Manager in his/her reasonable discretion.

Such credits will be calculated according to the following rules:

- (i) Key Deliverables not properly completed within thirty (30) working days of the Deliverable due date, as specified in Exhibit B (Schedule of Prices), shall entitle County to a credit of Five Hundred Dollars (\$500) for each day of the actual cost of such Deliverable, as set forth in Exhibit B (Schedule of Prices).
- (ii) The credits shall be increased by Five Hundred Dollars (\$500) for each day of such cost each Working Day the Deliverable is late beyond the thirty (30) working days.

A Deliverable shall be deemed completed for purposes of this Paragraph 8.2.2 and Paragraph 8.2.3 (Termination/Suspension) on the earliest date that all of the tasks, subtasks, deliverables, services and other Work required for the completion of such Deliverable are completed and delivered to County, provided that all of such tasks, subtasks, deliverables, services, and other Work required for the completion of such Deliverable are thereafter approved in writing by County pursuant to Paragraph 2.4 (Approval of Work) without prior rejection by County or significant delay in County's approval thereof, which delay is the result of Contractor's failure to deliver such tasks, subtasks, deliverables, services and other Work in accordance with the terms hereof. For purposes of this Paragraph 8.2.2 and Paragraph 8.2.3 (Termination/Suspension), the determination of whether a Deliverable has been so completed and is so approved, and of the date upon which such Deliverable was completed, shall be made by County's Project Director as soon as practicable after County is informed by Contractor that such Deliverable has been completed and is given all the necessary information, data and documentation to verify such completion.

10.2.3 Termination/Suspension

In addition to the foregoing provisions of Paragraph 8.2.2 (Credit to County), if any Deliverable is not completed within ninety (90) days after the applicable Due Date, and thereafter approved in writing by County pursuant to Paragraph 2.4 (Approval of Work), other than as a result of delays caused by acts or omissions of County as determined by Director in his/her reasonable judgment, and unless County's Project Director and Contractor's Project Director have otherwise agreed in writing prior to such date scheduled for completion, then County may, upon notice to Contractor, terminate/suspend this Agreement for default in accordance with Paragraph 21 (Termination/Suspension for Default) or for convenience in accordance with Paragraph 22 (Termination/Suspension for Default), as determined in the sole discretion of County, subject to the cure provisions set forth in Paragraph 21 (Termination/Suspension for Default).

10.3 SYSTEM MAINTENANCE

Contractor shall, during the term of this Agreement, provide County System Maintenance services, including Maintenance Services and Support Services, in exchange for County's payment of the applicable Service Fees in accordance with and as set forth in Exhibit B (Schedule of Prices), with all Schedules thereto. Service Fees will be paid by County to Contractor for System Maintenance commencing upon Notice to Proceed and shall not exceed the amounts specified in such Exhibit B (Schedule of Prices). Service Fees, including all components thereof, shall not increase during the Initial Term of the Agreement and shall increase by no more than the fixed COLA during the first year of the Extended Term of the Agreement.

10.4 RESERVED.

10.5 NON-APPROPRIATION OF FUNDS

County's obligation may be limited if it is payable only and solely from funds appropriated for the purpose of this Agreement. Notwithstanding any other provision of this Agreement, County shall not be obligated for Contractor's performance hereunder or by any provision of this Agreement during any of County's future fiscal years unless and until County's Board of Supervisors appropriates funds for this Agreement in County's budget for each such future fiscal year. In the event that funds are not appropriated for this Agreement, then County shall, at its sole discretion, either (i) terminate this Agreement as of June 30 of the last fiscal year for which funds were appropriated or (ii) reduce the work provided hereunder in accordance with the funds appropriated, as mutually agreed to by the parties. County will notify Contractor in writing of any such non-appropriation of funds at its election at the earliest possible date.

10.6 COUNTY'S OBLIGATION FOR FUTURE FISCAL YEARS

In the event that County's Board of Supervisors adopts, in any fiscal year, a County Budget which provides for the reductions in the salaries and benefits paid to the majority of County employees and imposes similar reductions with respect to County contracts, County reserves the right to reduce its payment obligation under this Agreement correspondingly for that fiscal year and any subsequent fiscal year during the term of this Agreement (including any extensions), and the services to be provided by Contractor under this Agreement shall also be reduced correspondingly. County's notice to the Contractor regarding said reduction in payment obligations shall be provided within thirty (30) calendar days of the Board of Supervisors' approval of such actions. Except as set forth in the preceding sentence, Contractor shall continue to provide all of the services set forth in this Agreement.

10.7 COST-OF-LIVING ADJUSTMENT

The cost of living adjustment for the Hourly Labor Rates applicable to any Work to be performed by Contractor under Tasks 1 (Project Management), 2.1 (Technical and Operational Support Monthly Progress Reports), 9 (Training) and 11 (Software and System Migration Support), provided by Contractor under this Agreement for the first year of the Extended Term shall be the lesser of: (i) the most recently published percentage change, if any, in the U.S. Department of Labor, Bureau of Labor Statistics Consumer Price Index (CPI) for the Los Angeles — Riverside — Orange County Area for the twelve (12) month period preceding the Agreement anniversary date, (ii) the general salary movement percentage granted to County employees for the twelve (12) month period preceding the prior July 1 as determined by County's Chief Executive Office and (iii) capped at 3 percent. The percentage change in the rate of compensation shall equal 12 times the average monthly change in the CPI over the first nine months of the contract term preceding the initial term. However, any percentage increase shall not exceed the general salary movement granted to County employees as determined by the County Chief Executive Office (hereinafter "Cost-of-Living Adjustment" or "COLA"). With regard to the general salary movement number, the pertinent figure in any fiscal year (hereinafter "FY") will always be determined by a retrospective look at the prior fiscal year. Furthermore, should fiscal circumstances ultimately prevent the Board from approving any increase in County employee salaries, no Cost-of-Living Adjustment will be granted.

11. INVOICES AND PAYMENTS

11.1 INVOICES

Contractor shall invoice County in accordance with Exhibit B (Schedule of Prices), for (i) Implementation Services, based on the Deliverable amounts due upon Contractor's completion and County's written approval of billable Deliverables; (ii) System Maintenance, by payment in arrears of the applicable Service Fees for System Maintenance commencing upon Notice to Proceed; and (iii) all Additional Work, on a per Change Notice basis, by payment of the actual price expended by

Contractor for the provision of any such Additional Work, which shall not exceed the Maximum Fixed Price quoted for such Additional Work following Contractor's completion and County's written approval of the Additional Work.

11.1.1 Submission of Invoices

Contractor's invoice shall include the charges owed to Contractor by County under the terms of this Agreement as provided in Exhibit B (Schedule of Prices). All invoices and supporting documents under this Agreement shall itemize the Work completed or invoiced and shall be submitted in triplicate (original and two copies) to the person(s) and address specified in Exhibit E (Administration of Agreement).

11.1.2 Invoice Details

Each invoice submitted by Contractor shall indicate, at a minimum:

Agreement Name and Number;

The tasks, subtasks, deliverables, services, other Work, any Change Orders or Amendments, as applicable, for which payment is claimed, including Services, Deliverable(s) and Additional Work;

- a) The price of such tasks, subtasks, deliverables, services or other Work calculated based on the pricing terms set forth in Exhibit B (Schedule of Prices) or any Change Notice and Amendments, as applicable.
- b) If the invoice is for Additional Work or any other Work for which Pool Dollars will be utilized, a copy of the applicable Change Order or Amendment, executed by the applicable representative of County, a copy of the Acceptance Certificate evidencing County's approval of such Work, and any additional supporting documentation reasonably requested by County. The invoice further shall include the cumulative amount of Pool Dollars charged to County to date, and the remaining Pool Dollars available for use in connection with future Additional Work or other Change Orders or Amendments.
- c) If applicable, the amount due under Task 1 (Project Management) of Exhibit A (Statement of Work), which shall be the lesser of: (i) the maximum amount for Task 1 as enumerated in Exhibit B (Project and Payment Schedule) or (ii) the total cost of Work performed for the invoiced period. The total cost of Work performed shall be calculated by multiplying the amount of hours worked by the applicable Hourly Labor Rates set forth in Exhibit B (Schedule of Prices).
- d) Indication of the maximum amount remaining under Task 1 (Project Management) and each approved Task of Exhibit A (Statement of Work), which shall equal: (i) the maximum amount available for

Task 1 and each approved Task as enumerated in Exhibit B (Schedule of Prices) less (ii) the cumulative cost accrued for Work performed under Task 1 (Project Management) and each approved Task of Exhibit A (Statement of Work) to date.

- e) The date of written approval of the tasks, subtasks, deliverables, services, or other Work by County's Project Director or designee;
- f) Indication of any applicable withhold or holdback amounts for payments claimed or reversals thereof;
- g) Indication of any applicable credits due County under the terms of this Agreement or reversals thereof;
- h) A copy of any applicable Acceptance certificates signed by County's Project Director and County's Project Manager; and
- i) Any other information required by County's Project Director.

11.1.3 Approval of Invoices

All invoices submitted by Contractor to County for payment shall have County's written approval as provided in this Paragraph 11.1, which approval shall not be unreasonably withheld. In no event shall County be liable or responsible for any payment prior to such written approval.

11.1.4 Partial or Progress Payments

Contractor may be entitled to partial or progress payment for Work completed in respect of a task or a deliverable or other Work approved by the County only if authorized in writing by County's Project Director.

11.1.5 Invoice Discrepancies

County's Project Director will review each invoice for any discrepancies and will, within thirty (30) days of receipt thereof, notify Contractor in writing of any discrepancies found upon such review and submit a list of disputed charges. Contractor shall review the disputed charges and send a written explanation detailing the basis for the charges within thirty (30) days of receipt of County's notice of discrepancies and disputed charges. If County's Project Director does not receive a written explanation for the charges within such thirty (30) day period, Contractor shall be deemed to have waived its right to justify the original invoice amount, and County, in its sole discretion, shall determine the amount due, if any, to Contractor and pay such amount in satisfaction of the disputed invoice, subject to the Dispute Resolution Procedure.

All County correspondence relating to invoice discrepancies shall be sent by email, followed by hard copy, directly to County's Project Manager with

a copy to County's Project Director at the addresses specified in Section 1 (County Key Personnel) of Exhibit E (Administration of Agreement).

11.2 DELIVERY OF SYSTEM SOFTWARE

It is in the intent of the parties that if any System Software or Documentation provided by Contractor under this Agreement, including any product of System Maintenance services or Additional Work, is delivered to County, such delivery shall be made either (i) in electronic format (e.g., via electronic mail or internet download) or (ii) personally by Contractor staff who shall load such System Software and Documentation onto County's hardware but who will retain possession of all originals and copies of such tangible media (e.g., CD-ROM, magnetic tape, printed manuals) used to deliver the System Software and Documentation to County.

Any System Software and Documentation that is provided or delivered by Contractor to County in a tangible format shall be at Contractor's expense. The Contract Sum shown in Paragraph 10.1 (Maximum Contract Sum) includes all amounts necessary for County to reimburse Contractor for all transportation and related insurance charges, if any, for System Software Components and Documentation procured by County from Contractor pursuant to this Agreement. All transportation and related insurance charges, if any, shall be paid directly by Contractor to the applicable carrier. Contractor shall be solely liable and responsible for, and shall indemnify, defend, and hold harmless County from, any and all such transportation and related insurance charges.

11.3 SALES/USE TAX

The Contract Sum shown in Paragraph 10 (Contract Sum) shall be deemed to include all amounts necessary for County to reimburse Contractor for all applicable California and other state and local sales/use taxes on all System components provided by Contractor to County or Participating Cities pursuant to or otherwise due as a result of this Agreement, including, but not limited to, any product of System Maintenance Services and any Additional Work, to the extent applicable. All California sales/use taxes shall be paid directly by Contractor to the State or other applicable taxing authority.

Contractor shall be solely liable and responsible for, and shall indemnify, defend, and hold harmless County from, any and all such California and other state and local sales/use taxes. Further, Contractor shall be solely liable and responsible for, and shall indemnify, defend, and hold harmless County from all applicable California and other state and local sales/use tax on all other items provided by Contractor pursuant to this Agreement and shall pay such tax directly to the State or other taxing authority. In addition, Contractor shall be solely responsible for all taxes based on Contractor's income or gross revenue, or personal property taxes levied or assessed on Contractor's personal property to which County does not hold title.

11.4 PAYMENTS

Provided that Contractor is not in default under any provision of this Agreement, County will endeavor reasonably to process each invoice received by the Contractor within thirty (30) days of receipt that have not been disputed in accordance with Paragraph 11.1.5 (Invoice Discrepancies) above. County's failure to pay within the thirty (30) day period, however, shall not be deemed as automatic invoice approval or Acceptance by County of any deliverable for which payment is sought, nor shall it entitle Contractor to impose an interest or other penalty on any late payment.

11.5 PREFERENCE PROGRAM ENTERPRISES – PROMPT PAYMENT PROGRAM

Certified Prompt Payment Enterprises (PPEs) will receive prompt payment for services they provide to County departments. Prompt payment is defined as fifteen (15) calendar days after receipt of an approved, undisputed invoice which has been properly matched against documents such as a receiving, shipping, or services delivered report, or any other validation of receipt document consistent with Board Policy 3.035 (Preference Program Payment Liaison and Prompt Payment Program).

11.6 COUNTY'S RIGHT TO WITHHOLD PAYMENT

Notwithstanding any other provision of this Agreement, and in addition to any rights of County given by law or provided in this Agreement, County may upon written notice to Contractor withhold payment for any deliverable while Contractor, with no fault of County, is in default hereunder or default related to Work.

11.7 HOLDBACKS

County will hold back ten percent (10%) of the amount of Deliverable invoices submitted by the Contractor under this Agreement and approved by County pursuant to Paragraph 2.4 (Approval of Work), as further specified in Exhibit B (Schedule of Prices) and ten percent (10%) of the amount of each invoice for Additional Work approved by County under Paragraph 7.3 (Additional Work) (collectively, the "Holdback Amount"). The cumulative amount of such holdbacks shall be due and payable to the Contractor upon completion of Deliverables as specified in Exhibit B (Schedule of Prices), subject to adjustment for any amounts arising under this Agreement owed to County by Contractor, including, but not limited to, any amounts arising from Paragraphs 11.1.5 (Invoice Discrepancies), 11.5 (County's Right to Withhold Payment) and any partial termination of any Task, Subtask or Deliverable set forth in the Statement of Work as provided herein.

12. OWNERSHIP AND LICENSE

12.1 OWNERSHIP

12.1.1 System Environment

Contractor acknowledges that County, or the rightful owner, owns all System Hardware components provided (i) by County or Contractor for County shall be owned by County or (ii) by County, Contractor or City for such City shall be owned by the City; while the rightful owner of Third Party Software installed in the System Environment shall retain ownership of such Third Party Software, as may be further described in Attachment A.2 (System Overview).

12.1.2 Application Software

All Application Software, including Software Modifications, provided by Contractor to County or Participating Cities pursuant to this Agreement and Third Party Products, and related Documentation, is and shall remain the property of Contractor or any rightful third party owner, with which all proprietary rights including patent, trademark, copyright, and trade secret rights and title shall reside, and which shall be subject to the terms of the License granted pursuant to Paragraph 12.2 (License) below.

12.1.3 System Data

All System Data provided or made accessible by County to Contractor is and shall remain the property of County during and following expiration or termination of the Agreement. Notwithstanding the foregoing, County shall not sell or transfer any traffic data generated by the System, including any derived data, to any private entities for profit without the prior written consent of Contractor. County hereby grants a license and shall, at no cost to County, provide to Contractor traffic data generated by the System for lawful use and distribution by Contractor. Such data shall be provided to Contractor "as-is" and without any warranties. Contractor shall notify County prior to transfer of any traffic data to private entities.

12.1.4 Work Product

Contractor, or the rightful owner, shall remain the sole owner of Contractor's Application Software, including the Baseline Application and Software Modifications, and all derivative works therein (hereinafter collectively "Work Product"). Work Product does not include any County Materials previously owned by County or designed or developed by Contractor for County.

12.2 LICENSE

12.2.1 License Grant

Subject to the provisions of Paragraph (Ownership), Contractor hereby grants to County a perpetual, fully paid, non-exclusive license to use the System Software, including but not limited to Core Software and Additional Products that may be acquired under the Agreement, and Work Product, together with any related Documentation (hereinafter "License"), by all Users in accordance with the scope set forth in Paragraph (Scope of License) and subject to the restrictions set forth in Paragraph 12.2.4 (License Restrictions) during the term specified in Paragraph 12.2.2 (License Term). Notwithstanding the foregoing, upon mutual agreement of the parties, County may obtain its own license for any Third Party Software, the term and scope of which shall be subject to the terms of County's agreement with the provider of such Third Party Software.

12.2.2 License Term

The License granted under this Agreement shall commence upon the Effective Date and shall continue in perpetuity and without regard to the end of the term of this Agreement, unless otherwise specified herein.

Notwithstanding anything herein to the contrary, the License shall survive the termination or expiration of this Agreement for any reason.

12.2.3 Scope of License

The License granted by Contractor under this Agreement provides County and the Cities with the following rights:

To use, install, integrate with other software, operate, and execute the System Software in the System Environment on an unlimited number of computers, mobile devices, servers, local area networks and wide area networks, including web connections, for the number of intersections specified in Exhibit A (Statement of Work), by an unlimited number of Users in the conduct of the business of County and Participating Cities as provided in the Agreement;

To use, modify, copy, and display the Documentation, including but not limited to System and User manuals, as necessary or appropriate for County to enjoy and exercise fully the rights granted under this Agreement and the License.

To extend connection of the System to all of the Cities identified in Attachment A.5 (Participating Cities) which acquire separate licenses to Contractor's National Electrical Manufacturers Association Traffic Control System. Such licenses shall be provided to such Cities or other agencies at no cost to County, except as specified in Exhibit A (Statement of Work).

To permit third party access to the System Software, the Documentation, or any part thereof, as necessary or appropriate for County to enjoy and exercise fully the rights granted under this Agreement and the License, including for the provision of System Maintenance services including Software Updates, Programming Modifications, Professional Services, and other business use or support of the System Software as contemplated by this Agreement; provided, however, without limiting County's rights under this Paragraph 12.2, County covenants and agrees that it shall not exercise any of the rights contained in this Paragraph 12.2 unless and until the occurrence of any one of the Release Conditions; and

Pursuant to Paragraph 57 (Assignment by County), to reproduce and use a reasonable number of copies of the System Software provided by Contractor: (i) by County and permitted assignees, for archive and backup purposes; and (ii) by County, for use by permitted assignees so long as all copies of the System Software contain the proprietary notices appearing on the copies initially furnished to County by Contractor.

12.2.4 License Restrictions

County acknowledges and agrees (i) that the Application Software provided by Contractor to County and Participating Cities under the Agreement, including related Documentation, is the confidential and copyrighted property of Contractor, or its licensors, and all rights therein not expressly granted to County and Participating Cities are reserved to Contractor, or its licensors, as applicable; and (ii) that Contractor, or its licensors, retain all proprietary rights in and to the foregoing and the licensed programs, program concepts or any of the support materials, with the exception of County Materials, shall not be made available to any party or organization other than County including its departments and agencies, Participating Cities, and Users without the written consent of Contractor. Subsequently, County's License to the Application Software provided by Contractor hereunder is limited by the restrictions set forth in this Paragraph 12.2.4. Accordingly, County will not:

- a) Reverse engineer, disassemble or decompile the Application Software provided by Contractor;
- b) Transfer, sublicense, rent, lease, convey, or assign (unless resulting from an Agreement assignment under Paragraph) the Application Software provided by Contractor;
- c) Copy or reproduce the Application Software provided by Contractor in any way except as necessary for using the Application Software as contemplated by this Agreement or for backup, archival or business continuity purposes;

- d) Use the Application Software provided by Contractor on a timesharing, service bureau, subscription service or rental basis for any third party; or
- e) Remove, modify, or obscure any copyright, trademark or other proprietary rights notices that appear on, or during the use of, the Application Software provided by Contractor.

12.2.5 Third Party Software

Contractor shall not utilize Third Party Products without the prior written approval of County in accordance with Paragraph 2.4 (Approval of Work), to be granted or withheld in its sole discretion. County's Project Director shall also have the right on behalf of County to so approve all of the terms under which Contractor will license any proposed Third Party Products from the third party licensor, including, without limitation, scope of license, risk allocation provisions, warranties, and financial terms.

Contractor represents and warrants that it has not modified and shall not modify, nor does Contractor have any need to modify, Third Party Software in order for the System Software to fully perform in accordance with this Agreement. Contractor represents and warrants that all Third Party Software will be provided to County in the same unmodified form as received by Contractor from the applicable third party. Contractor represents and warrants that Third Party Software shall, together with the remainder of the System Software, fully satisfy all functionality without the need for any modification of Third Party Software by Contractor or otherwise.

County acknowledges that it may have to execute certain third party license agreements in respect of such Third Party Software. These third party license agreements shall be at no additional cost to County. To the extent that any such third party license agreement conflicts with this Agreement or in any way restricts County's full use and enjoyment of the System Software as contemplated herein, Contractor shall take all necessary action and pay all sums required for County fully to enjoy all the rights and benefits in respect of the System Software granted under this Agreement. Contractor shall promptly and at no cost to County, either: (1) obtain a license from the appropriate third party which shall enable Contractor to modify such Third Party Software, and Contractor shall provide all necessary modifications, or (2) to the extent that Contractor is unable to obtain such a license, provide an Update or alternative solution, which is functionally equivalent, in the sole determination of Contractor's Project Manager and County's Project Manager, in lieu of modifying such Third Party Software. All approved Third Party Software shall be listed on Attachment A.7 (Third Party Software) of Exhibit A (Statement of Work).

13. SYSTEM ACCEPTANCE

13.1 ACCEPTANCE TESTS

County and/or Contractor, as applicable, shall conduct all Acceptance Tests specified in Exhibit A (Statement of Work) to ensure the System's compliance with the Specifications set forth in the Agreement, including but not limited to Exhibit A (Statement of Work), Attachment A.1 (System Requirements) and Exhibit C (System Maintenance). Such Acceptance Tests shall test, among others, the System's functionality, integration and interfacing, volume endurance and user acceptance.

13.2 PRODUCTION USE

The System shall be ready for Production Use following County's Project Director written Acceptance and approval, as evidenced by the applicable Acceptance Certificate.

Following installation by Contractor and prior to Final Acceptance by County, County shall have the right to use, in production mode, any completed portion of the System Software without any additional cost to County where County determines that it is desirable or necessary for County operations. Such production use shall not restrict the Contractor's performance under this Agreement and shall not be deemed to be Contractor's achievement of Go-Live or Final Acceptance.

13.3 FINAL ACCEPTANCE

The System shall achieve Final Acceptance upon County's Project Director written Acceptance and approval, as evidenced by the applicable Acceptance Certificate of Exhibit A (Statement of Work). In the event the System fails to successfully achieve Final Acceptance, Contractor shall provide County with a diagnosis of the Deficiencies and proposed solution(s). County and Contractor shall agree upon all such proposed solutions prior to their implementation. Contractor agrees to correct all Deficiencies in the System prior to Final Acceptance at no cost to County.

13.4 FAILED TESTING

If County's Project Director makes a good faith determination at any time that the System as a whole, or any component thereof, has not successfully completed an Acceptance Test or has not achieved Final Acceptance (collectively referred to for purposes of this Paragraph 13.3 as "Designated Test"), County's Project Director shall promptly notify Contractor in writing of such failure, specifying with as much detail as possible the manner in which the System component or the System failed to pass the applicable Designated Test. Contractor shall immediately commence all reasonable efforts to complete, as quickly as possible, such necessary corrections, repairs and modifications to the System component or the System as will permit the System component or the System to be ready for retesting.

Contractor shall notify County's Project Director in writing when such corrections, repairs and modifications have been completed, and the applicable Designated Test shall begin again. If, after the applicable Designated Test has been completed for a second time, County's Project Director makes a good faith determination that the System component or the System again fails to pass the applicable Designated Test, County's Project Director shall promptly notify Contractor in writing, specifying with as much detail as possible the manner in which the System component or the System failed to pass the applicable Designated Test. Contractor shall immediately commence all reasonable efforts to complete, as quickly as possible, such necessary corrections, repairs and modifications to the System component or the System as will permit the System component or the System to be ready for retesting.

13.4.1 Such procedure shall continue, subject to County's rights under Paragraphs 10.2.2 (Credits to County) and 10.2.3 (Termination/Suspension) in the event Contractor fails to timely complete any Key Deliverable until such time as County notifies Contractor in writing either: (i) of the successful completion of such Designated Test or (ii) that County has concluded, subject to the Dispute Resolution Procedure, that satisfactory progress toward such successful completion of such Designated Test is not being made, in which latter event, County shall have the right to make a determination, which shall be binding and conclusive on Contractor, that a non-curable default has occurred and to terminate this Agreement in accordance with Paragraph 10.2.3 (Termination/Suspension) on the basis of such non-curable default. In the event Contractor, using good faith effort, is unable to cure a Deficiency by re-performance after two (2) attempts, County and Contractor will work together to agree on a mutually acceptable resolution, provided that if County and Contractor cannot agree on a resolution, County may terminate this Agreement for default pursuant to Paragraph 10.2.3 (Termination/Suspension).

13.4.2 Such a termination for default by County shall be, subject to the Dispute Resolution Procedure, either, as determined by County in its sole judgment: (i) a termination with respect to one or more of the components of the System; or (ii) a termination of the entire Agreement, if County believes the failure to pass the applicable Designated Test materially affects the functionality, performance or desirability to County of the System as a whole. In the event of a termination under this Paragraph 13.4, County shall have the right to receive from Contractor (i) reimbursement of all payments made to Contractor by County under this Agreement for the System component(s) and related Deliverables as to which the termination applies or (ii) if the entire Agreement is terminated, all amounts paid by County to Contractor under this Agreement. If the termination applies only to one or more System component(s), at County's sole option, any reimbursement due to it may be credited against other sums due and payable by County to Contractor. The foregoing is without prejudice to any other rights that may accrue to County or Contractor under the terms of this Agreement or by law.

14. WARRANTIES AND CORRECTION OF DEFICIENCIES

14.1 GENERAL WARRANTIES

Contractor represents, warrants, covenants, and agrees that throughout the term of this Agreement:

1. Contractor shall comply with the description and representations (including, but not limited to, Deliverable documentation, performance capabilities, accuracy, completeness, characteristics, specifications, configurations, standards, functions, and requirements applicable to professional software design meeting industry standards) set forth in this Agreement, including the Exhibit A (Statement of Work) including all Attachments thereto and System Requirements.
2. Unless specified otherwise herein, the System shall be free from material Deficiencies.
3. The applicable System Maintenance service levels shall not degrade during the term of the Agreement.
4. Contractor shall not intentionally cause any unplanned interruption of the operations of, or accessibility to the System or any component through any device, method or means including, without limitation, the use of any "virus", "lockup", "time bomb", or "key lock", "worm", "back door" or "Trojan Horse" device or program, or any disabling code, which has the potential or capability of compromising the security of County's confidential or proprietary information or of causing any unplanned interruption of the operations of, or accessibility of the System or any component to County or any User or which could alter, destroy, or inhibit the use of the System or any component, or the data contained therein (collectively referred to as "Disabling Device(s)"), which could block access to or prevent the use of the System or any component by County or Users. Contractor represents, warrants, and agrees that it has not purposely placed, nor is it aware of, any Disabling Device in System component provided to County under this Agreement, nor shall Contractor knowingly permit any subsequently delivered or provided System component to contain any Disabling Device.

In addition, to the extent within Contractor's control or knowledge, Contractor shall prevent viruses from being incorporated or introduced into the System or updates or enhancements thereto prior to the installation onto the System and shall prevent any viruses from being incorporated or introduced in the process of Contractor's performance of on-line support.

14.2 SYSTEM WARRANTIES AND PROBLEM RESOLUTION

Provided that County is covered by System Maintenance as provided in this Agreement, any non-conformances, breaches of warranties specified herein, and other Deficiencies reported and discovered during the term of the Agreement shall be corrected in accordance with Exhibit C (System Maintenance).

Contractor also represents, warrants, covenants, and agrees that throughout the term of this Agreement:

1. All System components shall be compatible with each other and, to the extent applicable or required, shall interface with each other; and the System components, when taken together, shall be capable of delivering all of the functionality as set forth in this Agreement.
2. The System shall be capable of delivering all of the functionality and meeting all requirements set forth in the Specifications, as such may be modified as a result of System Implementation or provision of Additional Work.
3. The System shall meet the System performance requirements within Contractor's control as specified in the Agreement, including but not limited to those relating to System response time and availability, as further specified in the Statement of Work and Exhibit C (System Maintenance). All Deficiencies relating to System performance for the purpose of determining the applicable Deficiency Resolution time and County remedies, including Deficiency Credits, shall be deemed Severity Level 1 or Severity Level 2, as determined by County's Project Director or designee.
4. Contractor shall support the current Version Release of System Software, the most recent prior two (2) Major Version Releases and all Version Releases in between.

14.3 CONTINUOUS PRODUCT SUPPORT

14.3.1

In the event that Contractor replaces any or all components of the Application Software with other software modules or components (hereinafter "Replacement Product") during the term of the Agreement in order to fulfill its obligations under the Agreement and to meet the System Requirements, then the License shall be deemed to automatically include such Replacement Product without cost or penalty to County even if such Replacement Product contains greater functionality than the System Software it replaced. If required by County, Contractor shall provide the necessary training to County personnel to utilize the Replacement Product at no cost to County.

14.3.2

In the event any or all components of the Application Software are migrated to the Replacement Product as a result of an acquisition, sale, assignment, transfer or other change in control of Contractor, then any assignee or successor, by taking benefit (including, without limitation, acceptance of any payment under this Agreement), shall be deemed to have ratified this Agreement. All terms and conditions of this Agreement shall continue in full force and effect for the Replacement Product.

14.3.3

The following terms and conditions shall apply if County elects to transfer the License to a Replacement Product:

Contractor, or its assignee or successor, shall, at no cost to County, implement the Replacement Product in the System Environment, convert and migrate all of the System Data from the Application Software format to the Replacement Product format to ensure Production Use of such Replacement Product;

Any prepaid Service Fees for the System shall transfer in full force and effect for the balance of the Replacement Product's maintenance and support term (or equivalent service) at no additional cost. If the prepaid amount is greater than the Replacement Product's maintenance and support fees for the same term, the credit balance shall be applied to future Service Fees or returned to County, at County's option;

Any and all modules offered separately and needed to match the original Application Software's level of functionality shall be supplied by Contractor, or its assignee or successor, without additional cost or penalty, and shall not affect the calculation of any Annual Fees;

Contractor shall provide to County the necessary System Training for purposes of learning the Replacement Product. Such training shall be provided at no cost to County;

All License terms and conditions, at a minimum, shall remain as granted herein with no additional fees imposed on County; and

The definition of Application Software shall include the Replacement Product.

14.4 WARRANTY PASS-THROUGH

Contractor shall assign to County to the fullest extent permitted by law or by this Agreement, and shall otherwise ensure that the benefits of any applicable warranty or indemnity offered by any manufacturer of any System component or any other product or service provided hereunder shall fully extend to and be enjoyed by County.

14.5 REMEDIES

County's remedies under the Agreement for the breach of the warranties set forth in this Agreement, including Exhibit C (System Maintenance), shall include the repair or replacement by Contractor, at its own expense, of the non-conforming System components and the specific remedies set forth in Exhibit C (System Maintenance) and any other corrective measures specified in Exhibit C (System Maintenance) and this Agreement.

14.6 BREACH OF WARRANTY OBLIGATIONS

Failure by Contractor to timely perform its obligations set forth in this Paragraph 14 shall constitute a material breach, upon which, in addition to County's other rights and remedies set forth herein, County may, after written notice to Contractor and provision of a reasonable cure period, terminate or suspend this Agreement in accordance with Paragraph 24 (Termination/Suspension for Default).

15. INDEMNIFICATION

Notwithstanding any provision of this Agreement to the contrary, whether expressly or by implication, Contractor shall indemnify, defend, and hold harmless the County of Los Angeles, its Special Districts, Elected Officials, Appointed Officers, Agents, Employees, and Volunteers ("County Indemnities"), from and against any and all liability including, but not limited to, demands, claims, actions, fees, costs, and expenses of any nature whatsoever (including attorney and expert witness fees), to the extent arising from or connected with Contractor's acts and/or omissions arising from and/or relating to this Contract except for loss or damage arising from the sole negligence or willful misconduct of the County indemnitees. This indemnification also shall include any and all intellectual property liability, including copyright infringement and similar claims.

Any legal defense pursuant to Contractor's indemnification obligations under this Paragraph 15 shall be conducted by Contractor and performed by counsel selected by Contractor and approved by the County. Notwithstanding the preceding sentence, County shall have the right to participate in any such defense at its sole cost and expense.

16. WORKPLACE SAFETY INDEMNIFICATION

In addition to and without limiting the indemnification required by Section 13 (above), and to the extent allowed by law, contractor agrees to defend, indemnify, and hold harmless the County of Los Angeles, its special districts, elected officials, appointed officers, agents, employees, and volunteers from and against any and all investigations, complaints, citations, liability, expense (including defense costs and legal fees), claims, and/or causes of action for damages of any nature whatsoever including, but not limited to, injury or death to employees of contractor, its subcontractors or County, attributable to any alleged act or omission of contractor and/or its subcontractors which is in violation of any Cal/OSHA regulation. The obligation to defend, indemnify, and hold harmless County includes all investigations and proceedings associated with purported violations of Section 336.10 of Title 8 of the California Code of Regulations pertaining to multiemployer worksites. Contractor shall not be obligated to indemnify for liability and expenses arising from the active negligence of County. County may deduct from any payment otherwise due Contractor any costs incurred or anticipated to be incurred by County, including legal fees and staff costs, associated with any investigation or enforcement proceeding brought by Cal/OSHA arising out of the work being performed by Contractor under this Agreement.

17. INSURANCE**17.1 GENERAL INSURANCE REQUIREMENTS**

Without limiting Contractor's indemnification of County, and in the performance of this Agreement and until all of its obligations pursuant to this Agreement have been met, Contractor shall provide and maintain at its own expense insurance coverage satisfying the requirements specified in this Paragraph 17. These minimum insurance coverage terms, types, and limits ("Required Insurance") also are in addition to and separate from any other contractual obligation imposed upon Contractor pursuant to this Agreement. County in no way warrants that the Required Insurance is sufficient to protect Contractor for liabilities which may arise from or relate to this Agreement.

17.2 EVIDENCE OF COVERAGE AND NOTICE

Certificate(s) of insurance coverage (Certificate) satisfactory to County, and a copy of an Additional Insured endorsement confirming County and its Agents (defined below) has been given Insured status under the Contractor's General Liability policy, shall be delivered to County at the address shown below and provided prior to commencing services under this Agreement.

Renewal Certificates shall be provided to County not less than ten (10) days after renewal of Contractor's policy. County reserves the right to obtain complete certified copies of relevant sections of any required Contractor and/or subcontractor insurance policies at any time.

Certificates shall identify all Required Insurance coverage types and limits specified herein, reference this Agreement by name or number, and be signed by an authorized representative of the insurer(s). The Insured party named on the Certificate shall match the name of Contractor identified as the contracting party in this Agreement. Certificates shall provide the full name of each insurer providing coverage, its NAIC (National Association of Insurance Commissioners) identification number, its financial rating, the amounts of any policy deductibles or self-insured retentions exceeding fifty thousand (\$50,000.00) dollars, and list any County required endorsement forms.

Neither County's failure to obtain, nor County's receipt of, or failure to object to a non-complying insurance certificate or endorsement, or any other insurance documentation or information provided by the Contractor, its insurance broker(s) and/or insurer(s), shall be construed as a waiver of any of the Required Insurance provisions.

Certificates and copies of any required endorsements shall be sent to County's Contract Analyst at the address specified in Section 1 (County Key Personnel) of Exhibit E (Administration of Agreement).

Contractor also shall promptly report to County any injury or property damage accident or incident, including any injury to a Contractor employee occurring on

County property, and any loss, disappearance, destruction, misuse, or theft of County property, monies or securities entrusted to Contractor. Such report shall be made in writing within twenty-four (24) hour or the next Business Day. Contractor also shall promptly notify County of any third party claim or suit filed against Contractor or any of its subcontractors which arises from or relates to this Agreement and could result in the filing of a claim or lawsuit against Contractor and/or County.

17.3 ADDITIONAL INSURED STATUS AND SCOPE OF COVERAGE

The County of Los Angeles, its Special Districts, Elected Officials, Officers, Agents, Employees and Volunteers, and cities within Los Angeles County where Contractor installs a part of the System (collectively County and its Agents) shall be provided additional insured status under Contractor's General Liability policy with respect to liability arising out of Contractor's ongoing and completed operations performed on behalf of the County. County and its Agents additional insured status shall apply with respect to liability and defense of suits arising out of Contractor's acts or omissions, whether such liability is attributable to Contractor or to County. The full policy limits and scope of protection also shall apply to County and its Agents as an additional insured, even if they exceed the County's minimum Required Insurance specifications herein. Use of an automatic additional insured endorsement form is acceptable providing it satisfies the Required Insurance provisions herein.

17.4 CANCELLATION OF OR CHANGES IN INSURANCE

Contractor shall provide County, or Contractor's insurance policies shall contain, a provision that County shall receive written notice of cancellation or any change in Required Insurance, including insurer, limits of coverage, term of coverage or policy period. The written notice shall be provided to County not less than ten (10) days in advance of cancellation for non-payment of premium and thirty (30) days in advance of any other cancellation or policy change. Failure to provide written notice of cancellation or any change in Required Insurance may constitute a material breach of this Agreement, in the sole discretion of the County, upon which County may suspend or terminate this Agreement.

17.5 FAILURE TO MAINTAIN INSURANCE

Contractor's failure to maintain or to provide acceptable evidence that it maintains the Required Insurance shall constitute a material breach of the Agreement, upon which County immediately may withhold payments due to Contractor, and/or suspend or terminate this Agreement. County, at its sole discretion, may obtain damages from Contractor resulting from said breach. Alternatively, the County may purchase the Required Insurance, and without further notice to Contractor, deduct the premium cost from sums due to Contractor or pursue Contractor reimbursement.

17.6 INSURER FINANCIAL RATINGS

Coverage shall be placed with insurers acceptable to County with A.M. Best ratings of not less than A:VII unless otherwise approved by County.

17.7 CONTRACTOR 'S INSURANCE SHALL BE PRIMARY

Contractor's insurance policies, with respect to any claims related to this Agreement, shall be primary with respect to all sources of coverage available to Contractor. Any County maintained insurance or self-insurance coverage shall be in excess of and not contribute to any Contractor coverage.

17.8 WAIVERS OF SUBROGATION

To the fullest extent permitted by law, Contractor hereby waives its rights and its insurer(s)' rights of recovery against County under all the Required Insurance for any loss arising from or relating to this Agreement. Contractor shall require its insurers to execute any waiver of subrogation endorsements, which may be necessary to affect such waiver.

17.9 SUBCONTRACTOR INSURANCE COVERAGE REQUIREMENTS

Contractor shall include all subcontractors as insureds under Contractor's own policies, or shall provide County with each subcontractor's separate evidence of insurance coverage. Contractor shall be responsible for verifying each subcontractor complies with the Required Insurance provisions herein, and shall require that each subcontractor name the County and Contractor as additional insureds on the subcontractor's General Liability policy. Contractor shall obtain County's prior review and approval of any subcontractor request for modification of the Required Insurance.

17.10 DEDUCTIBLES AND SELF-INSURED RETENTIONS (SIRS)

Contractor's policies shall not obligate County to pay any portion of any Contractor deductible or SIR. County retains the right to require Contractor to reduce or eliminate policy deductibles and SIRs as respects County or to provide a bond guaranteeing Contractor's payment of all deductibles and SIRs, including all related claims investigation, administration, and defense expenses. Such bond shall be executed by a corporate surety licensed to transact business in the State of California.

17.11 CLAIMS MADE COVERAGE

If any part of the Required Insurance is written on a claims made basis, any policy retroactive date shall precede the effective date of this Agreement. Contractor understands and agrees it shall maintain such coverage for a period of not less than three (3) years following Agreement expiration, termination, or cancellation.

17.12 APPLICATION OF EXCESS LIABILITY COVERAGE

Contractor may use a combination of primary, and excess insurance policies, which provide coverage as broad as ("follow form" over) the underlying primary policies, to satisfy the Required Insurance provisions.

17.13 SEPARATION OF INSUREDS

All liability policies shall provide cross-liability coverage as would be afforded by the standard ISO (Insurance Services Office, Inc.) separation of insureds provision with no insured versus insured exclusions or limitations.

17.14 ALTERNATIVE RISK FINANCING PROGRAMS

County reserves the right to review, and then approve, Contractor use of self-insurance, risk retention groups, risk purchasing groups, pooling arrangements, and captive insurance to satisfy the Required Insurance provisions. County and its Agents shall be designated as an Additional covered Party under any approved program.

17.15 COUNTY REVIEW AND APPROVAL OF INSURANCE REQUIREMENTS

County reserves the right to review and adjust the Required Insurance provisions, conditioned upon County's determination of changes in risk exposures.

17.16 COMPENSATION FOR COUNTY COSTS

In the event that the Contractor fails to comply with any of the indemnification or insurance requirements of this Contract, and such failure to comply results in any costs to the County, the Contractor shall pay full compensation for all costs incurred by the County.

17.17 INSURANCE COVERAGE REQUIREMENTS

Commercial General Liability Insurance

Providing scope of coverage equivalent to ISO policy form CG 00 01, naming County and its Agents as an additional insured, with limits of not less than:

General Aggregate	\$2 million
Products/Completed Operations Aggregate	\$1 million
Personal and Advertising Injury	\$1 million
Each Occurrence	\$1 million

17.17.1 Automobile Liability Insurance

Providing scope of coverage equivalent to ISO policy form CA 00 01 with limits of not less than \$1 million for bodily injury and property damage, in combined or equivalent split limits, for each single accident. Insurance shall cover liability arising out of Contractor's use of autos pursuant to this Agreement, including owned, leased, hired, and/or non-owned autos, as each may be applicable.

17.17.2 Workers' Compensation and Employers' Insurance

Insurance or qualified self-insurance satisfying statutory requirements, which includes Employers' Liability coverage with limits of not less than \$1 million per accident. If Contractor will provide leased employees, or, is an employee leasing or temporary staffing firm or a professional employer organization (PEO), coverage also shall include an Alternate Employer Endorsement (providing scope of coverage equivalent to ISO policy form WC 00 03 01 A) naming County as the Alternate Employer, and the endorsement form shall be modified to provide that County will receive not less than thirty (30) days advance written notice of cancellation of this coverage provision. If applicable to Contractor's operations, coverage also shall be arranged to satisfy the requirements of any federal workers or workmen's compensation law or any federal occupational disease law.

17.17.3 Technology Errors and Omissions

Insurance for liabilities arising from errors, omissions, or negligent acts in rendering or failing to render computer or information technology services and technology products. Coverage for violation of software copyright should be included. Technology services should at a minimum include (1) systems analysis; (2) systems programming; (3) data processing; (4) systems integration; (5) outsourcing including outsourcing development and design; (6) systems design, consulting, development and modification; (7) training services relating to computer software or hardware; (8) management, repair and maintenance of computer products, networks and systems; (9) marketing, selling, servicing, distributing, installing and maintaining computer hardware or software; (10) data entry, modification, verification, maintenance, storage, retrieval or preparation of data output, and any other services provided by the vendor with limits of not less than \$10 million.

17.17.4 Privacy/Network Security (Cyber) Liability

Insurance coverage providing protection against liability for (1) privacy breaches [liability arising from the loss or disclosure of confidential information no matter how it occurs]; (2) system breach; (3) denial or loss of service; (4) introduction, implantation, or spread of malicious software code; (5) unauthorized access to or use of computer systems with limits of

not less than \$2 million. No exclusion/restriction for unencrypted portable devices/media may be on the policy.

18. INTELLECTUAL PROPERTY WARRANTY AND INDEMNIFICATION

Contractor represents and warrants: (i) that Contractor has the full power and authority to grant the License, ownership and all other rights granted by this Agreement to County and Cities; that no consent of any other person or entity is required by Contractor to grant such rights other than consents that have been obtained and are in effect; (iii) that County and Cities are entitled to use the System without interruption, subject only to County's obligation to make the required payments and observe the License terms under this Agreement; (iv) that this Agreement and the System licensed or acquired herein, are neither subject to any liens, encumbrances, or pledges nor subordinate to any right or claim of any third party, including Contractor's creditors; (v) that during the term of this Agreement, Contractor shall not subordinate this Agreement or any of its rights hereunder to any third party without the prior written consent of County, and without providing in such subordination instrument for non-disturbance of County's use of the System (or any part thereof) in accordance with this Agreement; and (vi) that neither the performance of this Agreement by Contractor, nor the License to or ownership by, and use by, County, the Cities and their Users of the System in accordance with this Agreement will in any way violate any non-disclosure agreement, nor constitute any infringement or other violation of any copyright, trade secret, trademark, service mark, patent, invention, proprietary information, or other rights of any third party.

Notwithstanding any provision to the contrary, whether expressly or by implication, Contractor shall indemnify, defend, and hold harmless the County its Special Districts, elected and appointed officers, employees, agents and volunteers (collectively referred to for purposes of this Paragraph 18 as "County") from and against any and all liability, including but not limited to demands, claims, actions, fees, damages, costs, and expenses (including reasonable attorneys and expert witness fees) arising from any alleged or actual infringement of any third party's patent or copyright, or any alleged or actual unauthorized trade secret disclosure, arising from or related to this Agreement and/or the operation and use of the System (collectively referred to for purposes of this Paragraph 18 as "Infringement Claim(s)"). Any legal defense pursuant to Contractor's indemnification obligations under this Paragraph 18 shall be conducted by Contractor and performed by counsel selected by Contractor. County shall provide Contractor with information, reasonable assistance, and authority to defend or settle the claim. Notwithstanding the foregoing, County shall have the right to participate in any such defense at its sole cost and expense.

County shall notify Contractor, in writing, as soon as practicable of any claim or action alleging such infringement or unauthorized disclosure. Upon such notice by County, Contractor shall, at no cost to County or the Cities, as remedial measures, either: (i) procure the right, by license or otherwise, for County and the Cities to continue to use the System or affected component(s) thereof, or part(s) thereof, to

the same extent of County's and the Cities' License or ownership rights under this Agreement; or (ii) to the extent procuring such right to use the System is not commercially reasonable, replace or modify the System or component(s) thereof with another software or component(s) thereof of at least equivalent quality and performance capabilities, as mutually determined by County and Contractor until the System and all components thereof become non-infringing, non-misappropriating, and non-disclosing (hereinafter collectively for the purpose of this Paragraph 18 "Remedial Act(s)").

If Contractor fails to complete the Remedial Acts described in Paragraph 18 above then, County may terminate this Agreement for default pursuant to Paragraph 23 (Termination/Suspension for Default), in which case, in addition to other remedies available to County, Contractor shall reimburse County for the entire Implementation Cost paid by County to Contractor under the Agreement.

19. PROPRIETARY CONSIDERATIONS

19.1 COUNTY MATERIALS

Except as otherwise provided in Paragraph 12 (Ownership and License), Contractor and County agree that all materials, including, but not limited to, designs, specifications, techniques, plans, reports, deliverables, data, photographs, diagrams, maps, images, graphics, text, videos, advertising, website plans and designs, drafts, working papers, outlines, sketches, summaries, software code and modifications thereto, edited and/or unedited versions of deliverables, and any other materials or information developed under this Agreement and any and all intellectual property rights to these materials, including any copyrights, trademarks, service marks, trade secrets, trade names, unpatented inventions, patent applications, patents, design rights, domain rights, know-how, and any other proprietary rights and derivatives thereof (collectively, "Intellectual Property"), is and shall be the sole property of County (hereafter collectively, "County Materials"). Contractor hereby assigns and transfers to County all Contractor's rights, titles, and interest in and to all such County Materials developed under this Agreement.

Notwithstanding such County ownership in the County Materials, Contractor may retain possession of working papers and materials prepared by Contractor under this Agreement. During and for a minimum of five (5) years subsequent to the term of this Agreement, County shall have the right to inspect any and all such working papers and materials, make copies thereof and use the working papers and materials and the information contained therein.

County shall also have the sole right to control the preparation, modification, and revisions to, all acknowledgement and/or attribution language for all County Materials resulting from this Agreement. County will however, exercise reasonable efforts to honor requests by Contractor seeking removal of all acknowledgements and/or attribution language relating to the Contractor, should Contractor no longer wish to receive attribution for its work on the County Materials.

19.2 TRANSFER TO COUNTY

Contractor shall execute all documents requested by County and shall perform all other reasonable acts requested by County to assign and transfer to, and vest in, County all Contractor's right, title, and interest in and to the County Materials, including, but not limited to, all copyright, patent, and trade secret rights. All material expense of effecting such assignment and transfer of rights shall be borne by County. Further, County shall have the right to assign, license or otherwise transfer any and all County's right, title and interest, including, but not limited to, copyrights and patents, in and to the County Materials.

19.3 INDEMNITY

Contractor represents and warrants that the County Materials prepared herein under this Agreement, is the original work of Contractor and does not infringe upon any Intellectual Property or proprietary rights of third parties. For those portions of the County Materials that are not the original work of Contractor, Contractor represents and warrants that it has secured all appropriate licenses, rights, and/or permission from appropriate third parties to include such materials in the County Materials.

Contractor shall defend, indemnify, and hold County harmless against any claims by third parties based on infringement of copyright, patent, trade secret, trademark, or any other claimed Intellectual Property or proprietary right, arising from County's use of County Materials created and/or prepared by Contractor. Contractor will also indemnify and defend at its sole expense, any action brought against County based on a claim that County Materials furnished hereunder by Contractor and used within the scope of this Agreement infringe any copyright, patent, trade secret, trademark, or any other claimed intellectual property or proprietary right of third parties, and Contractor shall pay any costs, damages and attorney's fees incurred by County. County will notify Contractor promptly and in writing of any such action or claim and will permit Contractor to fully participate in the defense thereof.

19.4 CONTRACTOR'S OBLIGATIONS

Contractor shall protect the security of and keep confidential all County Materials and shall use whatever security measures are reasonably necessary to protect all such County Materials from loss or damage by any cause, including fire and theft.

Contractor shall affix the following notice to all County Materials: "© Copyright 2023 (or such other appropriate date of first publication), County of Los Angeles. All Rights Reserved." Contractor shall affix such notice on the title page of all images, photographs, documents, and writings; and otherwise as County may direct.

19.5 PROPRIETARY AND CONFIDENTIAL

Any and all County Materials which are developed or were originally acquired by Contractor outside the scope of this Agreement, which Contractor desires to use hereunder, and which Contractor considers to be proprietary or confidential, must be specifically identified by Contractor to County's Project Director as proprietary or confidential, and shall be plainly and prominently marked by Contractor as "PROPRIETARY" or "CONFIDENTIAL", if applicable.

Notwithstanding any other provision of this Agreement, County shall not be obligated in any way under this Agreement for:

Any disclosure of any materials which County is required to make under the California Public Records Act or otherwise by law; or

Any Contractor's proprietary and/or confidential materials not plainly and prominently marked with restrictive legends.

19.6 ACKNOWLEDGEMENT/ATTRIBUTION

County shall also have the sole right to control the preparation, modification, and revisions to, all acknowledgment and/or attribution language for all County Materials resulting from this Agreement. County will however, exercise reasonable efforts to honor requests by Contractor seeking removal of all acknowledgment and/or attribution language relating to the Contractor, should Contractor no longer wish to receive attribution for its work on the County Materials.

20. DISCLOSURE OF INFORMATION

20.1 DISCLOSURE OF AGREEMENT

Contractor shall not disclose any terms or conditions of, or any circumstances or events that occur during the performance of this Agreement to any person or entity except as may be otherwise provided herein or required by law. In the event Contractor receives any court or administrative agency order, service of process, or request by any person or entity (other than Contractor's professionals) for disclosure of any such details, Contractor shall, to the extent allowed by law or such order, promptly notify County's Project Director. Thereafter, Contractor shall comply with such order, process, or request only to the extent required by applicable law. Notwithstanding the preceding sentence, to the extent permitted by law, Contractor shall delay such compliance and cooperate with County to obtain relief from such obligations to disclose until County shall have been given a reasonable opportunity to obtain such relief.

However, in recognizing Contractor's need to identify its services and related clients in order to sustain itself, County shall not inhibit Contractor from publicizing its role under this Agreement under the following conditions:

Contractor shall develop all publicity material in a professional manner.

During the term of this Agreement, Contractor shall not, and shall not authorize another to, publish or disseminate any commercial advertisements, press releases, feature articles, or other materials using the name of County without the prior written consent of County's Project Director for each such item.

Contractor may, without the prior written consent of County, indicate in its proposals and sales materials that it has been awarded this Agreement with the County of Los Angeles, provided that the requirements of this Paragraph 18 shall apply.

20.2 REQUIRED DISCLOSURE

Notwithstanding any other provision of this Agreement, either party may disclose information about the other that: (i) is lawfully in the public domain at the time of disclosure; (ii) is disclosed with the prior written approval of the party to which such information pertains; or (iii) is required by law to be disclosed.

21. CONFIDENTIALITY AND SECURITY

21.1 CONFIDENTIALITY

21.1.1 Confidential Information

Each party shall protect, secure and keep confidential all records, materials, documents, data and/or other information, including, but not limited to, billing, sensitive financial or security related information, County records, data and information, County Materials, Data, Work Product, Software, health information, and any other data, records and information, received, obtained and/or produced under the provisions of this Agreement (hereinafter also "Confidential Information"), in accordance with the terms of this Agreement and all applicable Federal, State or local laws, regulations, ordinances, and publicly known guidelines and directives relating to confidentiality. As used in this Agreement, the term "Confidential Information" shall also include records, materials, data, and information deemed confidential by County or the applicable law under Paragraph 3.6 (Rules and Regulations). Each party shall use whatever appropriate security measures are necessary to protect such Confidential Information from loss, damage and/or unauthorized dissemination by any cause, including but not limited to fire and theft.

Contractor shall inform all of its officers, employees, agents and subcontractors providing Work hereunder of the confidentiality provisions of this Agreement. Contractor shall ensure that all of its officers, employees, agents and subcontractors performing Work hereunder have entered into confidentiality agreements no less protective of County than the terms of this Agreement, including this Paragraph 21 and Exhibit G (Contractor Acknowledgement and Confidentiality Agreement).

21.1.2 DISCLOSURE

With respect to any of County's Confidential Information or any other records, materials, data or information that is obtained by Contractor (hereinafter collectively for the purpose of this Paragraph 21.1.2 "information"), Contractor shall: (i) not use any such information for any purpose whatsoever other than carrying out the express terms of this Agreement; (ii) promptly transmit to County all requests for disclosure of any such information; (iii) not disclose, except as otherwise specifically permitted by this Agreement, any such information to any person or organization other than County without County's prior written authorization that the information is releasable; and (iv) at the expiration or termination of this Agreement, return all such information to County or maintain such information according to the written procedures provided to Contractor by County for this purpose.

Under State law no information shall be in any way relayed to anyone except those employees of County so designated without written authorization from County.

21.1.3 INDEMNIFICATION

Notwithstanding any provision of this Agreement to the contrary, whether expressly or by implication, Contractor shall indemnify, defend and hold harmless County, its officers, employees, and agents, from and against any and all loss, damage, liability and expense, including, but not limited to, defense costs and reasonable legal, accounting and other expert, consulting or professional fees, arising from any disclosure of such records and information by Contractor, its officers, employees, or agents, except for any disclosure authorized by this Paragraph 21.

21.2 SECURITY

21.2.1 System Security

Notwithstanding anything to the contrary herein, Contractor shall provide all Work utilizing security technologies and techniques in accordance with the industry standards, Contractor's best practices and applicable County security policies, procedures and requirements provided by County to Contractor in writing as part of this Agreement or otherwise as required by law, including those relating to the prevention and detection of fraud or other inappropriate use or access of systems and networks. Without limiting the generality of the foregoing, Contractor shall implement and use applications and tools and fraud prevention and detection and encryption technologies and prevent the introduction of any disabling or intrusive device into the System. In no event shall Contractor's actions or inaction result in any situation that is less secure than the security that Contractor then provides for its own systems and data.

21.2.2 System Data Security

Contractor hereby acknowledges the right of privacy of all persons as to whom there exists any System Data or any other County data. Contractor shall protect, secure and keep confidential all System Data in compliance with all federal, state and local laws, rules, regulations, ordinances, and publicly known guidelines and directives, relating to confidentiality and information security (including any breach of the security of the System, such as any unauthorized acquisition of System Data that compromises the security, confidentiality or integrity of personal information), including California Civil Code Section 1798.82. Further, Contractor shall take all reasonable actions necessary or advisable to protect all System Data in its possession, custody or control from loss or damage by any cause, including fire, theft, or other catastrophe. In addition, if requested by County's Project Director, Contractor shall provide notification to all persons whose unencrypted personal information was, or is reasonably believed to have been, acquired by any unauthorized person, and the content, method and timing of such notification shall be subject to the prior approval of County's Project Director. Contractor shall not use System Data for any purpose or reason other than to fulfill its obligations under this Agreement. Contractor shall also comply with the requirements set forth in Exhibit O (Information Security and Privacy Requirements).

21.3 REMEDIES

Contractor acknowledges that a breach by Contractor of this Paragraph 21 may result in irreparable injury to County that may not be adequately compensated by monetary damages and that, in addition to County's other rights under this Paragraph 21 and at law and in equity, County shall have the right to seek injunctive relief to enforce the provisions of this Paragraph 21. The provisions of this Paragraph 21 shall survive the expiration of termination of this Agreement.

Contractor shall take all reasonable actions necessary or advisable to protect the System from loss or damage by any cause. Contractor shall bear the full risk of loss or damage to the System by any cause other than resulting from force majeure or County's sole fault.

21.4 INFORMATION TECHNOLOGY SECURITY REQUIREMENTS

Contractor must comply with all County and Public Works information security policies and standards where applicable. Where Contractor is providing managed, offsite infrastructure or processing services, Contractor's data center and network operations must be compliant with generally accepted best security practices and regulatory requirements where applicable (e.g., PCI, HIPAA, etc.). If requested by Public Works, Contractor shall provide evidence of certifications such as SAS70, SAE16, ISO 27000, PCI compliance, etc., or submit to an assessment of Contractor's information security policies and controls by the Public Works Department Information Security Officer (hereinafter "DISO"). Any questions or need for clarification regarding Public Works security policies and/or regulations

should be addressed to the DISO. County's Project Manager and Contractor must obtain sign-off from the DISO.

22. PROHIBITION AGAINST ASSIGNMENT AND DELEGATION

Contractor shall not assign its rights and/or delegate its duties under this Agreement, whether in whole or in part, without the prior written consent of County, and any attempted assignment and/or delegation without such consent shall be null and void. County may exercise or withhold consent in its sole discretion. No assignment and/or delegation shall be effective unless and until there is a duly-executed, written amendment to this Agreement. For purposes of this paragraph, County consent shall require a written amendment to this Agreement, which is formally approved and executed by Contractor and the Board or if delegated by the Board, the Director and Contractor. Any payments by County to any approved delegate or assignee on any claim under this Agreement shall be deductible, at County's sole discretion, against the claims, which the Contractor may have against County.

Shareholders, partners, members, or other equity holders of Contractor may transfer, sell, exchange, assign, or divest themselves of any interest they may have therein. However, in the event any such sale, transfer, exchange, assignment, or divestment is effected in such a way as to give majority control of Contractor to any person(s), corporation, partnership, or legal entity other than the majority controlling interest therein at the time of execution of the Agreement, such disposition is an assignment requiring the prior consent of County in accordance with the applicable provisions of this Agreement.

Any assumption, assignment, delegation, or takeover of any of Contractor's duties, responsibilities, obligations, or performance of same by any entity other than Contractor, whether through assignment, subcontract, delegation, merger, buyout, or any other mechanism, with or without consideration for any reason whatsoever without County's express written approval shall be a material breach of the Agreement which may result in the termination of this Agreement. In the event of such termination, County shall be entitled to pursue the same remedies against Contractor as it could pursue in the event of default by Contractor.

23. TERMINATION/SUSPENSION FOR DEFAULT

County may, by written notice to Contractor, terminate or suspend the whole or any part of this Agreement if:

- a) Contractor fails to timely provide and/or satisfactorily perform any task, subtask, deliverable, service, or other Work within the times specified in this Agreement, including the finalized Project Schedule; or
- b) Contractor fails to demonstrate a high probability of timely fulfillment of the performance requirements under this Agreement; or

- c) Contractor fails to make progress as to endanger performance of this Agreement in accordance with its terms; or
- d) Contractor in performance of Work under the Agreement fails to comply with the requirements of this Agreement, including but not limited to Exhibit A (Statement of Work) and Exhibit C (System Maintenance); or
- e) Contractor fails to perform or comply with any other provisions of this Agreement or materially breaches this Agreement;
- f) and, unless a shorter cure period is expressly provided in this Agreement, does not cure such failure or fails to correct such failure or breach within thirty (30) days (or such longer period as County may authorize in writing) of receipt of written notice from County specifying such failure or breach, except that Contractor shall not be entitled to any cure period, and County may terminate immediately, in the event that Contractor's failure to perform or comply is not reasonably capable of being cured.

If, after County has given notice of suspension or termination under the provisions of this Paragraph 23, it is determined by County that Contractor was not in default, or that the default was excusable, the rights and obligations of the parties shall be the same as if the notice of termination had been issued pursuant to Paragraph 24 (Termination/Suspension for Convenience).

The rights and remedies of County provided in this Paragraph 23 shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Agreement.

24. TERMINATION/SUSPENSION FOR CONVENIENCE

This Agreement may be suspended or terminated, in whole or in part, permanently or from time to time, when such action is deemed by County to be in its best interest. Suspension or Termination of Work hereunder shall be affected by notice of suspension or termination to Contractor specifying the extent to which performance of work is suspended or terminated and the date upon which such suspension or termination becomes effective, which shall be no less than sixty (60) calendar days after the notice is sent. In the event County has purported to suspend or terminate this Agreement for default by notice pursuant to Paragraph 23 (Termination/Suspension for Default) and it has later been determined that Contractor was not in default, no additional notice shall be required upon such determination.

After receipt of a notice of suspension or termination, Contractor shall:

- a) Stop work under this Agreement on the date and to the extent specified in such notice.
- b) Complete performance of such part of the work as shall not have been suspended or terminated by such notice.

- c) Submit to County, in the form and with any certifications as may be prescribed by County, Contractor's suspension or termination claim and invoice. Such claim and invoice shall be submitted promptly in accordance with Paragraph 11.
- d) All material including books, records, documents, or other evidence bearing on the costs and expenses of Contractor under this Agreement shall be maintained by Contractor in accordance with Paragraph 33 (Records and Audits).

If this Agreement is suspended or terminated, Contractor shall complete within the Director's suspension or termination date contain within the notice of suspension or termination, those items of work which are in various stages of completion, which the Director has advised the Contractor are necessary to bring the work to a timely, logical, and orderly end. Reports, samples, and other materials prepared by Contractor under this Agreement shall be delivered to County upon request and shall become the property of County.

25. TERMINATION/SUSPENSION FOR IMPROPER CONSIDERATION

County may, by written notice to Contractor, immediately suspend or terminate the right of Contractor to proceed under this Agreement if it is found that consideration, in any form, was offered or given by Contractor, either directly or through an intermediary, to any County officer, employee or agent with the intent of securing this Agreement or securing favorable treatment with respect to the award, Amendment or extension of the Agreement or the making of any determinations with respect to Contractor's performance pursuant to this Agreement. In the event of such suspension or termination, County shall be entitled to pursue the same remedies against Contractor as it could pursue in the event of default by Contractor.

Contractor shall immediately report any attempt by a County officer or employee to solicit such improper consideration. The report shall be made either to County manager charged with the supervision of the employee or to County's Auditor-Controller Employee Fraud Hotline at (800) 544 6861.

Among other items, such improper consideration may take the form of cash, discounts, services, the provision of travel or entertainment, or tangible gifts.

26. TERMINATION/SUSPENSION FOR INSOLVENCY

County may suspend or terminate this Agreement immediately at any time upon the occurrence of any of the following:

- a) Insolvency of Contractor. Contractor shall be deemed to be insolvent if it has ceased to pay its debts for at least 60 days in the ordinary course of business or cannot pay its debts as they become due, whether or not a petition has been filed under the Federal Bankruptcy Code, and whether or

not Contractor is insolvent within the meaning of the Federal Bankruptcy Code.

- b) The filing of a voluntary or involuntary bankruptcy petition relative to Contractor under the Federal Bankruptcy Code.
- c) The appointment of a bankruptcy Receiver or Trustee for Contractor.
- d) The execution by Contractor of a general assignment for the benefits of creditors.

The rights and remedies of County provided in this Paragraph 26 shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Agreement.

Contractor agrees that if Contractor as a debtor-in-possession, or if a trustee in bankruptcy, rejects this Agreement, County may elect to retain its rights under this Agreement, as provided under Section 365(n) of the United States Bankruptcy Code (11 United States Code, Section 365(n)). Upon written request of County to Contractor or the trustee in bankruptcy, as applicable, Contractor or such trustee shall allow County to exercise all of its rights and benefits under this Agreement including, without limitation, such Section 365(n) (including, without limitation, the right to continued use of all source and object code versions of the Software and related Documentation, and shall not interfere with the rights and benefits of County as provided therein. The foregoing shall survive the termination or expiration of this Agreement for any reason whatsoever).

27. TERMINATION/SUSPENSION FOR NON-ADHERENCE TO COUNTY LOBBYISTS ORDINANCE

Contractor, and each County lobbyist or County lobbying firm as defined in Los Angeles County Code Section 2.160.010, retained by Contractor, shall fully comply with County's Lobbyist Ordinance, Los Angeles County Code Chapter 2.160. Failure on the part of Contractor or any County Lobbyists or County Lobbying firm retained by Contractor to fully comply with County's Lobbyist Ordinance shall constitute a material breach of this Agreement, upon which County may in its sole discretion, immediately suspend or terminate for default of this Contract.

28. EFFECT OF TERMINATION/SUSPENSION

In the event that County, upon notice to Contractor, suspends or terminates this Agreement in whole or in part as provided herein, then:

Contractor and County shall continue the performance of this Agreement to the extent not suspended or terminated;

Contractor shall stop work under this Agreement on the date and to the extent specified in such notice and provide to County all completed Work and Work in progress, in a media reasonably requested by County;

Contractor shall promptly return to County any and all County's Confidential Information, including County data and County Materials, that relate to that portion of the Agreement and Work terminated by County;

County shall pay Contractor all monies due in accordance with the terms of the Agreement for the Work completed up to the time of termination;

Contractor shall return to County all monies paid by County, yet unearned by Contractor, including any prorated prepaid Service Fees calculated depending on the date of termination, if applicable. Notwithstanding the foregoing, upon termination by County for default during System implementation, Contractor shall return all Implementation Cost amounts paid by County to Contractor during such System implementation, and County will return to Contractor all products of the terminated Implementation Services;

Upon termination by County for default pursuant to Paragraph 23 (Termination/Suspension for Default) or for insolvency pursuant to Paragraph 26 (Termination/Suspension for Insolvency), County shall have the right to procure, upon such terms and in such a manner as County may deem appropriate, services and other Work, similar to those so terminated, and Contractor shall be liable to County for, and shall promptly pay to County by cash payment, any and all excess costs incurred by County, as determined by County, to procure and furnish such similar services and other Work.

Contractor understands and agrees that County has obligations that it cannot satisfy without use of the System provided to County hereunder or an equivalent solution, and that a failure to satisfy such obligations could result in irreparable damage to County and the entities it serves. Therefore, Contractor agrees that in the event of any termination of this Agreement, Contractor shall fully cooperate with County in the transition of County to a new solution, toward the end that there be no interruption of County's day-to-day operations due to the unavailability of the System during such transition. Upon notice to Contractor, Contractor shall allow County or another selected contractor a transition period until expiration of the term of the Agreement, or in all other cases, at a date specified by County, for the orderly turnover of Contractor's Agreement activities and responsibilities without additional cost to County. The transition from the System to another system shall be performed by Contractor as Additional Work.

29. INDEPENDENT CONTRACTOR STATUS

This Agreement is by and between County and Contractor and is not intended, and shall not be construed to create the relationship of agent, servant, employee, partnership, joint venture, or association as between County and Contractor. The employees and agents of one party shall not be, or be construed to be, the employees or agents of the other party for any purpose whatsoever. Contractor shall function as, and in all respects is, an independent Contractor.

Contractor shall be solely liable and responsible for providing to, or on behalf of, all persons performing work pursuant to this Contract all compensation and

benefits. County shall have no liability or responsibility for the payment of any salaries, wages, unemployment benefits, disability benefits, Federal, State, or local taxes, or other compensation, benefits, or taxes for any personnel provided by or on behalf of Contractor.

Contractor understands and agrees that all persons performing work pursuant to this Contract are, for purposes of Workers' Compensation liability, solely employees of Contractor and not employees of County. Contractor shall be solely liable and responsible for furnishing any and all Workers' Compensation benefits to any person as a result of any injuries arising from or connected with any work performed by or on behalf of Contractor pursuant to this Contract.

Contractor shall cause each employee performing services covered by this Contract to sign and adhere to the "Contractor Employee Acknowledgement, Confidentiality, and Copyright Assignment Agreement." Contractor shall cause each nonemployee performing services covered by this Contract to sign and adhere to the "Contractor Nonemployee Acknowledgement, Confidentiality, and Copyright Assignment Agreement."

The employees and agents of Contractor shall, while on the premises of County, comply with all rules and regulations of the premises, including, but not limited to, security requirements.

Notwithstanding the provisions of this Paragraph 29, the employees and agents of Contractor shall, while on the premises of County, comply with all rules and regulations of the premises, including, but not limited to, security requirements.

30. SUBCONTRACTING

County has relied, in entering into this Agreement, on the reputation of and on obtaining the personal performance of Contractor, specifically, Contractor Key Staff. Consequently, no performance by the Contractor Key Staff of this Agreement, or any portion thereof, shall be subcontracted by Contractor without notice to County as provided in this Paragraph 30. Any attempt by Contractor to subcontract any performance of this Agreement by the Contractor Key Staff without such notice shall be null and void and shall be deemed a material breach of this Agreement, upon which County may immediately suspend or terminate this Agreement.

In the event Contractor subcontracts any portion of its performance of the Agreement by the Contractor Key Staff, Contractor shall provide to County, in writing, a notice regarding such subcontract, which shall include:

- a) The reasons for the particular subcontract;
- b) Identification of the proposed subcontractor and an explanation of why and how the proposed subcontractor was selected;

- c) A detailed description of the Work to be provided by the proposed subcontractor;
- d) Confidentiality provisions applicable to the proposed subcontractor's officers, employees and agents, which would be incorporated into the subcontract;
- e) include (i) Exhibit G (Confidentiality and Assignment Agreement), (ii) Exhibit D (Contractor's EEO Certification), (iii) Exhibit H (Safely Surrendered Baby Law), and (iii) any other standard County required provisions;
- f) A representation from Contractor that:
 - 1. the proposed subcontractor is qualified to provide the Work for which subcontractor is being hired;
 - 2. either the proposed subcontractor maintains the insurance required by this Agreement or Contractor has procured and maintains such insurance coverage for the proposed subcontractor;
 - 3. either the proposed subcontractor or Contractor shall be solely liable and responsible for any and all of subcontractor's taxes, payments and compensation, including compensation to its employees, related to the performance of Work under this Agreement; and
 - 4. either the proposed subcontractor or Contractor shall provide for indemnification of County under the same terms and conditions as the indemnification provisions of this Agreement, including those specified in Paragraphs 15 (Indemnification) and 18 (Intellectual Property Warranty and Indemnification); and
 - 5. Other pertinent information and/or certifications reasonably requested by County.

County will review Contractor's request to subcontract and determine on a case-by-case basis whether or not to consent to such request, which consent shall not be unreasonably withheld.

Notwithstanding any provision of this Agreement to the contrary, whether expressly or by implication, Contractor shall indemnify, defend and hold harmless County, its officers, employees and agents, from and against any and all claims, demands, liabilities, damages, costs and expenses, including, but not limited to, defense costs and legal, accounting or other expert consulting or professional fees in any way arising from or related to Contractor's use of any subcontractor, including, without limitation, any officers, employees or agents of any subcontractor, in the same manner as required for Contractor, its officers, employees and agents, under this Agreement.

Notwithstanding any other provision of this Paragraph 30, Contractor shall remain fully responsible for any and all performance required of it under this Agreement, including those which Contractor has determined to subcontract, including, but not limited to, the obligation to properly supervise, coordinate and provide all Work required under this Agreement. All subcontracts shall be made in the name of Contractor and shall not bind nor purport to bind County. Furthermore, subcontracting of any Work under this Agreement shall not be construed to limit, in any way, Contractor's performance, obligations or responsibilities to County or limit, in any way, any of County's rights or remedies contained in this Agreement.

Subcontracting of any Work performed by the Contractor Key Staff under the Agreement shall not waive County's right to prior and continuing approval of any or all such Contractor Key Staff pursuant to the provisions of Paragraph 3.3 (Approval of Contractor's Staff), including any subcontracted members of the Contractor Key Staff. Contractor shall notify its subcontractors of this County's right prior to subcontractors commencing performance under this Agreement.

Notwithstanding subcontracting by Contractor of any Work under this Agreement, Contractor shall be solely liable and responsible for any and all payments and other compensation to all subcontractors, and their officers, employees, agents, and successors in interest, for any services performed by subcontractors under this Agreement.

In the event that County consents to any subcontracting, such consent shall apply to each particular subcontract only and shall not be, or be construed to be, a waiver of this Paragraph 30 or a blanket consent to any further subcontracting.

Employee Leasing is prohibited.

31. RISK OF LOSS

Contractor shall bear the full risk of loss due to total or partial destruction of any Software products loaded on CDs or other computer media, until such items are delivered to and accepted in writing by County as evidenced by County's signature on delivery documents.

32. MOST FAVORED PUBLIC ENTITY

If Contractor's prices decline, or should Contractor, at any time during the term of this Agreement, provide similar software, service levels, software models, components, or services under similar delivery conditions to the State of California or any county, municipality, or district of the State or to any other state, county or municipality at prices below those set forth in this Agreement, then such lower prices shall be immediately extended to County. County shall have the right, at County's expense, to utilize a County auditor or an independent auditor to verify Contractor's compliance with this Paragraph 32 by review of Contractor's books and records.

33. RECORDS AND AUDITS

Contractor shall maintain accurate and complete financial records of its activities and operations relating to this Agreement in accordance with generally accepted accounting principles. Contractor agrees that County, or its authorized representatives, shall have access to and the right to examine, audit, excerpt, copy, or transcribe any pertinent transaction, activity, or records relating to this Agreement to the extent required by law. All such material shall be kept and maintained by Contractor during the term of this Agreement and for a period of five (5) years thereafter, unless County's written permission is given to dispose of any such material prior to such time. All such material shall be maintained by Contractor at a location in Los Angeles County, provided that if any such material is located outside Los Angeles County, Contractor shall make the necessary arrangements at its own cost and expense to have such material made available to the County within the County's borders.

In the event that an audit is conducted of Contractor specifically regarding this Agreement by any Federal or State auditor, then Contractor shall file a copy of such audit report with County's Auditor-Controller within thirty (30) days of Contractor's receipt thereof, unless otherwise provided by applicable Federal or State law or under this Agreement. County shall make a reasonable effort to maintain the confidentiality of such audit report(s).

Failure on the part of Contractor to comply with any of the provisions of this Paragraph 33 shall constitute a breach of this Agreement upon which County may terminate or suspend this Agreement under the terms of Paragraph 23 (Termination/Suspension for Default).

34. COUNTY'S QUALITY ASSURANCE PLAN

County, or its agent, will evaluate Contractor's performance under this Agreement on not less than an annual basis. Such evaluation will include assessing Contractor's compliance with the terms and conditions of this Agreement. Contractor deficiencies, which County determines are severe or continuing and that may place performance of this Agreement in jeopardy, if not corrected, will be reported to the County's Board of Supervisors. The report will include improvements and/or corrective action measures taken by County and Contractor. If improvement does not occur consistent with the corrective action measures within thirty (30) days of County's notice of Contractor deficiencies, County may, at its sole option, terminate this Agreement, in whole or in part, pursuant to Paragraph 23 (Termination/Suspension for Default) or Paragraph 24 (Termination/Suspension for Convenience), or impose other penalties as specified in this Agreement.

The County maintains databases that track/monitor contractor performance history. Information entered into such databases may be used for a variety of purposes, including determining whether the County will exercise a contract term extension option.

35. CONFLICT OF INTEREST

No County employee whose position with County enables such employee to influence the award of this Agreement or any competing agreements shall be employed in any capacity by Contractor or have any other direct financial interest in this Agreement. No officer or employee of Contractor, who may financially benefit from the performance of work hereunder, shall in any way participate in County's approval or ongoing evaluation of such work, or in any way attempt to unlawfully influence County's approval or ongoing evaluation of such work.

Contractor represents and warrants that it is aware of, and its authorized officers have read, the provisions of Los Angeles County Code, Section 2.180.010, "Certain Contracts Prohibited," and that execution of this Agreement will not violate those provisions. Contractor shall comply with all conflict of interest laws, ordinances and regulations now in effect or hereafter to be enacted during the term of this Agreement which are applicable to it as a software and services provider. Contractor warrants that it is not now aware of any facts which do create an unlawful conflict of interest for Contractor. If a party hereafter becomes aware of any facts, which might reasonably be expected to create an unlawful conflict of interest for it, it shall immediately make full written disclosure of such facts to County. Full written disclosure shall include, but is not limited to, identification of all persons implicated and a complete description of all relevant circumstances. Failure to comply with the provisions of this paragraph shall be a material breach of this Agreement subjecting Contractor to either contract termination for default or debarment proceedings or both.

36. COMPLIANCE WITH APPLICABLE LAWS

In the performance of this Agreement, Contractor shall comply with all applicable Federal, State, and local laws, rules, regulations, ordinances, directives, guidelines, policies, and procedures, and all provisions required thereby to be included in this Agreement are hereby incorporated herein by reference.

Contractor shall indemnify, defend and hold harmless County, its elected and appointed officers, employees, and agents, from and against any and all claims, demands, damages, liabilities, losses, costs, and expenses, including, without limitation, defense costs and legal, accounting and other expert, consulting or professional fees, arising from, connected with, or related to any failure by Contractor, its officers, employees, agents or subcontractors, to comply with any such laws, rules, regulations, ordinances, directives, guidelines, policies, or procedures, as determined by County in its sole judgment. Any legal defense pursuant to Contractor's indemnification obligations under this Paragraph 36 shall be conducted by Contractor and performed by counsel selected by Contractor and approved by County. Notwithstanding the preceding sentence, County shall have the right to participate in any such defense at its sole cost and expense, except that in the event Contractor fails to provide County with full and adequate defense, as determined by County in its sole judgment, County shall be entitled to retain its own counsel, including without limitation, County Counsel, and reimbursement

from Contractor for all such costs and expenses incurred by County in doing so. Contractor shall not have the right to enter into any settlement, agree to any injunction or other equitable relief, or make any admission, in each case, on behalf of County without County's prior written approval.

Failure by Contractor to comply with such laws and regulations shall be material breach of this Agreement and may result in suspension or termination of this Agreement.

37. FAIR LABOR STANDARDS

Contractor shall comply with all applicable provisions of the Federal Fair Labor Standards Act and shall indemnify, defend, and hold harmless the County of Los Angeles, its Special Districts, Elected Officials, Officers, Agents, Employees, and Volunteers from any and all liability including, but not limited to, wages, overtime pay, liquidated damages, penalties, court costs, and attorneys' fees arising under any wage and hour law including, but not limited to, the Federal Fair Labor Standards Act, for work performed by Contractor's employees for which County may be found jointly or solely liable, provided that County: (i) promptly notifies Contractor in writing of the claim; and (ii) allows Contractor to control, and cooperate with Contractor in, the defense and any related settlement negotiations.

38. COMPLIANCE WITH CIVIL RIGHTS LAWS

Contractor herein certifies and agrees, and will re-certify upon County request no more frequently than once per year, that all persons employed by it, its affiliates, subsidiaries and holding companies will be treated equally during employment, without regard to race, color, religion, ancestry, national origin, sex, age, physical or mental disability, marital status or political affiliation, in compliance with all applicable Federal and State anti-discrimination laws and regulations. Such action shall include, but is not limited to: employment, upgrading, demotion, transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

Contractor shall allow County representatives access to Contractor's employment records during regular Business Hours to verify compliance with the provisions of this Paragraph 38 when so requested by County. Contractor shall certify to, and comply with, the provisions of Exhibit F (Contractor's EEO Certification).

If County finds that any of the provisions of this Paragraph 38 have been violated, such violation shall, at the election of County, constitute a material breach of this Agreement upon which County may terminate or suspend this Agreement at County's option, either for material breach under Paragraph 23 (Termination/Suspension for Default) of this Agreement or for convenience under Paragraph 24 (Termination/Suspension for Convenience) of this Agreement. While County reserves the right to determine independently that the antidiscrimination provisions of this Agreement have been violated, in addition, a determination by the California Fair Employment Practices Commission or the Federal Equal Employment Opportunity Commission that Contractor has violated

State or Federal anti-discrimination laws or regulations shall constitute a finding by County that Contractor has violated the anti-discrimination provisions of this Agreement.

The parties agree that in the event Contractor is found to have violated the antidiscrimination provisions of this Agreement, and that such discrimination was directly associated with the performance of services provided under this Agreement, County may require, pursuant to Los Angeles County Code Section 4.32.010 (E), that Contractor pay the sum of Five hundred Dollars (\$500) for each such violation, in lieu of termination or suspension hereof, as liquidated damages are extremely difficult to ascertain or calculate precisely. In the alternative, County may elect to terminate this Agreement pursuant to Paragraph 23 (Termination/Suspension for Default).

39. RESTRICTIONS ON LOBBYING

39.1 FEDERAL FUNDS PROJECTS

If any Federal funds are to be used to pay for any portion of Contractor's work under this Agreement, County shall notify Contractor in writing in advance of such payment and Contractor shall fully comply with all certification and disclosure requirements prescribed by Section 319 of Public law 101-121 (31 United States Code Section 1352) and any implementing regulations, and shall ensure that each of its subcontractors receiving funds provided under this Agreement also fully complies with all applicable certification and disclosure requirements.

39.2 LOBBYIST ORDINANCE

Contractor, and each County lobbyist or County lobbying firm, as defined in Los Angeles County Code Section 2.160.010, retained by Contractor, shall fully comply with County's Lobbyist Ordinance, Los Angeles County Code Chapter 2.160. Failure on the part of Contractor or any County lobbyist or County lobbying firm retained by Contractor to fully comply with County Lobbyist Ordinance shall constitute a material breach of this Agreement, upon which County may immediately terminate or suspend this Agreement at County's option, either for material breach under Paragraph 23 (Termination/Suspension for Default) of this Agreement or for convenience under Paragraph 24 (Termination/Suspension for Convenience) of this Agreement.

40. EMPLOYMENT ELIGIBILITY VERIFICATION

Contractor warrants that it fully complies with all Federal and State statutes and regulations regarding employment of aliens and others and that all its employees performing Services under this Agreement meet the citizenship or alien status requirements contained in Federal and State statutes and regulations including, but not limited to, the Immigration Reform and Control Act of 1986 (P.L. 99-603), or as they currently exist and as they may be hereafter amended. Contractor shall retain all such documentation for all covered employees for the period prescribed by law.

Contractor shall obtain from all employees performing under this Agreement all verification and other documentation of employment eligibility status required by Federal statutes and regulations as they currently exist and as they may be hereafter amended. Contractor shall retain such documentation for the period prescribed by law.

Contractor shall indemnify, defend, and hold harmless County, its officers, employees and agents from and against any and all claims, demands, damages, liabilities, losses, costs, and expenses, including, but not limited to, defense costs and legal, accounting and other expert, consulting or professional fees, arising out of or in connection with any employer sanctions and any other liability which may be assessed against Contractor or County in connection with any alleged violation of any Federal or State statutes or regulations pertaining to the eligibility for employment of any persons performing work under this Agreement.

41. CONTRACT HIRING

41.1 CONSIDERATION OF HIRING COUNTY EMPLOYEES TARGETED FOR LAYOFFS

Should Contractor require additional or replacement personnel after the effective date of this Agreement to perform the work set forth herein, Contractor shall give first consideration for such employment openings to permanent County employees who are targeted for layoff or qualified former County employees who are on a re-employment list during the term of this Agreement.

41.2 CONSIDERATION OF GAIN/START PROGRAM PARTICIPANTS FOR EMPLOYMENT

Should Contractor require additional or replacement personnel after the Effective Date, Contractor shall give consideration for any such employment openings to participants in the County's Department of Public Social Services' Greater Avenues for Independence (GAIN) Program or Skills and Training to Achieve Readiness for Tomorrow (START) Program who meet Contractor's minimum qualifications for the open position. For this purpose, consideration shall mean that Contractor will interview qualified candidates. County will refer GAIN participants by job category to Contractor.

In the event that both laid-off County employees and GAIN/START participants are available for hiring, Contractor shall give County employees first priority.

41.3 PROHIBITION AGAINST INDUCEMENT AND PERSUASION

Contractor and County agree that, during the term of this Agreement and for a period of one (1) year thereafter, neither party shall in any way intentionally induce or persuade any employee of one party to become an employee or agent of the other party. Notwithstanding the foregoing, such prohibition shall not apply to any hiring action initiated through a public announcement.

42. FEDERAL EARNED INCOME CREDIT

If required by applicable law, Contractor shall notify its employees, and shall require each subcontractor to notify its employees, that they may be eligible for the Federal Earned Income Credit under the Federal income tax laws. Such notice shall be provided, in accordance with the requirements set forth in Internal Revenue Service Notice 1015.

43. CONTRACTOR RESPONSIBILITY AND DEBARMENT

43.1 RESPONSIBLE CONTRACTOR

A responsible contractor is a contractor who has demonstrated the attribute of trustworthiness, as well as quality, fitness, capacity and experience to satisfactorily perform the Agreement. It is County's policy to conduct business only with responsible contractors.

43.2 CHAPTER 2.202

Contractor is hereby notified that, in accordance with Chapter 2.202 of the Los Angeles Code, if County acquires information concerning the performance of Contractor on this Agreement or other contracts which indicates that Contractor is not responsible, County may, in addition to other remedies provided in this Agreement, debar Contractor from bidding or proposing on, or being awarded, and/or performing work on, County agreements for a specified period of time, which generally will not exceed five (5) years, although may exceed five (5) years or be permanent if warranted by the circumstances, and terminate any or all existing agreements Contractor may have with County.

43.3 NON-RESPONSIBLE CONTRACTOR

County may debar Contractor if County's Board of Supervisors finds, in its discretion, that Contractor has done any of the following: (i) violated any term of a contract with County or a nonprofit corporation created by County; (ii) committed any act or omission which negatively reflects on Contractor's quality, fitness or capacity to perform a contract with County, any other public entity or a nonprofit corporation created by County, or engaged in a pattern or practice which negatively reflects on same; (iii) committed an act or offense which indicates a lack of business integrity or business honesty; or (iv) made or submitted a false claim against County or any other public entity.

43.4 CONTRACTOR HEARING BOARD

If there is evidence that Contractor may be subject to debarment, County's Project Director, or his/her designee, will notify Contractor in writing of the evidence which is the basis for the proposed debarment and will advise Contractor of the scheduled date for a debarment hearing before County's Contractor Hearing Board.

The Contractor Hearing Board will conduct a hearing where evidence on the proposed debarment is presented. Contractor and/or Contractor's representative shall be given an opportunity to submit evidence at that hearing. After the hearing, the Contractor Hearing Board will prepare a tentative proposed decision, which shall contain a recommendation regarding whether Contractor should be debarred, and, if so, the appropriate length of time of the debarment. Contractor, County's Project Director, or his/her designee, and County's departments shall be provided with an opportunity to object to the tentative proposed decision prior to its presentation to County's Board of Supervisors.

After consideration of any objections, or if no objections are submitted, a record of the hearing, the proposed decision and any other recommendation of the Contractor Hearing Board shall be presented to County's Board of Supervisors. The Board of Supervisors shall have the right to modify, deny or adopt the proposed decision and recommendation of the Contractor Hearing Board.

If Contractor has been debarred for a period longer than five (5) years, then Contractor may, after the debarment has been in effect for at least five (5) years, submit a written request for review of the debarment determination to reduce the period of debarment or terminate the debarment. County may, in its discretion, reduce the period of debarment or terminate the debarment if it finds that such Contractor has adequately demonstrated one or more of the following: (i) elimination of the grounds for which the debarment was imposed; (ii) a bona fide change in ownership or management; (iii) material evidence discovered after debarment was imposed; or (iv) any other reason that is in the best interests of County.

The Contractor Hearing Board will consider a request for review of a debarment determination only where (i) the requesting contractor has been debarred for a period longer than five (5) years, (ii) the debarment has been in effect for at least five (5) years and (iii) the request is in writing, states one or more of the grounds for reduction of the debarment period or termination of the debarment, and includes supporting documentation. Upon receiving an appropriate request, the Contractor Hearing Board will provide notice of the hearing on the request. At the hearing, the Contractor Hearing Board shall conduct a hearing where evidence on the proposed reduction of debarment period or termination of debarment is presented. This hearing shall be conducted and the request for review decided by the Contractor Hearing Board pursuant to the same procedures as for a debarment hearing.

The Contractor Hearing Board's proposed decision shall contain a recommendation on the request to reduce the period of debarment or terminate the debarment. The Contractor Hearing Board shall present its proposed decision and recommendation to County's Board of Supervisors. County's Board of Supervisors shall have the right to modify, deny, or adopt the proposed decision and recommendation of the Contractor Hearing Board.

43.5 SUBCONTRACTORS OF CONTRACTOR

The terms and procedures of this Paragraph 43 shall also apply to subcontractors, consultants and partners of Contractor performing work under this Agreement.

43.6 PROHIBITION OF CONTRACT WITH SUSPENDED, DEBARRED, INELIGIBLE OR EXCLUDED CONTRACTOR BY FEDERAL OR STATE GOVERNMENT

Contractor hereby acknowledges that County is prohibited from contracting with parties that are suspended, debarred, ineligible or excluded from securing State-funded or Federally-funded contracts. By executing this Contract, Contractor certifies that neither it nor any of its owners, officers, partners, directors, or other principals is currently suspended, debarred, ineligible or excluded from securing State-funded or Federally-funded Contracts. Further by executing this Contract, Contractor certifies that, to its knowledge, none of its subcontractors, at any tier, or any owner, officer, partner, director, or other principal of any subcontractor is currently suspended, debarred, ineligible or excluded from securing State-funded or Federally-funded contracts. During the term of this Contract, Contractor shall immediately notify County's Compliance Manager in writing should it or any of its subcontractors or any principals of either be suspended, debarred, ineligible or excluded from securing State-funded or Federally-funded contracts. Failure of Contractor to comply with this provision shall constitute a material breach of this Contract upon which County may immediately terminate or suspend this Contract.

44. FEDERAL ACCESS TO RECORDS

If, and to the extent that Section 1861(v)(1)(I) of the Social Security Act (42 United States Code Section 1395x(v)(1)(i) is applicable, Contractor agrees that for a period of four (4) years following the furnishing of services under this Agreement, Contractor shall maintain and make available, upon written request, to the Secretary of the United States Department of Health and Human Services or the Comptroller General of the United States or to any of their authorized representatives, the contracts, books, documents and records of Contractor which are necessary to verify the nature and extent of the costs of services provided hereunder. Furthermore, if Contractor carries out any of the services described in 42 United States Code Section 1395 through any subcontract with a value or cost of Ten Thousand Dollars (\$10,000) or more over a twelve month period with a related organization (as that term is defined under Federal law), Contractor agrees that each such subcontract shall provide for such access to the subcontract, books, documents and records of the subcontractor.

45. REQUIRED CERTIFICATIONS

Contractor shall obtain and maintain in effect during the term of this Agreement all licenses, permits, registrations, accreditations, and certificates required by all Federal, State, and local laws, ordinances, rules, regulations, guidelines, and directives, which are applicable to Contractor's provision of the Services under this Agreement. Contractor shall further ensure that all of its officers, employees,

agents and subcontractors who perform Services hereunder, shall obtain and maintain in effect during the term of this Agreement all licenses, permits, registrations, accreditations and certificates which are applicable to their performance hereunder. A copy of each such license, permit, registration, accreditation, and certificate required by all applicable Federal, State, and local laws, ordinances, rules, regulations, guidelines, and directives shall be provided, if required by law, in duplicate, to County's Project Manager at the address set forth in Section 1 (County Key Personnel) of Exhibit E (Administration of Agreement).

46. NO THIRD PARTY BENEFICIARIES

Notwithstanding any other provision of this Agreement, Contractor and County do not in any way intend that any person or entity shall acquire any rights as a third-party beneficiary of this Agreement, except that this provision shall not be construed to diminish Contractor's indemnification obligations hereunder.

47. CONTRACTOR PERFORMANCE DURING CIVIL UNREST AND DISASTER

Contractor recognizes that County provides services essential to the residents of the communities it serves, and that these services are of particular importance at the time of a riot, insurrection, civil unrest, natural disaster, or similar event. Notwithstanding any other provision of this Agreement, full performance by Contractor during any riot, insurrection, civil unrest, natural disaster, or similar event is not excused if such performance remains physically possible without related danger to Contractor's or subcontractors' employees and suppliers. During any such event in which the health or safety of any of Contractor's staff members would be endangered by performing their services on-site, such staff members may perform any or all of their services remotely.

48. WARRANTY AGAINST CONTINGENT FEES

Contractor warrants that no person or selling agency has been employed or retained to solicit or secure this Agreement upon any agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by Contractor for the purpose of securing business.

For breach of this warranty, County shall have the right to terminate this Agreement and, at its sole discretion, deduct from the fees owed, or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fee.

49. SAFELY SURRENDERED BABY LAW

49.1 NOTICE

As required by applicable law, Contractor shall notify and provide to its employees, and shall require each subcontractor to notify and provide to its employees, a fact sheet regarding the Safely Surrender Baby Law, its implementation in Los Angeles

County, and where and how to safely surrender a baby. The fact sheet is available on the Internet at for printing purposes.

49.2 ACKNOWLEDGMENT OF COMMITMENT

Contractor acknowledges that County places a high priority on the implementation of the Safely Surrendered Baby Law. Contractor understands that it is County's policy to encourage all County Contractors to voluntarily post County's "Safely Surrendered Baby Law" poster in a prominent position at Contractor's place of business. Contractor will also encourage its subcontractors, if any, to post this poster in a prominent position in the subcontractor's place of business. County's Department of Children and Family Services will supply Contractor with the poster to be used.

50. COMPLIANCE WITH COUNTY'S JURY SERVICE PROGRAM

50.1 JURY SERVICE PROGRAM

This Agreement is subject to the provisions of County's ordinance entitled Contractor Employee Jury Service Program (hereinafter "Jury Service Program" or "Program") as codified in Sections 2.203.010 through 2.203.090 of the Los Angeles County Code (hereinafter "County Code").

50.2 WRITTEN EMPLOYEE JURY SERVICE POLICY

Unless Contractor has demonstrated to County's satisfaction either that Contractor is not a "Contractor" as defined under the Jury Service Program (Section 2.203.020 of the County Code) or that Contractor qualifies for an exception to the Jury Service Program (Section 2.203.070 of the County Code), Contractor shall have and adhere to a written policy that provides that its Employees (as defined in Paragraph 50.2 below) shall receive from Contractor, on an annual basis, no less than five (5) days of regular pay for actual jury service. The policy may provide that Employees deposit any fees received for such jury service with Contractor or that Contractor deduct from the Employee's regular pay the fees received for jury service.

For purposes of this Paragraph 50.2, "Contractor" means a person, partnership, corporation, or other entity which has an agreement with County or a subcontract with Contractor and has received or will receive an aggregate sum of \$50,000 or more in any twelve (12) month period under one or more County agreements or subcontracts. "Employee" means any California resident who is a full-time employee of Contractor. "Full-time" means forty (40) hours or more worked per week, or a lesser number of hours if: (1) the lesser number is a recognized industry standard as determined by County, or (2) Contractor has a longstanding practice that defines the lesser number of hours as fulltime. Fulltime employees providing short term, temporary services of ninety (90) days or less within a twelve (12) month period are not considered fulltime for purposes of the Jury Service Program. If Contractor uses any subcontractor to perform services for County under this Agreement, the subcontractor shall also be subject to the

provisions of this Paragraph 50. The provisions of this Paragraph 50 shall be inserted into any such subcontract and a copy of the Jury Service Program shall be attached to the agreement.

If Contractor is not required to comply with the Jury Service Program when the Agreement commences, Contractor shall have a continuing obligation to review the applicability of its "exception status" from the Jury Service Program, and Contractor shall immediately notify County if Contractor at any time either comes within the Jury Service Program's definition of "Contractor" or if Contractor no longer qualifies for an exception to the Program. In either event, Contractor shall immediately implement a written policy consistent with the Jury Service Program. County may also require, at any time during this Agreement and at its sole discretion, that Contractor demonstrate to County's satisfaction that Contractor either continues to remain outside of the Jury Service Program's definition of "Contractor" and/or that Contractor continues to qualify for an exception to the Program.

Contractor's violation of this Paragraph 50 of this Agreement may constitute a material breach of the Agreement. In the event of such material breach, County may, in its sole discretion, terminate this Agreement with Contractor and/or bar Contractor from the award of future County agreements for a period of time consistent with the seriousness of the breach.

51. CONTRACTOR'S WARRANTY OF ADHERENCE TO COUNTY'S CHILD SUPPORT COMPLIANCE PROGRAM

Contractor acknowledges that County has established a goal of ensuring that all individuals who benefit financially from County through County agreements are in compliance with their court ordered child, family and spousal support obligations in order to mitigate the economic burden otherwise imposed upon County and its taxpayers.

As required by County's Child Support Compliance Program (County Code Chapter 2.200) and without limiting Contractor's duty under this Agreement to comply with all applicable provisions of State and Federal law, Contractor warrants that to the best of its knowledge it is now in compliance and shall during the term of this Agreement maintain compliance with employment and wage reporting requirements as required by the Federal Social Security Act (42 USC Section 653(a)) and California Unemployment Insurance Code Section 1088.5, and shall, implement all lawfully served Wage and Earnings Withholding Orders or County's Child Support Services Department Notices of Wage and Earnings Assignment for Child or Spousal Support, pursuant to Code of Civil Procedure Section 706.031 and Family Code Section 5246(b).

52. TERMINATION FOR BREACH OF WARRANTY TO MAINTAIN COMPLIANCE WITH COUNTY'S CHILD SUPPORT COMPLIANCE PROGRAM

Failure of Contractor to maintain compliance with the requirements set forth in Paragraph 51 (Contractor's Warranty of Adherence to County's Child Support

Compliance Program) shall constitute a default by Contractor under this Agreement. Without limiting the rights and remedies available to County under any other provision of this Agreement, failure to cure such default within ninety (90) days of notice by County's Child Support Services Department shall be grounds upon which the Auditor-Controller or County's Board of Supervisors may terminate this Agreement pursuant to Paragraph 23 (Termination/Suspension for Default) and pursue debarment of Contractor pursuant to Paragraph 43 (Contractor Responsibility and Debarment).

53. DEFAULTED PROPERTY TAX REDUCTION PROGRAM

53.1 CONTRACTOR'S WARRANTY OF COMPLIANCE WITH COUNTY'S DEFAULTED PROPERTY TAX REDUCTION PROGRAM

Contractor acknowledges that County has established a goal of ensuring that all individuals and businesses who benefit financially from County through contract are current in paying their property tax obligations (secured and unsecured roll) in order to mitigate the economic burden otherwise imposed upon County and its taxpayers.

Unless Contractor qualifies for an exemption or exclusion, Contractor warrants and certifies that to the best of its knowledge it is now in compliance, and during the term of this Agreement will maintain compliance, with Los Angeles County Code Chapter 2.206.

53.2 TERMINATION FOR BREACH OF WARRANTY TO MAINTAIN COMPLIANCE WITH COUNTY'S DEFAULTED PROPERTY TAX REDUCTION PROGRAM

Failure of Contractor to maintain compliance with the requirements set forth in Paragraph 52.1 (Contractor's Warranty of Compliance with County's Defaulted Property Tax Reduction Program) shall constitute default under this Agreement. Without limiting the rights and remedies available to County under any other provision of this Agreement, failure of Contractor to cure such default within ten (10) days of notice shall be grounds upon which County may terminate this Agreement and/or pursue debarment of Contractor pursuant to County Code Chapter 2.206.

54. SHRED DOCUMENTS

Contractor shall ensure that all confidential documents/papers, as defined under State law relating to this Agreement must be shredded and not put in trash containers when Contractor disposes of these documents/papers. All documents/papers to be shredded are to be placed in a locked or secured container/bin/box and labeled "shred" until they are destroyed. No confidential documents/papers are to be recycled.

Documents for record and retention purposes in accordance with Paragraph 33 (Records and Audits) of this Agreement are to be maintained for a period of five (5) years.

55. COUNTY AUDIT SETTLEMENTS

If, at any time during or after the term of this Agreement, representatives of County conduct an audit of Contractor regarding the work performed under this Agreement, and if such audit reasonably and accurately find that County's dollar liability for such work is less than payments made by County to Contractor, then the difference, together with County's reasonable costs of audit, shall be either repaid by Contractor to County by cash payment upon demand or deducted from any amounts due to Contractor from County, as determined by County. If such audit finds County's dollar liability for such work is more than payments made by County to Contractor, then the difference shall be repaid to Contractor by cash payment.

56. DISPUTE RESOLUTION PROCEDURE

Contractor and County agree to act immediately to mutually resolve any disputes which may arise with respect to this Agreement. All such disputes shall be subject to the provisions of this Paragraph 56 (such provisions shall be collectively referred to as the "Dispute Resolution Procedure"). Time is of the essence in the resolution of disputes.

Contractor and County agree that the existence and details of a dispute notwithstanding, both parties shall continue without delay their performance hereunder.

Neither party shall delay or suspend its performance during the Dispute Resolution Procedure.

In the event of any dispute between the parties with respect to this Agreement, Contractor and County shall submit the matter to their respective Project Managers for the purpose of endeavoring to resolve such dispute.

In the event that the Project Managers are unable to resolve the dispute within a reasonable time not to exceed ten (10) days from the date of submission of the dispute to them, then the matter shall be immediately submitted to the parties' respective Project Directors for further consideration and discussion to attempt to resolve the dispute.

In the event that the Project Directors are unable to resolve the dispute within a reasonable time not to exceed ten (10) days from the date of submission of the dispute to them, then the matter shall be immediately submitted to Contractor's Project Executive and the Director or designee. These persons shall have ten (10) days to attempt to resolve the dispute.

In the event that at these levels, there is not a resolution of the dispute acceptable to both parties, then each party may assert its other rights and remedies provided under this Agreement and/or its rights and remedies as provided by law.

All disputes utilizing this Dispute Resolution Procedure shall be documented in writing by each party and shall state the specifics of each alleged dispute and all actions taken. The parties shall act in good faith to resolve all disputes. At all three (3) levels described in this Paragraph 56, the efforts to resolve a dispute shall be undertaken by conference between the parties' respective representatives, either orally, by face-to-face meeting or by telephone, or in writing by exchange of correspondence.

Notwithstanding the foregoing, in the event of County's infringement of Contractor's intellectual property rights under the Agreement or violation by either party of the confidentiality obligations hereunder, the violated party shall have the right to seek injunctive relief against the other without waiting for the outcome of the Dispute Resolution Procedure.

Notwithstanding any other provision of this Agreement, County's right to seek injunctive relief to enforce the provisions of Paragraph 21 (Confidentiality and Security) shall not be subject to this Dispute Resolution Procedure. The preceding sentence is intended only as a clarification of County's rights and shall not be deemed to impair any claims that County may have against Contractor or County's rights to assert such claims after any such injunctive relief has been obtained.

57. ASSIGNMENT BY COUNTY

This Agreement may be assigned in whole or in part by County, without the further consent of Contractor, to a party which is not a competitor of Contractor and which agrees in writing to perform County's obligations under this Agreement.

58. NEW TECHNOLOGY

Contractor and County acknowledge the probability that the technology of the software and hardware which comprise the System will change and improve during the term of this Agreement. County desires the flexibility to incorporate into the System any new technologies as they may become available. Accordingly, Contractor's Project Manager shall, promptly upon discovery and on a continuing basis, apprise County's Project Director of all new technologies, methodologies, and techniques which Contractor considers to be applicable to the System. Specifically, upon County's request, Contractor shall provide, in writing, a description of such new technologies, methodologies and techniques, indicating the advantages and disadvantages of incorporating same into the System, and provide an estimate of the impact such incorporation will have on the performance, scheduling and price of the System. County, at its sole discretion, may request that this Agreement be amended to incorporate the new technologies, methodologies, and techniques into the System pursuant to the provisions of Paragraph 4 (Changes Notices and Amendments).

59. NON-DISCRIMINATION IN SERVICES

Contractor shall not discriminate in the provision of services hereunder because of race, color, religion, national origin, ancestry, sex, age, or physical or mental

handicap, in accordance with all applicable requirements of Federal and State law. For the purpose of this Paragraph 59, discrimination in the provision of services may include, but is not limited to, the following: denying any person any service or benefit or the availability of the facility, providing any service or benefit to any person which is not equivalent or is not provided in an equivalent manner or at an equivalent time to that provided to others; subjecting any person to segregation or separate treatment in any manner related to the receipt of any service; restricting any person in any way in the enjoyment of any advantage or privilege enjoyed by others receiving any service or benefit; and treating any person differently from others in determining admission, enrollment quota, eligibility, membership, or any other requirements or conditions which persons must meet in order to be provided any service or benefit.

Contractor shall ensure that recipients of services under this Agreement are provided services without regard to race, color, religion, national origin, ancestry, sex, age, or condition of physical or mental handicap.

60. UNLAWFUL SOLICITATION

Contractor shall inform all of its employees who provide services hereunder of the provisions of Article 9 of Chapter 4 of Division 3 (commencing with Section 6150) of California Business and Professions Code (i.e., State Bar Act provisions regarding unlawful solicitation as a runner or capper for attorneys) and shall take positive and affirmative steps in its performance hereunder to ensure that there is no violation of such provisions by its employees.

61. GOVERNING LAW, JURISDICTION AND VENUE

This Agreement shall be governed by, and construed in accordance with, the substantive and procedural laws of the State of California applicable to agreements made and to be performed within the State. Contractor agrees and consents to the exclusive jurisdiction of the courts of the State of California for all purposes regarding this Agreement and further agrees and consents that venue of any action brought hereunder shall be exclusively in the County of Los Angeles, California. For claims that are subject to exclusive Federal subject matter jurisdiction, Contractor agrees and consents to the exclusive jurisdiction of the Federal District Court of the Central District of California.

62. WAIVER

No breach of any provision hereof can be waived unless in writing. No waiver by County or Contractor of any breach of any provision of this Agreement shall constitute a waiver of any other breach or of such provision. Failure of County or Contractor to enforce at any time, or from time to time, any provision of this Agreement shall not be construed as a waiver thereof. The rights and remedies set forth in this Agreement shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Agreement.

63. AUTHORIZATION WARRANTY

Contractor and County represent and warrant that the person executing this Agreement or any Amendment thereto pursuant to Paragraph 4 (Changes Notices and Amendments) on its behalf is an authorized agent who has actual authority to bind it to each and every term, condition and obligation of this Agreement, and that all requirements of Contractor and County have been fulfilled to provide such actual authority.

64. VALIDITY AND SEVERABILITY

64.1 VALIDITY

The invalidity of any provision of this Agreement shall not render the other provisions hereof invalid, unenforceable, or illegal, unless the essential purposes of this Agreement shall be materially impaired thereby.

64.2 SEVERABILITY

In the event that any provision herein contained is held to be invalid, void or illegal by any court of competent jurisdiction, the same shall be deemed severable from the remainder of this Agreement, if practicable, and shall in no way affect, impair or invalidate any other provision contained herein. If any such provision shall be deemed invalid in its scope or breadth, such provision shall be deemed valid to the extent of the scope or breadth permitted by law. If any provision of this Agreement is adjudged void or invalid for any reason whatsoever but would be valid if part of the wording thereof were deleted or changed, then such provision shall apply with such modifications as may be necessary to make it valid and effective.

65. NOTICES

All notices or demands required or permitted to be given or made under this Agreement, unless otherwise specified, shall be in writing and shall be addressed to the parties at the following addresses and delivered: (i) by hand with signed receipt; (ii) by first class registered or certified mail, postage prepaid; or (iii) by facsimile or electronic mail transmission followed within twenty-four (24) hours by a confirmation copy mailed by first-class registered or certified mail, postage prepaid. Notices shall be deemed given at the time of signed receipt in the case of hand delivery, three (3) days after deposit in the United States mail as set forth above, or on the date of facsimile or electronic mail transmission if followed by timely confirmation mailing. Addresses may be changed by either party by giving ten (10) days prior written notice thereof to the other party.

Director shall have the authority to issue all notices or demands which are required or permitted to be issued by County under this Agreement.

To County, notices shall be sent to the attention of County's Project Manager and County's Project Director at the respective addresses specified in Section 1 (County Key Personnel) of Exhibit E (Administration of Agreement).

To Contractor, notices shall be sent to the attention of Contractor's Project Manager at the address specified in Section 2 (Contractor Key Personnel) of Exhibit E (Administration of Agreement), with a copy to Contractor's Project Executive.

Each party may change the names of the people designated to receive notices pursuant to this Paragraph 65 by giving written notice of the change to the other party, subject to County's right of approval in accordance with Paragraph 3.3 (Approval of Contractor's Staff).

In the event of suspension or termination of this Agreement, notices may also be given upon personal delivery to any person whose actual knowledge of such suspension or termination would be sufficient notice to Contractor. Actual knowledge of such suspension or termination by an individual Contractor or by a copartner, if Contractor is a partnership; or by the president, vice president, secretary, or general manager, if Contractor is a corporation; or by the managing agent regularly in charge of the work on behalf of said Contractor shall in any case be sufficient notice.

66. ARM'S LENGTH NEGOTIATIONS

This Agreement is the product of arm's length negotiations between Contractor and County, with each party having had the opportunity to receive advice from and representation by independent counsel of its own choosing. As such, the parties agree that this Agreement is to be interpreted fairly as between them and is not to be strictly construed against either as the drafter or otherwise.

67. NON-EXCLUSIVITY

Nothing herein is intended nor shall be construed as creating any exclusive arrangement with Contractor. This Agreement shall not restrict County from acquiring similar, equal or like and/or services from other entities or sources.

68. CAPTIONS AND PARAGRAPH HEADINGS

Captions and paragraph headings used in this Agreement are for convenience only, are not a part of this Agreement, and shall not be used in construing this Agreement. If there is a conflict when referencing a Paragraph in this Agreement, between the Paragraph heading title and its number, the Paragraph heading title shall control.

69. FORCE MAJEURE

69.1 Neither party shall be liable for such party's failure to perform its obligations under and in accordance with this Agreement, if such failure arises out of fires, floods, epidemics, quarantine restrictions, other natural occurrences, strikes, lockouts (other than a lockout by such party or any of such party's subcontractors), freight embargoes, or other similar events to those described above, but in every such case the failure to perform must be

totally beyond the control and without any fault or negligence of such party (such events are referred to in this sub-paragraph as "force majeure events").

69.2 Notwithstanding the foregoing, a default by a subcontractor of Contractor shall not constitute a force majeure event, unless such default arises out of causes beyond the control of both Contractor and such subcontractor, and without any fault or negligence of either of them. In such case, Contractor shall not be liable for failure to perform, unless the services to be furnished by the subcontractor were obtainable from other sources in sufficient time to permit Contractor to meet the required performance schedule. As used in this sub-paragraph, the term "subcontractor" and "subcontractors" mean subcontractors at any tier.

69.3 In the event Contractor's failure to perform arises out of a force majeure event, Contractor agrees to use commercially reasonable best efforts to obtain services from other sources, if applicable, and to otherwise mitigate the damages and reduce the delay caused by such force majeure event.

70. FORMS AND PROCEDURES

All existing forms and procedures used by Contractor in implementation of the provisions of this Agreement are deemed "approved" by County for purposes of this Paragraph 70. Any new forms and procedures which materially affect Contractor's performance of this Agreement shall be subject to review and approval by County prior to use by Contractor.

71. DAMAGE TO COUNTY FACILITIES, BUILDINGS AND GROUNDS

Contractor shall repair, or cause to be repaired, at its own cost, any and all damage to County facilities, buildings, or grounds caused by Contractor or employees or agents of Contractor. Such repairs shall be made immediately after Contractor has become aware of such damage, but in no event later than thirty (30) days after the occurrence.

If Contractor fails to make timely repairs, County may make any necessary repairs. All costs incurred by County, as determined by County, for such repairs shall be repaid by Contractor by cash payment upon demand or, without limitation of all County's other rights and remedies provided by law or under this Agreement, County may deduct such costs from any amounts due Contractor from County under this Agreement.

72. MINIMUM AGE, LANGUAGE SKILLS AND LEGAL STATUS OF CONTRACTOR PERSONNEL AT FACILITY

Contractor cannot assign employees under the age of eighteen (18) to perform work under this Agreement. All of Contractor's employees working at County facilities must be able to communicate in English. Contractor's employees must

be United State citizens or legally present and permitted to work in the United States.

73. NOTICE OF DELAYS

Exception as otherwise provided herein, when either party has knowledge that any actual or potential situation is delaying or threatens to delay the timely performance of this Agreement, that party shall, within five (5) Business Days, give notice thereof, including all relevant information with respect thereto, to the other party.

74. RE-SOLICITATION OF BIDS AND PROPOSALS

Contractor acknowledges that, prior to the expiration or earlier termination of this Agreement, County, in its sole discretion, may exercise its right to invite bids or request proposals for the continued provision of the services delivered or contemplated under this Agreement. County shall make the determination to re-solicit bids or request proposals in accordance with applicable County policies.

Contractor acknowledges that County, in its sole discretion, may enter into an agreement for the future provision of services, based upon the bids or proposals received, with a provider or providers other than Contractor. Further, Contractor acknowledges that it obtains no greater right to be selected through any future invitation for bids or request for proposals by virtue of its present status as Contractor.

75. NO PAYMENT FOR SERVICES PROVIDED FOLLOWING EXPIRATION OR TERMINATION OF AGREEMENT

Contractor shall have no claim against County for payment of any money or reimbursement, of any kind whatsoever, for any services provided by Contractor after the expiration or other termination of this Agreement. Should Contractor receive any such payment, it shall immediately notify County and shall immediately repay all such funds to County. Payment by County for services rendered after expiration/termination of this Agreement shall not constitute a waiver of County's right to recover such payment from Contractor. The provisions of this Paragraph 75 shall survive the expiration, suspension, or other termination of this Agreement.

76. ACCESS TO COUNTY FACILITIES

Contractor, its employees, and agents, may be granted access to County facilities, subject to Contractor's prior notification to County's Project Manager, for the purpose of executing Contractor's obligations hereunder. Access to County facilities shall be restricted to 7:00 a.m. until 6:00 p.m., Pacific Time, Monday through Thursday, County observed holidays excepted. Access to County facilities outside of normal business hours must be approved in writing in advance by County's Project Manager, which approval will not be unreasonably withheld. Contractor shall have no tenancy, or any other property or other rights, in County facilities. While present at County facilities, Contractor's personnel shall

be accompanied by County personnel at all times, unless this requirement is waived in writing prior to such event by County's Project Manager.

77. COUNTY FACILITY OFFICE SPACE

In order for Contractor to perform Services hereunder and only for the performance of such Services, County may elect, subject to County's standard administrative and security requirements, to provide Contractor with office space and equipment, as determined at the discretion of the applicable County's Project Manager at County facilities, on a non-exclusive use basis. County shall also provide Contractor with reasonable telephone service in such office space for use only for purposes of this Agreement. County disclaims any and all responsibility for the loss, theft or damage of any property or material left at such County office space by Contractor.

78. PHYSICAL ALTERATIONS

Contractor shall not in any way physically alter or improve any County facility without the prior written approval of the Director, County's Project Director, and the Director of County's Internal Services Department, in their discretion.

79. STAFF PERFORMANCE WHILE UNDER THE INFLUENCE

Contractor shall use reasonable efforts to ensure that no employee of Contractor shall perform services hereunder while under the influence of any alcoholic beverage, medication, narcotic or other substance which might impair his or her physical or mental performance.

80. RECYCLED PAPER

Consistent with the County's Board of Supervisors' policy to reduce the amount of solid waste deposited at the County landfills, Contractor agrees to use recycled-content paper to the maximum extent possible in this project.

81. LOCAL SMALL BUSINESS ENTERPRISE UTILIZATION

When requested by the County, the Contractor shall provide to the County via methods specified by the County, such as submission of electronic live (or dynamic) data on invoices for the prime and all subcontractors using County-designated third party software system or to a County approved website, or other means of submitting expenditure information on subcontractors, including but not limited to the following information: the name, business address and telephone number/email address of each subcontractor.

In addition, the Contractor shall be required to provide each of the specified subcontractor Local Small Business Enterprise (SBE), Disabled Veteran Business Enterprise (DVBE), and Social Enterprise (SE) status (i.e., whether any of the listed subcontractors are Local SBE's) and the proposed monetary amount of the work the subcontractor will perform on each Notice to Proceed. At the time of submittal of

each invoice, the Contractor shall indicate, via methods specified by the County, the actual dollar amounts paid to each listed subcontractor who performed work on the project. The subcontractor may be requested to confirm receipt of the actual payment to the subcontractor by the prime.

The parties agree that it will be impracticable or extremely difficult to fix the extent of actual damages resulting from the failure to the Contractor to comply with this Section. The parties will agree that under the current circumstances a reasonable estimate of such damages is specified in Exhibit F, Performance Requirements Summary, and that the Contractor shall be liable to the County for said amount.

If in the judgment of the Director, or his/her designee, the Contractor is deemed to be in non-compliance with the terms and obligations, the Director or his/her designee, at his/her option, in addition to, or in lieu of, other remedies provided in Exhibit F, Performance Requirements Summary, may deduct and withhold liquidated damages from County's final payment to the Contractor.

82. LOCAL SMALL BUSINESS ENTERPRISE PREFERENCE PROGRAM

This Contract is subject to the provisions of County's ordinance entitled Local Small Business Enterprise Preference Program, as codified in Chapter 2.204 of the Los Angeles County Code.

Contractor shall not knowingly and with the intent to defraud, fraudulently obtain, retain, attempt to obtain, or retain, or aid another in fraudulently obtaining or retaining or attempting to obtain or retain certification as a Local Small Business Enterprise.

Contractor shall not willfully and knowingly make a false statement with the intent to defraud, whether by affidavit, report, or other representation, to a County official or employee for the purpose of influencing the certification or denial of certification of any entity as a Local Small Business Enterprise.

If Contractor has obtained County certification as a Local Small Business Enterprise by reason of having furnished incorrect supporting information or by reason of having withheld information, and which knew, or should have known, the information furnished was incorrect or the information withheld was relevant to its request for certification, and which by reason of such certification has been awarded this Contract to which it would not otherwise have been entitled, shall:

1. Pay to County any difference between this Contract amount and what County's costs would have been if this Contract had been properly awarded.
2. In addition to the amount described in subdivision (1), be assessed a penalty in an amount of not more than 10 percent of the amount of this Contract.

3. Be subject to the provisions of Chapter 2.202 of the Los Angeles County Code (Determinations of Contractor Non-responsibility and Contractor Debarment).

The above penalties shall also apply to any business that has previously obtained proper certification, however, as a result of a change in their status would no longer be eligible for certification, and fails to notify the State and the Department of Consumer and Business Affairs of this information prior to responding to a solicitation or accepting a contract award.

83. DISABLED VETERAN BUSINESS ENTERPRISE PREFERENCE PROGRAM

This Contract is subject to the provisions of the County's ordinance entitled Disabled Veteran Business Enterprise (DVBE) Preference Program, as codified in Chapter 2.211 of the Los Angeles County Code.

Contractor shall not knowingly and with the intent to defraud, fraudulently obtain, retain, attempt to obtain, or retain, or aid another in fraudulently obtaining or retaining or attempting to obtain or retain certification as a DVBE.

Contractor shall not willfully and knowingly make a false statement with the intent to defraud, whether by affidavit, report, or other representation, to a County official or employee for the purpose of influencing the certification or denial of certification of any entity as a DVBE.

If Contractor has obtained certification as a DVBE by reason of having furnished incorrect supporting information or by reason of having withheld information, and which knew, or should have known, the information furnished was incorrect or the information withheld was relevant to its request for certification, and which by reason of such certification has been awarded this contract to which it would not otherwise have been entitled, shall:

1. Pay to the County any difference between the Contract amount and what the County's costs would have been if the Contract had been properly awarded.
2. In addition to the amount described in subdivision (1), be assessed a penalty in an amount of not more than 10 percent of the amount of the Contract.
3. Be subject to the provisions of Chapter 2.202 of the Los Angeles County Code (Determinations of Contractor Non-responsibility and Contractor Debarment).

Notwithstanding any other remedies in this contract, the above penalties shall also apply to any business that has previously obtained proper certification, however, as a result of a change in their status would no longer be eligible for certification, and fails to notify the State and the Department of Consumer and Business Affairs of this information prior to responding to a solicitation or accepting a contract award.

84. SOCIAL ENTERPRISE PREFERENCE PROGRAM

This Contract is subject to the provisions of the County's ordinance entitled SE Preference Program, as codified in Chapter 2.205 of the Los Angeles County Code.

Contractor shall not knowingly and with the intent to defraud, fraudulently obtain, retain, attempt to obtain, or retain, or aid another in fraudulently obtaining or retaining or attempting to obtain or retain certification as a SE.

Contractor shall not willfully and knowingly make a false statement with the intent to defraud, whether by affidavit, report, or other representation, to a County official or employee for the purpose of influencing the certification or denial of certification of any entity as a SE.

If Contractor has obtained County certification as a SE by reason of having furnished incorrect supporting information or by reason of having withheld information, and which knew, or should have known, the information furnished was incorrect or the information withheld was relevant to its request for certification, and which by reason of such certification has been awarded this contract to which it would not otherwise have been entitled, Contractor shall:

1. Pay to the County any difference between the Contract amount and what the County's costs would have been if the Contract had been properly awarded.
2. In addition to the amount described in subdivision (1), be assessed a penalty in the amount of not more than 10 percent of the amount of this Contract.
3. Be subject to the provisions of Chapter 2.202 of the Los Angeles County Code (Determinations of Contractor Non-responsibility and Contractor Debarment).

The above penalties shall also apply to any entity that has previously obtained proper certification, however, as a result of a change in their status would no longer be eligible for certification and fails to notify the Department of Consumer and Business Affairs of this information prior to responding to a solicitation or accepting a contract award.

85. COMPLIANCE WITH COUNTY'S ZERO TOLERANCE ON HUMAN TRAFFICKING

Contractor acknowledges that County has established a Zero Tolerance on Human Trafficking Policy prohibiting contractors from engaging in human trafficking.

If Contractor or member of Contractor's staff is convicted of a human trafficking offense, County shall require that Contractor or member of Contractor's staff be removed immediately from performing any Work under the Agreement. County will not be under any obligation to disclose confidential information regarding the offenses other than those required by law.

Disqualification of any member of Contractor's staff pursuant to this Paragraph 83 shall not relieve Contractor of its obligation to complete all Work in accordance with the terms and conditions of this Agreement.

86. DEFAULT METHOD OF PAYMENT: DIRECT DEPOSIT OR ELECTRONIC FUNDS TRANSFER (EFT)

County, at its sole discretion, may determine that the most efficient and secure default form of payment for services provided under the Agreement with County shall be Electronic Funds Transfer (EFT) or direct deposit, unless an alternative method of payment is deemed appropriate by County's Auditor-Controller (A-C).

Upon the Effective Date of the Agreement and the request of County's A-C or DPW, Contractor shall submit to the A-C a direct deposit authorization request via the website together with banking and vendor information, and any other information that the A-C determines is reasonably necessary to process the payment and comply with all accounting, record keeping and tax reporting requirements.

Any provision of law, grant or funding agreement requiring a specific form or method of payment other than EFT or direct deposit shall supersede this requirement with respect to those payments.

At any time during the term of the Agreement, Contractor may submit a written request for an exemption to this requirement. Such request must be based on specific legal, business, or operational needs and explain why the payment method designated by the A-C is not feasible and an alternative is necessary. The A-C, in consultation with the DPW, shall decide whether to approve any exemption request.

87. COMPLIANCE WITH FAIR CHANCE EMPLOYMENT PRACTICES

Contractor shall comply with fair chance employment hiring practices set forth in California Government Code Section 12952, Employment Discrimination: Conviction History. Contractor's violation of this paragraph of the Contract may constitute a material breach of the Contract. In the event of such material breach, County may, in its sole discretion, terminate the Contract compliance with County Policy of equity.

88. COMPLIANCE WITH THE COUNTY POLICY OF EQUITY

The Contractor acknowledges that the County takes its commitment to preserving the dignity and professionalism of the workplace very seriously, as set forth in the County Policy of Equity (CPOE) (<https://ceop.lacounty.gov/>). The contractor further acknowledges that the County strives to provide a workplace free from discrimination, harassment, retaliation, and inappropriate conduct based on a protected characteristic, and which may violate the CPOE. The Contractor, its employees, and Subcontractors acknowledge and certify receipt and understanding of the CPOE. Failure of the Contractor, its employees, or its

Subcontractors to uphold the County's expectations of a workplace free from harassment and discrimination, including inappropriate conduct based on a protected characteristic, may subject the Contractor to termination of contractual agreements as well as civil liability.

89. TIME OFF FOR VOTING

Contractor shall notify its employees and provide information regarding the time off for voting law (California Elections Code Section 14000). Not less than ten (10) calendar days before every statewide election, every Contractor and subcontractor shall keep posted conspicuously at the place of work, if practicable, or elsewhere where it can be seen as employees come or go to their place of work, a notice setting forth the provisions of California Elections Code Section 14000.

90. COMPLAINTS

Contractor shall develop, maintain, and operate procedures for receiving, investigating, and responding to any complaints by any individual. Within 12 Business Days after this Contract's effective date, Contractor shall provide County with Contractor's policy for receiving, investigating, and responding to any complaints by any individual.

County will review Contractor's policy and provide Contractor with approval of said plan or with requested changes. If County requests changes in Contractor's policy, Contractor shall make such changes and resubmit the plan within five Business Days for County approval. If, at any time, Contractor wishes to change Contractor's policy, Contractor shall submit proposed changes to County for approval before implementation. Contractor shall preliminarily investigate all complaints and notify the Contract Manager of the status of the investigation within five Business Days of receiving the complaint. When complaints cannot be resolved informally, a system of follow-through shall be instituted which adheres to formal plans for specific actions and strict time deadlines. Copies of all written responses shall be sent to the Contract Manager within three Business Days of mailing to the complainant.

91. GENERAL CONDITIONS OF CONTRACT WORK

91.1 AUTHORITY OF PUBLIC WORKS AND INSPECTION

The Director will have the final authority in all matters affecting the work covered by this Contract's Terms, Requirement, Conditions, and Specifications. On all questions relating to work acceptability or interpretations of these Terms, Requirements, Conditions, and Specifications, the decision of the Director will be final.

91.2 COOPERATION

Contractor shall cooperate with Public Works' forces engaged in any other activities at the jobsite. Contractor shall carry out all work in a diligent manner and according to instructions of the Director.

91.3 COOPERATION AND COLLATERAL WORK

Contractor shall perform work as directed by the Director. The Director will be supported by other Public Works personnel in assuring satisfactory performance of the work under these Specifications and that satisfactory Contract controls and conditions are maintained.

91.4 EQUIPMENT, LABOR, SUPERVISION, AND MATERIALS

All equipment, labor, supervision, and materials required to accomplish this Contract, except as might be specifically outlined in other sections, shall be provided by Contractor.

91.5 JOBSITE SAFETY

Contractor shall be solely responsible for ensuring that all work performed under this Contract is performed in strict compliance with all applicable Federal, State, and local occupational safety regulations. Contractor shall provide at its expense all safeguards, safety devices, and protective equipment and shall take any and all actions appropriate to providing a safe jobsite.

91.6 LABOR

No person shall be employed on any work under this Contract who is found to be intemperate, troublesome, disorderly, or is otherwise objectionable to Public Works. Any such person shall be reassigned immediately and not again employed on Public Works' projects or providing services.

91.7 LABOR LAW COMPLIANCE

Contractor, its agents, and employees shall be bound by and shall comply with all applicable provisions of the Labor Code of the State of California as well as all other applicable Federal, State, and local laws related to labor including compliance with prevailing wage laws. The Contractor is responsible for selecting the classification of workers, which will be required to perform this service in accordance with the Contractor's method of performing the work and when applicable, is required to pay current prevailing wage rates adopted by the Director of the Department of Industrial Relations and will indemnify the County for any claims resulting from their failure to so comply. Contractor shall comply with Labor Code, Section 1777.5, with respect to the employment of apprentices.

91.8 OVERTIME

Eight hours labor constitutes a legal day's work. Work in excess thereof, or greater than 40 hours during any one week, shall be permitted only as authorized by and in accordance with Labor Code, Section 1815 et seq.

91.9 PROHIBITION AGAINST USE OF CHILD LABOR

91.9.1 Contractor shall:

- a. Not knowingly sell or supply to County any products, goods, supply, or other personal property manufactured in violation of child labor standards set by the International Labor Organization through its 1973 Convention Concerning Minimum Age for Employment.
- b. Upon request by County, identify the country/countries of origin of any products, goods, supplies, or other personal property Contractor sells or supplies to County.
- c. Upon request by County, provide to County the manufacturer's certification of compliance with all international child labor conventions.
- d. Should County discover that any products, goods, supplies, or other personal property sold or supplied by Contractor to County are produced in violation of any international child labor conventions, Contractor shall immediately provide an alternative, compliant source of supply.

91.9.2 Failure by Contractor to comply with provisions of this Paragraph will constitute a material breach of this Contract and will be grounds for immediate suspension or termination of this Contract for default.

91.10 PUBLIC CONVENIENCE

Contractor shall conduct operations to cause the least possible obstruction and inconvenience to public traffic or disruption to the peace and quiet of the area within which the work is being performed.

91.11 PUBLIC SAFETY

It shall be the Contractor's responsibility to maintain security against public hazards at all times while performing work at contracted work locations. In the event Contractor determines a public hazard exists at a work location, Contractor shall immediately mark the location to prevent public access to the hazard and immediately notify the Contract Manager.

91.12 QUALITY OF WORK

Contractor shall provide the County high and consistent quality work under this Contract, and which is at least equivalent to that which Contractor provides to all other clients it serves. All work shall be executed by experienced and well-trained

workers. All work shall be under supervision of a well-qualified supervisor. Contractor also agrees that work shall be furnished in a professional manner and according to these Specifications.

91.13 QUANTITIES OF WORK

Contractor shall be allowed no claims for anticipated profits or for any damages of any sort because of any difference between the work estimated by Contractor in responding to County's solicitation and actual quantities of work done under this Contract or for work decreased or eliminated by County.

91.14 SAFETY REQUIREMENTS

Contractor shall be responsible for the safety of equipment, material, and personnel under Contractor's jurisdiction during the work.

91.15 STORAGE OF MATERIALS AND EQUIPMENT

Contractor shall not store material or equipment at the jobsite, except as might be specifically authorized by this Contract. County will not be liable or responsible for any damage, by whatever means, or for the theft of Contractor's material or equipment from any jobsite.

91.16 TRANSPORTATION

County will not provide transportation to and from the jobsite and will not provide travel around the limits of the jobsite.

91.17 WORK AREA CONTROLS

Contractor shall comply with all applicable laws and regulations. Contractor shall maintain work area in a neat, orderly, clean, and safe manner. Contractor shall avoid spreading out equipment excessively. Location and layout of all equipment and materials at each jobsite will be subject to the Contract Manager's approval. Contractor shall be responsible for the security of any and all of Public Works/County facilities in its care. Contractor shall provide protection against vandalism and accidental and malicious damage, both during working and nonworking hours.

92. COMPLIANCE WITH COUNTY'S WOMEN IN TECHNOLOGY HIRING INITIATIVE

At the direction of the Board, the County has established a "Women in Technology" (WIT) Hiring Initiative focused on recruiting, training, mentoring and preparing all genders, including women, at-risk youth, and underrepresented populations (program participants) for County Information Technology (IT) careers. In support of the subject initiative, IT contractors currently offering certification, training, and/or mentoring programs must make such program(s) available to WIT program

participants, if feasible. Contractors must report such programs available to: WITProgram@isd.lacounty.gov.

93. PROHIBITION FROM PARTICIPATION IN FUTURE SOLICITATIONS

A Proposer, or a Contractor or its subsidiary or Subcontractor ("Proposer/Contractor"), is prohibited from submitting a bid or proposal in a County solicitation if the Proposer/Contractor has provided advice or consultation for the solicitation. A Proposer/Contractor is also prohibited from submitting a bid or proposal in a County solicitation if the Proposer/Contractor has developed or prepared any of the solicitation materials on behalf of the County. A violation of this provision will result in the disqualification of the Contractor/Proposer from participation in the County solicitation or the termination or cancellation of any resultant County contract.

94. SURVIVAL

In addition to any provisions in this contract which specifically state that they shall survive the suspension, termination or expiration of the contract, the provisions in the following paragraphs shall also survive the expiration, suspension, or termination of this contract for any reason:

Paragraph	Title
1.	Applicable Documents
1.3	Definitions
2.4	Approval of Work
11.6	County's Right to Withhold Payment
12	Ownership and License
14	Warranties and Corrections of Deficiencies
15	Indemnification
17	Insurance
18	Intellectual Property Warranty and Indemnification
19	Proprietary Considerations
20	Disclosure of Information
21	Confidentially and Security
28	Effect of Termination/Suspension

33	Records and Audits
36	Compliance with Applicable Laws
37	Fair Labor Standards
40	Employment Eligibility Verification
44	Federal Access to Records
46	No Third Party Beneficiaries
54	Shred Documents
55	County Audit Settlements
61	Governing Laws, Jurisdiction and Venue
62	Waiver
64	Validity and Severability
65	Notices
75	No Payment for Services Provided Following Expiration or Termination of Agreement
93	Prohibition from Participation in Future Solicitation(s)

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IN WITNESS WHEREOF, the COUNTY has, by order of its Board of Supervisors, caused these presents to be subscribed by the Director of Public Works, and the CONTRACTOR has subscribed its name by and through its duly authorized officers, as of the day, month, and year first written above.

COUNTY OF LOS ANGELES

By _____
Director of Public Works

APPROVED AS TO FORM:

DAWN R. HARRISON
County Counsel

By _____
Deputy

Type/Print Name

KIMLEY-HORN AND ASSOCIATES, INC.

By _____
Its President

Type/Print Name

By _____
Its Secretary

Type/Print Name

STATEMENT OF WORK

LOS ANGELES COUNTY ADVANCED TRAFFIC MANAGEMENT SYSTEM PHASE III
(BRC0000494)

1. PROJECT SCOPE

OVERVIEW

This document defines the scope of services and other Work for the Los Angeles County Advanced Traffic Management System (“ATMS” or “System”) Phase III Project (the “Project”). Capitalized terms used in this Exhibit A (“Statement of Work” or “SOW”) without definition shall have the meanings given to such terms in the Base Agreement. Work for the Project described in this Exhibit A will be completed and delivered by Contractor to County in accordance with the terms of the Agreement.

This Exhibit A consists of Tasks, Subtasks, Deliverables, Services, and other Work to be provided by Contractor to County to supply, design, develop, install, integrate, and provide on-going maintenance and support for the System.

The proposed System must be installed at County facilities, hosted on County servers, and must, at a minimum, meet all System Requirements set forth in Attachment A.1 (System Requirements) to this Exhibit A (Statement of Work) and, unless specified otherwise, Attachments A.1 through A.2 thereto.

Los Angeles County Department of Public Works (“DPW”), in partnership with the Los Angeles County Metropolitan Transportation Authority (“MTA”), administers a number of regional traffic flow improvement projects throughout the County area. The primary component of these projects is the installation of multi-jurisdictional ATMS’s, which will allow monitoring and control of traffic signals across jurisdictional boundaries. Other project elements include the installation of communications and surveillance systems required to support the ATMS and the installation of other advanced elements such as closed-circuit televisions, advanced traveler information systems, and workstations in each agency. Subregional Traffic Management Centers (“TMC’s”) are also included. These Centers will provide a means for monitoring, data distribution, and information sharing among the affected jurisdictions.

The Los Angeles County ATMS Phase III will build upon the System Software developed and deployed by this Contractor. This Exhibit A (Statement of Work) details the design and development of custom features to the System Software and installation and field integration for 900 intersections in Los Angeles County with the potential for future installation of up to a total of 1,600 intersections.

The general scope of required Work to be performed under this Agreement includes, but is not limited to, the following:

- Preliminary Engineering
- Custom Programming Modifications
- System Implementation

- Technical and Operational Support

1.2 CONTRACTOR'S REQUIREMENTS AND RESPONSIBILITIES

Without limiting the more detailed descriptions set forth in the subsequent sections of this Statement of Work and otherwise in the Agreement, Contractor's Work hereunder shall be subject to the following requirements and responsibilities, in each case in full accordance with this Statement of Work:

1. Contractor shall perform all Services and other Work to setup, configure, integrate, train and transfer knowledge to County staff to support and operate the System.
2. Contractor shall perform, complete, and deliver all Tasks, Deliverables, Services, and other Work as set forth below or in any referenced document in full compliance with this Statement of Work and within the timeframes specified in Exhibit B (Form PW-2, Project and Payment Schedule). Such Tasks and Deliverables shall include all configurations, System interface configuration, knowledge transfer, tests, training, and Documentation set forth or referenced herein. Also defined in this Statement of Work are those Tasks that involve participation of Contractor and County. Except to the extent expressly specified as an obligation of County, Contractor shall perform all Tasks and provide all Deliverables set forth herein.
3. A Deliverable shall only be deemed complete upon County's approval and acceptance, irrespective of the number of attempts it takes Contractor to provide a successful Deliverable.
4. County will provide the system hosting environment for Testing, Training, and Production Use of the System. County will also provide training facilities as needed.
5. Contractor shall supply all materials not provided by County that are needed to comply with this Statement of Work and other requirements of this Agreement.

The general scope of work to be performed under this Agreement includes, but is not limited to, providing services necessary to implement, support and maintain the System, which meets the requirements specified in Attachment A.1 (System Requirements), including Project Management, Preliminary Engineering, System Integration, System Acceptance Tests, System Maintenance, and Additional Work, if any, provided by Contractor to County under the Agreement. Contractor shall, during the term of the Agreement, provide System Maintenance as set forth in Exhibit C (System Maintenance).

Contractor's Work will be successfully completed upon delivery of a fully implemented, tested and County accepted System that meets the requirements and legal mandates of the County as detailed in the Agreement, while addressing all functions and requirements described or referenced within this SOW.

1.3 INSTRUCTIONS

Contractor shall provide all general correspondence and documentation to County in an electronic format or on media as mutually agreed upon by County and Contractor, including without limitation for the following:

- All status reports and meeting minutes;

- All project Deliverables;
- All required training materials; and
- All invoices and billing documentation.

All Work must be approved by County, as evidenced by County's Project Manager and County Project Director's countersignature on the applicable Acceptance Certificate (Attachment A.4).

This Statement of Work under Section 2 is comprised of the following Tasks:

Task 1 – Project Plan & Project Management

Task 2 – Procurement

Task 3 – Custom Programming Modifications

Task 4 – System Integration & Testing

Task 5 – Training

Task 6 – System Warranty, Operational Maintenance, and Support

The following Attachments are attached to, incorporated into, and are deemed to be part of this Exhibit A:

Attachment A.1 – Minimum System Requirements

Attachment A.2 – System Overview

Attachment A.3 – Existing System Architecture

Attachment A.4 – Acceptance Certificate

Attachment A.5 – Baseline Interfaces & Participating Agencies

Attachment A.6 – I-210 CC System Interface Design Specification

Attachment A.7 – Third Party Software

2. TASKS AND DELIVERABLES

This Section of Exhibit A specifies all Tasks, Subtasks and Deliverables which shall be provided by Contractor to County. All payments for these Tasks shall be in accordance with and shall not exceed the maximum budget as shown in Exhibit B (Form PW-2, Project and Payment Schedule).

TASK 1 – Project Plan & Project Management

Contractor's Project Manager ("Contractor's PM") will act as the principal contact for County. Contractor's PM is expected to oversee and participate in the day-to-day activities of the Work required by the Agreement and should, therefore, have no concurrent assignments that would interfere with the successful and timely completion of all Tasks related to this Project. In addition, Contractor will prepare the Project Plan Document (PDD), invoices, billings, and other financial information for review and approval by County, as required by this Agreement. Contractor shall employ project management industry standards and practices and coordinate with County's Project Manager with regards to any County responsibilities in the performance of all Work.

Contractor's activities under this Task shall include, but not be limited to:

- Providing a Project Plan Document (PPD) within thirty (30) days from the Effective Date of this Agreement.
- Providing effective and proactive coordination and communication with County to ensure Project success.
- Maintaining Project communications through County's Project Manager.
- Attending meetings with County Executives and Management as needed.
- Coordinating and managing the activities of Contractor's Project personnel.
- Developing presentation materials, brochures, etc. as requested by County.
- Contractor shall provide other ongoing project administration activities, which shall include, but not be limited to updating the Project Schedule.
- Preparing meeting minutes summarizing discussions at all meetings attended by Contractor. Minutes should include summaries and follow-up action items.

Subtask 1.1 – Project Planning

The objective of this task is to ensure that adequate planning and project management are dedicated to this project. The Contractor shall, in coordination with County oversight, provide project management, planning, monitoring, supervision, tracking, and control for all project activities during the term of the Agreement. The Contractor shall employ good project management standards and practices in the performance of all work. Contractor shall prepare a Project Plan Document (PPD). The PPD shall include, at a minimum, but not be limited to:

- Detailed project plan with fixed deadlines, including but not limited to:
 - Project schedule including tasks, activities, activity duration, sequencing and dependencies;
 - Project work plan for each deliverable referenced in this SOW and elsewhere in the Contract, including a work breakdown structure;
 - Start date and completion date of each task;
 - Proposed project milestones
 - Project deliverables and proposed County review period for each;
 - Entrance and exit criteria for specific project milestones; and
 - Roles and responsibilities for the Contractor and County.

Subtask 1.1 Deliverable: Project Plan Document (PPD) (Key Deliverable)

Contractor shall carry out the activities described in Task 1 and submit a completed PPD. Deliverables shall be reviewed and approved, in writing, by the County Project Manager and County Project Director.

Subtask 1.2 – Project Administration

Contractor's Project Manager shall present to County's Project Manager a monthly written Project Status Report documenting Project progress, plans and outstanding issues. The first report shall be presented to County's Project Manager four (4) weeks following the Effective Date, or at such later date as agreed to by County and Contractor, in a format approved by County.

The Project Status Report shall include:

- Tasks accomplished since the last meeting
- A review of any incomplete Tasks and the reasons why they are not completed
- An outline of the Tasks anticipated to be accomplished in the next monthly period
- A list and status of outstanding issues, Deliverables, and Invoices as required by this Agreement
- Any Project risks or problems identified
- Tracking of all issues and their resolution

In addition, Contractor's Project Manager shall meet with or conduct a status update phone call with County's Project Manager on a bi-weekly basis via teleconference, or as otherwise agreed to by County and Contractor, to review Project Status Reports and any related matters.

Subtask 1.2 Deliverables

- Meeting Minutes & Agendas
- Presentation materials, brochures, etc. as requested by County
- Participation in bi-weekly Project Status Meetings
- Monthly Project Status Reports
- Invoice preparation/submittal (on a monthly basis)

TASK 2 – Procurement

As further described in Paragraph 12 (Ownership and License) of the Agreement, County has purchased a perpetual License to use the Integrated System. Agencies contracted with County for traffic engineering and signal maintenance services will have their traffic signals on County's ATMS and connection from County's ATMS to the contracted agencies shall use various methods to connect to a standalone local area network ("LAN") set up for the Integrated System by Remote Access Server ("RAS") access. This does not constitute a center-to-center connection, which is not provided under this Agreement. This License fee is payable as Deliverable 2.1 and covers those agencies who have their traffic signals on County's traffic control system without requiring a separate runtime license for the benefit of each such agency.

In addition, included as part of the License is the right for agencies within Los Angeles County to acquire separate runtime licenses from Contractor for the Integrated System and install individual versions of the Integrated System at no additional cost to County (other than the license fees set forth herein) or to such agency. This portion of the License fee is payable as Deliverable 4.1. Agencies with a separate runtime license will be running the Integrated System on their own equipment and will be required to purchase the necessary hardware, supporting software, installation, integration services, and training with their own funds.

Task 2 Deliverables

20 years KITS License for 1,500 County intersections – LACO, 4E, Maxtime, D4, and Omni (without incremental license fees for other agencies)

TASK 3 – Custom Programming Modifications

All modifications to the System Software will be performed under this Task. The modified System Software must have the ability to support Type 170 and 2070 Controllers. The modified System Software shall also integrate with the communications protocol developed to support the DPW's controller firmware known as LACO-4E. This protocol will be based upon the AB3418E protocol.

Custom software modifications to the System to be completed under this Task include the following:

- Excel Import.

For each modification specified above, Contractor shall provide GUI Screen mockups, where applicable. The screens will be designed to be consistent with the current operation of existing ATMS screens. Contractor shall provide GUI Screen mockups for the custom-generated displays to support the LACO-4E controller type. Contractor shall present these modifications to County during a Critical Design Review (CDR). County shall provide feedback within 21 calendar days of viewing the GUI. The comments shall be limited to screens designed specifically for County. Modifications to the existing System other than what is specified in this SOW must be funded by pool dollars. Upon completion of the CDR and acceptance of the screen designs by County, Contractor will complete the software. Subsequent to this approval, further changes to the displays shall not be required, but may be considered if agreed between County and Contractor.

Task 3 Deliverables

- 3.1 Draft Excel Import/Export design document – MaxTime, D4, Omni
- 3.2 Final Excel Import/Export design document – MaxTime, D4, Omni
- 3.3 KITS Excel Import software customization
- 3.4 KITS update with Excel import for Maxtime and D4

TASK 4 – System Integration and Testing

As discussed under Task 2 of this Exhibit A (Statement of Work), the License fee covering agencies within Los Angeles County to acquire separate runtime licenses from Contractor for the Integrated System and install individual versions of the Integrated System at no additional cost to County (other than the license fees set forth herein) or to such agency is payable as Deliverable 4.1.

Task 4 Deliverables

- 4.1 License to the Integrated System for Additional Agencies (Key Deliverable)

TASK 5 – Training

Contractor shall provide electronic copies of training documentation to the County for each training session.

The training in deliverable 5.2 will be a comprehensive, hands-on review of all previous training sessions. In addition, County may request additional topics that were not previously covered. The following topics will be discussed:

- Operation and Management of the Integrated System
- Overview of the System and Los Angeles County Custom Features
- Operations and System Maintenance
- Security
- Configuration and Customization
- Advanced Functionality

A training schedule will be delivered two (2) weeks prior to the comprehensive training session that will detail the date and time for each topic. County can provide input that will help determine the amount of time that is spent on each topic.

Task 5 Deliverables

5.1 Electronic Copies of Training Documentation (syllabus, manuals, visual presentation materials) should include Draft and Final training plan with input from County stakeholders.

5.2 KITS training session-specific agendas provided in advance of each session, and Forty (40) Hours of Hands-on Training

TASK 6 – System Maintenance

The System Maintenance period shall be initiated following the completion of Final Acceptance per the conditions set forth in Paragraph 10.3 (System Maintenance) of the Base Agreement in accordance with Exhibit C (System Maintenance). The System Maintenance period shall be initiated following Final Acceptance and will continue for five (5) years with four (4) optional Extended Terms of one (1) year each.

The selected Contractor will utilize a VPN connection to remotely access the System and assist in diagnostics and troubleshooting. In addition, software updates will be loaded remotely through this VPN connection.

3. ADDITIONAL WORK

Contractor will provide System support to assist County as needed. All efforts for this Additional Work must receive prior approval from County's Project Manager. This Additional Work may be provided for effort such as virtualizing servers, installing and configuring System Software on County-owned workstations, and other labor associated with the troubleshooting, repair, and enhancement of the System. Activities associated with this Additional Work will be reported as a part of Subtask 1.1 – Project Management monthly reports.

Contractor will perform activities on an hourly basis in accordance with Schedule B.1 (Hourly Labor Rates). All Additional Work will be subject to approval of County up to the

Statement of Work - Exhibit A

budgeted amount in Pool Dollars as shown in Exhibit B (Form PW-2, Project and Payment Schedule).

This Additional Work may also include, but are not limited to the following:

- Integrate and/or bring additional intersections on-line with the System
- Procure and/or install the System Software on additional workstations and/or laptops
- Develop additional intersection graphics
- Develop additional maps and/or corridor graphics
- Set-up time-space diagrams (TSDs)
- Set-up real-time split monitoring
- Provide additional and/or in-depth training
- Provide communications and/or network troubleshooting, analysis, etc.

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Minimum System Requirements

ATTACHMENT A.1

Proposer Name: Kimley-Horn & Associates, Inc.

1.0 System Functional Requirements

1.1 General

Functional Requirement Response Form Matrix		Response Code			Comments
		Available	Customization	Not Available	
1.1.1	The System shall be user-friendly, including in presentation, navigation, and other ease of use features.	X			KITShas a user-friendly 'ribbon' interface that mirrors most modern software offerings, such as Microsoft Office.
1.1.2	The System shall be an existing commercial off the shelf solution (COTS)	X			KITSIis a COTSo solution used by many of the largest agencies in the USand Canada.
1.1.3	The System shall perform batch processing updates without affecting the performance of the System.	X			KITShas a batch compare process that processes all field controller timings nightly. For KITSIUI updates, users simply click a button to update KITSIand no backend processing is interrupted.
1.1.4	The System shall support online real-time processes.	X			KITSpulls background map aerials from the web in real-time, communicates with all ITSdevices in real-time, and communicates information back to users through a variety of means in real-time.
1.1.5	The System should be easy to operate and maintain thereby reducing the staffing resources required.	X			KITShas a user-friendly 'ribbon' interface that mirrors most modern software offerings, such as Microsoft Office.
1.1.6	Open hardware and software systems will be used wherever possible.	X			KITSIis an open solution, meaning that it is designed to work with a wide variety of traffic signal controller and ITSdevice firmware.
1.1.7	Fully Actuated operation under coordination will be supported where possible.	X			This is a function of the signal controller firmware and is fully supported in KITSIvia controller pages and a variety of timing analysis displays.
1.1.8	The System shall be scaleable to the entire County.	X			KITSIcan scale to support well over 5,000 signals due to the distributed architecture used by the system. KITSIis used by several large agencies, each of whom are using the software to control over 1,000 signals.
1.1.9	The System shall be capable of synchronizing the time reference clocks from the communication server with the entire system to enable adjacent intersections in different jurisdictions to be coordinated.	X			KITShas robust time upload/download capabilities and can alert on time sync issues and sync controller clocks up to 24 times per day.
1.1.10	The System shall have a multijurisdictional capability, allowing for two or more jurisdictions to share one system, and provide security restrictions by jurisdiction as appropriate.	X			KITShas role and zone based security, allowing users privileges to be granularly defined by responsibility and by geographical area.
1.1.11	Security shall be configurable by functionality and device. This security strategy will apply to all system elements including CCTV and CMS.	X			KITSIsecurity is "unit" based, meaning security privileges can be assigned to different areas of functionality, including different ITSdevices.
1.1.12	For multijurisdictional systems, each agency shall be able to monitor signal operations, reference plans, and traffic conditions in neighboring agencies in order to provide for enhanced coordination.	X			KITSIsecurity is fully customizable to set any user up with any desired privilege level for any desired zone or functional unit within KITSI.
1.1.13	For multijurisdictional systems, the System shall display inter-jurisdictional traffic signal data to enable coordination and achieve seamless traffic flow between jurisdictions.	X			KITSIsecurity allows for user configurations that can restrict access to signals from neighboring jurisdictions, allow 'view only' access, or allow 'full access'. There are many KITSItools, like the Time-Space Diagram and Corridor Timing Values, that can seamlessly show signal data from multiple jurisdictions.
1.1.14	The System shall be capable of providing access from multiple sites, and be able to control access and security privileges based on jurisdiction and by user.	X			In addition to the security features mentioned above, KITSIcan be accessed from any location via a VPN connection or via a browser if KITSIis setup in a virtualized environment (e.g. Citrix or VMWare).
1.1.15	The System will be modular and scaleable.	X			KITSIcan scale to 1,000s of devices and all feature sets are integrated in a modular fashion, allowing the UI to be customized by agency and access levels customized by role/zone/functional unit.
1.1.16	All System hardware components shall operate on a Windows platform.	X			KITSIis Windows-based.
1.1.17	The System shall not require a reboot from the communication server when adding a new intersection to the system or changing values.	X			When signals are added to KITSIor edited, the KITSIcomm service will automatically start communicating and/or adjust signal communication settings without requiring a restart.
1.1.18	The System shall use a map Dot net approach for its main map display, or approved equivalent.	X			The KITSImap is based off of MapDotNet and has all MapDotNet equivalent functionality and more.
1.1.19	The System shall attempt to reconnect to the System server if the connection is lost.	X			All connections throughout KITSI have retry logic, ensuring re-connection attempts are made regularly enough that all systems will quickly and automatically re-connect when communication is restored.
1.1.20	The System shall support various devices including up to 15,000 intersection controllers, 300,000 system detectors, and 2,000 sections.	X			There is no practical limit to the number of intersection controllers, system detectors, or sections KITSIcan support due to the distributed architecture that KITSIuses. Many agencies use KITSIto control multiple thousands of devices.
1.1.21	The System shall allow for multiple Users to simultaneously monitor System devices and data.	X			Multiple users can simultaneously monitor any device through a variety of means including the KITSIMap and dedicated real-time displays like Timing Values.
1.1.22	The System shall have an administration tool that allows for modification of System configuration by authorized Users.	X			Administrative Users' can be set up in KITSI with full access to major system settings and 'Non-administrative Users' can have their access to these settings restricted. This is done via the 'System' unit in KITSIsecurity.
1.1.23	The system shall be able to display User log-in history current log-in status	X			The Server Connection List will display any users actively logged into KITSIand the User Activity Log shows historical records for all user activity, including log ons/ offs.

1.1.24	The system shall be able to generate ATSPM reports	X			KITS supports a variety of signal performance measures through second-by-second polling, including the HIT Report, Split Monitor Log, TMC Report, Signal Health Dashboard, and more. For controllers that support ATSPM data logging, that data can be leveraged by KITS to further supplement these reports with high resolution information that isn't always available via standard polling.
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1.2 Communications

Functional Requirement Response Form Matrix		Response Code			Comments
		Available	Customization	Not Available	
1.2.1	The System shall be capable of communicating via hardwire, wireless and leased telephone lines. All communication shall be UDP/TCP.	X			KITS can communicate via any communication medium and this is typically done via UDP communication. TCP communication is supported for controllers, like Caltrans TSCP, that don't support UDP and only support TCP instead.
1.2.2	The System shall be capable of access from remote sites. VPN access will be configured into the network by the County.	X			KITS can be accessed via a VPN/RDP connection or can be accessed from a browser if setup in a Citrix or VMWare type of virtualized environment.
1.2.3	The System communications protocol shall be based on AB3418E standards.	X			KITS supports AB3418E protocol for Caltrans TSCP, LACO 4E, and any other controllers that primarily use AB3418E. KITS supports NTCIP protocol for most other controllers, including D4, Maxtime, and Econolite ASC3/Cobalt/EOS.
1.2.4	The System will support different baud rates for communications channels to the controllers.	X			KITS has full support for legacy serial communication methodologies.
1.2.5	The System shall communicate with each intersection once per second.	X			KITS message frequency is user configurable and is typically set up for once per second real-time polling.
1.2.6	The System shall support communication protocols for Type 170 Controller software (LACO-4E) and various Type 2070 Controller software (D4, MaxTime, Omni eX, SEPAC)	X			As described above, KITS supports all of the industry standard communication protocols, including AB3418E and NTCIP.

1.3 User Interface - General

Functional Requirement Response Form Matrix		Response Code			Comments
		Available	Customization	Not Available	
1.3.1	The System shall provide a common graphical user interface (GUI) to support all System capabilities and user accessible software.	X			All KITS functionality is contained within a single software application with one common GUI.
1.3.2	The GUI shall be organized into main functional areas (such as configuration, alarms, administrative, network maps, etc.).	X			The KITS GUI is organized by device type, module, and functional areas and this organization carries through the ribbon layout and the button groupings within each ribbon tab.
1.3.3	The GUI shall provide a complete view of the System through a single visualized user interface/console that integrates all functions.	X			KITS contains a real-time system map that can show the real-time status of all devices in a single view. There are many other displays, such as System Status, that provide different ways to view data across the system.
1.3.4	The GUI displays will be created and updated within 3 seconds or less.	X			KITS performance has been optimized for quick load times. When a user opens a display, it will open in less than 3 seconds.
1.3.5	The GUI shall provide an efficient pathway to view detailed data from summary screens.	X			KITS uses user interface design best practices to minimize the number of button presses and mouse clicks that it takes to get to desired information.
1.3.6	The GUI shall be accessible from multiple simultaneous sessions and each session shall be able to simultaneously display data from the same or different intersections.	X			Any number of users can run KITS simultaneously and any user can run KITS from any workstation provided their Windows privileges allow access. Multiple users can also view the same intersection at the same time via any display in KITS.
1.3.7	The GUI shall provide Users with menus for giving all commands to the System.	X			KITS contains all necessary menus to support any type of command. That includes Central Commands for special event scheduling, Manual Commands for quick overrides, Congestion Manager Commands for logic based detour plans, and more.
1.3.8	The GUI shall provide context-sensitive help.	X			KITS has a built-in context sensitive wiki-based help system.
1.3.9	The GUI will allow the use of a mouse.	X			KITS navigation is primarily done via the mouse, but also supports keyboard shortcuts for efficient access to key features.
1.3.10	The GUI shall have drop down menus to provide users with commands to the system.	X			Users can right-click on signals or 'rubber band' select signals on the map to perform quick commands, like an incident
1.3.11	The GUI will provide context-sensitive help for all windows and dialog boxes.	X			KITS help is context sensitive as described above.
1.3.12	The GUI will run on a workstation running via the Microsoft Windows platform.	X			KITS is Windows based.
1.3.13	The user interface will provide geographically accurate maps of LA County, corridors in the county, and cities in corridors.	X			KITS typically leverages internet maps such as Bing and OpenStreets which are reliably geographically accurate. KITS also supports custom ArcMap configurations, allowing background tiles to be pulled from agency repositories if that map information is available and is desired over internet-based maps.

1.4 Workstations						
Functional Requirement Response Form Matrix			Response Code			
			Available	Customization	Not Available	Comments
1.4.1	The operator workstations shall have a minimum screen resolution of 1920x1200x16 colors.		X			KITS supports any resolution that Windows supports.
1.4.2	Operator workstations will be able to print a useful readable copy of the screen on paper.		X			KITS has robust printing capabilities throughout the system. This includes all KITS reports, controller database pages, and more.
1.4.3	The system shall support a variable number of operator workstations for the system as a whole and at individual TOC's.		X			There is no limit to the number of workstations that can be supported by KITS.
1.4.4	The System will allow users at any workstation to have the ability to control any intersection in the system if they have been granted that privilege.		X			As mentioned in a previous requirement, users can access KITS via their account from any workstation if Windows is set up to permit them to do so.
1.4.5	The System shall be able to have multiple windows open at the same time, limited by the communication bandwidth and the processing component on the workstation.		X			KITS uses a "container" style interface that allows many displays to be stacked and tiled in a variety of configurations. This interface also allows displays to be pulled out of the main container and onto a separate screen.
1.5 Database						
Functional Requirement Response Form Matrix			Response Code			
			Available	Customization	Not Available	Comments
1.5.1	All static data will be maintained using an off-the-shelf Relational Database Management System (RDBMS) accessible via SQL.		X			KITS uses Microsoft SQL Server for the backend database.
1.5.2	Static database backups may be performed onto a DAT tape backup, write able CD-ROM drive, a network drive or other physical or virtual media as approved and managed by the County. Should provide easy access to archived data through cloud archiving.		X			This is a function of the database backup capabilities of Microsoft SQL Server. In our experience, Microsoft SQL Server database backups can be transferred to all of the mediums listed, provided enough space is available.
1.5.3	All data required for System control and monitoring will be maintained to permit high-speed access.		X			KITS has a robust archiving process that runs nightly, keeping the SQL Server database table sizes at manageable levels while ensuring all long-term data is maintained. Data can easily and quickly be retrieved from the archive when it needs to be accessed by users.
1.5.4	The System will include the ability to restore data stored on thumb drive or other physical or virtual media as used by the County back to the online database. The Restore program will allow the user to select the data type and date of interest. Restored data will be accessible through History Reports.		X			KITS has a "laptop interface" that allows users to run KITS offline with a local database copy, most commonly on a field technician laptop. This "laptop KITS" allows technicians to connect their laptop directly to controllers in the field where there may be faulty comms back to central and upload data from the controller into KITS. Finally, when the technician is able to connect their laptop back to central, a "laptop update" process can be run to sync all local changes back into the central database. Restored data is accessible through history reports and/or controller database history.
1.6 Data Collection						
1.7 Signal Operations						
Functional Requirement Response Form Matrix			Response Code			
			Available	Customization	Not Available	Comments
1.7.1	Libraries of approved timing plans will be available to assign to intersection controllers. The system will allow copying of plans within and between intersections		X			This is partially a function of agency workflow, but is supported in KITS via the controller page and controller pattern copy features. "Approved timing plans" would typically be defined and noted on a certain group of bench controllers and then the KITS controller page and controller plan copy features would be used to assign these pre-approved plans to other intersection controllers by users when appropriate.
1.7.2	The system will support eighteen (18) LACO-4E coordination plans per intersection, nine (9) of which will be marked temporary.		X			KITS supports 9 core plans and 9 temporary plans for LACO 4E controllers.
1.7.3	The System shall support minimum of eighteen (18) timing coordination plans per intersection.		X			KITS supports any number of coordination plans, with that number varying based on what the controller supports.
1.7.4	The System shall be capable of supporting TRSP based plan selection.		X			KITS TRSP functionality goes well above and beyond traditional TRSP via the capabilities of the Congestion Manager. Congestion Manager logic can be configured in any desired way, including V+KO TRSP calculations, to dynamically command plans to signals based on the customized logic and input data from
1.7.5	The System shall support Manual plan selection, and be capable of overriding TOD/TRSP plans, by system, group, and intersection.		X			KITS supports Central Commands and Congestion Manager/TRSP plans by signal or by any signal grouping.

1.7.6	The System shall support Time reference and plan selection to sync groups (within same ATMS and across ATMS boundaries).	X			Time can be synchronized manually to specific coordinated groups of signals via the Time Upload/Download feature in KITS. Plan selection, or plan commands, can be sent to signals individually, or to coordinated groups of signals via Sections, Areas, or Zones.
1.7.7	The System shall support up to twenty-four (24) system detectors per intersection.	X			KITS supports up to 64 system detectors per intersection.
1.7.8	The System shall be capable of issuing plan and mode changes to local controller.	X			KITS can issue a wide variety of plan commands and other remote "mode change" commands.
1.7.9	The System shall be capable of downloading plan data to local controller.	X			KITS controller database pages support full upload/download for data transfer between KITS and the controller.
1.7.10	The System shall provide services to upload and download local controller databases.	X			The KITS batch compare process uploads database nightly and reports on any differences between the field and central. KITS also supports robust download options, including the ability for field initiated remote
1.7.11	The System shall be capable of comparing controller signal timing data in the central database with that in the field controller and issuing reports and	X			The KITS batch compare process uploads database nightly and reports on any differences between the field and central in the Batch Compare Log. KITS also uploads controller time every hour and reports/alerts on any time sync discrepancies.
1.7.12	The System shall be able to monitor intersection operation to verify compliance with the selected timing plan.	X			KITS provides a Plan/Cycle layer on the map, a Plan field on Timing Values, and control source information via the map and Central Commands indicating the source of the plan that is running. These features, combined with the time monitoring/synchronization features and Event Log, provide users with ample information to verify compliance with the selected timing plan. Additionally, Cycle Summary allows users to verify correct configuration of timing plans and HIT Report shows phase behavior, allowing users to verify consistent cycle-by-cycle operation compared to the configured plan parameters.
1.7.13	The System shall provide for TOD/DOW Control via system-wide, group, and individual intersection, w/ command hierarchy.	X			KITS supports all varieties of central TOD/DOW scheduling via the 'Schedule Recurrence' feature in Central Commands. KITS also supports a command heirarchy where, for instance, a Central Command will take priority over a Congestion Manager Command, which will take priority over the plan running as part of the local TOD/DOW schedule.
1.7.14	The System shall provide for Fixed and "floating" holiday exception tables. Holidays will override the standard TOD/DOW control tables.	X			KITS supports all of the local controller database scheduling configuration pages, including TOD/DOW and "fixed and floating" holiday exception tables. The specific workflow for these holiday tables will vary based on how it is implemented in the controller firmware.
1.7.15	The System shall provide the ability for the user to import and export LACO-4E and 2070 programs timing from Excel.		X		KITS supports full import/export from/to Excel for LACO 4E controllers. KITS supports full export to Excel for 2070-based firmware like D4 and Maxtime. A software customization would be required to implement Excel Import for those 2070 controller firmwares.
1.7.16	The System shall allow an operator to modify a subset of the intersection timing plan database items (offset) via the time space Diagram Editor.	X			Users can drag the individual signal bars on the Time-Space Diagram to change offsets, with green band information updating in real-time on the display to show the impact of that offset change on the corridor.
1.7.17	The System shall be capable of printing time/space diagrams.	X			Time-Space diagram can be printed.
1.7.18	The System shall be capable of synchronizing time via a web-based time control to synchronize Windows time.	X			KITS synchronizes controller time up to 24 times per day. The time that it uses is determined by the time source on the Windows server that the KITS communication service is running on, which is typically set to one of the industry standard internet time sources.
1.7.19	The System central server will maintain time for the system. Local controller time will serve as back up if communication is lost.	X			KITS synchronizes controller time up to 24 times per day. If communication is lost, controllers local time will be maintained by the local firmware, but may still drift if a GPS clock or other local mechanism is not installed in the cabinet to keep the clock from drifting.
1.7.20	Operators will be able to manipulate intersection controller database if they have the proper privileges.	X			Users with appropriate privileges can edit, upload, download, or export controller database parameters.

1.8 System Operations

Functional Requirement Response Form Matrix		Response Code			Comments
		Available	Customization	Not Available	
1.8.1	The System shall have search capabilities across multiple displays, reports, contract, and project types.	X			KITS has a very robust search available throughout the GUI, including the map, reports, dashboards, and in
1.8.2	The System shall provide the capability to zoom maps to more detailed views. This will take less than 5 seconds using current PC technology. Aerial photographs will take longer than 5 seconds, but can be disabled. Once zoomed, the System shall provide the capability to pan the view through different areas of the map.	X			KITS map is very flexible and can zoom in as far as the internet map tiles allow. Additionally, the real-time Timing Values display contains a detailed aerial view of the intersection where users can add custom graphics to communicate various real-time status elements. Map zooming is very quick and typically takes less than 1-2 seconds to refresh as users pan and zoom around the map. However, this refresh can sometimes be a bit slower over VPN and RDP connections, especially if there is not a strong internet connection.
1.8.3	The System shall provide the capability to click areas on the maps and allow switching to more detailed views of the county, corridors, jurisdictions, sections, or intersections.	X			The KITS map supports user customizable presets, allowing users to quickly jump to different pre-saved views at different detail levels. KITS also supports a "Corridor Timing Values" view that allows users to set up a custom Timing Values graphic for an entire group or corridor of signals.
1.8.4	The System shall allow an operator with the correct security privileges to edit the base map displays and textual or graphical information in them.	X			KITS Timing Values graphics can only be edited by users with the appropriate privileges.

1.8.5	The System shall allow an operator to edit the base map displays, and textual or graphical information using Arc View. Windows file based security can be used to restrict access.	X		KITS Timing Values graphics support copy/paste from many other graphical applications, allowing for unique fonts and graphical elements to be pulled into KITS graphics even if they aren't natively supported in the
1.8.6	The System shall provide the capability to initiate the download of traffic signal data from the field.	X		KITS supports downloads initiated remotely by field techs via the controller front panel.
1.8.7	The System shall be capable of formatting printouts - not "print-screens". Will be able to print out full or partial database with "clean" layout.	X		KITS has cleanly formatted controller database timing sheet exports that can be printed to PDF or to a physical printer.
1.8.8	The System shall provide a mechanism for auto-upload, auto-compare of all system functions by TOD or upon user request.	X		KITS has a batch upload process that runs nightly and compares controller timings to central. Additionally, users can initiate an upload/compare on-demand via the controller database pages.
1.8.9	The System shall be capable of uploading traffic signal data from the field to the central.	X		KITS has full controller database upload support for many controller firmware.
1.8.10	The System shall use an automated routine to extract and convert location information to latitude and longitude coordinates.	X		KITS maintains records of all device latitudes and longitudes in the backend SQL Server database. This can be extracted from KITS by exporting the desired device list to Excel, which contains each device lat/long.
1.8.11	The System shall send a command to the controller to copy main memory to backup memory prior to initiating a download command.	X		This is a feature unique to the LACO 4E firmware and is fully supported in KITS.
1.8.12	The System shall store phase changes in a database table.	X		The KITS HIT Report contains a full record of all phase changes.
1.8.13	The System shall be configured to add the following parameters to the Intersection Definition Form: <ul style="list-style-type: none"> •complete IPSubnet mask •gateway address •agency ownership (up to 3) •maintaining agency •port •latency •indication of UPS and video detection 	X		All of these parameters are available in the KITS intersection definition form.
1.8.14	The System shall allow the user to add a new ITS element to the system.	X		KITS supports many ITS devices through their own unique layers, e.g. CCTV. Additionally, KITS supports custom ITS device layers, allowing users to add any type of web enabled device to the KITS map and save
1.8.15	The System shall enable the user to perform other activities while the time upload is occurring for the entire system.	X		The user can perform other operations throughout KITS while time uploads are being performed. Additionally, time uploads are typically just performed hourly via our automated process, which does not interfere with users' abilities to use other functions of the software.
1.8.16	The System shall allow the user to highlight an intersection, section, route, area, region, zone, or arterial and have those entities prominently displayed on the main map.	X		The KITS map supports "highlight" and "show-only" capabilities to provide the desired visibility into only the devices the user is interested in.
1.8.17	The System shall allow the user to define a location on the map as a pre-set and select to zoom to that location from a right-click menu on the map.	X		The KITS map supports presets and zoom-to options for all device types and device groupings.
1.8.18	The System shall allow the user to go to the previous map view/zoom level by using a right click to launch a menu of options including: <ul style="list-style-type: none"> •zooming to the previous level •Go To (last selected preset), •Next, •Previous, •Select, •Add, •Save to current, •Rename, •Delete. 	X		The KITS map supports all of this functionality via the map presets feature.
1.8.19	The System shall allow the user to view only intersections that are categorized as County maintained on the main map.	X		KITS and the KITS map are fully capable of only loading intersections for certain zones (i.e. the zone indicating which signals are County maintained) if configured appropriately.
1.8.20	The System shall allow the user to view which agency owns the intersection.	X		KITS has fields in the intersection definition that indicate which agency owns, maintains, and operates the signal.
1.8.21	The System shall include a Controller Scheduled Batch Upload and Compare module to create a list of intersection defined in the selected area that are online and to calculate database mismatched elements.	X		The KITS nightly batch compare does these comparisons and can be configured to do comparisons by area or for the entire system.
1.8.22	The System shall allow the intersection definition form to auto populate from the detector timing sheet.	X		KITS supports auto-populating detectors/system detectors based on detector settings imported from the controller database.
1.8.23	The System shall allow the user to define a time period for events to occur before an alert is generated.	X		KITS supports "persistence" settings for all alerts, allowing users to implement a timer that must elapse before an alert is generated to users.
1.8.24	The System shall support time of day functions on the real-time time space diagram.	X		KITS supports time of day functions on the real-time time-space diagram in addition to many other timing and plan indicators.
1.8.25	The System shall support turbo lanes in the real-time time space diagram for intersections that do not have a phase in a ring.	X		KITS supports turbo lanes on the Time-Space Diagram and this feature has been implemented specifically with LACO 4E configurations in mind.
1.8.26	The System shall provide a compressed real-time time space diagram that reduces the detail for multiple intersections to be shown on the same screen.	X		The KITS Time-Space Diagram supports the ability to compress from several to many intersections on the same screen.
1.8.27	The System shall integrate the data on the real-time time space diagram with the historical intersection report data.	X		The Historical Intersection Timing Report data that feeds the HIT Report is also used to plot the Historical Time-Space Diagram.
1.8.28	The System shall allow the time-space diagram selection dialog to remain open after selecting a time-space diagram to allow selection of an additional arterial.	X		The Time-Space Diagram selection will remain open after the user makes a selection.
1.8.29	The System shall provide the ability to copy and paste data from one controller database page to another.	X		KITS has a robust controller database page copy feature.

1.8.30	The System shall display errors and warnings for a time space diagram in a single display.	X			The KITS Time-Space Diagram will generate a dedicated error log in a single display if there are missing timing details from any intersections contained within the corridor.
1.8.31	The System shall allow directional mnemonics for phases to be editable by the user.	X			Phase mnemonics are fully editable in KITS.
1.8.32	The System shall allow the user to search an arterial name.	X			KITS has numerous places where arterial names can be searched.
1.8.33	The System shall allow a new timing values window to open on a different part of the screen than the first window.	X			Users can open many different Timing Values windows simultaneously and in different placement configurations.
1.8.34	•Save schedule forms •Save to user manual commands •Changes to database parameters.	X			All of these actions and more are available in the User Activity Log.
1.8.35	The System shall allow a user to insert or delete an intersection in the middle of any arterial definition form.	X			While editing an arterial, users can insert or delete intersections within, or in the middle of, the arterial.
1.8.36	The System shall disable tracking of controller database history for intersections that are marked as type "Test."	X			KITS database history tracking can be disabled for 'Test' intersections.
1.8.37	The System shall have the "find" binoculars search feature to all existing reports.	X			KITS has both a full text and "smart" search for all reports.
1.8.38	•Add search key under Arterial Menu (in addition to searching by Arterial name identified in task 16, ability to identify which arterials contain a user specified asset number. Please note that an intersection may be assigned to multiple arterials/routes.) •Add Type filter (Arterial or Route)	X			KITS arterial list and arterial edit has been structured to match this workflow.
1.8.39	•Add capability to switch to another intersection under the links menu •Contractor will change the Section definition to add a print capability.	X			KITS link list edit, and section lists all have robust printing and switching capabilities. Additionally, all list views can be exported to Excel for further manipulation.
1.8.40	The System shall enable an authorized User to put an intersection controller or User-selectable groups of intersection controllers into time of day operation/free mode.	X			This is typically assumed to be the default option, unless signals are under central control. KITS Central Commands and controller database batch download capabilities can be used to accomplish this in a variety of fashions.
1.8.41	The System shall enable an authorized User to put an intersection controller or User-selectable groups of intersection controllers into traffic responsive operation.	X			This can be configured through the KITS Congestion Manager as described previously.
1.8.42	The System shall enable an authorized User to put an intersection controller or User-selectable groups of intersection controllers into adaptive operation. The adaptive module shall be fully integrated into the System with no additional third-party software required for implementation	X			KITS contains a fully centralized adaptive module called Kadence. Kadence is fully contained within KITS and has all of the scheduling capabilities necessary to allow for easy scheduling and assignment of intersection groups (i.e. Sections) to adaptive operations.
1.8.43	The System shall enable Users to select a method to provide different "color" indications to indicate cycle length per intersection.	X			KITS exceeds this requirement by supporting a separate 'Plan/Cycle' layer on the main map that displays the currently running Plan number and Cycle Length in plain text. The KITS HIT Report, Kadence Action Log, and Kadence Phase Utilization Log all provide additional ways to visualize cycle length fluctuations and trends, with the Action Log notably containing color coding to indicate cycle increases versus cycle decreases during adaptive operation. Finally, the Kadence Before and After tool contains comparison graphs of cycle length distributions over user defined before/after periods.

1.9 System Display					
Functional Requirement Response Form Matrix					
		Response Code			Comments
		Available	Customization	Not Available	
1.9.1	The System shall be capable of displaying green-band time-space diagrams based on current intersection/timing plan database.	X			The Time-Space Diagram displays partial and full green bands in both directions with each being clearly distinguishable.
1.9.2	The System shall be capable of viewing CMS messages in the map view with various CMS sign software compatibility	X			KITS has a full CMS/DMS module and can display the active sign message through a hover tooltip shown directly on the KITS map.
1.9.3	The System will provide a means to display current timing plan information (cycle/split/offset) for arterial controllers.	X			This information is available in a variety of places, including via map tooltips, the Plan/Cycle layer on the map, Timing Values, Cycle Summary, and more.
1.9.4	The System shall be capable of displaying volume, occupancy, and speed, and V+KO data directly as well as congestion data.	X			KITS displays this information in a variety of places, including the System Detector Log and Congestion Manager Trace Log.
1.9.5	The System shall be capable of displaying main and side street green returns for intersection controllers.	X			This information is viewable in real-time in Timing Values and historically on the KITS HIT Report.

1.9.6	The System shall display intersection phase color indications.	X			Real-time phase color indications are available via Timing Values. Additionally, the HIT Report uses unique color-coding by phase to visually indicate to users when each phase served its green time.
1.9.7	The System shall display intersection pedestrian indications (Walk/Don't Walk).	X			This information is viewable in Timing Values.
1.9.8	The System shall display Pedestrian Push Button calls.	X			This information is viewable in real-time in Timing Values and historically on the KITS HIT Report. KITS also has a dedicated 'Ped Event Log'.
1.9.9	The System shall display vehicle detector calls.	X			This information is viewable in Timing Values.
1.9.10	The System shall display RR/EV preemptions and Transit priority calls.	X			This information is viewable on Timing Values, the HIT Report, and the Event Log.
1.9.11	The System shall display link congestion indication.	X			KITS supports showing link congestion information. This can be visualized via the results of the queue estimation algorithm for signals running Kadence, via a map layer linking segments to Bluetooth devices, or via pulling in internet map 'traffic' information.
1.9.12	The System shall display indication of which interval currently timing on each controller.	X			KITS Timing Values clearly shows which interval is currently timing on each controller. KITS additionally has device-specific I/O displays, like the LACO 4E test board display, with additional details from the real-time poll response.
1.9.13	The System shall display status of coordination at each controller.	X			This is displayed in many places: the map, Timing Values, various reports, etc.
1.9.14	The System shall display details of coordination at a controller: coordination timers. This includes the master cycle timer.	X			Timing Values shows master and local cycle timers, in addition to the controller time, current cycle counter, and individual split counters.
1.9.15	The System shall display the status of all conflict monitors as reported by the controller.	X			KITS can show detailed conflict monitor information as it is provided by the controller. This is typically tracked in the KITS Event Log but for some controllers, like D4, additional alarm information may be viewable on the D4 I/O Status display.
1.9.16	The System shall be capable of displaying data from the same or different intersections on multiple workstations simultaneously.	X			KITS can show data from any number of signals on any number of workstations simultaneously and even within a single KITS session on a single workstation.
1.9.17	The System shall display detector volume counts.	X			This is available through the System Detector Log.
1.9.18	The System shall display detector occupancy (%).	X			This is available through the System Detector Log.
1.9.19	The System shall display average speed over detector.	X			This is available through the System Detector Log. By grouping on certain columns, averages and totals can be displayed.
1.9.20	The System shall display V+kO value for each detector.	X			This can be seen through the congestion manager tracelog as V+kO is calculated for each 60 second bin of system detector data.
1.9.21	The System shall be capable of displaying new data types available from existing or new controllers if required in the future if required in the future. Once a new controller is configured, it will be available without a central server reboot.	X			New signals can be added to KITS and will come online seamlessly without requiring a reboot. KITS is regularly updated to support new features and database parameters released in controller firmware updates, and users will see these new parameters and features in KITS as they become available.
1.9.22	The System shall have a timing value display to show the mismatches between the central database and the field.	X			Timing Values has a 'Batch Compare Results' tab that shows the latest nightly batch comparison mismatches between central and the field.
1.9.23	The System shall provide a scale on each printed time space diagram.	X			The printed Time-Space Diagram contains a scale.
1.9.24	The System shall contain fields for direction, number of lanes, and detector type in the intersection definition form.	X			All of these fields are available on the intersection/detector definition displays.
1.9.25	The System shall allow an arterial name of forty (40) characters or less.	X			Arterials can be created with up to 40 characters
1.9.26	The System shall tile windows to arrange open timing values forms in a matrix.	X			KITS supports opening and tiling Timing Values windows in a wide variety of ways.
1.9.27	The System shall add the name of user who initiated a manual command to the current commands display .	X			KITS tracks which users saved, scheduled, or initiated a manual or central command.
1.9.28	The System shall provide geographically accurate maps showing boundaries of cities and corridors in Los Angeles County and bordering counties such as, but not limited to, Orange County.	X			KITS uses internet maps that contain all of the desired geographic information.
1.9.29	The System map shall use individual layers for various devices types such as intersection controller, detector, etc. and Agencies or Regional Projects.	X			The KITS map layers are broken out by various devices types and, in the case of signals, device groupings.

1.9.30	The System shall enable Users to turn on and off any layer on the map.	X			Layers can be turned on/off via the map layer manager.
1.9.31	The System shall enable the size of icons on the map to grow in proportion as the zoom level increases and shrink in proportion as the zoom level decreases.	X			KITS icons resize appropriately based on the zoom level and can additionally be increased/ decreased in size on demand via a right-click on the map.
1.9.32	The System shall be programmed to enable Users to turn on or off layers on the map at different zoom levels.	X			The KITS map will dynamically show/ hide different layers at different zoom levels, such as the phase status and plan/ cycle layers, which make the map too cluttered when zoomed out but provide good detail when zoomed in a bit more.
1.9.33	The System shall enable Users to zoom maps via a zooming scale to more detailed views.	X			The KITS map supports typical pan/ zoom capabilities via the map, and background map tiles are reloaded with more zoomed in, higher detail tiles as the zoom is increased.
1.9.34	The System shall enable Users to pan the view at all zoom levels of the map.	X			At all zoom levels, users can click and drag on the map with the mouse to pan around the map.
1.9.35	The System shall provide a traffic signal layer which will enable Users to view all intersection controllers on the map.	X			The primary layer on the KITS map is the traffic signal layer. Many other devices are supported on their own separate layers.
1.9.36	The System map shall provide a means to display current timing plan information (cycle/split/offset) for arterial traffic signals.	X			This is available via the plan/ cycle layer on the map and via a tooltip that appears on mouse hover.
1.9.37	The System map shall provide means to view arterial link volumes and speed information.	X			This is available through the Link History report in KITS. This can also be separately aggregated via the System Detector Log.
1.9.38	The System shall provide an arterial congestion link layer which will enable a User to view all arterial congestion links on the map.	X			KITS supports a link layer. Furthermore, if Bluetooth devices are collecting travel time information on these links, this information can be assigned to the appropriate segments in KITS and displayed through color coding on the map.
1.9.39	The arterial congestion links shall have designation by color for the following User-selected criteria: average volume, average speed, average occupancy, or average demand (volume plus weighted occupancy).	X			See previous comment, this is typically done by linking Bluetooth devices to congestion links, but can be tied to system detectors as well.
1.9.40	The System map shall include an arterial segment map layer to display travel time, speed, and volume, as available.	X			See previous comments, this is supported via the link layer on the map.
1.9.41	The System map shall be able to display volume, occupancy, speed, and V+kO data.	X			See previous comments, KITS can display all of this information via the System Detector Log and Congestion Manager Trace Log.
1.9.42	The System map shall provide a layer to display travel time data from available Bluetooth, Wi-Fi, or other travel time measurement devices.	X			See previous comments, Bluetooth devices can be polled in KITS and assigned to links for color coded view on the map.
1.9.43	The System map shall provide a layer to display incident and planned events on the map.	X			The KITS map can pull data from a variety of sources that may provide incident and event data, such as Waze or 511 systems.
1.9.44	The System map shall display the status of all arterial equipment connected to the System.	X			This is viewable in many places, including the map and System Status display.
1.9.45	The System map shall provide a Freeway layer.	X			KITS supports a Freeway layer and many freeway devices including ramp meters, detector stations, CCTV, DMS, and Gantries.
1.9.46	The System map shall provide a layer to display available freeway data which shall include freeway ramp meter status (on/off/failed) and ramp metering rates.	X			KITS supports display of ramp meter status on the map via the dedicated ramp meter layer. This includes on/ off/ failed. Ramp meter rates are currently being added to the system.
1.9.47	The System map shall provide a jurisdiction layer which will display the boundaries of the County, Councils of Government, Subregions, Cities, and Supervisorial Districts.	X			KITS accomplishes this by allowing map visibility to be controlled by controller-zone groupings, allowing users to only view signals that are within defined geographical areas. This can be additionally accomplished by configuring the KITS Map to use an ArcMap server with background tiles that visibly show these delineations.
1.9.48	The System map shall enable a user to double-click areas on the maps will allow switching to more detailed views of the county, jurisdictions, sections, or intersections.	X			Double-clicking a device or grouping in the layer manager will pan and zoom in to that location, showing more detail. Additionally, users can double-click a signal to open the more detailed Timing Values view.
1.9.49	The System map shall be available for all simultaneous sessions of the web-based user interface.	X			The system map uses web-based map tiles that do not limit the ability for map tiles to be streamed to any other users. There is no limit to the number of simultaneous map windows that can be open at any given time.
1.9.50	The System map data shall update and refresh in real time.	X			The KITS map updates in real-time.
1.9.51	The System shall include the ability to display communication quality (good/on versus bad/off) data for individual devices, including intersection controllers.	X			The KITS map has a dedicated comm quality layer.
1.9.52	The System shall provide an indication when transit signal priority and/or signal preemption operations become active at an intersection.	X			KITS has a variety of indicators for TSP and EVP calls. These can be viewed in real-time via Timing Values or historically via the Event Log. EVP operations can additionally be viewed as a standalone signal operation on the signal layer.

1.9.53	The System shall provide an indication when a scenario response plan is activated.	X			The KITS Congestion Manager, Central Commands, and Alerts are all linked together, such that there are multiple places to see when a scenario response plan has been activated. Namely, triggered scenario response plans can be viewed historically and in real-time via the Congestion Manager Tracelog and Central Commands display, with alerts for different types of scheduled plan commands also available.
1.9.54	The System shall display duration of transit signal priority and/or signal preemption operations at an intersection.	X			KITShas fully integrated support for TSP and preemption. All of this information can be viewed in the Event Log, or if the Traction Priority TSP/EVP module is installed into KITS, there is additional logging available through the Priority Event Log and Priority Trace Log.
1.9.55	The System Map and intersection displays shall include detector volume counts.	X			System detector information is viewable in a variety of places in KITS, including on the map via the Link layer if link->system detector mappings are done appropriately.
1.9.56	The System Map and intersection displays shall include detector occupancy (%).	X			System detector information is viewable in a variety of places in KITS, including on the map via the Link layer if link->system detector mappings are done appropriately.
1.9.57	The System Map and intersection displays shall include average speed over detector.	X			System detector information is viewable in a variety of places in KITS, including on the map via the Link layer if link->system detector mappings are done appropriately.
1.9.58	The System Map and intersection displays shall include V+kO value for each detector.	X			V+kOper detector is typically viewed via the Congestion Manager Trace Log and equivalent information can be visualized on the map.
1.9.59	The System Map and intersection displays shall include freeway ramp status.	X			As indicated previously, KITShas a ramp meter layer that will show status of these devices.
1.9.60	The System intersection display shall display main and side street green returns for intersection controllers.	X			This is available in numerous places throughout KITS, notably on the HITReport.
1.9.61	The System intersection display shall include intersection phase color indications.	X			Timing Values shows green/yellow/red and many other indicators relevant to signal heads and signal indicators.
1.9.62	The System intersection display shall include intersection pedestrian indications (Walk/Don't Walk).	X			Timing Values shows these pedestrian indicators in real-time.
1.9.63	The System intersection display shall include pedestrian push button calls.	X			Timing Values shows push button calls in real-time and they can be viewed historically on the HITReport and via the Ped Event Log.
1.9.64	The System intersection display shall include vehicle detector calls.	X			Timing Values shows vehicle detector calls. For many firmware types, this can also be seen historically on the Split Monitor Log.
1.9.65	The System intersection display shall include vehicle detector calls.	X			Timing Values shows vehicle detector calls. For many firmware types, this can also be seen historically on the Split Monitor Log.
1.9.66	The System intersection display shall include signal operational mode such as free, time based, traffic responsive, or adaptive.	X			Timing Values and the KITSMAP show all of these operational states and more.
1.9.67	The System intersection display shall include indication of which interval currently timing on each intersection controller.	X			Timing Values shows which interval is currently timing and even has an alternate pie chart style timing view.
1.9.68	The System intersection display shall include status of coordination at each controller such as plan, transition, free, traffic responsive, adaptive, semi-actuated, full-actuated, or manual.	X			Timing Values and the KITSMAP show all of these operational states and more.
1.9.69	The System intersection display shall include details of coordination at a controller such as coordination timers.	X			Timing Values has a detailed view showing Master and Local cycle timers in addition to controller time, cycle timers, and phase timers.
1.9.70	The System intersection display shall include the status of the conflict monitor.	X			KITScan alarm and report on conflict monitor details as they are provided by the signal controller. This typically includes logging of conflict flash start/end events, alerting on conflict flash, and seeing summary information of signals in conflict flash via the Map and System Status displays. If controllers provide additional conflict monitor details, that information will be logged to the Event Log.
1.9.71	The System intersection display shall include phase diagrams.	X			Phase diagrams are supported throughout KITS, notably via Timing Values graphics and automatically generated phase diagrams for timing sheet exports.
1.9.72	The System shall provide the ability to hover the cursor over an intersection to display the following information as a tooltip in real time: Name string, control mode, active timing plan number, cycle length, offset, communication status, and section ID.	X			All of this information is available via a mouse hover on the map.
1.9.73	The System shall provide the ability to hover the cursor over an arterial congestion link to display the following information as a tooltip in real time: link ID, travel time, entity name, posted speed limit, comment string, speed, occupancy, and demand defined by volume plus weighted occupancy.	X			A variety of congestion link information is available via the mouse hover tooltip.
1.9.74	The System Intersection display shall be able to auto fit to the size of screen.	X			KITSdisplays can be resized to automatically fit to different screen sizes.
1.9.75	The System shall provide control capabilities for authorized Users to change intersection timing plans, intersection mode, and command devices within the System.	X			KITSdisplays can be resized to automatically fit to different screen sizes.

1.9.76	The System intersection detail view shall display the names of the main and cross streets, and the direction of the main street.	X			This information is typically provided through the background map tiles, but can be added via custom text on the Timing Values graphics if additional detail is needed.
1.9.77	The System section detail shall display the site name, system name, entity name, section name, signal control mode, timing plan ID number, and IDs of all intersections that the section contains.	X			This information is all viewable and filterable on the Intersection List display by filtering or searching for the desired Section or Zone. Other features in KITS allow for similar display of section info including Corridor Timing Values.
1.9.78	name, entity name, intersection ID, section number, timing plan, cycle counter, master cycle counter, planned cycle length/offset, last cycle length/offset, signal status, comm state, comm response, mode, alarm, preempt, main street direction, cross street, last cycle phase split, programmed phase split, active phases, vehicle call state, ped phase state, and number of seconds between poll attempts for the controller.	X			This information is all available via the Timing Values display.
1.9.79	The System detector detail view shall display in real time the site ID, entity ID, controller ID, volume (VPH) V+KO (VPH), speed (MPH), occupancy (%), K weighting factor, status, last update, detector class, detector type, detector direction, detector lane, description, roadway name, cross street name, and averaging period (sec).	X			Most of this static information is available via the Detector Definition grid. Volume, Speed, Occupancy, Status, and K weighting factor are viewable on the System Detector Log and Congestion Manager Trace Log. Additionally, the Turning Movement Count display will aggregate volumes for system detectors on various approaches if configured appropriately via the detector definition grid.
1.9.80	The System intersection detail view shall display in real time the following types of data: Intersection real-time status, Phase state data (green returns), Pedestrian phase data, Vehicle call data, Current cycle phase data, Last cycle phase data, Timing plan phase data, Preemptions/Priority call data.	X			All of this data and more is available via the Timing Values display.
1.9.81	The system shall be capable of displaying Connected Vehicle Technology data, including Basic Safety Message (BSM) data and Roadside Equipment (RSE) status.	X			KITS supports dedicated layers for RSE status and BSM trajectories.

1.10 Alarms/Notifications/Logs/Reports

Functional Requirement Response Form Matrix		Response Code			Comments
		Available	Customization	Not Available	
1.10.1	The System shall report when a controller is in Conflict Flash.	X			Conflict flash events are reported in the Event Log and can be alerted on via the Alert Viewer or User Email Alerts.
1.10.2	The System shall report a controller communication failure or recovery.	X			Communication failure start and end events are logged and can be alerted/emailed on.
1.10.3	The System shall report when detectors are experiencing constant calls for user-set time period, if reported by the controller.	X			KITS has very robust support for detector stuck on (Max Presence) and detector stuck off (No Activity) reporting. All detector failures are logged in the Event Log and System Detector Log and can be alerted/emailed on.
1.10.4	The System shall report when detectors experiencing no calls for user-set time period, if reported by the controller.	X			KITS has very robust support for detector stuck on (Max Presence) and detector stuck off (No Activity) reporting. All detector failures are logged in the Event Log and System Detector Log and can be alerted/emailed on.
1.10.5	The System shall report when a detector is experiencing excessive calls (user set).	X			KITS supports the 'erratic activity' or 'detector chatter' failure states as provided by the controller firmware.
1.10.6	The System shall be able to generate reports on detector % available at detector, intersection, or area level.	X			This can be accomplished by filtering, searching, sorting, and grouping the System Detector Log, Detector Definition display, or via the Detector Health module.
1.10.7	The System shall report when a cabinet door is opened and detected by the controller.	X			This is supported as an alarm in KITS and is logged to the Event Log.
1.10.8	The System shall report when the Controller reports local database changes.	X			The KITS Batch Compare process runs nightly and reports on any changes between the local database and the central database.
1.10.9	The System shall report when the Controller reports operating status change (+COI).	X			KITS reports all operational state changes as reported by the controller. For instance, if the controller goes from local TOD operation to Central, the 'Control Source' layer on the KITS map will update to show 'Central' as the source instead of 'Local Schedule'.
1.10.10	The System shall be capable of prioritizing Alarms. There shall be a minimum of three levels of priority (low, medium and high) for alarms. New, unacknowledged, high-priority alerts shall be displayed at the top of the alert window.	X			KITS supports Low, Medium, and High Priority alarms and they function consistent with this requirement.
1.10.11	The System shall allow user-selectable priority for each possible type of alarm.	X			Alarm priority is configurable in KITS for each alarm.
1.10.12	If field communications are error free, the System shall display alarms within 5 seconds of occurring.	X			Alarms are generated as soon as they occur, unless persistence is set. When persistence is set, the alarm will be held until the persistence timer has elapsed and will not be displayed to the users until then.
1.10.13	All Alarms shall be logged and maintained in a database file.	X			KITS has an Alert Log that maintains a record of all historical alerts.

1.10.14	The System shall allow users to select to ignore an alarm based on alarm type.	X		All alarms can be customized by user role to 'Alert' or 'Ignore'.
1.10.15	The System shall provide for different alarm report features by user and by alarm type. The System shall provide a feature allowing unique icons, priority, wav file, and action to be assigned to each alarm.	X		KITS alarms can be fully customized as requested with unique sound files, icons, priorities, and actions per alarm.
1.10.16	The System shall allow users to select Alarms to print upon request and automatically print on designated printers.	X		The KITS Alert Viewer has full print capabilities.
1.10.17	The System shall provide for Automatic archiving of Alarms on disk.	X		KITS has a dedicated archival process that ensures all long-term data is maintained after it is removed from the live database.
1.10.18	The System shall automatically time stamp alarms and route to specified operator stations.	X		KITS alarms are generated with a timestamp corresponding to the system time at the time the alarm came in. Alarms will only be shown to users that are in a role that is set to 'Alert' for desired events.
1.10.19	The System shall provide the ability to add new alarms or events to one component of the system without rebuilding any other part of the system.	X		New alarms/email alerts/events can be configured seamlessly in the UI without requiring any processes to be restarted.
1.10.20	The System shall provide the ability for Administrators to configure the system to deliver various alarms to multiple destinations.	X		KITS security allows for configurations where only administrators are able to configure alarms for various system roles, or security can be configured to allow multiple user types to edit alarms for themselves or for other roles.
1.10.21	The System shall provide the ability for Users to configure individual delays for alarms.	X		KITS alerts support 'Persistence', which imposes a delay on a per alarm basis, ensuring users don't see an alert until it has persisted for the configured amount of time.
1.10.22	The System shall provide the capability for Users to route alarms to specific agencies.	X		KITS alerts can be configured by any combination of role and zone, allowing for unique sets of alarms for different groups of users and for different groups of signals.
1.10.23	The System shall be capable of printing formatted reports from logged VOS data.	X		KITS has multiple reports that operate on VOS data, namely the System Detector Log and Turning Movement Count Report.
1.10.24	The System shall be capable of providing a report of intersection delays by date and/or time.	X		The Phase Utilization Log, which is typically reserved for signals running adaptive control, displays calculated intersection delay on a per-cycle basis, with these calculations based on raw detector actuations. High resolution data logging will need to be enabled for delays to be calculated broadly for all locations and may require coordination with LA County to ensure adequate database resources for the increased data needs.
1.10.25	The System shall be capable of providing a report of arterial congestion link speeds.	X		KITS has a Link History Report that reports this information.
1.10.26	The System shall be capable of providing a report of arterial congestion link volumes V+kO.	X		The KITS Link History Report can be exported to Excel and manipulated to provide V+kO in addition to Volume, Occupancy, and Speed.
1.10.27	The System shall be capable of providing a report indicating variations in link volumes. The System shall be capable of providing a report of arterial congestion link Occupancy reports.	X		The KITS Link History Report provides this information.
1.10.28	The System shall be capable of providing a report of arterial congestion link Occupancy reports.	X		The KITS Link History Report provides this information.
1.10.29	The System shall be capable of providing a report indicating variations in volumes by day, week, month, and season.	X		The KITS Turning Movement Count Report displays all of this information in a graphical fashion and with tabular views.
1.10.30	The System shall provide a customized report generator tool.	X		KITS has full support for custom Microsoft SQL Reports and can be deployed with several additional default reports to get users started. Users can create additional reports for integration into KITS via the SQL Server Report Builder application.
1.10.31	The System shall be capable of automatically generating a report by TOD.	X		KITS has full support for scheduled reports, allowing users to receive various reports via email on a daily basis.
1.10.32	The System shall be capable of generating a report of alarms, such as link congestion or traffic condition.	X		KITS has many reports that cover this information and more. Notably, the Alert Log, Event Log, Link History Report, and System Detector Log.
1.10.33	The operator interface will provide a means of reporting system alarms to users.	X		KITS has an alert viewer and supports email alerts, providing multiple ways to send alarms to users.
1.10.34	The operator can add informational events to the system event log.	X		KITS has numerous places where comments can be entered or files can be attached to signals. These places include the intersection definition form, Timing Values, Signal Health Dashboard, and controller database pages when making edits.
1.10.35	The System shall provide a mechanism to alert a user that a controller database page is currently open by another user.	X		KITS can display a popup to users indicating when another user has a controller database page open for the selected intersection.
1.10.36	The System shall provide a mechanism to track temporary timing for each intersection. Reports can be generated for intersections and database pages that currently have temporary timing set. The user shall have the ability to view and roll-back to the previous timing.	X		KITS supports temporary timing and has a temporary timing report.
1.10.37	The System shall provide a mechanism to track and produce an alarm acknowledgment reports.	X		KITS has an Acknowledged Alerts Log as well as a general Alerts Log for all historical alert tracking.

1.10.38	1.Green state of all controller phases 2.Intersection ID 3.Date/Time Stamp	X			This information is available via the KITS Historical Intersection Timing Report.
1.10.39	The System shall allow the user to generate a report for a designated intersection, date, and time period that will provide a timed sequence of phase and controller status changes.	X			This information is available via the KITS Historical Intersection Timing Report.
1.10.40	The System shall include details for discrepancies in the data for the existing event log.	X			KITS reports on data discrepancies in a variety of ways. For example, controller database mismatches and time upload mismatches are all reported with detail on differences in the Event Log.
1.10.41	The System shall generate a scheduled event log report to provide the list of mismatched intersection pages.	X			KITS has a Batch Compare Log that can be generated on-demand or set up to be distributed to users on a schedule via the Scheduled Reports GUI.
1.10.42	The System shall allow the plotting of historical data for an arterial for a user-defined time period within the past 30 days.	X			The Time-Space Diagram includes a historical view that graphs the TSD with historical phase return information, relying on a similar dataset to the HIT Report.
1.10.43	The System shall have the ability to filter by agency on a variety of reports including communication, event log, MOE, system detector, and user activity log reports.	X			Agencies are typically denoted by 'Zone' in KITS and all reports can be searched/sorted/filtered by Zone.
1.10.44	The System shall have the ability to group and aggregate subsections of the data for communication, event log, MOE, system detector, and user activity log reports.	X			KITS Reports support grouping and aggregating data for any column. Users just need to drag the column header to the 'Group by' pane at the top of the report.
1.10.45	The System shall have the ability to export the data to a variety of formats including MS Excel, Adobe PDF, and HTML file.	X			KITS Reports can be exported to these formats.
1.10.46	The System shall report preemption and transit priority activity for a specified time frame.	X			The KITS Event Log contains detailed information on preemption and transit priority events. If Traction Priority is installed and providing preemption or transit priority, additional preemption and transit details are available via the Priority Event Log and Priority Trace log.
1.10.47	The System shall log and report any discrepancies when time is uploaded from central.	X			KITS uploads time from controllers up to 24 times per day and Time Upload Mismatch events are logged to the Event Log as they are detected. This is indicated to users as a 'Time Drift', or the number of seconds that the controller clock differs from the KITS system clock.
1.10.48	The System shall allow reports to be filtered by date and time of day.	X			All KITS reports can be filtered by date and time of day.
1.10.49	The System shall generate a report that provides a snapshot in time of all intersections currently collecting MOE data along with the IP address of each intersection.	X			The KITS Intersection List has a column showing which intersections have MOE data logging enabled.
1.10.50	The System shall generate a report that provides a comprehensive history review of any controller.	X			KITS has a Controller History Log that aggregates all controller database changes into a comprehensive report. Additionally, controller database pages have a historical view that lists all historical user timing changes.
1.10.51	The System shall generate a scheduled report configured in Excel, email, or printable report with configurable selection criteria.	X			The KITS Scheduled Reports GUI has all of these features.
1.10.52	The System shall allow the user to configure alerts for user-defined events or areas.	X			If users have appropriate privileges, they can configure alerts for various user roles and zones/areas.
1.10.53	The System shall allow alerts to be assigned to users by zone.	X			If users have appropriate privileges, they can configure alerts for various user roles and zones/areas.
1.10.54	The System shall indicate connection status of server processing.	X			KITS has a Connection Status List that shows all system connections, including backend service connections to KITS and any users that are actively running the KITS GUI.
1.10.55	The System shall provide system status indication for critical issues as defined by the user.	X			The System Status Display has system status indicators for both critical and secondary issues. These different categories of issues are easily filterable.
1.10.56	The System shall provide a generic list of issues updated on demand.	X			The Signal Health Dashboard displays any issues detected with controller timing, as determined by our signal health algorithm. Some notable issues that will be displayed here include phases that are in Constant Call (FO) state, phases that are being skipped too frequently, suspected stuck ped pushbuttons, phase recalls, and more.
1.10.57	The System shall allow the administrative users to designate alarms as critical or generic.	X			KITS Alerts can be configured with three priority levels: Low, Medium, and High.
1.10.58	The System shall include "area" on the event log report selection form.	X			The Event Log can be filtered by Area.
1.10.59	The System shall have a detailed and a summary communication status report. The detailed report will include the circuit, drop, segment, and IP address.	X			KITS has an all purpose Communication Quality Report as well as a Communication Quality layer on the map. This report and layer indicate relative levels of comm over the current 15 minute polling period, noting missed polls and bad poll responses for locations with < 100% comm quality.
1.10.60	The System shall provide the option to sort the report showing the system status by asset, intersection name, IP address, or status.	X			The Communication Quality Report can be sorted by all of these fields.
1.10.61	The System shall have user-defined performance measurement capabilities. The System will include an automated Utah DOT (a.k.a Purdue) model.	X			This is supported by the custom SQL Report capabilities mentioned previously. Additionally, if high resolution controller data is made available to KITS, the HIT Report can display per phase detector data in a Purdue Coordination Diagram format.

1.10.62	The System shall have the ability to log and provide a detailed report of transit signal priority (TSP) activity, whether the TSP solution is native, or 3rd party.	X			All Transit Signal Priority activity is logged to the Event Log as it is received from the controller. Even if our software is not sending TSP requests, the Event Log can still show when a TSP request was made, what the controller did to accommodate the request, and when the TSP request ended.
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1.11 Interfaces and Firmware

Functional Requirement Response Form Matrix		Response Code			Comments
		Available	Customization	Not Available	
1.11.1	The System shall have a center to center interface with RIITS based on the latest ITE TMDD and SAE J2735 versions available.	X			KITS has a fully capable TMDD interface that is currently running on the I-210 corridor. Additionally, KITS has historically supported a secondary TMDD feed for transmitting data to the IEN. This TMDD feed can easily be updated to send to any additional portals or platforms.
1.11.2	The System shall connect to RIITS for bi-directional network communications and communicate TMDD and other information that may be available from the System.	X			KITS has a fully capable TMDD interface that is currently running on the I-210 corridor. Additionally, KITS has historically supported a secondary TMDD feed for transmitting data to the IEN. This TMDD feed can easily be updated to send to any additional portals or platforms.
1.11.3	The System shall support the latest NTCIP communication protocol.	X			KITS fully supports NTCIP and AB3418E communication protocols, in addition to many others.
1.11.4	The System shall support the latest TMDD schema.	X			KITS has full support for the TMDD C2C interface.
1.11.5	The System shall support Transit Signal Priority.	X			KITS has full TSP support as described previously.
1.11.6	The System shall support the Battery Backup Monitoring.	X			KITS supports integration with BBU and has a dedicated BBU layer. Additional coordination may be required to integrate LA County specific BBUs.
1.11.7	The System shall support RR/Light Rail Transit/EV operation monitoring.	X			This information is reported back to KITS from the signal controller via standard second-by-second polling. This information can be seen in Timing Values and via the Event Log.
1.11.8	The System shall import notes from the LACO-4E and 2070 timing sheets directly to the general intersection definition parameters.	X			This is supported via the file attachment feature in the KITS Intersection Definition display. This feature allows any file, including timing sheets, to be attached to the signal for easy reference within KITS.
1.11.9	The System shall export notes from the System intersection definition form to the LACO-4E and 2070 timing sheet.	X			Comments are included in the Excel Export.
1.11.10	The System shall include a phase diagram on the front cover of the LACO-4E and 2070 Timing Sheet.	X			Phase diagrams are drawn programmatically on the first page of timing sheet exports.
1.11.11	The System shall enable proper plotting and graphical depiction of 'special' logic that is currently implemented within 170 and 2070 firmware timing sheets.	X			KITS controller database pages have graphical displays that depict 'special' or 'I/O' logic in an intuitive way. KITS also supports timing sheet exports of these pages.
1.11.12	The System shall support the latest D4 controller firmware version.	X			KITS has support for the latest D4 version and is continuously updated to maintain support with the latest versions.
1.11.13	The System shall support the latest MaxTime controller firmware version.	X			KITS has support for the latest Maxtime version and is continuously updated to maintain support with the latest versions.
1.11.14	The System shall support the latest Omni eX controller firmware version.	X			KITS has support for full second-by-second polling for Omni eX controllers and has a set of base NTCIP controller database pages for uploading/downloading of common timing parameters.
1.11.15	The System shall support the latest SEPAC controller firmware version.	X			KITS has support for the latest SEPAC version and is continuously updated to maintain support with the latest versions.
1.11.16	The System shall interface with various transportation programs via RIITS.	X			KITS has a fully capable TMDD interface that is currently running on the I-210 corridor. Additionally, KITS has historically supported a secondary TMDD feed for transmitting data to the IEN. This TMDD feed can easily be updated to send to any additional platforms, including RIITS.
1.11.17	The System shall integrate with available Bluetooth, Wi-Fi, or other travel time measurement devices.	X			KITS can integrate with Bluetooth devices and can map Bluetooth status elements to the Link Layer on the map as described previously. KITS can also integrate with Traction Travel to bring crowd sourced travel times into the system for use in the Congestion Manager or posting travel time messages to DMS.
1.11.18	The System shall support the SAE J2735 format for outputting realtime signal status and map information.	X			KITS fully supports J2735 and can generate SPaT and MAP data.
1.11.19	The System shall have a mobile-based travel time performance tool that is capable of integrating with Waze and other crowd sourced navigation applications.	X			KITS integrates with Traction Travel, Kimley-Horn's mobile-based travel time performance tool. Traction Travel integrates with Google, Azure, and Waze, allows users to generate their own travel time data with the mobile app, and integrates with KITS to provide travel times for Congestion Manager logic or for automatic posting to DMS.

1.12 Video and CCTV

Functional Requirement Response Form Matrix

Response Code

Available
Customization
Not Available

Comments

		Available	Customization	Not Available	Comments
1.12.1	The System shall allow Pan, Tilt, Zoom (PTZ) control for the CCTV directly from the mouse.	X			KITS has a fully integrated CCTV module that supports PTZ control from mouse clicks on the PTZ control in KITS.
1.12.2	The System shall allow the integrated operation for multiple versions of Cohu, Bosch, and Pelco cameras used by LA County.	X			KITS supports all of these camera types and more.
1.12.3	The System shall allow County staff to place CCTV and VID icons on the main system map .	X			KITS supports a CCTV map layer with unique icons for CCTV and for VIDs.
1.12.4	The System shall have two different icons for the VID and the CCTV.	X			KITS supports a CCTV map layer with unique icons for CCTV and for VIDs.
1.12.5	The System shall allow users to pop open a video viewer with an integrated control by clicking on a CCTV or VID icon.	X			KITS CCTV control display can be accessed via right-click on the CCTV or VID icon.
1.12.6	The System shall allow the integrated viewing of VID cameras (i.e. Iteris, Econolite, MioVision, Gridsmart)	X			KITS has native support for multiple video detection systems. For some (Autoscope and Gridsmart), that includes dedicated video detection reports and ingestion of information from the video detection system API. For others, support is limited to viewing the VID feed.

Proposer Name: _____				
2.1 General Technical Requirements				
Technical Requirement Response Form Matrix				
		AVAILABLE		Comments
		Y	N	
2.1.1	The System shall provide a secure thick client graphical user interface for Users to access the System from various operating systems (e.g., Windows 10, or the latest supported version.)	X		KITS is a thick client application that runs on all modern versions of Windows.
2.1.2	The System Software shall provide a thick client graphical user interface or a secure web based user interface for Users to access the System from a web browser (e.g. latest versions of Edge, Chrome, Firefox, Safari, etc.)	X		KITS can be deployed as a thick client on workstations or can be served up in a browser if deployed in a virtualized environment like Citrix or VMWare.
2.1.3	The System shall provide a user interface that complies with recognized usability standards (e.g., the American Disabilities Act (http://www.ada.gov/), the Rehabilitation Act Section 508 (http://www.section508.gov/ , etc.).	X		KITS complies with recognized usability standards and has many color customization features to allow for better visibility for those with vision impairments.
2.1.4	The System shall provide a device agnostic solution and shall not require plug-ins or additional installed software (e.g., Adobe Flash), with respect to devices used for data entry.	X		KITS does not require any plug-ins for device-specific functionality. KITS is an open solution and supports dozens of signal controller and ITS device firmware.
2.1.5	The System shall provide a browser agnostic solution (e.g. Edge, Chrome, Firefox, Safari, etc.) and shall not require plug-ins or additional installed software (e.g., Adobe Flash).	X		If KITS is virtualized and served up through a browser, there is no specific browser that would be required.
2.1.6	The System shall keep all components updated with current antivirus, operating system, and application security patches.	X		This is typically handled by agency IT as part of their security policy. Kimley-Horn will comply with all applicable security standards and practices and will keep components updated as directed by county IT.
2.1.7	Contractor shall require annual cyber security training for all personnel with access to IT resources (e.g., hardware, software, data).	X		Kimley-Horn has a robust cyber security training that all employees must participate in. There are typically no less than 6 cyber security courses provided per year.
2.1.8	Contractor shall provide to County an attestation by an objective third party, stating the application has been tested for common security vulnerabilities (e.g. Service Organization Control (SOC)).	X		Kimley-Horn, and KITS specifically, is SOC certified.
2.1.9	The System shall provide User audit trail capabilities that logs and archives all User actions that modify its behavior. The log entry will include username, action (including before and after configuration values), time, and date of action.	X		The KITS User Activity Log tracks all of this audit information.
2.1.10	The System Application Programming Interface (API) shall use secure authentication and encryption (128-bit or greater).	X		as an API and TMDD does not support 128-bit
2.2 Access				
Technical Requirement Response Form Matrix				
		AVAILABLE		Comments
		Y	N	
2.2.1	The System shall have a hierarchical User model with rights and capabilities able to be assigned to various User roles as defined by an administrator.	X		KITS has a robust security configuration that allows for granular privileges by any role/zone combination. KITS security can be configured by different role and zone combinations, allowing for different groups of users to have specific privileges for their intersections, including the ability to send/manage incident response plans.
2.2.2	The System shall provide assignable User groups with rights and capabilities specific to that User group. For example, Participating Agencies implement scenario response plans as part of incident responses that impact devices on their Interfaced System.	X		KITS Security can be configured to allow only administrative users to set up accounts. KITS leverages Windows AD so password management is typically handled by agency IT via Windows AD settings.
2.2.3	The System shall enable administrators to create new unique User accounts with unique usernames and passwords.	X		

2.0 General Technical Requirements

FORM PW-18

2.2.4 The System shall enable administrators to grant Users various levels of access (administrator, operator, agency operator, guest, etc.).
The System shall enable administrators and Users (with appropriate rights) to create and maintain profiles of information and capabilities for each User.

2.2.5

The System shall require all Users to login with valid username and password to access the System.

2.2.7 The System shall provide Multi-Factor Authentication for User log-in.

2.2.8 The System shall support password complexity that meets the County Password Security or equivalent: A minimum of 8 characters with at least three of the four characteristics

X

Administrative users can configure other users with any desired privileges, as described previously. KITS security is flexible enough to empower additional user roles to create and maintain additional user accounts and user roles. KITS leverages Windows AD and this is a function of the Windows platform. KITS leverages Windows AD and this is a function of the Windows platform.

X

X

X

2.3.5	The System shall support a backup protocol on backup media approved by County.	X	KITS leverages standard Microsoft SQL Server backup processes, storing KITS database backups into .BAK files stored on County provided storage media.
2.3.6	The System backup processes shall be automated.	X	All database backups are fully automated and are part of a nightly maintenance schedule.
2.3.7	The System shall perform backups with no adverse effect on performance of the System.	X	KITS database maintenance and archival processes are scheduled to run in the middle of the night during low volume periods and as such, have no noticeable impact on system performance.
2.3.8	The System shall, at least daily, backup System Data.	X	KITS database backups and archival processes all run nightly.
2.3.9	The System's backup media shall be encrypted.	X	This is a function of Microsoft SQL Server, nightly backups can be configured to encrypt all data with the desired encryptor when the backup is created.
2.3.10	Access to County data must be limited only to the Contractor's personnel to perform work necessary defined in the scope of services. County must be notified in writing of any third party which the Contractor is required to share County data.	X	Kimley-Horn will limit work on the KITS system to only those personnel who have been approved to conduct KITS related work in the County environment. Kimley-Horn will coordinate with County IT to obtain approval for any additional personnel that may need access.
2.3.11	The System shall provide the ability to automatically export System Data or reports	X	All reports have export features and KITS has a built-in scheduled reports GUI for automatic emailing of reports to users.
2.3.12	The System shall allow authorized Users to select periodic archiving of User selectable data	X	KITS has a dedicated archival process that can be configured by authorized County personnel.
2.3.13	The System shall allow for authorized Users to archive data received from Interfaced Systems.	X	KITS has a dedicated archival process that can be configured by authorized County personnel.
2.3.14	The System shall enable authorized Users to back up each major Interfaced System and/or sub system to a County approved back up media.	X	Kimley-Horn can work with the County to identify authorized users and determine how and where to back up each major interfaced system and/or sub system.
2.3.15	The System Data should be retained per County's record retention compliance requirements.	X	KITS archival periods are configurable and can be set to any desired County standard.
2.3.16	The System's logs shall not contain sensitive or Confidential Information.	X	KITS logs do not contain what would typically be considered sensitive or confidential information. Please note, however, that controller IP addresses are available in certain key reports, but are necessary for effective use of the system. Some agencies may consider that sensitive and if this is the case for the County, this information can be removed or hidden through additional configuration.
2.3.17	The System shall allow an administrator to configure the System to share all or partial data received from Interfaced Systems.	X	This is typically configured through the intersection definition display by setting the 'Enable C2C' checkbox. Setting this checkbox will allow this signal to have its information transmitted through the TMDD C2C feed. Additional message restrictions to narrow down to a specific subset of partial data can be configured via the backend TMDD processes and via backend TMDD system settings.
2.3.18	The System shall transmit any sensitive data or Confidential Information using secure protocols.	X	KITS uses industry standard protocols such as NTP and TMDD, which have various security features built-in. Proprietary KITS data transmission processes and APIs leverage all modern forms of security and encryption.
2.3.19	The System shall use AES-128 encryption or stronger used for all System Data in storage and in transit.	X	and TMDD, which have various security features built-

2.3.21	The System shall not store sensitive data in cookies or URLs.		X		KITS does not store any sensitive data in cookies or URLs.
2.5 Security Requirements - Sensitive Data					
Technical Requirement Response Form Matrix					
			AVAILABLE		
			YES	NO	Comments
2.5.1	The System shall not store sensitive data and secrets (e.g., password challenge phrases, credential and authentication tokens) in code.		X		KITS follows security best practices and does not store sensitive data and secrets in code.
2.5.2	The System shall store secrets securely using a one-way hash or encryption. The System shall not store secrets, database keys, connections, and passwords in plain text.		X		KITS follows security best practices and stores secrets securely using a one-way hash or encryption. Note that since KITS relies on Windows AD, there is minimal need to store passwords or secrets in the system.
2.5.3	The System shall protect application logs that contain sensitive data.		X		KITS security allows for administrators to restrict access to reports with sensitive data if desired.
2.5.4	The System shall provide database/file encryption for protection of sensitive data fields while the data is at rest (e.g., stored data).		X		Sensitive data is encrypted when stored in the database. KITS config files are also encrypted, ensuring database connection details cannot be discerned from the config file.
2.5.5	The System shall include protection mechanisms for sensitive data that is sent over the network.		X		KITS uses industry standard protocols such as NTCIP and TMDD, which have various security features built-in for data sent over the network. Proprietary KITS data transmission processes and APIs leverage all modern forms of security and encryption.
2.5.6	The System shall transmit sensitive data using secure protocols, such as sftp, ssh, https, etc., or tunneled through an authenticated encrypted connection (e.g., VPN).		X		KITS uses industry standard protocols such as NTCIP and TMDD, which have various security features built-in for data sent over the network. Proprietary KITS data transmission processes and APIs leverage all modern forms of security and encryption, including those listed in this requirement.
2.7 Security Requirements - Exception Management / Error Handling					
Technical Requirement Response Form Matrix					
			AVAILABLE		
			YES	NO	Comments
2.7.1	The System shall provide exception handling to minimize information disclosure in case of an exception (e.g., login failure).		X		KITS has robust exception handling and a dedicated errorlog that Kimley-Horn support staff can access for troubleshooting. User-visible error messages have minimal information and only KH support staff and system admins are able to access the additional details in the database errorlog.
2.7.2	The System shall return generic errors messages to the client, to avoid disclosure of sensitive information (e.g., database error, application error).		X		KITS has robust exception handling and a dedicated errorlog that Kimley-Horn support staff can access for troubleshooting. User-visible error messages have minimal information and only KH support staff and system admins are able to access the additional details in the database errorlog.
2.8 Security Requirements - Recovery					
Technical Requirement Response Form Matrix					
			AVAILABLE		
			YES	NO	Comments

2.8.1	Contractor shall have a clear way to address how data and system security are protected from disruption and loss in the event of disaster, emergency, and security breaches. System shall be monitored to ensure the effectiveness of security controls. Promptly notify the County project manager and Departmental Security Officer within twenty-four (24) hours of when there is a suspected system breach.	X	Kimley-Horn has a dedicated InfoSec team that helps ensure these best practices are followed, and Kimley-Horn has experience, notably with the County, in navigating through a disaster recovery situation successfully. Typically, agency IT take more of an active role in establishing monitoring processes (antivirus, firewall, etc.) that ensure the effectiveness of security protocols.
2.8.2	Contractor shall have the ability to restore data or portions of data within eight (8) hours after request is made.	X	Data can be retrieved from the KITS archive upon request and within 8 hours of the request. The latest version of KITS has a new archival process that fully automates this and makes data retrieval seamless to the user.
2.8.4	System should return generic error messages to avoid disclosure of sensitive information (e.g., database error or application error).	X	KITS has robust exception handling and a dedicated errorlog that Kimley-Horn support staff can access for troubleshooting. User-visible error messages have minimal information and only KH support staff and system admins are able to access the additional details in the database errorlog.
2.8.5	The Test environment shall include robust and automated regression testing tools for use by authorized County Users.	X	The internal Kimley-Horn test environment leverages a variety of automated testing tools to ensure regression testing is being done. Additionally, code reviews and unit tests are leveraged as best practices to ensure consistent operation and code structure. Kimley-Horn can set up a test environment and automated testing tools if desired by the County so that County Users can take an active role in testing the system as new updates are made available.
2.9 Performance and Availability			
Technical Requirement Response Form Matrix			
		AVAILABLE	
		Y	N
			Comments
2.9.1	The System environments shall operate on a 24x7x365 basis.	X	KITS typically has a 99.9% uptime and has been running continuously in LA County for well over 15 years with minimal disruption.
2.9.2	System Availability shall be ninety-nine point nine percent (99.9%)	X	KITS typically has a 99.9% uptime and has been running continuously in LA County for well over 15 years with minimal disruption.
2.9.3	The System shall have an average response time of five (5) seconds, as measured from the Hosted Environments.	X	KITS exceeds this response time in nearly all cases. Polling is done on a second-by-second basis and any latency is typically limited to 1-2 seconds.

ATTACHMENT A.2 - SYSTEM OVERVIEW

Under this Project, the County will receive a “commercial-off-the-shelf” Advanced Traffic Management System (ATMS) by utilizing a client-server architecture.

The System shall include a map and intersection graphics display which shall update the status of all devices on all map displays once per second when data is retrieved from a field device. Each instance of the map display shall be set up independently by panning zooming such that each map region can be utilized as an individual sub-area for monitoring individual intersections or groups of intersection.

The System shall render maps dynamically using geo-coded Geographic Information Systems (GIS)-based map data and shall support bitmap (.BMP), JPG/JPEG, .PNG, and .GIF raster file formats, ESRI shape files, and SDE version 9.x.

The System shall support Web Map Service (WMS) to display geo-referenced map images from any WMS source, including ESRI ArcInfo Enterprise.

The System shall include the map icon for the traffic signals which will include a colored area that indicates high-level intersection status. The standard zoom level for this icon shall include:

- Intersection Status only – coordinated, free, flash, transition, preempted, communications fail, offline, etc.
- Intersection Status, plus main street (through phase) and side street signal colors
- Intersection Status, main street and side street colors and pattern number
- Intersection-level graphics with all signal phases, overlaps, pedestrian indications, detection, preemption, alarms, and status

The System shall provide multi-jurisdictional security for its user accounts. Each jurisdiction shall restrict security so that users within said jurisdiction shall not have access to System data or functions outside their assigned jurisdiction. System administrators shall have the capability to customize jurisdiction settings.

The System shall be able to be configured to send alerts to online users based on specific events from field devices or from components in the system. Existing alerts shall be displayed in an Alert Monitor dialog.

The System shall provide an “Alert” notification which can be sent to an online, logged-in user, or an offline recipient via an email or SMS text message.

If an alert is not acknowledged or closed within a certain period, the System shall be able to “escalate” alerts or send it to an additional recipient or group of recipients.

The System shall provide a scheduler for configuring events and functions to be executed or terminated at specific points in time. The scheduler shall be flexible and allows scheduling of events daily, weekly, monthly, annually, seasonally, on floating or fixed holidays, and as special or one-time events.

System events shall be configurable and able to control individual field devices, groups of devices, sections, or systemwide. It shall be possible to combine devices, groups, and sections for a single event or function. The scheduler shall be able to schedule time broadcasts, log uploads, special function outputs, CCTV presets, actions sets, and time drift checks. The scheduler shall provide a means to print reports automatically.

The System shall support four central traffic control strategies:

1. Manually selected timing plans
2. Time-of-Day (TOD) selected timing plans
 - a. Time and date control the system regardless of demand
 - b. Predetermined timing plans (cycle lengths, offsets, splits)
 - c. Predetermined schedules (year, week, and day of week schedules)
 - d. Grid traffic scenario
 - e. Traffic Responsive algorithm responds to real-time volume and occupancy data to select a predefined timing plan to best serve the current traffic
3. Traffic Responsive algorithm responds to real-time volume and occupancy data to select a predefined timing plan to best serve the current traffic
 - a. System detectors control the system based on level of demand
 - b. Predetermined timing plans (cycle lengths, offsets, splits)
 - c. No schedule
 - d. Log records explain when and why a plan changed
4. Adaptive (licensed per intersection)

The control methods shall be able to be applied in any combination to individual controllers, sections of controllers, and groups of controllers. Controllers can belong to a single section at any time but can be moved from one section to another manually or by time-of-day. Controllers can also belong to multiple groups at any one time, offering maximum flexibility in traffic control strategies.

The System shall provide a full set of historical system and device reports generated using Microsoft SWL Reporting Services. The reports shall allow for specifying, filtering, and sorting parameters. The following reports shall be available:

<ul style="list-style-type: none"> • Alerts Log • ATC Traffic Control System • Communications Statistics • Device Fault Status • Device Daily Communications • Device Comm. Configuration • Entity Hierarchy • Links • Raw Detector Data • Signal Changes • Signal Configuration 	<ul style="list-style-type: none"> • Signal MMU/CMU Events • Split Monitor • System Activity • System Events • Time Drift • Traffic Responsive • Upload and Compare • User Login • VOS Daily Report • VOS Hourly Report • VOS Multi-Date Hourly Report
---	---

<ul style="list-style-type: none">• Signal Detector Events• Signal Events	<ul style="list-style-type: none">• VOS Multi-Date Daily Report
--	---

The System shall also provide a means by which user-specific reports can be created without the requirement of additional third-party software or custom development work by the software provider. Reports shall be able to be developed via email in Microsoft Excel, Word, PDF, CSV, and other formats.

The Advance Traffic Management System (ATMS) software shall be compatible with the following local controller software and hardware:

- LACO 4E
- D4
- MaxTime
- Econolite EOS
- Omni eX
- Daktronics Changeable Message Sign (CMS) software
- Skyline CMS software
- I-210 Connected Corridor System

The system shall enable a self-contained laptop version which shall include intersection status monitor and database editors.

The laptop version will support the following features:

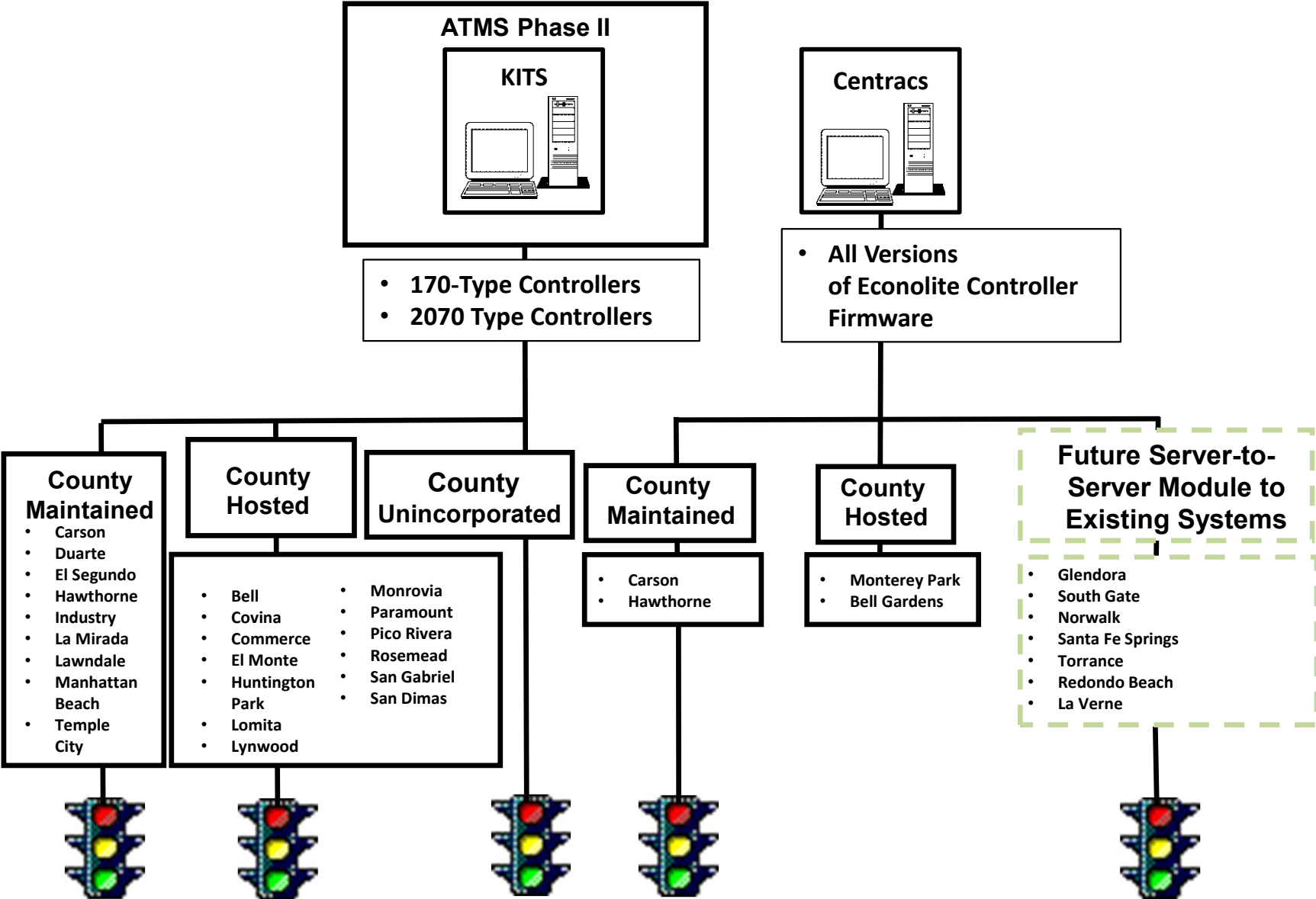
- Connection to a single controller at a time.
- Manual commands, such as a pattern change, which can be sent to the controller from the laptop.
- Allows users to download, clear and view logs from the controller.
- Provides a convenient tool for synchronizing data between the laptop running the Local Edition and the ATMS.
- The ability to inspect the data on both systems and provides an indication of which system has the newer data for each object. This includes the ability to copy all data in either direction or selectively decide what individual data to transfer in which direction.
- Synchronization between two laptops running ATMS Local Edition which allows multiple users to maintain a “master” copy of controller databases to simplify the process of keeping field technician databases current and consistent.

The system shall connect to the Information Exchange Network (IEN) such that the County and Cities will have the ability to monitor and manage each other systems. The Consultant will configure the IEN connection such that the County and Cities will have full control over which devices are exposed to other systems.

The software maintenance agreement shall be current in order to receive updated patch releases at no additional cost.

Attachment A.3 Existing System Architecture

COUNTY'S TRAFFIC MANAGEMENT CENTER - ADVANCED TRAFFIC MANAGEMENT SYSTEMS



ATTACHMENT A.4

ATTACHMENT A.4 – ACCEPTANCE CERTIFICATE

(Name and Address)		TRANSMITTAL DATE
ACCEPTANCE CERTIFICATE		CONTRACT NUMBER
		TITLE
FROM: _____ Contractor's Project Director (Signature Required)	TO: Jeffrey Pletyak County's Project Director Department of Public Works	
Contractor hereby certifies to County that as of the date of this Task/Deliverable Acceptance Certificate, it has satisfied all conditions precedent in the Agreement, including the Exhibits thereto to the completion of the Tasks and delivery of the Deliverables set forth below, including satisfaction of the completion criteria applicable to such Tasks and Deliverables for County's approval of the Work performed in connection with the achievement of such Task. Contractor further represents and warrants that the Work performed in respect of such Tasks and Deliverables has been completed in accordance with the Exhibit A (Statement of Work). County's approval and signature constitutes an acceptance of the Tasks and Deliverables listed below.		
TASK DESCRIPTION (including Task and subtask numbers as set forth in the Statement of Work)	DELIVERABLES (including Deliverable numbers as set forth in the Statement of Work)	
Comments:		
Attached hereto is a copy of all supporting documentation required pursuant to the Agreement and Exhibit A (Statement of Work), including any additional documentation reasonably requested by County.		
County Acceptance: NAME _____ SIGNATURE _____ DATE _____ County's Project Director		

Distribution:

Original – Financial Services

Copy 1 - Contractor

Copy 2 - County's Project Director

Copy 3 - DPW Master Contract File

ATTACHMENT A.5

**BASELINE INTERFACES AND PARTICIPATING AGENCIES
FOR
LOS ANGELES COUNTY ADVANCED TRAFFIC MANAGEMENT SYSTEM
PHASE III
(ATMS PHASE III)**

ATTACHMENT A.5
BASELINE INTERFACES AND PARTICIPATING AGENCIES

GENERAL INFORMATION

The System shall implement the following Baseline Interfaces for the Participating Agencies and Regional Projects as specified in this Attachment A.5 as part of the Baseline Application implementation. The Baseline Interfaces, Pilot Agencies, and Participating Agencies may be further refined during the completion of Tasks 2-8.

PARTICIPATING AGENCIES

County Maintained

- Carson
- Duarte
- El Segundo
- Hawthorne
- Industry
- La Mirada
- Lawndale
- Manhattan Beach
- Temple City

County Hosted

- Bell
- Covina
- Commerce
- El Monte
- Huntington Park
- Lomita
- Lynwood
- Monrovia
- Paramount
- Pico Rivera
- Rosemead
- San Dimas
- San Gabriel

PILOT AGENCIES

- Alhambra – TransSuite
- Buena Park - TACTICS
- Caltrans – Freeway Performance Measurement System (PeMS)
- Los Angeles County – KITS, Centracs
- Palmdale - Transparency
- Pasadena – i2, Series 2000, Transparency
- Santa Monica – MaxView
- West Hollywood - QuicNet

BASELINE INTERFACES FOR REGIONAL PROJECTS

- Interstate 210 Connected Corridor Integrated Corridor Management Project
- Interstate 105 Integrated Corridor Management System
- Interstate 710 Integrated Corridor Management System
- Regional Integration of Intelligent Transportation Systems (RIITS)
- Information Exchange Network (IEN)

ATTACHMENT A.6

PARTNERS FOR ADVANCED TRANSPORTATION TECHNOLOGY
INSTITUTE OF TRANSPORTATION STUDIES
UNIVERSITY OF CALIFORNIA, BERKELEY

Connected Corridors: I-210 Pilot Integrated Corridor Management System System Interface Design Specification

March 20, 2020
Version 1.2



Partners for Advanced Transportation Technology works with researchers, practitioners, and industry to implement transportation research and innovation, including products and services that improve the efficiency, safety, and security of the transportation system

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REVISION HISTORY

Version	Date	Description	Changed By	Reviewed By
1.0	12/15/17	First release	G Gremaux	B Peterson
1.1 - DRAFT FOR FINAL COMMENT	7/26/18	Includes significant changes to response plan dialogs and various corrections and enhancements	G Gremaux	B Peterson
1.1	11/27/18	Added extended data frames used by CMS and Data Hub, made Authentication requirements consistent, removed duplicate Organization data frames, defined elements that were "TBD", changes to facilitate defining incident locations, and various corrections.	G Gremaux	B Peterson
1.1.1	12/06/18	Redefine "BoundingBox" extended type as "GeometrySpatialData" type. Change name of SectionControlSchedule.Node-Id-List to Device-Id-List for consistency with SectionStatus. Add missing extended data frame EventLaneExtended. Rename EventLane.Lanes-Link-Id to Event-Lane-Ext and change type to EventLaneExtended. Remove extended elements LandmarkLocation.Location-Id and LinkLocation.Location-Id.	G Gremaux	B Peterson

Version	Date	Description	Changed By	Reviewed By
1.2	3/20/20	<p>Added descriptions of the wsdl and xsd files.</p> <p>Changed structure of many extended dataframes to allow additional separate dataframes for different vendors.</p> <p>Added custom extended dataframes to support McCain and Transcore implementations.</p> <p>Added "mock-event-flag" and "target-hub-org-id" elements in extended dataframes for CMS.</p> <p>Fixed dMSMessageAppearanceMsg to allow multiple devices in the response.</p> <p>Added device-cancellation-list in ResponsePlanDetails to allow cancelling control requests in a Termination Plan.</p> <p>Added list of enumerated values which will be used for specific dialogs for the Device-Type and Device-Information-Type elements.</p> <p>Added appendix describing request and subscription dialog properties and behaviors.</p> <p>Added appendix describing how to startup an on-change subscription.</p> <p>Added appendix describing workflows related to incident and response plan processing.</p>	G Gremaux	B Peterson

1. INTRODUCTION

This document provides the data dictionary for the Connected Corridors ICM system.

Note: This is a first version of the data interface specification. Typically, the data interface specification would be the result of system requirements, high-level design, subsystem requirements, and detailed design, with continuous updates as the system progresses through its lifecycle. With the size and complexity of the Connected Corridors ICM system, substantial changes can be expected from this first version. The primary purpose of this initial document is to create an initial framework from which the final system data specification can be developed as the system is defined, developed, and implemented.

This initial version accomplishes the following:

- Establishes the Transportation Management Data Dictionary (TMDD) version 3.03d as a standard for describing data transfer both with systems that provide information and within subsystems of the ICM system whenever applicable
- Provides an initial specification of the TMDD elements that are expected to be required for Connected Corridors
- Identifies a limited number of initial extensions to TMDD that will be necessary from the initial system requirements document
- Identifies types of data (from a review of the initial system requirements document) for which TMDD will not be appropriate, along with other specifications that may be more suitable for each type of data identified. Note that this document does not yet choose specific standards or specifications outside of TMDD, but rather recommends possible alternatives. As the system requirements and design process progresses, and more detail becomes available, it will then be appropriate to select from possible alternatives and provide additional detail regarding implementation of those standards and specifications.
- Resolves issues within the TMDD specifications regarding SOAP implementation, making the result compliant with the WSI Basic Profile 2.0 specification.

The changes that can be expected as the system requirements and design process continues include:

- Selection and identification of the specific standards and specifications for information not related to TMDD
- Details of implementation of those selected standards and specifications
- Additional data formatting and type information
- Subsystem data definition implementation details, where differences between subsystems may exist
- References to source system data specifications, where available
- References to target system data specifications, where available
- Details of data definition mappings between systems that provide or consume information to/from the ICM system

The Connected Corridors ICM system is fundamentally a data-driven system, with a significant volume of information from multiple systems located in multiple jurisdictions being received by the system for processing, decision support, traffic state determination, traffic prediction, status monitoring, control, storage, and system management. This data will include:

1. Corridor asset inventory describing the physical road, infrastructure such as intersection signals and ramp meters, sensors available, and organizational assets such as decision authorities and incidence response assets.
2. Corridor asset state information, indicating the current state of the corridor assets such as road condition, signal plans currently being implemented, and availability of incidence response assets.
3. Traffic data, characterizing the current state of traffic, including sensor data.
4. ICM traffic state and traffic forecast information.
5. ICM response plan information, including response plans developed, response plans implemented, response plan workflow and approval information, response plan execution results.
6. System rules used for creation, analysis, and implementation of response plans.
7. Corridor and system metrics and analysis results.
8. System information, such as system security data (users, roles, permissions), system maintenance data, data archives, system and user configuration information, system configuration management, and system activity logs.

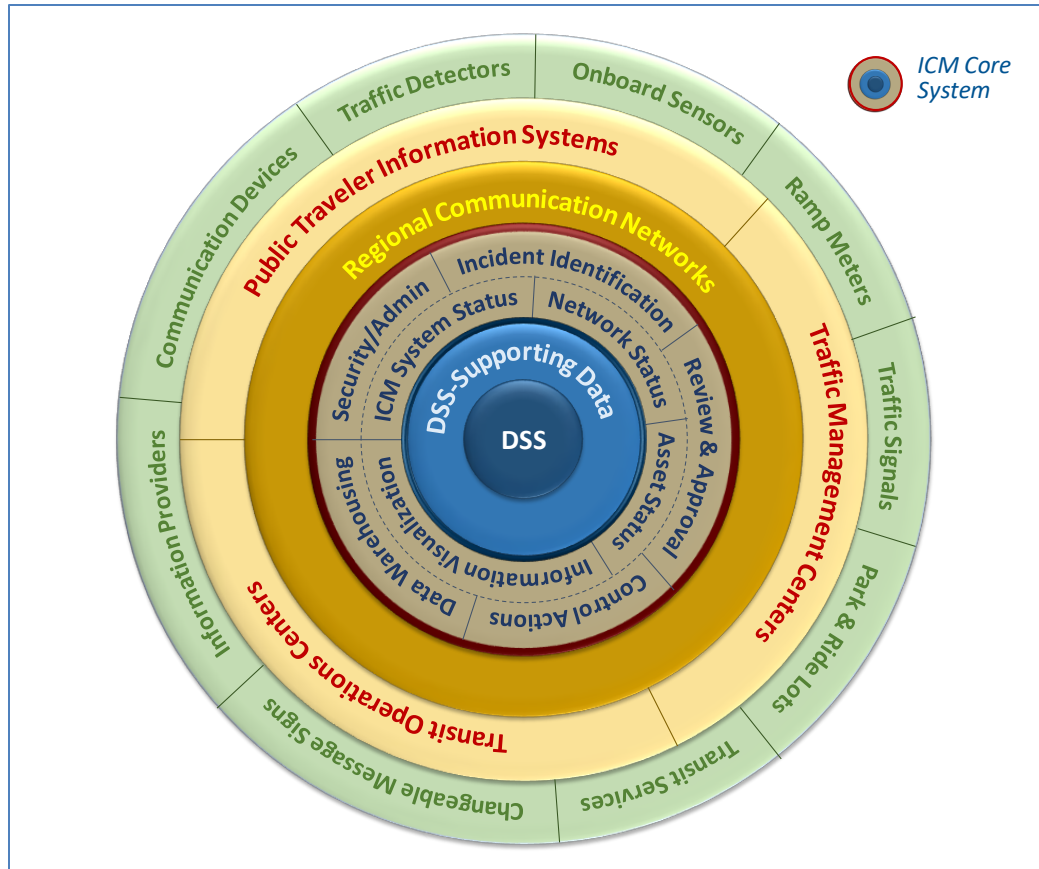


Figure 1 – High-Level ICM System Conceptual Diagram

Figure 1 provides a high-level concept view of the Connected Corridors ICM system. The ICM system consists of an ICM Core System that contains incident detection, corridor state/status functions, traffic state determination and prediction, system management functions, information visualization and reporting, decision support functions, data management functions, system management functions, response plan development, and corridor control functions.

The ICM Core System is part of the larger ICM Environment, which contains the primary systems that provide information to the ICM Core System and that consume the response plans from the ICM Core System. These ICM Environment elements include regional and local transportation communication networks and transportation management systems, public traveler information systems, the transportation network elements connected to those systems (sensors, ramp meters, intersection signals, organizational assets, changeable message signs, etc.), parking resources, and transit systems.

This document provides the following information for data within the ICM Core System and the ICM Environment:

1. Defines TMDD as the standard for data elements and Application Programming Interfaces (APIs) whenever applicable.
2. Defines which TMDD messages are required for system operation.
3. Lists and defines data classes and their attributes to be stored within the data hub (currently attributes for TMDD classes and expected extensions only).
4. Provides an inventory of current known sources of information for the system.

Note: This is a preliminary version of the document and is subject to revision as the design and development of the system progresses. It is expected that as the requirements and design process continues, significant additions and revisions will be required.

1.1. DOCUMENT ORGANIZATION

This document is organized into two primary sections:

- **Data Inventory**—The Data Inventory (section 2) lists, at a high level, the assets which are used in the I-210 Connected Corridors ICM project. Assets consist of elements such as physical roads, freeway sensors, changeable message signs, intersection signals, ramp meters, arterial traffic sensors, road maintenance crews, emergency personnel, and organizations.
- **Data Dictionary**—The Data Dictionary (section 3) specifies the data format specifications for data, the data elements and types, and the descriptions and definition of data elements within the system. The data classes, types, and their elements are organized in this document by a set of data layers that are distinguished by the function they perform within the system and the frequency by which the information is provided to or updated within the system. The Data Dictionary section provides information about the TMDD messages that are applicable to the specific data layer and the data contained within those messages. As the system requirements and design process continues, additional information about other types of data required, their specifications, and data storage details will be provided as well.

1.2. DATA LAYERS



Figure 2 - Data Layers

To assist with categorization of the data, different types of data can be categorized into the data layers shown in Figure 2 and listed below, starting with the most static data and becoming progressively more dynamic. Primary data layers include the Geographic and Institutional Data, Asset Inventories, Asset Capabilities, Asset State, Asset Real-Time Data, Traffic State and Forecasting data, Proposed Response Plans, and Selected Response Plans. Cross-cutting and supporting data layers include those on the right of Figure 2, including Performance Metrics and Evaluations, Historical Pattern data, and Archive and Data Warehouse information.

1.2.1. Primary Data Layers

1.2.1.1. Geographic and Institutional Data

This layer includes base map information, geographic and geospatial information, political information, jurisdictional information, and organizational information at the highest institutional level.

1.2.1.2. Asset Inventory: Transportation Networks, Physical Infrastructure, Departments

This layer contains the transportation networks (roadways, transit, pedestrian) in the corridor and the assets (signals, ramp meters, sensors, etc.) within those networks. The assets are summarized by type in the inventory section of this document. Organizational Departmental Information is also contained in this layer.

1.2.1.3. Asset Capabilities: Signal Plans, Ramp Plans, Organizational Availability, and Traveler Behavior Information

This layer contains signal plan and ramp plan data associated with the assets in the physical infrastructure layer. It also contains traveler behavior information for the transportation networks: fundamental diagrams, demands and split ratios. It also contains working hours for response crews and other organizational assets.

1.2.1.4. Asset States

This layer contains the current status of each asset listed in the inventory, such as road closures or devices that are not working, or response crew availability.

1.2.1.5. Asset Real-Time Data

This layer contains the real-time data reported by each device or asset such as the data contained in the PeMS and IEN data feed, and requests to control assets in the corridor.

1.2.1.6. Traffic State and Traffic Forecasts

This layer contains the traffic state estimation and traffic forecast data.

1.2.1.7. Proposed Response Plans

This layer includes details of the proposed response plans, including the properties of each plan and model prediction results.

1.2.1.8. Selected Response Plan

This layer includes details of the selected response plan, regardless of whether the plan is implemented or not. It also includes the real-time implementation results of any deployed response plan.

1.2.2. Cross-cutting Layers

There are three categories of system data that cross multiple data layers: performance metrics and evaluation, historical patterns, and archival and data warehousing.

Note: These three layers, and in particular the historical patterns and archival data and warehousing are highly dependent and duplicative of the data in the other layers. As requirements and design processes for the ICM system development progress, additional sections will be added to this document to provide specifications for these layers. At this time, however, these layers are not being specified in this document.

1.2.2.1. Performance Metrics and Evaluations

In order to evaluate how well a selected response plan worked, performance metrics will be defined and stored in the system. The metrics of the selected response plan, as well as the other proposed response plans can be evaluated and compared to each other and to the actual traffic that resulted after implementing the selected response plan. This layer will also include the information necessary for post-incident analysis, as well as overall system performance analysis, either quarterly or annually.

1.2.2.2. Historical Patterns

Historical traffic patterns can be used to assist in developing scenarios for estimation, particularly in the areas of demand and split ratios.

1.2.2.3. Archival and Data Warehousing

The data warehouse will store the data coming into the ICM system. This data will feed the Decision Support System and will be used for the performance metrics and historical patterns described above. It can also be used for reporting and other analysis as needed.

1.3. ADDITIONAL LAYERS AND INFORMATION

There are additional sections in this document that describe both common base data elements (Global Data Elements) that are used throughout the different layers, and data classes that are used by the system itself (System Data Classes) and do not represent traffic entities.

2. DATA INVENTORY

This section identifies the data sources that may be used to support the operation of the ICM System.

Expected data sources:

Source	Information Type	System	Vendor	Product
CHP CAD	Incident	CAD	Manual input by operator	CHP CAD
Caltrans incident	Incident	Caltrans ATMS	Parsons	Custom
Caltrans FW Lane closure	Lane status	LCS		
LA County	Lane status	City Lane Closure System (HSR)		
Pasadena	Lane status	City Lane Closure System (HSR)		
Arcadia	Lane status	City Lane Closure System (HSR)		
Duarte	Lane status	City Lane Closure System (HSR)		
Monrovia	Lane status	City Lane Closure System (HSR)		
Caltrans FW Traffic	Loop sensing	PeMS (Caltrans D7 ATMS)	Parsons	Custom
Caltrans Intersections	Intersection signal	TSMSS	Transcore	Transuite
Pasadena	Intersection signal	<ul style="list-style-type: none"> • i2 Traffic Management System • QuickNet Traffic Management System • SCATS Traffic Management System • Transparency 	McCain	Transparity
LA County	Intersection signal	County TMC	Kimley Horne	KITS
Arcadia	Intersection signal	Arcadia TMC	Transcore	Transuite
Duarte	Intersection signal	County TMC	Kimley Horne	KITS
Monrovia	Intersection signal	County TMC	Kimley Horne	KITS
Caltrans FW Ramps	Ramp meters	Caltrans ATMS	Parsons	Custom
Caltrans Video	Video	via RIITS		

Source	Information Type	System	Vendor	Product
Pasadena	Video	RIITS		
Arcadia	Video	RIITS		
Caltrans FW CMS	DMS	Caltrans ATMS	Parsons	Custom
LA County	DMS	Corridor Trailblazer		
Arcadia	DMS	Corridor Trailblazer		
Duarte	DMS	Corridor Trailblazer		
Monrovia	DMS	Corridor Trailblazer		
Metro	Transit	Gold Line (NextBus)	NextBus	
Metro	Transit	<ul style="list-style-type: none"> • Metro Bus CAD/AVL (RIITS) • Metro Rail CAD/AVL(RIITS) 		
Foothill Transit	Transit	Foothill Transit CAD/AVL(RIITS)		
Pasadena Transit	Transit	Pasadena Transit CAD/AVL(RIITS)		
RIITS Environmental sensing	Environmental	RIITS		
Bluetooth traffic 1	Travel time	Vendor	Iteris or Other	
Bluetooth traffic 2	Travel time	County TMC	Unknown	

Other potential data sources:

Source Agency	Information Type	System
CHP	Incident Reports	Traffic Incident Information Webpage (Sigalerts)
FSP	Incident Reports	Unknown
County Sheriff	Incident Reports	Unknown
Pasadena PD	Incident Reports	Pasadena Traffic Record System
Arcadia PD	Incident Reports	Unknown
Monrovia PD	Incident Reports	Unknown
Duarte PD	Incident Reports	Unknown
Verdugo Fire Communications Center	Incident Reports	Verdugo Fire Communications CAD
Waze	Incident Reports	Crowdsourced reported incidents
Caltrans	Travel time measurements	None
LA County	Travel time measurements	None

Source Agency	Information Type	System
Pasadena	Travel time measurements	Digiwest BlueMAC Bluetooth sensor network
Arcadia	Travel time measurements	Iteris Vantage Velocity Bluetooth sensor network
Monrovia	Travel time measurements	None
Duarte	Travel time measurements	None
Metro/SCAG	Average link speeds	INRIX database
HERE	Point measurements	HERE vehicle tracking data
HERE	Vehicle tracking; route patterns	HERE vehicle tracking data
Google/Waze	Vehicle tracking; route patterns	Vehicle tracking system?
LA County	CCTV Feeds	1 camera (COHU)
Monrovia	CCTV Feeds	2 cameras
Duarte	CCTV Feeds	None
Pasadena	CMS status	<ul style="list-style-type: none"> • McCain (4 signs) • Skyline (1 sign) • Daktronics (Future signs)
	Parking Occupancy	Unknown
	Weather Information	Weather stations installed within I-210 corridor
	Weather Information	Unknown

TSMSS – Traffic Signal Management and Surveillance Systems

The table below contains names of various TMDD dialogs and identifies who needs to be capable of handling those dialogs. The numbers in the columns (1-9) refer to the systems below:

1. Caltrans ATMS
2. Caltrans LCS
3. Caltrans TSMSS - Transuite
4. Arcadia TMC - Transuite
5. County TMC - KITS
6. Pasadena TMC - Transparency
7. City Lane Closure System (HSR)
8. Corridor Trailblazer
9. RIITS

Legend: R = Required
 Rq = Required, only "Request" portion implemented
 Rx = Required, not implemented
 N = Not Required
 F = Not Required for Current I-210 Operations, Future Corridors As Needed
 * = As needed
 *x = As needed, not implemented

Dialog Name	1	2	3	4	5	6	7	8	9	Corridor Mgmt System
dlCCTVControlRequest	N	N	N	N	N	N	N	N	R	R
dlCCTVInventoryRequest	N	N	N	N	N	N	N	N	R	R
dlCCTVInventoryUpdate	N	N	N	N	N	N	N	N	R	R
dlCCTVStatusRequest	N	N	N	N	N	N	N	N	R	R
dlCCTVStatusUpdate	N	N	N	N	N	N	N	N	R	R
dlCenterActiveVerificationRequest	R	R	R	R	R	R	R	R	R	R
dlCenterActiveVerificationSubscription	R	R	R	R	R	R	R	R	R	R
dlCenterActiveVerificationUpdate	R	R	R	R	R	R	R	R	R	R
dlDetectorDataRequest	R	*	R	R	R	R	*	*	*	R
dlDetectorDataSubscription	R	*	R	R	R	R	*	*	*	R
dlDetectorDataUpdate	R	*	R	R	R	R	*	*	*	R
dlDetectorInventoryRequest	R	*	R	R	R	R	*	*	*	R
dlDetectorInventoryUpdate	R	*	R	R	R	R	*	*	*	R
dlDetectorMaintenanceHistoryRequest	Rx	*	R	R	Rx	R	*	*	*	R
dlDetectorStatusRequest	R	*	R	R	R	R	*	*	*	R
dlDetectorStatusUpdate	R	*	R	R	R	R	*	*	*	R
dlDeviceCancelControlRequest	R	R	R	R	R	R	R	R	N	R
dlDeviceControlStatusRequest	R	R	R	R	R	R	R	R	N	R
dlDeviceInformationSubscription	R	R	R	R	R	R	R	R	R	R
dlDMSControlRequest	R	N	N	N	N	N	N	R	N	R
dlDMSFontTableRequest	N	N	N	N	N	N	N	N	N	N
dlDMSInventoryRequest	R	N	N	N	N	N	N	R	N	R
dlDMSInventoryUpdate	R	N	N	N	N	N	N	R	N	R
dlDMSMessageAppearanceRequest	R	N	N	N	N	N	N	R	N	R
dlDMSMessageInventoryRequest	Rx	N	N	N	N	N	N	R	N	R

Dialog Name	1	2	3	4	5	6	7	8	9	Corridor Mgmt System
dlDMSMessageInventorySubscription	Rx	N	N	N	N	N	N	R	N	R
dlDMSMessageInventoryUpdate	Rx	N	N	N	N	N	N	R	N	R
dlDMSPriorityQueueRequest	Rx	N	N	N	N	N	N	R	N	R
dlDMSStatusRequest	R	N	N	N	N	N	N	R	N	R
dlDMSStatusUpdate	R	N	N	N	N	N	N	R	N	R
dlESSInventoryRequest	N	N	N	N	N	N	N	N	R	R
dlESSInventoryUpdate	N	N	N	N	N	N	N	N	R	R
dlESSObservationMetadataRequest	N	N	N	N	N	N	N	N	R	R
dlESSObservationReportRequest	N	N	N	N	N	N	N	N	R	R
dlESSObservationReportUpdate	N	N	N	N	N	N	N	N	R	R
dlESSStatusRequest	N	N	N	N	N	N	N	N	R	R
dlESSStatusUpdate	N	N	N	N	N	N	N	N	R	R
dlEventIndexRequest	R	*	N	N	N	N	*	*	*	R
dlEventIndexSubscription	R	*	N	N	N	N	*	*	*	R
dlEventIndexUpdate	R	*	N	N	N	N	*	*	*	R
dlFullEventUpdateRequest	R	*	N	N	N	N	*	*	*	R
dlFullEventUpdateSubscription	R	*	N	N	N	N	*	*	*	R
dlFullEventUpdateUpdate	R	*	N	N	N	N	*	*	*	R
dlHARControlRequest	N	N	N	N	N	N	N	N	N	R
dlHARControlScheduleRequest	N	N	N	N	N	N	N	N	N	R
dlHARControlScheduleUpdate	N	N	N	N	N	N	N	N	N	R
dlHARInventoryUpdate	N	N	N	N	N	N	N	N	N	R
dlHARInventoryRequest	N	N	N	N	N	N	N	N	N	R
dlHARMessageInventoryRequest	N	N	N	N	N	N	N	N	N	R
dlHARMessageInventoryUpdate	N	N	N	N	N	N	N	N	N	R
dlHARPriorityQueueRequest	N	N	N	N	N	N	N	N	N	R
dlHARStatusRequest	N	N	N	N	N	N	N	N	N	R
dlHARStatusUpdate	N	N	N	N	N	N	N	N	N	R
dlIntersectionSignalControlRequest	N	N	R	R	R	R	N	N	N	R
dlIntersectionSignalControlScheduleRequest	N	N	R	R	R	R	N	N	N	R
dlIntersectionSignalControlScheduleUpdate	N	N	R	R	R	R	N	N	N	R
dlIntersectionSignalInventoryRequest	N	N	R	R	R	R	N	N	N	R
dlIntersectionSignalInventoryUpdate	N	N	R	R	R	R	N	N	N	R
dlIntersectionSignalPriorityQueueRequest	N	N	R	R	Rx	R	N	N	N	R
dlIntersectionSignalStatusRequest	N	N	R	R	R	R	N	N	N	R
dlIntersectionSignalStatusUpdate	N	N	R	R	R	R	N	N	N	R
dlIntersectionSignalTiming PatternInventoryRequest	N	N	R	R	R	R	N	N	N	R
dlIntersectionSignalTiming PatternInventorySubscription	N	N	R	R	R	R	N	N	N	R
dlIntersectionSignalTimingPatternInventoryUpdate	N	N	R	R	R	R	N	N	N	R
dlLCSControlRequest	N	R	N	N	N	N	R	N	N	R
dlLCSControlScheduleRequest	N	R	N	N	N	N	R	N	N	R
dlLCSControlScheduleUpdate	N	R	N	N	N	N	R	N	N	R
dlLCSInventoryRequest	N	R	N	N	N	N	R	N	N	R
dlLCSInventoryUpdate	N	R	N	N	N	N	R	N	N	R
dlLCSStatusRequest	N	R	N	N	N	N	R	N	N	R
dlLCSStatusUpdate	N	R	N	N	N	N	R	N	N	R
dlLinkInventoryRequest	Rq	*	N	N	N	N	*	*	*	R
dlLinkInventoryUpdate	Rx	*	N	N	N	N	*	*	*	R

Dialog Name	1	2	3	4	5	6	7	8	9	Corridor Mgmt System
dlLinkStatusRequest	*x	*	N	N	N	N	*	*	*	*
dlLinkStatusUpdate	*x	*	N	N	N	N	*	*	*	*
dlNodeInventoryRequest	Rq	*	N	N	N	N	*	*	*	R
dlNodeInventoryUpdate	Rx	*	N	N	N	N	*	*	*	R
dlNodeStatusRequest	*x	*	N	N	N	N	*	*	*	*
dlNodeStatusUpdate	*x	*	N	N	N	N	*	*	*	*
dlOrganizationInformationRequest	R	R	R	R	R	R	R	R	R	R
dlOrganizationInformationSubscription	R	R	R	R	R	R	R	R	R	R
dlOrganizationInformationUpdate	R	R	R	R	R	R	R	R	R	R
dlRampMeterControlRequest	R	N	N	N	N	N	N	N	N	R
dlRampMeterControlScheduleRequest	F	N	N	N	N	N	N	N	N	F
dlRampMeterControlScheduleUpdate	F	N	N	N	N	N	N	N	N	F
dlRampMeterInventoryRequest	R	N	N	N	N	N	N	N	N	R
dlRampMeterInventoryUpdate	R	N	N	N	N	N	N	N	N	R
dlRampMeterPlanInventoryRequest	F	N	N	N	N	N	N	N	N	F
dlRampMeterPlanInventorySubscription	F	N	N	N	N	N	N	N	N	F
dlRampMeterPlanInventoryUpdate	F	N	N	N	N	N	N	N	N	F
dlRampMeterPriorityQueueRequest	F	N	N	N	N	N	N	N	N	F
dlRampMeterStatusRequest	R	N	N	N	N	N	N	N	N	R
dlRampMeterStatusUpdate	R	N	N	N	N	N	N	N	N	R
dlResponsePlanApprovalRequest	R	N	N	N	N	N	N	N	N	R
dlResponsePlanApprovalSubscription	R	N	N	N	N	N	N	N	N	R
dlResponsePlanApprovalUpdate	R	N	N	N	N	N	N	N	N	R
dlResponsePlanLogRequest	N	N	N	N	N	N	N	N	N	R
dlResponsePlanLogSubscription	N	N	N	N	N	N	N	N	N	R
dlResponsePlanLogUpdate	N	N	N	N	N	N	N	N	N	R
dlResponsePlanStatusRequest	R	N	N	N	N	N	N	N	N	R
dlResponsePlanStatusSubscription	R	N	N	N	N	N	N	N	N	R
dlResponsePlanStatusUpdate	R	N	N	N	N	N	N	N	N	R
dlResponsePlanRequest	R	N	N	N	N	N	N	N	N	R
dlResponsePlanSubscription	R	N	N	N	N	N	N	N	N	R
dlResponsePlanTerminationRequest	R	N	N	N	N	N	N	N	N	R
dlResponsePlanUpdate	R	N	N	N	N	N	N	N	N	R
dlRouteInventoryRequest	Rq	*	N	N	N	N	*	*	*	R
dlRouteInventoryUpdate	Rx	*	N	N	N	N	*	*	*	R
dlRouteStatusRequest	Rx	*	N	N	N	N	*	*	*	R
dlRouteStatusUpdate	Rx	*	N	N	N	N	*	*	*	R
dlSectionControlRequest	N	N	R	R	Rx	R	N	N	N	R
dlSectionControlScheduleRequest	N	N	R	R	Rx	R	N	N	N	R
dlSectionControlScheduleUpdate	N	N	R	R	Rx	R	N	N	N	R
dlSectionControlStatusRequest	N	N	R	R	Rx	R	N	N	N	R
dlSectionPriorityQueueRequest	N	N	R	R	Rx	R	N	N	N	R
dlSectionSignalTimingPatternInventoryRequest	N	N	R	R	Rx	R	N	N	N	R
dlSectionSignalTimingPatternInventorySubscription	N	N	R	R	Rx	R	N	N	N	R
dlSectionSignalTimingPatternInventoryUpdate	N	N	R	R	Rx	R	N	N	N	R
dlSectionStatusRequest	N	N	R	R	Rx	R	N	N	N	R
dlSectionStatusUpdate	N	N	R	R	Rx	R	N	N	N	R
dlTrafficNetworkInformationSubscription	Rx	*	N	N	N	N	*	*	*	R
dlVideoSwitchInventoryRequest	N	N	N	N	N	N	N	N	*	*
dlVideoSwitchInventoryUpdate	N	N	N	N	N	N	N	N	*	*

Dialog Name	1	2	3	4	5	6	7	8	9	Corridor Mgmt System
dlVideoSwitchStatusRequest	N	N	N	N	N	N	N	N	*	*
dlVideoSwitchStatusUpdate	N	N	N	N	N	N	N	N	*	*

3. DATA DICTIONARY

This data dictionary provides basic data class descriptions for ICM data objects. It is broken down by the layers described in Figure 2 - Data Layers. Generic data elements that are frequently referenced as data types within the primary classes are included in a section for Global Data Elements.

Many of the data frames below have a "CC Required" column which indicates whether a field or class is required when communicating with the ICM system beyond what is required within TMDD. "Yes" indicates that the field is always required, and "Yes-when applicable" indicates that when the field or class is applicable then the field or class must be supported and included. For this purpose the field or class is "applicable" when the data element is a selected element and the data is available for the field element being reported. "Choice: select one" indicates that one of the optional values must be selected. The "CC Required" column also indicates extensions to TMDD which are required for Connected Corridors. Regardless of whether or not a "CC Required" column appears in the data frame, **all elements and data frames must comply with the TMDD 3.03d standard.**

The schema is defined in the following four files:

- **tmdd_path.wsdl** and **tmdd_path.xsd**: These files are from the TMDD 3.03d standard and have been modified to reflect proposed changes to the TMDD standard including support of response plan definition and implementation dialogs as well as some corrections to the standard definitions to comply with the SOAP protocol.
- **path_extension.xsd**: This schema contains extensions to the TMDD 3.03d standard to support vendor-specific implementations.
- **cc-extension.xsd**: This schema contains extensions to the TMDD 3.03d standard that will be used internally in the ICM system (data hub, decision support system, and corridor management system). These extensions will not be visible to data source systems nor will they affect command target systems except for target systems which interact with dialogs related to response plans.

3.1. GLOBAL DATA ELEMENTS

The Global Data elements provide a set of base data elements that are often referenced in multiple data layers and provide common data elements such as time, person, or location information for different data classes.

3.1.1. DateTimeZone

This data frame is used to describe date and time information, including time zone information. This is the same as the DateTimeZone data frame described in TMDD 3.3.10.1.

Attribute Name	Type/Element	Reference	CC Required
Date	Element		Yes
Time	Element		Yes
Offset	Element		No

3.1.2. ContactDetails

This data frame contains contact information for a specific person but it can also be used for a group.

This is the same as the ContactDetails data frame described in TMDD 3.3.16.1.

Attribute Name	Type/Element	Reference	CC Required
Contact-Id	Element		Yes
Person-Name	Element		No
Person-Title	Element		No
Phone-Number	Element		No
Phone-Alternate	Element		No
Mobile-Phone-Number	Element		No
Mobile-Phone-Id	Element		No
Fax-Number	Element		No
Pager-Number	Element		No
Pager-Id	Element		No
Email-Address	Element		No
Radio-Unit	Element		No
Address-Line1	Element		No
Address-Line2	Element		No
City	Element		No
State	Element		No
Zip-Code	Element		No
Country	Element		No

3.1.3. GeoLocation

This data frame specifies the geographic location of a device, building or any other object.

This is the same as the GeoLocation data frame described in TMDD 3.6.9.4.

Attribute Name	Type/Element	Reference	CC Required
Latitude	Element		Yes
Longitude	Element		Yes
Horizontal-Datum	Element		No
Height	Type: Height	TMDD 3.6.9.5	No

3.1.4. Height

This data frame specifies the height of an object and is the same as the Height data frame described in TMDD 3.6.9.5.

Attribute Name	Type/Element	Reference	CC Required
Altitude	Element		Yes
Verticaldatum	Element		Yes-when applicable
Verticallevel	Element		No

3.1.5. UrlReference

This data frame specifies a uniform resource locator and is the same as the UrlReference data frame described in TMDD 3.3.10.2.

Attribute Name	Type/Element	Reference	CC Required
Url-Reference	Element		Yes
Url-Reference-Medium	Element		No

3.1.6. GeometrySpatialData

This is an extended data frame which defines the physical dimensions of an object.

Attribute Name	Type/Element	Reference	CC Required
Geometry-Wkt	Element: Geom-well-known-text		Yes

3.1.7. LinkRestrictions

This is an extended data frame which contains additional attributes for a link.

Attribute Name	Type/Element	Reference	Description	CC Required
Detour-Time-Restrictions	Type: Sequence of Effective Schedule (Extended) Types	System Requirements spec 8.5.2.3	Times during which links are not available for detours such as when children are walking to/from schools or arterials are heavily travelled by buses.	Yes-when applicable
HOV-Lane-Count	Element: link-lanes-count	System Requirements spec 8.7.1.2	For freeway segment, on-ramp or freeway-to-freeway connector	Yes-when applicable
HOV-Restriction-Type	Type: Hov-Restriction-Type (Extended)	System Requirements spec 8.7.1.2	For freeway segment, on-ramp or freeway-to-freeway connector; indicates whether HOV is for 2+ occupants or 3+ occupants	Yes-when applicable
HOV-Time-Restrictions	Type: Sequence of Effective Schedule (Extended) Types	System Requirements spec 8.7.1.2	For freeway segment, on-ramp or freeway-to-freeway connector: Periods during which HOV restriction is in effect	Yes-when applicable

3.1.8. EffectiveSchedule

This is an extended data frame which defines schedule times during which something is in effect. This is very similar to the deviceControlScheduleHeader data frame in TMDD 3.3.5.4 but is not limited to use with devices, and it defines a start and end time.

Attribute Name	Type/Element	Reference	Description	CC Required
Time-Base-Schedule-Month	NTCIP.TimeBaseScheduleMonth		The Month(s) Of the Year that the schedule entry shall be allowed	Yes
Time-Base-Schedule-Day	NTCIP.TimeBaseScheduleDay		The Day(s) of Week that the schedule entry shall be allowed	Yes
Time-Base-Schedule-Date	NTCIP.TimeBaseScheduleDate		The Day(s) of a Month that the schedule entry shall be allowed	Yes
Day-Plan-Hour-Start	NTCIP.DayPlanHour		The Hour of day that the schedule shall start	Yes
Day-Plan-Minute-Start	NTCIP.DayPlanMinute		The Minute of day that the schedule shall start	Yes
Day-Plan-Hour-End	NTCIP.DayPlanHour		The Hour of day that the schedule shall end	Yes
Day-Plan-Minute-End	NTCIP.DayPlanMinute		The Minute of day that the schedule shall end	Yes
Last-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1		Yes

3.2. LAYER: GEOGRAPHIC AND INSTITUTIONAL DATA

Geographic and Institutional data includes information regarding:

- Geographic and institutional boundaries
- Organizational information, including listings and details regarding organizations and individuals
- Ownership information
- Map- and location-based information



Figure 3 - Geographic & Institutional Layer

3.2.1. Data Messages

TMDD Message Dialogs include the following:

Name	Reference	Description
dlOrganizationInformationRequest	TMDD 3.1.15.1	Request for Organization and Center Information
dlOrganizationInformationSubscription	TMDD 3.1.15.2	Request for subscription to updates to Organization and Center Information

Other messaging dialogs required include the following:

Name	Reference	Description
Maps API	Google Maps API (https://developers.google.com/maps/documentation/javascript/reference?hl=en) or HERE Maps API (https://developer.here.com/documentation)	Requests for mapping tile and map based information for display
Map Information	Map information subscription	Downloaded updates for map and geospatial information required for Decision Support System

3.2.2. Data Class Descriptions

Data Class Descriptions include data elements for basic objects. Classes may be referenced within other classes (parent classes), and may be referenced in multiple parent classes. These do not represent database structures, but instead are based primarily on TMDD, or are structured similarly. Database design is expected to occur during system design.

See the beginning of section 3 for a description of the "CC Required" column.

3.2.2.1. Organization Class

3.2.2.1.1. OrganizationCenterInformation

This provides information for an organization center and is the same as the OrganizationCenterInformation data frame in TMDD 3.3.16.2.

Attribute Name	Type/Element	Reference	CC Required
Center-Id	Element		Yes
Center-Name	Element		No
Center-Location	Type: GeoLocation	TMDD 3.6.9.4	No
Center-Description	Element		No
Center-Type	Element		No
Center-Contact-Details	Type: Contact Details	TMDD 3.3.16.1	No

3.2.2.1.2. OrganizationInformation

The organization class can specify organizations, departments, teams, crews, etc.

This provides basic Organization information and is similar to the OrganizationInformation data frame in TMDD 3.3.16.3.

Attribute Name	Type/Element	Reference	CC Required
Organization-Id	Element		Yes
Organization-Name	Element		No
Organization-Location	Element		No
Organization-Function	Element		No
Organization-Contact-Details	Type: Contact Details	TMDD 3.3.16.1	No
Center-Contact-List	Type: Sequence of "Organization Center Information" types	TMDD 3.3.16.3	No
Last-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable *
Organization-Ext (Extended: cc-extension.xsd)	Type: OrganizationInformationExtended (Extended)		Yes - Only for CMS and Data Hub

* Required under the organizationInformationMsg dataframe (ie, for dlOrganizationInformationRequest and dlOrganizationInformationUpdate) but not otherwise.

3.2.2.1.3. OrganizationInformationHub

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional Data Hub-specific data for organization information and center active sources.

Attribute Name	Type/Element	Description	CC Required
Hub-Org-Id	Element: Hash-Sequence-Id	Unique organization ID	Yes - Only for CMS and Data Hub
Inventory-Verification	Element: Enumerated: Pass (1), Fail: In original inventory but not currently reported (2)		No

Attribute Name	Type/Element	Description	CC Required
Data-Value-Check	Type: Element: Enumerated: Pass (1), Fail (2)	Contains results of data value validation checks	No

3.2.2.1.4. OrganizationInformationExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the OrganizationInformation data frame (TMDD 3.3.16.3).

Attribute Name	Type/Element	Description	CC Required
Organization-Hub	Type: OrganizationInformationHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.3. LAYER: ASSET INVENTORY

Asset Inventory includes the following:

- Road inventory
- Transit inventory, including types and routes
- Pedestrian walkways and thoroughfares
- Ramp meters
- Intersection signals
- Dynamic Message Signs
- Environmental Sensors?
- Gates
- CCTV/Video assets
- HAR Radio assets
- Physical sensors
- Organizational assets – organizational departments and their assets, including groups, service vehicles, maintenance crews, incident response crews, traffic engineers, control centers, emergency and first responders

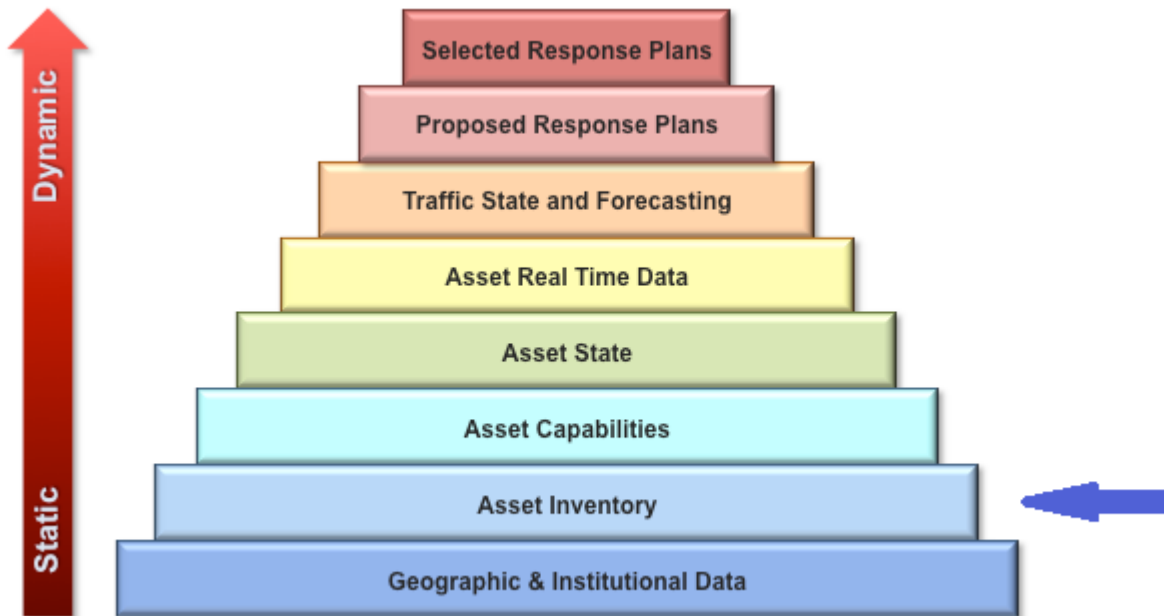


Figure 4 - Asset Inventory Layer

3.3.1. Data Messages

TMDD Message Dialogs include the following:

Name	Reference	Description
dlCCTVInventoryRequest	TMDD 3.1.2.1	Request for inventory of CCTVs
dlDetectorInventoryRequest	TMDD 3.1.4.1	Request for inventory of detectors and sensors
dlDeviceInformationSubscription	TMDD 3.1.5.3	Request for updates for device inventory
dlDMSInventoryRequest	TMDD 3.1.6.1	Request for inventory of dynamic message signs
dlESSInventoryRequest	TMDD 3.1.7.1	Request for inventory of environmental sensors
dlHARInventoryRequest	TMDD 3.1.10.1	Request for inventory of highway advisory radios
dlIntersectionSignalInventoryRequest	TMDD 3.1.11.1	Request for inventory of intersection signals
dlLCSInventoryRequest	TMDD 3.1.12.1	Request for inventory of lane control signals
dlLinkInventoryRequest	TMDD 3.1.13.1	Request for traffic network links
dlNodeInventoryRequest	TMDD 3.1.14.1	Request for traffic network nodes
dlOrganizationInformationRequest	TMDD 3.1.15.1	Request for Organization and Center Information
dlOrganizationInformationSubscription	TMDD 3.1.15.2	Request for subscription to updates to Organization and Center Information
dlRampMeterInventoryRequest	TMDD 3.1.16.1	Request for ramp meter inventory
dlRouteInventoryRequest	TMDD 3.1.17.1	Request for traffic route inventory
dlTrafficNetworkInformationSubscription	TMDD 3.1.19.1	Request for subscription to information updates for network links, nodes, and routes
dlVideoSwitchInventoryRequest	TMDD 3.1.20.1	
dlCCTVInventoryUpdate	TMDD 3.1.21.1	
dlDetectorInventoryUpdate	TMDD 3.1.23.1	
dlDMSInventoryUpdate	TMDD 3.1.24.1	
dlESSInventoryUpdate	TMDD 3.1.25.1	
dlHARInventoryUpdate	TMDD 3.1.28.1	
dlIntersectionSignalInventoryUpdate	TMDD 3.1.29.1	
dlLCSInventoryUpdate	TMDD 3.1.30.1	
dlOrganizationInformationUpdate	TMDD 3.1.31.1	
dlRampMeterInventoryUpdate	TMDD 3.1.32.1	
dlLinkInventoryUpdate	TMDD 3.1.34.1	
dlNodeInventoryUpdate	TMDD 3.1.35.1	
dlRouteInventoryUpdate	TMDD 3.1.36.1	
dlVideoSwitchInventoryUpdate	TMDD 3.1.37.1	

Other messaging dialogs required include the following:

Name	Reference	Description
PARKING FACILITY	APTA TCIP-S-001 4.1.1 * or ISO/TS 18234-7:2013 **	Inventory for parking facilities including capacity, location, facility operator, whether a parking availability monitoring system is used. System Requirements specs 8.2.3, 8.2.6, 8.7.1.2
TRANSIT	APTA TCIP-S-001 4.1.1 *	Inventory for transit services

* American Public Transportation Association Standard for Transit Communications Interface Profiles

** Intelligent transport systems -- Traffic and travel information via transport protocol experts group, generation 1 (TPEG1) binary data format -- Part 7: Parking information (TPEG1-PKI)

3.3.2. Data Class Descriptions

See the beginning of section 3 for a description of the "CC Required" column.

3.3.2.1. CCTV Class

3.3.2.1.1. CCTVInventory

This provides information for a CCTV asset and is similar to the CCTVInventory data frame in TMDD 3.3.2.3.

Attribute Name	Type/Element	Reference	CC Required
Device-Inventory-Header	Type: DeviceInventoryHeader	TMDD 3.3.5.8	Yes
Cctv-Requests-Supported-List	Element: Sequence of "Cctv-request-command" types		Yes
Cctv-Image-List	Element		Yes
Cctv-Titling-Text	Element		No
Cctv-Camera-Type	Element		No
Cctv-Camera-Pan-Left-Limit	Element		No
Cctv-Camera-Pan-Right-Limit	Element		No
Cctv-Camera-Tilt-Up-Limit	Element		No
Cctv-Camera-Tilt-Down-Limit	Element		No
Cctv-Camera-Zoom-Limit	Element		No
Cctv-Camera-Focus-Limit	Element		No

Attribute Name	Type/Element	Reference	CC Required
Cctv-Camera-Iris-Limit	Element		No
Cctv-Camera-Environmental	Element		No
Cctv-Inventory-Ext (Extended: cc-extension.xsd)	Type: CCTVInventoryExtended (Extended)		Yes - Only for CMS and Data Hub

3.3.2.1.2. AssetInventoryHub

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional Data Hub specific data for inventory sources.

Attribute Name	Type/Element	Description	CC Required
Hub-Org-Id	Element: Hash-Sequence-Id	Unique organization ID	Yes - Only for CMS and Data Hub
Hub-Asset-Id	Element: Hash-Sequence-Id	Unique asset ID across all organizations	Yes - when applicable. Only for CMS and Data Hub
Inventory- Verification	Element: Enumerated: Pass (1), Fail: In original inventory but not currently reported (2)	Indicates when inventory is not as expected	Yes - when applicable. Only for CMS and Data Hub
Data-Value-Check	Type: Element: Enumerated: Pass (1), Fail (2)	Contains results of data value validation checks	Yes - when applicable. Only for CMS and Data Hub

3.3.2.1.3. CCTVInventoryExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the CCTVInventory data frame (TMDD 3.3.2.3).

Attribute Name	Type/Element	Description	CC Required
Cctv-Inventory-Hub	Type: AssetInventoryHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.3.2.2. ConnectionManagement Class

3.3.2.2.1. Authentication

This provides authentication information and is the same as the Authentication data frame in TMDD 3.3.3.1.

Attribute Name	Type/Element	Reference	CC Required
User-Id	Element		Yes
Password	Element		Yes
Operator-Id	Element		No

3.3.2.3. Detector Class

3.3.2.3.1. DetectorInventory

This provides detector information and is similar to the DetectorInventory data frame in TMDD 3.3.4.4.

Attribute Name	Type/Element	Reference	Description	CC Required
Detector-Station-Inventory-Header	Type: DeviceInventoryHeader	TMDD 3.3.5.8		Yes-when applicable
Detector-Inventory-List	Type: Sequence of "DetectorInventoryDetails" types	TMDD 3.3.4.5		Yes
Detector-Inventory-Ext (Extended: cc-extension.xsd)	Type: DetectorInventory Extended (Extended)		Additional information for this dataframe	Yes - Only for CMS and Data Hub (Extended)

3.3.2.3.2. DetectorInventoryDetails

This provides detector detail for a single detector and is similar to the DetectorInventoryDetails data frame in TMDD 3.3.4.5.

Attribute Name	Type/Element	Reference	Description	CC Required
Detector-Inventory-Header	Type: DeviceInventory Header	TMDD 3.3.5.8		Yes

Attribute Name	Type/Element	Reference	Description	CC Required
Detector-Type	Element			Yes
Detection-Lanes	Element: Sequence of "Link-lane- number" types			Yes-when applicable
Is-Detector-Speed-Trap-Flag	Element			Yes-when applicable
Vehicle-Classification-Bin1	Element			No
Vehicle-Classification-Bin2	Element			No
Vehicle-Classification-Bin3	Element			No
Vehicle-Classification-Bin4	Element			No
Vehicle-Classification-Bin5	Element			No
Vehicle-Classification-Bin6	Element			No
Reporting-System	Element: Name of reporting system	System Requirements spec 8.7.1.2	For devices used to monitor traffic flow or travel time data, this is the name of the reporting system to which the sensor is connected.	Yes-when applicable (Extended)
Ab3418-Presence-Index (Extended)	Element: Integer (1-128) "ab3418- presence-index- ext" (Extended)		Only applies to detectors for controllers designed to the AB3418E protocol. Represents the detector number in the presenceN elements in the "ab3418eController Ext" data frame.	Yes-when applicable (Extended)
Detector-Inventory- Details-Ext (Extended: cc- extension.xsd)	Type: Detector Inventory Extended (Extended)		Additional information for this dataframe	Yes - Only for CMS and Data Hub (Extended)

3.3.2.3.3. DetectorMaintenanceHistory

This provides detector maintenance information and is the same as the DetectorMaintenanceHistory data frame in TMDD 3.3.4.6.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No

Attribute Name	Type/Element	Reference	CC Required
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Detector-History-List	Type: Sequence of "DetectorMaintenanceHistoryDetail" types	TMDD 3.3.4.7	Yes

3.3.2.3.4. DetectorMaintenanceHistoryDetail

This provides detector maintenance detail information and is similar to the DetectorMaintenanceHistoryDetail data frame in TMDD 3.3.4.7.

Attribute Name	Type/Element	Reference	CC Required
Station-Id	Element		Yes-when applicable
Detector-Id	Element		Yes
Detector-Type	Element		Yes-when applicable
Detector-Installation-Date	Type: DateTimeZone	TMDD 3.3.10.1	No
Detector-Calibration-Date	Type: DateTimeZone	TMDD 3.3.10.1	No
Detector-Calibration-Method	Element		No
Detector-Last-Operational-Date	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Detector-Last-Non-Operational-Date	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Detector-Repair-Description	Element		Yes-when applicable
Last-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Maint-History-Ext (Extended: cc-extension.xsd)	Type: DetectorMaintenanceHistoryDetailExtended (Extended)		Yes - Only for CMS and Data Hub

3.3.2.3.4.1. PeMSStation

Note: The three table layouts discussed below are preliminary designs and subject to change. They are only for internal use within the system.

The freeway detector station data is stored in the data warehouse in a table called PEMS_VD_STATIONS which has one record for each station.

PEMS_VD_STATIONS table layout:

Column Name	Data Type	Description of stored value
ID	BigInt	The unique ID for this PEMS VDS Station
FWY_NUM	Integer	Numeric value for the freeway that this detector is located on.
DIRECTION	Character	A one byte char value indicating a cardinal heading.
DISTRICT	Numeric	The caltrans distric number.
COUNTY	Numeric	The numeric value of the county as defined is the FIPS county table.
CITY	Numeric	The numeric value of the city as defined is the FIPS city table.
STATE_PM	Numeric	The State Post Miles. The postmile starts at zero at the western or southern end of the route or at the western or southern boundary of the county through which the route is traveling.
STATE_PM_CODE	Character Varying	The State Post Miles Code.
ABS_PM	Numeric	The State Post Miles. This number normally represents the distance from the freeway or highway origination or from the border of the state.
LATITUDE	Numeric	Latitude in decimal degrees.
LONGITUDE	Numeric	longitude in decimal degrees.
ADJ_LATITUDE	Numeric	The *ADJUSTED* latitude in decimal degrees.
ADJ_LONGITUDE	Numeric	The *ADJUSTED* longitude in decimal degrees.
DET_LENGTH	Numeric	The length of the detector
DET_TYPE	Character	Type of detector eg: ML, OR, FR
LANES	Numeric	Number of lanes this detector covers.
DET_NAME	Character Varying	This is generally the exit ramp street from the freeway
USER_ID_1	Character Varying	User Defined Data
USER_ID_2	Character Varying	User Defined Data
USER_ID_3	Character Varying	User Defined Data
USER_ID_4	Character Varying	User Defined Data
PEMS_REV_DATE	Date	
GEOM	Geometry	The spatial location POINT(x,y,z) that is detector is located.
ADJ_GEOM	Geometry	The *ADJUSTED* spatial location POINT(x,y,z) that is detector is located.

The database also contains two reference tables for the cities and counties in the corridor. Each city name is associated with a unique numeric ID that is stored in the PEMS_VD_STATIONS_CITIES table. Similarly, Each county name is associated with a unique numeric ID that is stored in the PEMS_VD_STATIONS_COUNTIES table. When station data is stored in the PEMS_VD_STATIONS table the numeric ID's of the city and county are stored instead of the city and county names.

PEMS_VD_STATIONS_CITIES table layout:

Column Name	Data Type	Description of stored value
ID	Numeric	Unique ID for a city in the corridor
NAME	Character Varying	Name of the city

PEMS_VD_STATIONS_COUNTIES table layout:

Column Name	Data Type	Description of stored value
ID	Numeric	Unique ID for a county in the corridor
NAME	Character Varying	Name of the county

3.3.2.3.5. SensorDataHub

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional Data Hub-specific data for data and status sources containing sensors.

Attribute Name	Type/Element	Description	CC Required
Hub-Org-Id	Element: Hash-Sequence-Id	Unique organization ID	Yes - Only for CMS and Data Hub
Hub-Sensor-Id	Element: Hash-Sequence-Id	Unique asset ID across all organizations	Yes - when applicable. Only for CMS and Data Hub
Inventory-Check	Element: Enumerated: Pass (1), Fail: In inventory but missing data (2) Fail: Not in inventory (3)	Indicates when inventory is not as expected	Yes - when applicable. Only for CMS and Data Hub
Data-Value-Check	Type: Element: Enumerated: Pass (1), Fail (2)	Contains results of data value validation checks	Yes - when applicable. Only for CMS and Data Hub

3.3.2.3.6. DetectorMaintenanceHistoryDetailExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the DetectorMaintenanceHistoryDetail data frame (TMDD 3.3.4.7).

Attribute Name	Type/Element	Description	CC Required
Maint-History-Hub	Type: SensorDataHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.3.2.3.7. DetectorInventoryExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the DetectorInventory data frame (TMDD 3.3.4.4) and the DetectorInventoryDetails data frame (TMDD 3.3.4.5).

Attribute Name	Type/Element	Description	CC Required
Detector-Inventory-Hub (Extended: cc-extended.xsd)	Type: AssetInventoryHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub
Detector-Inventory-Transcore (Extended: cc-extended.xsd)	Type: DetectorInventoryTranscore (Extended)	Additional information used by CMS and Data Hub in TransCore implementations	Yes - Only for CMS and Data Hub

3.3.2.3.8. DetectorInventoryTranscore

This extended data frame contains additional data for the DetectorInventoryExtended data frame used by CMS and Data Hub for TransCore implementations.

Attribute Name	Type/Element	Description	CC Required
Ab3418-Presence-Index (Extended)	Element: Integer (1-128) "ab3418-presence-index-ext" (Extended)	Only applies to detectors for controllers designed to the AB3418E protocol. Represents the detector number in the presenceN elements in the "ab3418eControllerExt" data frame.	Yes - Only for CMS and Data Hub

3.3.2.4. DMS Class

3.3.2.4.1. DMSInventory

This provides dynamic message sign device information and is based on the DMSInventory data frame in TMDD 3.3.6.6.

Attribute Name	Type/Element	Reference	Description	CC Required
Device-Inventory-Header	Type: DeviceInventory Header	TMDD 3.3.5.8		Yes
Dms-Sign-Type	Element			Yes
Signtechnology	Element			No
Signheightpixels	Element			No
Signwidthpixels	Element			No
Signheight	Element			No
Signwidth	Element			No
Charheightpixels	Element			No
Charwidthpixels	Element			No
Dms-Beacon-Type	Element			No
Dms-Vertical-Border	Element			No
Dms-Horizontal-Border	Element			No
Dms-Vertical-Pixel-Pitch	Element			No
Dms-Horizontal-Pixel-Pitch	Element			No
Dms-Max-Pages	Element			Yes-when applicable

Attribute Name	Type/Element	Reference	Description	CC Required
Dms-Max-Message-Length	Element			Yes-when applicable
Dms-Color-Scheme	Element			No
Dms-Multi-Tag-Support	Element			No
Display-Line-Count	Element: Dms-display-line-count	System Requirements spec 8.7.1.2	Indicates number of display lines; For each fixed CMS that may be used by the ICM system to disseminate information to travelers	Yes-when applicable (Extended)
Character-Per-Line-Count	Element: Dms-character-per-line-count	System Requirements spec 8.7.1.2	Indicates total number of characters that can be displayed per line; For each fixed CMS that may be used by the ICM system to disseminate information to travelers	Yes-when applicable (Extended)
DMS-Inventory-Ext (Extended: cc-extension.xsd)	Type: DMSInventory Extended (Extended)		Additional information for this dataframe	Yes - Only for CMS and Data Hub (Extended)

3.3.2.4.2. DMSInventoryExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the DMSInventory data frame (TMDD 3.3.6.6).

Attribute Name	Type/Element	Description	CC Required
Dms-Inventory-Hub	Type: AssetInventoryHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.3.2.5. ESS Class

3.3.2.5.1. ESSInventory

This provides environmental sensor device information and is similar to the ESSInventory data frame in TMDD 3.3.7.4.

Attribute Name	Type/Element	Reference	CC Required
Device-Inventory-Header	Type: DeviceInventoryHeader	TMDD 3.3.5.8	Yes
Ess-Inventory-List	Type: Sequence of "ESSInventoryDetails" types	TMDD 3.3.7.5	Yes
Ess-Inventory-Ext (Extended: cc-extension.xsd)	Type: ESSInventoryDetailsExtended (Extended)		Yes - Only for CMS and Data Hub

3.3.2.5.2. ESSInventoryDetails

This provides details of environmental sensor inventory for a single sensor and is similar to the ESSInventoryDetails data frame in TMDD 3.3.7.5.

Attribute Name	Type/Element	Reference	CC Required
Ess-Sensor-Inventory-Header	Type: DeviceInventoryHeader	TMDD 3.3.5.8	Yes
Lane-Number	Element		No
Sensor-Location-Elevation	Element		No
Sensor-Location-Height	Element		No
Sensor-Type	Element		No
Sensor-Operation-Type	Element		No
Sensor-Mobility-Type	Element		No
Ess-Sensor-Inventory-Header	Element		No
Ess-Inventory-Details-Ext (Extended: cc-extension.xsd)	Type: ESSInventoryDetailsExtended (Extended)		Yes - Only for CMS and Data Hub

3.3.2.5.3. ESSDataCollectorInformation

This provides environmental sensor collector metadata and is the same as the ESSDataCollectorInformation data frame in TMDD 3.3.7.2.

Attribute Name	Type/Element	Reference	CC Required
Data-Collector-Description	Element		Yes

Attribute Name	Type/Element	Reference	CC Required
Data-Collector-Installation-Date	Type: DateTimeZone	TMDD 3.3.10.1	Yes
Data-Collector-Manufacturer	Element		Yes
Data-Collector-Product-Name	Element		Yes
Data-Collector-Model-Number-Software-Version	Element		Yes

3.3.2.5.4. ESSSiteMetadataDetail

This provides environmental site metadata is the same as the ESSSiteMetadataDetail data frame in TMDD 3.3.7.14.

Attribute Name	Type/Element	Reference	CC Required
Site-Id	Element		No
Site-Description	Element		Yes
Site-Directions-Description	Element		No
Site-Representativeness	Element		No
Site-Obstructions-Description	Element		No
Site-Landscape-Description	Element		No
Site-Has-Access-Control-Flag	Element		No
Site-Roadway-Name	Element		No
Site-Roadway-Linear-Reference	Element		No
Site-Roadway-Linear-Reference-Version	Element		No
Site-Roadway-Linear-Reference-Units	Element		No
Site-Roadway-To-Station-Distance	Element		No
Site-Roadway-To-Station-Elevation	Element		No
Site-Jurisdiction-Name	Element		No
Site-State-Code	Element		No
Site-Country-Code	Element		No
Site-Slope-Angle	Element		No
Site-Grade-Direction	Element		No
Site-Wind-Roughness-From-North	Element		No
Site-Wind-Roughness-From-South	Element		No
Site-Wind-Roughness-From-East	Element		No
Site-Wind-Roughness-From-West	Element		No
Site-Soil-Description	Element		No
Site-Soil-Percent-Sand	Element		No
Site-Soil-Percent-Silt	Element		No
Site-Soil-Percent-Clay	Element		No

3.3.2.5.5. ESSStationMetadataDetail

This provides environmental sensor station metadata and is the same as the ESSStationMetadataDetail data frame in TMDD 3.3.7.15.

Attribute Name	Type/Element	Reference	CC Required
Station-Category	Element		Yes
Station-Id	Element		Yes
Station-Location	Type: GeoLocation	TMDD 3.6.9.4	Yes
Station-Elevation	Element		Yes
Station-Description	Element		No
Station-Type	Element		No
Station-Horizontal-Datum	Element		No
Station-Vertical-Datum	Element		No
Station-Power-Source	Element		No
Station-Door-Status	Element		No
Station-Battery-Status	Element		No
Station-Line-Volts	Element		No
Station-Maintenance-Group-Name	Element		No
Station-Maintenance-Contact-Information	Type: Contact Details	TMDD 3.3.16.1	No
Station-Maintenance-Frequency	Element		No
Station-Maintenance-Calibration-Frequency	Element		No
Station-Maintenance-Status	Element		No
Station-Installation-Date	Type: DateTimeZone	TMDD 3.3.10.1	No
Station-Number-Of-Devices	Element		No
Station-Comm-Method	Element		No
Station-Telephone-Number	Element		No
Station-Ip-Address	Element		No
Station-Manufacturer	Element		No
Station-Observation-Collection-Frequency	Element		No
Station-Observation-Collection-Offset	Element		No
Station-Transmission-Frequency	Element		No
Station-Transmission-Offset	Element		No
Station-Transmission-Format	Element		No

3.3.2.5.6. ESSSensorMetadataDetail

This provides environmental sensor metadata and is the same as the ESSSensorMetadataDetail data frame in TMDD 3.3.7.12.

Attribute Name	Type/Element	Reference	CC Required
Station-Id	Element		Yes
Sensor-Id	Element		Yes
Sensor-Description	Element		No
Sensor-Information-Distribution-Group	Element		Yes
Sensor-Installation-Date	Element		No
Ess-Observation-Type	Element		Yes
Sensor-Min-Value-Range	Element		No
Sensor-Max-Value-Range	Element		No
Sensor-Manufacturer	Element		Yes
Sensor-Model-Number	Element		Yes
Sensor-Index	Element		Yes
Sensor-Rate-Of-Change-Interval	Element		No
Sensor-Max-Positive-Rate-Of-Change	Element		No
Sensor-Max-Negative-Rate-Of-Change	Element		No
Sensor-Persistence-Interval	Element		No
Sensor-Persistence-Threshold	Element		No
Sensor-Like-Instrument-Threshold	Element		No
Sensor-Maintenance-Calibration-Date	Element		No
Sensor-Last-Maintenance-Date	Element		No
Sensor-Serial-Number	Element		No
Sensor-Resolution	Element		No
Sensor-Accuracy	Element		No
Sensor-Min-Value-Output	Element		No
Sensor-Max-Value-Output	Element		No
Sensor-To-Station-North-South-Offset	Element		No
Sensor-To-Station-East-West-Offset	Element		No
Sensor-To-Station-Elevation-Offset	Element		No
Sensor-To-Surface-Elevation-Offset	Element		No
Sensor-Embedded-Material-Description	Element		No
Sensor-Output-Average-Interval	Element		No
Sensor-Output-Internal-Units	Element		No
Sensor-Last-Out-Of-Service-Begin-Date-Time	Element		No
Sensor-Last-Out-Of-Service-End-Date-Time	Element		No
Sensor-Sampling-Interval	Element		No

3.3.2.5.7. ESSInventoryDetailsExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the ESSInventory data frame (TMDD 3.3.7.4) and the ESSInventoryDetails data frame (TMDD 3.3.7.5).

Attribute Name	Type/Element	Description	CC Required
Ess-Inventory-Hub	Type: AssetInventoryHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.3.2.6. HAR Class

3.3.2.6.1. HARInventory

This provides HAR attribute information is the same as the HARInventory data frame in TMDD 3.3.11.4.

Attribute Name	Type/Element	Reference	CC Required
Device-Inventory-Header	Type: DeviceInventoryHeader	TMDD 3.3.5.8	No
Device-Beacon	Element		No
Har-Characteristics	Element		No
Har-Frequency-Description	Element		No
Har-Call-Sign	Element		No

3.3.2.7. IntersectionSignal Class

3.3.2.7.1. IntersectionSignalInventory

This provides information for a single intersection signal device and is based on the IntersectionSignalInventory data frame in TMDD 3.3.12.5.

Attribute Name	Type/Element	Reference	Description	CC Required
Device-Inventory-Header	Type: DeviceInventoryHeader	TMDD 3.3.5.8		Yes
Intersection-Name	Element			Yes

Attribute Name	Type/Element	Reference	Description	CC Required
Controller-Master-Id	Element			Yes-when applicable
Intersection-Link-List	Type: Sequence of "IntersectionSignalInventoryLinkList" types	TMDD 3.3.12.6		No
Movement-List	Type: Sequence of "IntersectionSignalMovement" types	TMDD 3.3.12.8		No
Phase-List	Type: Sequence of "IntersectionSignalInventoryPhase" types	TMDD 3.3.12.7		Yes - when applicable
Overlap-Phase-List	Type: Sequence of "IntersectionSignalOverlapPhase" types	TMDD 3.3.12.9		Yes - when applicable
Ring-List	Type: Sequence of "IntersectionSignalRing" types	TMDD 3.3.12.14		Yes - when applicable
Special-Functions-List	Type: Sequence of "IntersectionSignalSpecialFunctions" types	TMDD 3.3.12.17		No
Time-Reference-Code	Element			No
Pattern-Sync-Reference	Element			No
Signal-Controller-Type	Element: Type of signal controller used	System Requirements specs 8.7.1.2 and 8.7.1.3	For each signalized intersection under ICM management	Yes-when applicable (Extended)
Signal-Controller-Firmware	Element: Name of controller firmware	System Requirements spec 8.7.1.2	For each signalized intersection under ICM management	Yes-when applicable (Extended)
Signal-Inventory-Ext (Extended: cc-extensions.xsd)	Type: SignalInventoryExtended (Extended)		Additional information for this dataframe	Yes - Only for CMS and Data Hub (Extended)

3.3.2.7.2. IntersectionSignalInventoryLinkList

This provides the intersection signal link information and is the same as the IntersectionSignalInventoryLinkList data frame in TMDD 3.3.12.6.

Attribute Name	Type/Element	Reference	CC Required
Link-Id	Element		No
Link-Direction	Element		No

3.3.2.7.3. IntersectionSignalInventoryPhase

This provides intersection signal phase information and is the same as the IntersectionSignalInventoryPhase data frame in TMDD 3.3.12.7.

Attribute Name	Type/Element	Reference	CC Required
Phase-Identifier	Element		Yes
Coordinated-Phase	Element		Yes
Concurrent-Phases-List	Element: Sequence of "NTCIP.PhaseNumber" types		Yes
Active-Movements-List	Element: Sequence of "Organization-resource-identifier" types		No

3.3.2.7.4. IntersectionSignalMovement

This provides intersection signal movement information and is the same as the IntersectionSignalMovement data frame in TMDD 3.3.12.8.

Attribute Name	Type/Element	Reference	CC Required
Movement-Identifier	Element		No
Approach-Link-Id	Element		No
Departing-Link-Id	Element		No
Crossing-Point	Type: GeoLocation	TMDD 3.6.9.4	No
Approach-Vector	Element		No
Turning-Movement-Code	Element		No
Turning-Movement-Lanes	Element: Sequence of "Organization Center Information" types		No
Turning-Movement-Text	Element		No

3.3.2.7.5. IntersectionSignalOverlapPhase

This provides intersection signal overlap phase information and is the same as the IntersectionSignalOverlapPhase data frame in TMDD 3.3.12.9.

Attribute Name	Type/Element	Reference	CC Required
Overlap-Identifier	Element		Yes
Overlap-Included-Phases	Element: Sequence of "NTCIP.PhaseNumber" types		Yes
Active-Movements-List	Element: Sequence of "Organization-resource-identifier" types		No

3.3.2.7.6. IntersectionSignalRing

This provides intersection signal ring information and is the same as the IntersectionSignalRing data frame in TMDD 3.3.12.14.

Attribute Name	Type/Element	Reference	CC Required
Ring-Identifier	Element		Yes
Ring-Phase-Assignment	Element: Sequence of "NTCIP.PhaseNumber" types		Yes

3.3.2.7.7. IntersectionSignalSequenceData

This provides intersection signal ring phase sequence information and is the same as the IntersectionSignalSequenceData data frame in TMDD 3.3.12.16.

Attribute Name	Type/Element	Reference	CC Required
Ring-Identifier	Element		Yes
Sequence-Data	Element: Sequence of "NTCIP.PhaseNumber" types		Yes

3.3.2.7.8. IntersectionSignalSpecialFunctions

This provides intersection signal controller special functions and is the same as the IntersectionSignalSpecialFunctions data frame in TMDD 3.3.12.17.

Attribute Name	Type/Element	Reference	CC Required
Special-Function-Identifier	Element		Yes
Special-Function-Description	Element		No

3.3.2.7.9. SignalInventoryExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the IntersectionSignalInventory data frame (TMDD 3.3.12.5).

Attribute Name	Type/Element	Description	CC Required
Signal-Inventory-Hub	Type: AssetInventoryHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.3.2.8. LCS Class

3.3.2.8.1. LCSInventory

This provides information for an LCS device in the LCS inventory is similar to the LCSInventory data frame in TMDD 3.3.13.3.

Attribute Name	Type/Element	Reference	CC Required
Device-Inventory-Header	Type: DeviceInventoryHeader	TMDD 3.3.5.8	Yes
Controlled-Lane-Number	Element		Yes
Link-Lane-Count	Element		Yes-when applicable
LCS-Inventory-Ext (Extended: cc-extension.xsd)	Type: LCSInventoryExtended (Extended)		Yes - Only for CMS and Data Hub

3.3.2.8.2. LCSInventoryExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the LCSInventory data frame (TMDD 3.3.13.3).

Attribute Name	Type/Element	Description	CC Required
LCS-Inventory-Hub	Type: AssetInventoryHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.3.2.9. Link Class

3.3.2.9.1. LinkInventory

This provides information for the inventory of road network links. This is the same as the LinkInventory data frame in TMDD 3.3.14.2.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Link-Inventory-List	Type: Sequence of "LinkInventoryList" types	TMDD 3.3.14.3	Yes

3.3.2.9.2. LinkInventoryList

This provides information for a single link within the link inventory. This is based on the LinkInventoryList data frame in TMDD 3.3.14.3.

Attribute Name	Type/Element	Reference	Description	CC Required
Network-Id	Element			Yes
Network-Name	Element			No
Link-Id	Element			Yes
Link-Name	Element			No
Alternate-Link-Name	Element			No
Link-Route-Designator	Element			No
Secondary-Link-Route-Designator	Element			No
Link-Type	Element			Yes

Attribute Name	Type/Element	Reference	Description	CC Required
Link-Begin-Node-Id	Element			Yes
Link-Begin-Node-Location	Type: GeoLocation	TMDD 3.6.9.4		Yes
Link-End-Node-Id	Element			Yes
Link-End-Node-Location	Type: GeoLocation	TMDD 3.6.9.4		Yes
Linear-Reference	Element			No
Linear-Reference-Version	Element			No
Link-Length	Element			No
Link-Capacity	Element			No
Link-Speed-Limit	Element			No
Link-Speed-Limit-Truck	Element			No
Link-Speed-Limit-Units	Element			No
Link-Jurisdiction	Element			No
Link-Owner	Element			No
Left-Shoulder-Width	Element			No
Right-Shoulder-Width	Element			No
Lane-Separator	Element			No
Last-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1		Yes
Link-Restrictions	Type: LinkRestrictions	Custom type; see Global Data Elements	Times during which links are not available for detours such as when children are walking to/from schools or arterials are heavily travelled by buses.	Yes-when applicable (extended)
Left-Turn-Bay-Length	Element: Length of turn bay	System Requirements spec 8.7.1.2	For approach to a signalized intersection under ICM management	Yes-when applicable (extended)
Right-Turn-Bay-Length	Element: Length of turn bay	System Requirements spec 8.7.1.2	For approach to a signalized intersection under ICM management	Yes-when applicable (extended)
Link-Geom-Location	Type: Geometry SpatialData	Custom type; see Global Data Elements	Geometry of the link	Yes-when applicable (extended)

3.3.2.10. Node Class

3.3.2.10.1. NodeInventory

This provides information for the inventory of road network nodes. This is the same as the NodeInventory data frame in TMDD 3.3.15.1.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Node-Inventory-List	Type: Sequence of "NodeInventoryList" types	TMDD 3.3.15.2	Yes

3.3.2.10.2. NodeInventoryList

This provides information for a single node within the node inventory. This is the same as the NodeInventoryList data frame in TMDD 3.3.15.2.

Attribute Name	Type/Element	Reference	CC Required
Network-Id	Element		Yes
Network-Name	Element		No
Node-Id	Element		Yes
Node-Name	Element		No
Node-Description	Element		No
Node-Route-Designator	Element		No
Node-Direction	Element		No
Linear-Reference	Element		No
Linear-Reference-Version	Element		No
Node-Type	Element		No
Node-Location	Type: GeoLocation	TMDD 3.6.9.4	Yes
Node-Links-Number	Element		No
Last-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes

3.3.2.11. Organization Class

3.3.2.11.1. OrganizationInformationRequest

This provides information for the request of organization information. This is the same as the OrganizationInformationRequest data frame in TMDD 3.3.16.4.

Attribute Name	Type/Element	Reference	CC Required
Authentication	Type: Authentication	TMDD 3.3.3.1	Yes - when applicable
Organization-Requesting	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Organization-Information-Type	Element		Yes
Organization-Id	Element		No
Center-Id-List	Element		No

3.3.2.12. RampMeter Class

3.3.2.12.1. RampMeterInventory

This provides information on a single ramp meter device. This is the same as the RampMeterInventory data frame in TMDD 3.3.17.4.

Attribute Name	Type/Element	Reference	CC Required
Device-Inventory-Header	Type: DeviceInventoryHeader	TMDD 3.3.5.8	Yes
Metered-Inventory-List	Type: RampMeterInventoryDetails	TMDD 3.3.17.5	Yes

3.3.2.12.2. RampMeterInventoryDetails

This provides details on a single ramp meter device. This is based on the RampMeterInventoryDetails data frame in TMDD 3.3.17.5.

Attribute Name	Type/Element	Reference	Description	CC Required
Metered-Lane-Inventory-Header	Type: DeviceInventoryHeader	TMDD 3.3.5.8		Yes
Ramp-Exit-Roadway-Name	Element			Yes
Lane-Number	Element			Yes-when applicable

Attribute Name	Type/Element	Reference	Description	CC Required
Lane-Type	Element			Yes-when applicable
Associated-Detectors	Element: Sequence of "Organization-resource-identifier" types			Yes-when applicable
Absolute-Minimum-Metering-Rate	Element			Yes-when applicable
Absolute-Maximum-Metering-Rate	Element			Yes-when applicable
System-Minimum-Metering-Rate	Element			Yes-when applicable
System-Maximum-Metering-Rate	Element			Yes-when applicable
Signal-Controller-Type	Element: Type of signal controller used	System Requirements specs 8.7.1.2	For each metered on-ramp or freeway-to-freeway connector under ICM management	Yes-when applicable (Extended)
Signal-Controller-Metering-Program	Element: Ramp metering program installed in controller	System Requirements spec 8.7.1.2	For each metered on-ramp or freeway-to-freeway connector under ICM management	Yes-when applicable (Extended)
Queue-Sensor-Distance	Element: Distance of queue sensors from ramp metering stop line	System Requirements spec 8.7.1.2	For each metered on-ramp or freeway-to-freeway connector under ICM management	Yes-when applicable (Extended)
Ramp-Inventory-Ext (Extended: cc-extension.xsd)	Type: RampInventory Extended (Extended)		Additional information for this dataframe	Yes - Only for CMS and Data Hub (Extended)

3.3.2.12.3. RampInventoryExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the RampMeterInventoryDetails data frame (TMDD 3.3.17.5).

Attribute Name	Type/Element	Description	CC Required
Ramp-Inventory-Hub	Type: AssetInventoryHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.3.2.13. Route Class

3.3.2.13.1. RouteInventory

This provides information for a list of routes. This is the same as the RouteInventory data frame in TMDD 3.3.18.1.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Route-Inventory-List	Type: Sequence of "RouteInventoryList" types	TMDD 3.3.18.2	Yes

3.3.2.13.2. RouteInventoryList

This provides information for an individual route. This is the same as the RouteInventoryList data frame in TMDD 3.3.18.2.

Attribute Name	Type/Element	Reference	CC Required
Network-Id	Element		Yes
Network-Name	Element		Yes-when applicable
Route-Id	Element		Yes
Route-Link-Id-List	Element: Sequence of "Transportation-network-identifier" types		Yes
Route-Type	Element		Yes
Route-Name	Element		Yes-when applicable

Attribute Name	Type/Element	Reference	CC Required
Alternate-Route-Name-List	Element: Sequence of "Transportation-network-name" types		No
Route-Length	Element		Yes-when applicable
Route-Node-Id-List	Element: Sequence of "Transportation-network-identifier" types		No
Route-Url	Element		No
Last-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes

3.3.2.14. Section Class

3.3.2.14.1. SectionStatus

This provides information for an organizational section status. This is the same as the SectionStatus data frame in TMDD 3.3.19.7 except the Node-Id-List element has been renamed to Device-Id-List as a proposed change to the TMDD spec. In addition an extended element was added.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Section-Id	Element		Yes
Section-Name	Element		Yes-when applicable
Device-Id-List	Element: Sequence of "Organization-resource-identifier" types		Yes
Section-Control-Mode	Element		Yes
Timing-Pattern-Id	Element		Yes
Timing-Pattern-Name	Element		Yes-when applicable
Cycle-Time	Element		Yes-when applicable
Operator-Id	Element		Yes-when applicable
Event-Id	Element		Yes-when applicable
Response-Plan-Id	Element		Yes-when applicable
Last-Comm-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Section-Status-Ext (Extended: cc-extension.xsd)	Type: SectionStatusExtended (Extended)		Yes - Only for CMS and Data Hub

3.3.2.14.2. AssetDataHub

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional Data Hub -specific data for data and status sources.

Attribute Name	Type/Element	Description	CC Required
Hub-Org-Id	Element: Hash-Sequence-Id	Unique organization ID	Yes - Only for CMS and Data Hub
Hub-Asset-Id	Element: Hash-Sequence-Id	Unique asset ID across all organizations	Yes - when applicable. Only for CMS and Data Hub
Inventory-Check	Element: Enumerated: Pass (1), Fail: In inventory but missing data (2) Fail: Not in inventory (3)	Indicates when inventory is not as expected	Yes - when applicable. Only for CMS and Data Hub
Data-Value-Check	Type: Element: Enumerated: Pass (1), Fail (2)	Contains results of data value validation checks	Yes - when applicable. Only for CMS and Data Hub

3.3.2.14.3. SectionStatusExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the SectionStatus data frame (TMDD 3.3.19.7).

Attribute Name	Type/Element	Description	CC Required
Section-Status-Hub	Type: AssetDataHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.3.2.15. VideoSwitch Class

3.3.2.15.1. VideoSwitchInventory

This provides information for an individual video switch. This is similar to the VideoSwitchInventory data frame in TMDD 3.3.21.3.

Attribute Name	Type/Element	Reference	CC Required
Device-Inventory-Header	Type: DeviceInventoryHeader	TMDD 3.3.5.8	Yes
Input-Channel-List	Type: Sequence of "VSVideoChannelData" types	TMDD 3.3.21.5	Yes
Output-Channel-List	Type: Sequence of "VSVideoChannelData" types	TMDD 3.3.21.5	Yes
Input-Channel-Count	Element		No
Output-Channel-Count	Element		No
Request-Supported-Type	Element		No
Switch-Inventory-Ext (Extended: cc-extension.xsd)	Type: VideoSwitchInventoryExtended (Extended)		Yes - Only for CMS and Data Hub

3.3.2.15.2. VSVideoChannelData

This provides information for a single video channel for a video switch device. This is the same as the VSVideoChannelData data frame in TMDD 3.3.21.5.

Attribute Name	Type/Element	Reference	CC Required
Channel-Id	Element		Yes
Channel-Name	Element		Yes
Channel-Titling-Text	Element		Yes

3.3.2.15.3. VideoSwitchInventoryExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the VideoSwitchInventory data frame (TMDD 3.3.21.3).

Attribute Name	Type/Element	Description	CC Required
Switch-Inventory-Hub	Type: AssetInventoryHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.4. LAYER: ASSET CAPABILITIES

Asset Capabilities includes the following:

- Intersection signal plans
- Ramp meter plans
- Transit schedules, trips and routes
- Response Plans
- Dynamic Message Signs Display options
- Traveler characterizations
- Organizational assets – employees, including people, service vehicles, maintenance crews, incident response crews, traffic engineers, control centers, emergency and first responders



Figure 5 - Asset Capabilities Layer

3.4.1. Data Messages

TMDD Data messages include the following:

Name	Reference	Description
dIDMSMessageInventoryRequest	TMDD 3.1.6.3	Request for inventory of dynamic message sign messages
dIDMSMessageInventorySubscription	TMDD 3.1.6.4	Request for inventory updates of dynamic message sign messages

Name	Reference	Description
dlDMSFontTableRequest	TMDD 3.1.6.6	
dlHARMMessageInventoryRequest	TMDD 3.1.10.2	Request for inventory of highway advisory radio messages
dlIntersectionSignalTimingPatternInventoryRequest	TMDD 3.1.11.3	Request for inventory of intersection signal timing patterns
dlIntersectionSignalTimingPatternInventorySubscription	TMDD 3.1.11.4	Request for inventory of intersection signal timing patterns
dlRampMeterControlScheduleRequest	TMDD 3.1.16.4	Request for ramp meter control schedules
dlRampMeterPlanInventoryRequest	TMDD 3.1.16.6	Request for ramp meter plan inventories
dlRampMeterPlanInventorySubscription	TMDD 3.1.16.7	Request for ramp meter plan inventory updates
dlSectionSignalTimingPatternInventoryRequest	TMDD 3.1.18.6	Request for organizational section timing pattern inventory
dlSectionSignalTimingPatternInventorySubscription	TMDD 3.1.18.7	Request for organizational section timing pattern inventory updates
dlDMSMessageInventoryUpdate	TMDD 3.1.24.2	
dlHARMMessageInventoryUpdate	TMDD 3.1.28.2	
dlIntersectionSignalTimingPatternInventoryUpdate	TMDD 3.1.29.2	
dlIntersectionSignalControlScheduleUpdate	TMDD 3.1.29.4	
dlLCSControlScheduleUpdate	TMDD 3.1.30.3	
dlRampMeterControlScheduleUpdate	TMDD 3.1.32.3	
dlRampMeterPlanInventoryUpdate	TMDD 3.1.32.4	
dlSectionControlScheduleUpdate	TMDD 3.1.33.2	
dlSectionSignalTimingPatternInventoryUpdate	TMDD 3.1.33.3	

Other messaging dialogs required include the following:

Name	Reference	Description
TRANSIT	GTFS * or APTA TCIP-S-001 4.1.1 **	Schedules, trips, routes and fares for transit services

* General Transit Feed Specification

** American Public Transportation Association Standard for Transit Communications Interface Profiles

3.4.2. Data Class Descriptions

See the beginning of section 3 for a description of the "CC Required" column.

3.4.2.1. ConnectionManagement

3.4.2.1.1. ErrorReport

This provides an error response to an individual request. This is the same as the ErrorReport data frame in TMDD 3.3.3.4.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Organization-Requesting	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Error-Code	Element		Yes
Error-Text	Element		Yes

3.4.2.2. Device Class

3.4.2.2.1. DeviceControlScheduleHeader

This is the header information for a device control request. This is the same as the DeviceControlScheduleHeader data frame in TMDD 3.3.5.4.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Device-Id	Element		Yes
Time-Base-Schedule-Number	Element		Yes
Time-Base-Schedule-Month	Element		Yes
Time-Base-Schedule-Day	Element		Yes
Time-Base-Schedule-Date	Element		Yes
Time-Base-Schedule-Day-Plan	Element		Yes
Day-Plan-Hour	Element		Yes
Day-Plan-Minute	Element		Yes
Last-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes

3.4.2.2.2. DeviceInformationRequest

This provides the information regarding a request for device inventory, status, schedule, or timing plan information. This is the same as the DeviceInformationRequest data frame in TMDD 3.3.5.6.

Attribute Name	Type/Element	Reference	CC Required
Authentication	Type: Authentication	TMDD 3.3.3.1	Yes - when applicable
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Organization-Requesting	Type: OrganizationInformation	TMDD 3.3.16.3	Yes-when applicable
Device-Type	Element		Yes
Device-Information-Type	Element		Yes
Device-Filter	Type: DeviceInformationRequestFilter	TMDD 3.3.5.7	Yes-when applicable

The following enumerated values for the Device-Type and Device-Information-Type elements will be used in the specified request dialogs and their corresponding subscription dialogs:

Dialog Name	Device-Type	Device-Information-Type
dlCCTVInventoryRequest	cctv camera	device inventory
dlCCTVStatusRequest	cctv camera	device status
dlDetectorDataRequest	detector	device data
dlDetectorInventoryRequest	detector	device inventory
dlDetectorMaintenanceHistoryRequest	detector	device maintenance history
dlDetectorStatusRequest	detector	device status
dlDMSFontTableRequest	dynamic message sign	dms font table
dlDMSInventoryRequest	dynamic message sign	device inventory
dlDMSMessageAppearanceRequest	dynamic message sign	message appearance
dlDMSMessageInventoryRequest	dynamic message sign	other
dlDMSStatusRequest	dynamic message sign	device status
dlESSInventoryRequest	environmental sensor station	device inventory
dlESSObservationMetadataRequest	environmental sensor station	device metadata
dlESSObservationReportRequest	environmental sensor station	device data
dlESSStatusRequest	environmental sensor station	device status

Dialog Name	Device-Type	Device-Information-Type
dlHARControlScheduleRequest	highway advisory radio	device schedule
dlHARInventoryRequest	highway advisory radio	device inventory
dlHARMessageInventoryRequest	highway advisory radio	other
dlHARStatusRequest	highway advisory radio	device status
dlIntersectionSignalControlScheduleRequest	signal controller	device schedule
dlIntersectionSignalInventoryRequest	signal controller	device inventory
dlIntersectionSignalStatusRequest	signal controller	device status
dlIntersectionSignalTimingPatternInventoryRequest	ramp meter	device plan
dlLCSControlScheduleRequest	lane control signal	device schedule
dlLCSInventoryRequest	lane control signal	device inventory
dlLCSStatusRequest	lane control signal	device status
dlRampMeterControlScheduleRequest	ramp meter	device schedule
dlRampMeterInventoryRequest	ramp meter	device inventory
dlRampMeterPlanInventoryRequest	ramp meter	device plan
dlRampMeterStatusRequest	ramp meter	device status
dlSectionControlScheduleRequest	signal section	device schedule
dlSectionSignalTimingPatternInventoryRequest	signal section	device plan
dlSectionStatusRequest	signal section	device status
dlVideoSwitchInventoryRequest	video switch	device inventory

3.4.2.2.3. DeviceInformationRequestFilter

This is used to provide filters for a device information request. This is the same as the DeviceInformationRequestFilter data frame in TMDD 3.3.5.7.

Attribute Name	Type/Element	Reference	CC Required
Device-Id-List	Element: Sequence of "Organization-resource-identifier" types		Yes - when applicable
Network-Id-List	Element: Sequence of "Transportation-network-identifier" types		Yes - when applicable
Link-Id-List	Element: Sequence of "Transportation-network-identifier" types		Yes - when applicable
Link-Designator-List	Element: Sequence of "Link-route-designator" types		Yes - when applicable
Linear-Reference	Type: LinearReferenceRange	TMDD 3.3.14.1	Yes - when applicable

Attribute Name	Type/Element	Reference	CC Required
Section-Id-List	Element: Sequence of "Organization-resource-identifier" types		Yes - when applicable
Pattern-Id-List	Element: Sequence of "Organization-resource-identifier" types		Yes - when applicable
Center-Id-List	Element: Sequence of "Organization-resource-identifier" types		Yes - when applicable

3.4.2.2.4. DeviceInventoryHeader

This is the header for a device inventory response. This is similar to the DeviceInventoryHeader data frame in TMDD 3.3.5.8.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Device-Id	Element		Yes
Device-Location	Type: GeoLocation	TMDD 3.6.9.4	Yes
Device-Name	Element		Yes
Device-Description	Element		Yes-when applicable
Device-Control-Type	Element		Yes-when applicable
Controller-Description	Element		Yes-when applicable
Network-Id	Element		No
Node-Id	Element		No
Node-Name	Element		No
Link-Id	Element		No
Link-Name	Element		No
Link-Direction	Element		No
Linear-Reference	Element		No
Linear-Reference-Version	Element		No
Route-Designator	Element		No
Device-Url	Type: UrlReference	TMDD 3.3.10.2	No
Last-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Device-Inv-Header-Ext	DeviceInventoryHeaderExt		Yes-when applicable (Extended)

3.4.2.2.5. DeviceInventoryHeaderExt

This extended data frame contains additional data for the DeviceInventoryHeader data frame (TMDD 3.3.5.8).

Attribute Name	Type/Element	Description	CC Required
Device Inv-Header-Mccain	Type: DeviceInventoryHeader Mccain (Extended)	Additional information used in McCain implementations	Yes-when applicable Only for McCain implementations (Extended)

3.4.2.2.6. DeviceInventoryHeaderMccain

This extended data frame provides extra information in the DeviceInformationHeaderExt data frame for McCain implementations.

Attribute Name	Type/Element	Description	CC Required
Alt-Device-Id	Element: Integer "AlternateDeviceIdentifierMccain" (Extended)		Yes-when applicable (Extended)
Device-Comm-Config	Element: String "DeviceCommConfigMccain" (Extended)		Yes-when applicable (Extended)

3.4.2.3. DMS Class

3.4.2.3.1. DMSCharacterTableEntry

This provides information regarding a DMS character table entry. This is the same as the DMSCharacterTableEntry data frame in TMDD 3.3.6.1.

Attribute Name	Type/Element	Reference	CC Required
Character-Number	Element		No
Character-Width	Element		No
Character-Bitmap	Element		No

3.4.2.3.2. DMSFontTable

This provides information for a DMS device font table. This is the same as the DMSFontTable data frame in TMDD 3.3.6.4.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	No
Device-Id	Element		No
Defaultfont	Element		No
Fontnumber	Element		No
Fontheight	Element		No
Fontcharspacing	Element		No
Fontlinespacing	Element		No
Fontversionid	Element		No
Fontstatus	Element		No
Charactertable	Type: Sequence of "DMSCharacterTableEntry" types	TMDD 3.3.6.1	No
Last-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	No

3.4.2.3.3. DMSFontTableRequest

This provides information required for a DMS font table request. This is the same as the DMSFontTableRequest data frame in TMDD 3.3.6.5.

Attribute Name	Type/Element	Reference	CC Required
Device-Information-Request-Header	Type: DeviceInformationRequest	TMDD 3.3.5.6	No
Fontnumber	Element		No

3.4.2.3.4. DMSMessageAppearance

This provides the message appearance characteristics for a DMS device. This is similar to the DMSMessageAppearance data frame in TMDD 3.3.6.7.

Note: the DMSMessageAppearanceMsg element has been modified to allow up to 10,240 devices to be reported in the message rather than just one.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No

Attribute Name	Type/Element	Reference	CC Required
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Device-Id	Element		Yes
Dms-Sign-Type	Element		Yes
Signheightpixels	Element		No
Signwidthpixels	Element		No
Signheight	Element		No
Signwidth	Element		No
Charheightpixels	Element		No
Charwidthpixels	Element		No
Dms-Vertical-Border	Element		No
Dms-Horizontal-Border	Element		No
Dms-Vertical-Pixel-Pitch	Element		No
Dms-Horizontal-Pixel-Pitch	Element		No
Dms-Max-Pages	Element		Yes-when applicable
Dms-Max-Message-Length	Element		Yes-when applicable
Dms-Color-Scheme	Element		No
Dms-Multi-Tag-Support	Element		No
Message-Appearance-Ext (Extended: cc-extension.xsd)	Type: DMSMessageAppearanceExtended (Extended)		Yes - Only for CMS and Data Hub

3.4.2.3.5. DMSMessageAppearanceRequest

This is the information required for a request of a DMS message appearance attributes. This is the same as the DMSMessageAppearanceRequest data frame in TMDD 3.3.6.8.

Attribute Name	Type/Element	Reference	CC Required
Device-Information-Request-Header	Type: DeviceInformationRequest	TMDD 3.3.5.6	Yes
Dms-Message-Appearance	Type: dMSMessageAppearanceRequest Type	TMDD 3.3.6.9	Yes

3.4.2.3.6. DMSMessageAppearanceRequestType

This provides the choices for a DMS message appearance request. This is the same as the dMSMessageAppearanceRequestType data frame in TMDD 3.3.6.9.

Attribute Name	Type/Element	Reference	CC Required
Dms-Message	Element		Yes
Message-Number	Element		Yes
Return-Current-Message-Snapshot	Element		Yes

3.4.2.3.7. DMSMessageInventory

This provides the DMS message library for a single DMS device. This is similar to the DMSMessageInventory data frame in TMDD 3.3.6.10.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Device-Id	Element		Yes
Message-Memory-Type	Element		Yes
Message-Number	Element		Yes
Message	Element		Yes
Message-Owner-Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Enable-Beacon-Flag	Element		Yes
Message-Run-Time-Priority	Element		Yes
Message-Status	Element		Yes
Last-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes
Dms-Message-Ext (Extended: cc-extension.xsd)	Type: DMSMessageInventoryExtended (Extended)		Yes - Only for CMS and Data Hub

3.4.2.3.8. DMSMessageInventoryRequest

This is the information required for a request of a DMS message inventory. This is the same as the DMSMessageInventoryRequest data frame in TMDD 3.3.6.11.

Attribute Name	Type/Element	Reference	CC Required
Device-Information-Request-Header	Type: DeviceInformationRequest	TMDD 3.3.5.6	Yes

Attribute Name	Type/Element	Reference	CC Required
Message-Number	Element		No
Message-Memory-Type	Element		No

3.4.2.3.9. AssetMessageHub

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional Data Hub-specific data for message inventory sources.

Attribute Name	Type/Element	Description	CC Required
Hub-Org-Id	Element: Hash-Sequence-Id	Unique organization ID	Yes - Only for CMS and Data Hub
Hub-Asset-Id	Element: Hash-Sequence-Id	Unique asset ID across all organizations	Yes - when applicable. Only for CMS and Data Hub
Hub-Message-Id	Element: Hash-Sequence-Id	Unique asset ID across all organizations	Yes - when applicable. Only for CMS and Data Hub
Inventory-Check	Element: Enumerated: Pass (1), Fail: In inventory but missing data (2) Fail: Not in inventory (3)	Indicates when inventory is not as expected	Yes - when applicable. Only for CMS and Data Hub
Data-Value-Check	Type: Element: Enumerated: Pass (1), Fail (2)	Contains results of data value validation checks	Yes - when applicable. Only for CMS and Data Hub

3.4.2.3.10. DMSMessageAppearanceExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the DMSMessageAppearance data frame (TMDD 3.3.6.7).

Attribute Name	Type/Element	Description	CC Required
Message-Appearance-Hub	Type: AssetDataHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.4.2.3.11. DMSMessageInventoryExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the DMSMessageInventory data frame (TMDD 3.3.6.10).

Attribute Name	Type/Element	Description	CC Required
Dms-Message-Hub	Type: AssetMessageHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.4.2.4. HAR Class

3.4.2.4.1. HARMessageInventory

This provides the message library for a single HAR device. This is the same as the HARMessageInventory data frame in TMDD 3.3.11.5.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	No
Device-Id	Element		No
Message-Number	Element		No
Current-Message	Element		No
Last-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	No

3.4.2.5. IntersectionSignal Class

3.4.2.5.1. IntersectionSignalControlSchedule

This provides the control schedule for a single intersection signal device. This is similar to the IntersectionSignalControlSchedule data frame in TMDD 3.3.12.4.

Attribute Name	Type/Element	Reference	CC Required
Device-Control-Schedule-Header	Type: DeviceControlScheduleHeader	TMDD 3.3.5.4	Yes
Request-Control-Mode	Element		Yes
Timing-Pattern-Id	Element		Yes
Signal-Schedule-Ext (Extended: cc-extension.xsd)	Type: IntersectionSignalControlScheduleExtended (Extended)		Yes - Only for CMS and Data Hub

3.4.2.5.2. IntersectionSignalTimingPatternInventory

This provides the signal timing pattern for a center’s intersection signal timing pattern inventory. This is similar to the IntersectionSignalTimingPatternInventory data frame in TMDD 3.3.12.19.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Device-Id	Element		Yes
Timing-Pattern-Id	Element		Yes
Timing-Pattern-Name	Element		Yes-when applicable
Cycle-Length	Element		Yes
Offset-Time	Element		Yes
Phase-Tp-List	Type: IntersectionSignalTPInventoryPhase	TMDD 3.3.12.21	Yes
Sequence-Information	Type: IntersectionSignalSequenceData	TMDD 3.3.12.16	Yes-when applicable
Last-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes

Attribute Name	Type/Element	Reference	CC Required
Signal-Timing-Pattern-Inv-Ext (Extended: cc-extension.xsd)	Type: IntersectionSignalTimingPatternInventoryExt (Extended)		Yes - when applicable

3.4.2.5.3. IntersectionSignalTimingPatternInventoryRequest

This provides the information necessary to request an intersection signal timing pattern inventory. This is the same as the IntersectionSignalTimingPatternInventoryRequest data frame in TMDD 3.3.12.20.

Attribute Name	Type/Element	Reference	CC Required
Device-Information-Request-Header	Type: DeviceInformationRequest	TMDD 3.3.5.6	Yes
Timing-Pattern-Id	Element		No

3.4.2.5.4. IntersectionSignalTPInventoryPhase

This provides the phase attributes of a timing pattern. This is similar to the IntersectionSignalTPInventoryPhase data frame in TMDD 3.3.12.21.

Attribute Name	Type/Element	Reference	CC Required
Phase-Identifier	Element		Yes
Coordinated-Phase	Element		Yes
Split-Mode	Element		Yes
Phase-Split	Element		Yes
Maximum-Green-Duration	Element		Yes-when applicable
Minimum-Green-Duration	Element		Yes-when applicable
Vehicle-Clearance-Duration	Element		Yes-when applicable
Vehicle-Red-Duration	Element		Yes-when applicable
Minimum-Walk-Duration	Element		No
Pedestrian-Clearance-Duration	Element		No
Steady-Dont-Walk-Duration	Element		No

Attribute Name	Type/Element	Reference	CC Required
Int-Sig-Tp-Inv-Phase-Ext	Type: IntersectionSignalTPInventoryPhaseExt (Extended)		Yes - when applicable (Extended)

3.4.2.5.5. AssetScheduleHub

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional Data Hub-specific data for control schedule sources.

Attribute Name	Type/Element	Description	CC Required
Hub-Org-Id	Element: Hash-Sequence-Id	Unique organization ID	Yes - Only for CMS and Data Hub
Hub-Asset-Id	Element: Hash-Sequence-Id	Unique asset ID across all organizations	Yes - when applicable. Only for CMS and Data Hub
Hub-Schedule-Id	Element: Hash-Sequence-Id	Unique asset ID across all organizations	Yes - when applicable. Only for CMS and Data Hub
Inventory-Check	Element: Enumerated: Pass (1), Fail: In inventory but missing data (2) Fail: Not in inventory (3)	Indicates when inventory is not as expected	Yes - when applicable. Only for CMS and Data Hub
Data-Value-Check	Type: Element: Enumerated: Pass (1), Fail (2)	Contains results of data value validation checks	Yes - when applicable. Only for CMS and Data Hub

3.4.2.5.6. AssetPlanHub

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional Data Hub-specific data for plan inventory and timing pattern inventory sources.

Attribute Name	Type/Element	Description	CC Required
Hub-Org-Id	Element: Hash-Sequence-Id	Unique organization ID	Yes - Only for CMS and Data Hub
Hub-Asset-Id	Element: Hash-Sequence-Id	Unique asset ID across all organizations	Yes - when applicable. Only for CMS and Data Hub
Hub-Plan-Id	Element: Hash-Sequence-Id	Unique asset ID across all organizations	Yes - when applicable. Only for CMS and Data Hub
Inventory-Check	Element: Enumerated: Pass (1), Fail: In inventory but missing data (2) Fail: Not in inventory (3)	Indicates when inventory is not as expected	Yes - when applicable. Only for CMS and Data Hub
Data-Value-Check	Type: Element: Enumerated: Pass (1), Fail (2)	Contains results of data value validation checks	Yes - when applicable. Only for CMS and Data Hub

3.4.2.5.7. IntersectionSignalControlScheduleExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the IntersectionSignalControlSchedule data frame (TMDD 3.3.12.4).

Attribute Name	Type/Element	Description	CC Required
Signal-Schedule-Hub	Type: AssetScheduleHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.4.2.5.8. IntersectionSignalTimingPatternInventoryExt

This extended data frame contains additional data for the IntersectionSignalTimingPatternInventory data frame (TMDD 3.3.12.19).

Attribute Name	Type/Element	Description	CC Required
Signal-Timing-Pattern-Inv-Hub (Extended: cc-extended.xsd)	Type: AssetPlanHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub
Signal-Timing-Pattern-Inv-Mccain (Extended)	Type: IntersectionSignalTimingPatternInventoryMccain (Extended)	Additional information used in McCain implementations	Yes-when applicable Only for McCain implementations

3.4.2.5.9. IntersectionSignalTimingPatternInventoryMccain

This extended data frame contains additional data for the IntersectionSignalTimingPatternInventoryExt data frame for McCain implementations.

Attribute Name	Type/Element	Description	CC Required
Stages-List	Type: Sequence of required elements: <ul style="list-style-type: none"> Interval-Identifier (PhaseNumber) Start-Time (Byte) "PatternStageStartTime Mccain" Duration (Byte) "PatternStageDuration Mccain" (Extended)		Yes-when applicable (Extended)
Ring-Barrier-Data	Type: IntersectionSignalTimingPatternInventoryRingBarrierData (Extended)		Yes-when applicable (Extended)
Ped-Adjust-Time	Element: Byte "PatternPedAdjustTimeMccain" (Extended)		Yes-when applicable (Extended)
Reservice-Time	Element: Byte "PatternReserviceTimeMccain" (Extended)		Yes-when applicable (Extended)
Perm1-End	Element: Byte "PatternPermStartEndTimeMccain" (Extended)		Yes-when applicable (Extended)
Perm2-Start	Element: Byte "PatternPermStartEndTimeMccain" (Extended)		Yes-when applicable (Extended)

Attribute Name	Type/Element	Description	CC Required
Perm2-End	Element: Byte "PatternPermStartTimeMcCain" (Extended)		Yes-when applicable (Extended)
Perm3-Start	Element: Byte "PatternPermStartTimeMcCain" (Extended)		Yes-when applicable (Extended)
Perm3-End	Element: Byte "PatternPermStartTimeMcCain" (Extended)		Yes-when applicable (Extended)

3.4.2.5.10. IntersectionSignalTimingPatternInventoryRingBarrierData

This extended data frame contains additional data for the IntersectionSignalTimingPatternInventoryMcCain data frame for McCain implementations.

Attribute Name	Type/Element	Description	CC Required
Ring-Identifier	Element: String (Extended)		Yes-when applicable (Extended)
Barrier-Data	Type: IntersectionSignalSequenceBarrierData (Extended)		Yes-when applicable (Extended)

3.4.2.5.11. IntersectionSignalSequenceBarrierData

This extended data frame contains additional data for the IntersectionSignalTimingPatternInventoryRingBarrierData data frame for McCain implementations.

Attribute Name	Type/Element	Description	CC Required
Barrier-Identifier	Element: Byte (Extended)		Yes (Extended)
Barrier-Data	Type: Sequence of elements: <ul style="list-style-type: none"> Phase-Identifier (PhaseNumber) (Extended)		Yes (Extended)

3.4.2.5.12. IntersectionSignalTPInventoryPhaseExt

This extended data frame contains additional data for the IntersectionSignalTPInventoryPhase data frame (TMDD 3.3.12.21).

Attribute Name	Type/Element	Description	CC Required
Phase-Mccain	Type: IntersectionSignalTPInventoryPhase Mccain (Extended)		Yes-when applicable Only for McCain implementations (Extended)

3.4.2.5.13. IntersectionSignalTPInventoryPhaseMccain

This extended data frame contains additional data for the IntersectionSignalTPInventoryPhaseExt data frame for McCain implementations.

Attribute Name	Type/Element	Description	CC Required
Split-Options	Element: Byte "SplitOptionsMccain" (Extended)		Yes-when applicable (Extended)
Max-Green	Element: Byte "MaxGreenTimeMccain" (Extended)		Yes-when applicable (Extended)

3.4.2.6. LCS Class

3.4.2.6.1. LCSSchedule

This provides a schedule for a lane control device. This is similar to the LCSSchedule data frame in TMDD 3.3.13.2.

Attribute Name	Type/Element	Reference	CC Required
Device-Control-Schedule-Header	Type: DeviceControlScheduleHeader	TMDD 3.3.5.4	Yes
Lane-Request-Command	Element		Yes
Lcs-Schedule-Ext (Extended: cc-extension.xsd)	Type: LCSScheduleExtended (Extended)		Yes - Only for CMS and Data Hub

3.4.2.6.2. LCSScheduleExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the LCSSchedule data frame (TMDD 3.3.13.2).

Attribute Name	Type/Element	Description	CC Required
LCS-Schedule-Hub	Type: AssetScheduleHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.4.2.7. Link Class

3.4.2.7.1. LinearReferenceRange

This defines the range of linear reference values for which a request is valid. This is the same as the LinearReferenceRange data frame in TMDD 3.3.14.1.

Attribute Name	Type/Element	Reference	CC Required
Linear-Reference-Start	Element		Yes
Linear-Reference-End	Element		Yes

3.4.2.8. Organization Class

3.4.2.8.1. Intentionally left blank

3.4.2.8.2. Intentionally left blank

3.4.2.8.3. Restrictions

This describes restrictions for forwarding organization center information. This is the same as the Restrictions data frame in TMDD 3.3.16.5.

Attribute Name	Type/Element	Reference	CC Required
Organization-Information-Forwarding-Restrictions	Element		Yes

3.4.2.9. RampMeter Class

3.4.2.9.1. RampMeterControlSchedule

This provides the ramp meter control schedule for an individual ramp meter. This is similar to the RampMeterControlSchedule data frame in TMDD 3.3.17.3.

Attribute Name	Type/Element	Reference	CC Required
Device-Control-Schedule-Header	Type: DeviceControlScheduleHeader	TMDD 3.3.5.4	Yes
Metered-Lane-Identifier	Element		Yes
Action-Number	Element		Yes
Meter-Action-Control	Element		Yes-when applicable
Meter-Requested-Plan	Element		Yes-when applicable
Meter-Requested-Rate	Element		Yes-when applicable
Meter-Vehicles-Per-Green	Element		Yes-when applicable
Min-Meter-Rate	Element		Yes-when applicable
Max-Meter-Rate	Element		Yes-when applicable
Meter-Lane-Usage-Mode	Element		No
Ramp-Schedule-Ext (Extended: cc-extension.xsd)	Type: RampMeterControlScheduleExtended (Extended)		Yes - Only for CMS and Data Hub

3.4.2.9.2. RampMeterPlanInventory

This provides an entry in a center’s ramp meter plan inventory. This is similar to the RampMeterPlanInventory data frame in TMDD 3.3.17.8.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Device-Id	Element		Yes
Meter-Plan	Element		Yes
Meter-Level	Element		Yes
Meter-Rate	Element		Yes
Flow-Rate-Threshold	Element		Yes
Occupancy-Threshold	Element		Yes
Speed-Threshold	Element		Yes
Last-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes
Ramp-Plan-Inventory-Ext (Extended: cc-extension.xsd)	Type: RampMeterPlan InventoryExtended (Extended)		Yes - Only for CMS and Data Hub

3.4.2.9.3. RampMeterControlScheduleExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the RampMeterControlSchedule data frame (TMDD 3.3.17.3).

Attribute Name	Type/Element	Description	CC Required
Ramp-Schedule-Hub	Type: AssetScheduleHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.4.2.9.4. RampMeterPlanInventoryExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the RampMeterPlanInventory data frame (TMDD 3.3.17.8).

Attribute Name	Type/Element	Description	CC Required
Ramp-Plan-Inventory-Hub	Type: AssetPlanHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.4.2.10. Section Class

3.4.2.10.1. SectionControlSchedule

This provides information for a centers traffic signal control schedule for an individual section. This is the same as the SectionControlSchedule data frame in TMDD 3.3.19.4 except the Node-Id-List element has been renamed to Device-Id-List as a proposed change to the TMDD spec. In addition an extended element was added.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Section-Id	Element		Yes
Time-Base-Schedule-Number	Element		Yes
Time-Base-Schedule-Month	Element		Yes
Time-Base-Schedule-Day	Element		Yes
Time-Base-Schedule-Date	Element		Yes
Time-Base-Schedule-Day-Plan	Element		Yes
Day-Plan-Hour	Element		Yes
Day-Plan-Minute	Element		Yes
Last-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes
Device-Id-List	Element: Sequence of "Organization-resource-identifier" types		Yes
Request-Control-Mode	Element		Yes
Timing-Pattern-Id	Element		Yes
Section-Schedule-Ext (Extended: cc-extension.xsd)	Type: SectionControlScheduleExtended (Extended)		Yes - Only for CMS and Data Hub

3.4.2.10.2. SectionTimingPatternInventory

This provides information for an entry in a sections timing pattern inventory. This is similar to the SectionTimingPatternInventory data frame in TMDD 3.3.19.8.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Section-Id	Element		Yes
Section-Timing-Pattern-Id	Element		Yes
Section-Timing-Pattern-Name	Element		Yes-when applicable
Section-Cycle-Length	Element		Yes
Intersection-Tp-List	Type: Sequence of "SectionSignalTimingPatternInventory" types	TMDD 3.3.19.10	Yes
Last-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes
Section-Plan-Inventory-Ext (Extended: cc-extension.xsd)	Type: SectionTimingPatternInventoryExtended (Extended)		Yes - Only for CMS and Data Hub

3.4.2.10.3. SectionSignalTimingPatternInventoryRequest

This is a request for a section signal timing pattern inventory. This is the same as the SectionSignalTimingPatternInventoryRequest data frame in TMDD 3.3.19.9.

Attribute Name	Type/Element	Reference	CC Required
Device-Information-Request-Header	Type: DeviceInformationRequest	TMDD 3.3.5.6	Yes
Section-Timing-Pattern-Id	Element		No

3.4.2.10.4. SectionSignalTimingPatternInventory

This is information for a single traffic signal in a signal section timing pattern inventory. This is the same as the SectionSignalTimingPatternInventory data frame in TMDD 3.3.19.10.

Attribute Name	Type/Element	Reference	CC Required
Intersection-Id	Element		Yes
Cycle-Length	Element		Yes
Offset-Time	Element		Yes
Phase-Tp-List	Type: Sequence of "IntersectionSignalTPInventoryPhase" types	TMDD 3.3.12.21	Yes
Sequence-Information	Type: Sequence of "IntersectionSignalSequenceData" types	TMDD 3.3.12.16	Yes-when applicable

3.4.2.10.5. SectionControlScheduleExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the SectionControlSchedule data frame (TMDD 3.3.19.4).

Attribute Name	Type/Element	Description	CC Required
Section-Schedule-Hub	Type: AssetScheduleHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.4.2.10.6. SectionTimingPatternInventoryExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the SectionTimingPatternInventory data frame (TMDD 3.3.19.8).

Attribute Name	Type/Element	Description	CC Required
Section-Plan-Inventory-Hub	Type: AssetPlanHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.4.2.11. *TransportationNetwork Class*

3.4.2.11.1. *TrafficNetworkInformationRequest*

This is the information required to request an inventory or status of network links, nodes, or routes. This is the same as the TrafficNetworkInformationRequest data frame in TMDD 3.3.20.1.

Attribute Name	Type/Element	Reference	CC Required
Authentication	Type: Authentication	TMDD 3.3.3.1	Yes - when applicable
Organization-Requesting	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Network-Information-Type	Element		Yes
Network-Identifiers	Element: Sequence of "Transportation-network-identifier" types		Yes-when applicable
Roadway-Network-Id-List	Element: Sequence of "Transportation-network-identifier" types		Yes-when applicable

3.4.2.12. *Transit Class*

These objects are defined by files in GTFS (General Transit Feed Specification) and are included per System Requirements specs 8.2.2, 8.2.6 and 8.7.1.2.

3.4.2.12.1. *Agency*

This is the layout of the Agency.txt GTFS file which defines one or more transit agencies that provide the data in this feed.

Attribute Name	Type/Element	Reference
Agency_Id	Element	
Agency_Name	Element	
Agency_Url	Element	
Agency_Timezone	Element	
Agency_Lang	Element	
Agency_Phone	Element	
Agency_Fare_Url	Element	

3.4.2.12.2. Stops

This is based on the layout of the stops.txt GTFS file which defines individual locations where vehicles pick up or drop off passengers.

Attribute Name	Type/Element	Reference	Description
Stop_Id	Element		
Stop_Code	Element		
Stop_Name	Element		
Stop_Desc	Element		
Stop_Lat	Element		
Stop_Lon	Element		
Zone_Id	Element		
Stop_Url	Element		
Location_Type	Element		
Parent_Station	Element		
Stop_Timezone	Element		
Wheelchair_Boarding	Element		
Park_And_Ride_Facility_Exists	Element: Yes/No	System Requirements spec 8.7.1.2	Indicates presence of park-and-ride facility at each station

3.4.2.12.3. Routes

This is the layout of the routes.txt GTFS file which defines transit routes. A route is a group of trips that are displayed to riders as a single service.

Attribute Name	Type/Element	Reference
Route_Id	Element	
Agency_Id	Element	
Route_Short_Name	Element	
Route_Long_Name	Element	
Route_Desc	Element	
Route_Type	Element	
Route_Url	Element	
Route_Color	Element	
Route_Text_Color	Element	

3.4.2.12.4. Trips

This is the layout of the trips.txt GTFS file which defines trips for each route. A trip is a sequence of two or more stops that occurs at a specific time.

Attribute Name	Type/Element	Reference
Route_Id	Element	
Service_Id	Element	
Trip_Id	Element	
Trip_Headsign	Element	
Trip_Short_Name	Element	
Direction_Id	Element	
Block_Id	Element	
Shape_Id	Element	
Wheelchair_Accessible	Element	
Bikes_Allowed	Element	

3.4.2.12.5. Stop_Times

This is the layout of the stop_times.txt GTFS file which defines times that a vehicle arrives at and departs from individual stops for each trip.

Attribute Name	Type/Element	Reference
Trip_Id	Element	
Arrival_Time	Element	
Departure_Time	Element	
Stop_Id	Element	
Stop_Sequence	Element	
Stop_Headsign	Element	
Pickup_Type	Element	
Drop_Off_Type	Element	
Shape_Dist_Traveled	Element	
Timepoint	Element	

3.4.2.12.6. Calendar

This is the layout of the calendar.txt GTFS file which defines dates for service IDs using a weekly schedule. Specify when service starts and ends, as well as days of the week where service is available.

Attribute Name	Type/Element	Reference
Service_Id	Element	
Monday	Element	
Tuesday	Element	
Wednesday	Element	
Thursday	Element	
Friday	Element	
Saturday	Element	
Sunday	Element	
Start_Date	Element	
End_Date	Element	

3.4.2.12.7. Calendar_Dates

This is the layout of the calendar_dates.txt GTFS file which defines exceptions for the service IDs defined in the calendar.txt file. If calendar_dates.txt includes ALL dates of service, this file may be specified instead of calendar.txt.

Attribute Name	Type/Element	Reference
Service_Id	Element	
Date	Element	
Exception_Type	Element	

3.4.2.12.8. Fare_Attributes

This is the layout of the fare_attributes.txt GTFS file which defines fare information for a transit organization's routes.

Attribute Name	Type/Element	Reference
Fare_Id	Element	
Price	Element	
Currency_Type	Element	
Payment_Method	Element	
Transfers	Element	
Transfer_Duration	Element	

3.4.2.12.9. Fare_Rules

This is the layout of the fare_rules.txt GTFS file which defines rules for applying fare information for a transit organization's routes.

Attribute Name	Type/Element	Reference
Fare_Id	Element	
Route_Id	Element	
Origin_Id	Element	
Destination_Id	Element	
Contains_Id	Element	

3.4.2.12.10. Shapes

This is the layout of the shapes.txt GTFS file which defines rules for drawing lines on a map to represent a transit organization's routes.

Attribute Name	Type/Element	Reference
Shape_Id	Element	
Shape_Pt_Lat	Element	
Shape_Pt_Lon	Element	
Shape_Pt_Sequence	Element	
Shape_Dist_Traveled	Element	

3.4.2.12.11. Frequencies

This is the layout of the frequencies.txt GTFS file which defines headway (time between trips) for routes with variable frequency of service.

Attribute Name	Type/Element	Reference
Trip_Id	Element	
Start_Time	Element	
End_Time	Element	
Headway_Secs	Element	
Exact_Times	Element	

3.4.2.12.12. Transfers

This is the layout of the transfers.txt GTFS file which defines rules for making connections at transfer points between routes.

Attribute Name	Type/Element	Reference
From_Stop_Id	Element	
To_Stop_Id	Element	
Transfer_Type	Element	
Min_Transfer_Time	Element	

3.4.2.12.13. Feed_Info

This is the layout of the feed_info.txt GTFS file which defines additional information about the feed itself, including publisher, version, and expiration information.

Attribute Name	Type/Element	Reference
Feed_Publisher_Name	Element	
Feed_Publisher_Url	Element	
Feed_Lang	Element	
Feed_Start_Date	Element	
Feed_End_Date	Element	
Feed_Version	Element	

3.5. LAYER: ASSET STATE

This layer contains the current status of each asset listed in the inventory, such as road closures or devices that are not working, or response crew availability.



Figure 6 - Asset State Layer

3.5.1. Data Messages

TMDD Data Message Dialogs include the following:

Name	Reference	Description
dlCCTVStatusRequest	TMDD 3.1.2.2	Request for CCTV status
dlCenterActiveVerificationRequest	TMDD 3.1.3.1	Request for Center Active/Not Active Status
dlCenterActiveVerificationSubscription	TMDD 3.1.3.2	Request for Subscription to Center Active/Not Active Status
dlDetectorStatusRequest	TMDD 3.1.4.2	Request for Detector status
dlDetectorMaintenanceHistoryRequest	TMDD 3.1.4.5	Request for Detector Maintenance History
dlDeviceControlStatusRequest	TMDD 3.1.5.2	Request for Status of Device Control Request
dlDMSStatusRequest	TMDD 3.1.6.2	Request for DMS status

Name	Reference	Description
dlESSStatusRequest	TMDD 3.1.7.2	Request for environmental sensor status
dlHARStatusRequest	TMDD 3.1.10.3	Request for HAR status
dlIntersectionSignalStatusRequest	TMDD 3.1.11.2	Request for Intersection Signal status
dlLCSSStatusRequest	TMDD 3.1.12.2	Request for LCS status
dlLinkStatusRequest	TMDD 3.1.13.2	Request for Link status
dlNodeStatusRequest	TMDD 3.1.14.2	Request for Node status
dlRampMeterStatusRequest	TMDD 3.1.16.2	Request for Ramp Meter status
dlRouteStatusRequest	TMDD 3.1.17.2	Request for Route status
dlSectionStatusRequest	TMDD 3.1.18.1	Request for Organizational Section status
dlSectionControlStatusRequest	TMDD 3.1.18.2	Request for status of section control request
dlVideoSwitchStatusRequest	TMDD 3.1.20.2	Request for Video Switch status
dlCCTVStatusUpdate	TMDD 3.1.21.2	Request for CCTV status update
dlDetectorStatusUpdate	TMDD 3.1.23.2	Request for Detector status update
dlDMSStatusUpdate	TMDD 3.1.24.3	Request for DMS status update
dlESSStatusUpdate	TMDD 3.1.25.2	Request for ESS status update
dlHARStatusUpdate	TMDD 3.1.28.3	Request for HAR status update
dlIntersectionSignalStatusUpdate	TMDD 3.1.29.3	Request for Intersection Signal status update
dlLCSSStatusUpdate	TMDD 3.1.30.2	Request for LCS status update
dlSectionStatusUpdate	TMDD 3.1.33.1	Request for Organizational Section status update
dlLinkStatusUpdate	TMDD 3.1.34.2	Request for Link status update
dlNodeStatusUpdate	TMDD 3.1.35.2	Request for Node status update
dlRouteStatusUpdate	TMDD 3.1.36.2	Request for Node status update
dlVideoSwitchStatusUpdate	TMDD 3.1.37.2	Request for Video Switch status update

Other messaging dialogs required include the following:

Name	Reference	Description
PARKING FACILITY	APTA TCIP-S-001 4.1.1 * or ISO/TS 18234-7:2013 **	State of parking facilities, including available spaces and occupancy rate.
TRANSIT	APTA TCIP-S-001 4.1.1 *	State of transit services.
FREIGHT	FRATIS ***	State of freight services.

* American Public Transportation Association Standard for Transit Communications Interface Profiles

** Intelligent transport systems -- Traffic and travel information via transport protocol experts group, generation 1 (TPEG1) binary data format -- Part 7: Parking information (TPEG1-PKI)

*** The standards used in the Freight Advanced Traveler Information Systems (FRATIS) bundle of applications.

3.5.2. Data Class Descriptions

Data Class Descriptions include data elements for basic objects. Data classes may be referenced in other data classes (parent classes), and may be referenced in multiple parent classes. These do not represent database structures, but instead are based primarily on TMDD, or are structured similarly. Database design is expected to occur during system design.

See the beginning of section 3 for a description of the "CC Required" column.

3.5.2.1. CCTV Class

3.5.2.1.1. CCTVStatus

This provides the CCTV status of a single CCTV device. This is similar to the CCTVStatus data frame in TMDD 3.3.2.4.

Attribute Name	Type/Element	Reference	CC Required
Device-Status-Header	Type: DeviceStatusHeader	TMDD 3.3.5.13	Yes
Cctv-Error	Element		No
Cctv-Image-List	Element: Sequence of "Cctv-image-supported" types		No

Attribute Name	Type/Element	Reference	CC Required
Cctv-Position-Preset	Element		No
Cctv-Position-Pan	Element		No
Cctv-Position-Tilt	Element		No
Cctv-Position-Zoom-Lens	Element		No
Cctv-Position-Iris-Lens	Element		No
Cctv-Position-Focus-Lens	Element		No
Cctv-Environmental-Status	Element		No
Cctv-Status-Ext (Extended: cc-extension.xsd)	Type: CCTVStatusExtended (Extended)		Yes - Only for CMS and Data Hub

3.5.2.1.2. CCTVStatusExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the CCTVStatus data frame (TMDD 3.3.2.4).

Attribute Name	Type/Element	Description	CC Required
CCTV-Status-Hub	Type: AssetDataHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.5.2.2. Connection Management Class

3.5.2.2.1. CenterActiveVerificationRequest

This is the information required to request active status of a center. This is the same as the CenterActiveVerificationRequest data frame in TMDD 3.3.3.2.

Attribute Name	Type/Element	Reference	CC Required
Authentication	Type: Authentication	TMDD 3.3.3.1	Yes
Organization-Requesting	Type: OrganizationInformation	TMDD 3.3.16.3	Yes

3.5.2.2.2. CenterActiveVerificationResponse

This is the information provided to indicate whether a center is active or not. This is similar to the CenterActiveVerificationResponse data frame in TMDD 3.3.3.3.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Center-Id	Element		Yes
Center-Name	Element		Yes
Center-Active-Ext (Extended: cc-extension.xsd)	Type: CenterActiveVerificationResponseExtended (Extended)		Yes - Only for CMS and Data Hub

3.5.2.2.3. CenterActiveVerificationResponseExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the CenterActiveVerificationResponse data frame (TMDD 3.3.3.3).

Attribute Name	Type/Element	Description	CC Required
Center-Active-Hub	Type: OrganizationInformationHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.5.2.3. Detector Class

3.5.2.3.1. DetectorMaintenanceHistoryRequest

This is a request for detector maintenance history for a list of detector devices. This is the same as the DetectorMaintenanceHistoryRequest data frame in TMDD 3.3.4.8.

Attribute Name	Type/Element	Reference	CC Required
Device-Information-Request-Header	Type: DeviceInformationRequest	TMDD 3.3.5.6	Yes
Detector-Station-Id	Element		Yes-when applicable

3.5.2.3.2. DetectorStatus

This is the status for an individual detector. This is the same as the DetectorStatus data frame in TMDD 3.3.4.9.

Attribute Name	Type/Element	Reference	CC Required
Detector-Station-Status-Header	Type: DeviceStatusHeader	TMDD 3.3.5.13	No
Detector-Status-List	Type: Sequence of "DetectorStatusDetails" types	TMDD 3.3.4.10	Yes

3.5.2.3.3. DetectorStatusDetails

This provides the details for the status of an individual sensor or station. This is similar to the DetectorStatusDetails data frame in TMDD 3.3.4.10.

Attribute Name	Type/Element	Reference	CC Required
Detector-Status-Header	Type: DeviceStatusHeader	TMDD 3.3.5.13	Yes
Detector-Lane-Number	Element		Yes-when applicable
Lane-Direction	Element		Yes-when applicable
Detector-Outputmode	Element		No
Detector-Status-Ext (Extended: cc-extension.xsd)	Type: DetectorStatusDetailsExtended (Extended)		Yes - Only for CMS and Data Hub

3.5.2.3.4. DetectorStatusDetailsExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the DetectorStatusDetails data frame (TMDD 3.3.4.10).

Attribute Name	Type/Element	Description	CC Required
Detector-Status-Hub	Type: AssetDataHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.5.2.4. Device Class

3.5.2.4.1. DeviceControlResponse

This is the confirmation or rejection of a device control request. This is the same as the DeviceControlResponse data frame in TMDD 3.3.5.3.

Attribute Name	Type/Element	Reference	CC Required
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Device-Id	Element		Yes
Request-Id	Element		Yes
Operator-Id	Element		Yes-when applicable
Operator-Lock-Id	Element		Yes-when applicable
Request-Status	Element		Yes
Operator-Last-Revised	Type: DateTimeZone	TMDD 3.3.10.1	No

3.5.2.4.2. DeviceControlStatusRequest

This is the information required to request the status of a previous device control request. This is the same as the DeviceControlStatusRequest data frame in TMDD 3.3.5.5.

Attribute Name	Type/Element	Reference	CC Required
Authentication	Type: Authentication	TMDD 3.3.3.1	Yes - when applicable
Organization-Requesting	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Device-Id	Element		Yes
Request-Id	Element		Yes

3.5.2.4.3. DeviceStatusHeader

This is the header information included with all device status information. This is the same as the DeviceStatusHeader data frame in TMDD 3.3.5.13.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Device-Id	Element		Yes
Device-Status	Element		Yes

Attribute Name	Type/Element	Reference	CC Required
Center-Id	Element		Yes-when applicable
Device-Comm-Status	Element		Yes-when applicable
Operator-Id	Element		Yes-when applicable
Event-Id	Element		Yes-when applicable
Response-Plan-Id	Element		Yes-when applicable
Last-Comm-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable

3.5.2.5. DMS Class

3.5.2.5.1. DMSStatus

This is the status of an individual dms device. This is based on the DMSStatus data frame in TMDD 3.3.6.13.

Attribute Name	Type/Element	Reference	Description	CC Required
Device-Status-Header	Type: DeviceStatusHeader	TMDD 3.3.5.13		Yes
Current-Message	Element			Yes
Message-Number	Element			No
Message-Time-Remaining	Element			No
Message-Source-Mode	Element			No
Message-Beacon	Element			No
Location-When-Not-In-Use	Element: Location where device is normally stored when not used	System Requirements spec 8.7.1.2	For each moveable DMS that may be used by the ICM system to disseminate information to travelers	Yes-when applicable (extended)
DMS-Status-Ext (Extended: cc-extension.xsd)	Type: DMSStatusExtended (Extended)		Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.5.2.5.2. DMSStatusExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the DMSStatus data frame (TMDD 3.3.6.13).

Attribute Name	Type/Element	Description	CC Required
DMS-Status-Hub	Type: AssetDataHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.5.2.6. ESS Classes

3.5.2.6.1. ESSSensorStatusDetails

This provides the status of a single environmental sensor. This is similar to the ESSSensorStatusDetails data frame in TMDD 3.3.7.13.

Attribute Name	Type/Element	Reference	CC Required
Device-Status-Header	Type: DeviceStatusHeader	TMDD 3.3.5.13	Yes
Sensor-Status-Details-Ext (Extended: cc-extension.xsd)	Type: ESSSensorStatusDetailsExtended (Extended)		Yes - Only for CMS and Data Hub

3.5.2.6.2. ESSStatus

This provides the status of a single environmental sensor station. This is similar to the ESSStatus data frame in TMDD 3.3.7.16.

Attribute Name	Type/Element	Reference	CC Required
Ess-Station-Status-Header	Type: DeviceStatusHeader	TMDD 3.3.5.13	Yes
Ess-Sensor-List	Type: Sequence of "ESSSensorStatusDetails" types	TMDD 3.3.7.13	Yes
Sensor-Status-Ext (Extended: cc-extension.xsd)	Type: ESSSensorStatusDetailsExtended (Extended)		Yes - Only for CMS and Data Hub

3.5.2.6.3. ESSSensorStatusDetailsExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the ESSStatus data frame (TMDD 3.3.7.16) and the the ESSSensorStatusDetails data frame (TMDD 3.3.7.13).

Attribute Name	Type/Element	Description	CC Required
Sensor-Status-Hub	Type: SensorDataHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.5.2.7. HAR Class

3.5.2.7.1. HARStatus

This provides the status of a single highway advisory radio device. This is the same as the HARStatus data frame in TMDD 3.3.11.7.

Attribute Name	Type/Element	Reference	CC Required
Device-Status-Header	Type: DeviceStatusHeader	TMDD 3.3.5.13	No
Har-Current-Message	Element		No
Message-Beacon	Element		No
Message-Number	Element		No

3.5.2.8. IntersectionSignal Class

3.5.2.8.1. IntersectionSignalOverlapStatusGroup

This provides the active signal indications for a group of overlap phases for a single intersection signal. This is the same as the IntersectionSignalOverlapStatusGroup data frame in TMDD 3.3.12.10.

Attribute Name	Type/Element	Reference	CC Required
Overlap-Status-Group-Number	Element		No
Overlap-Status-Group-Greens	Element		No
Overlap-Status-Group-Yellows	Element		No

Attribute Name	Type/Element	Reference	CC Required
Overlap-Status-Group-Reds	Element		No

3.5.2.8.2. IntersectionSignalPhaseSplit

This describes the time in tenths of a second that a intersection signal phase is allowed to receive. This is the same as the IntersectionSignalPhaseSplit data frame in TMDD 3.3.12.11.

Attribute Name	Type/Element	Reference	CC Required
Phase-Identifier	Element		Yes
Phase-Duration	Element		Yes

3.5.2.8.3. IntersectionSignalPhaseStatusGroup

This provides the active signal indications for a group of phases for an intersection signal. This is based on the IntersectionSignalPhaseStatusGroup data frame in TMDD 3.3.12.12.

Attribute Name	Type/Element	Reference	Description	CC Required
Phase-Status-Group-Number	Element			Yes
Phase-Status-Group-Greens	Element			Yes
Phase-Status-Group-Yellows	Element			Yes-when applicable
Phase-Status-Group-Reds	Element			Yes-when applicable
Phase-Status-Group-Walks	Element			No
Phase-Status-Group-Pedclears	Element			No
Phase-Status-Group-Dontwalks	Element			No
Phase-Status-Group-Right-On-Red-Prohib	Element: Yes/No for each phase	System Requirements spec 8.7.1.3	For each signalized intersection under ICM management. Indicates whether right turns on red movements are prohibited. Enhances Phase-Status- Group-Reds.	Yes-when applicable (Extended)

3.5.2.8.4. IntersectionSignalRingStatus

This provides that status of the phases of a signal ring. This is the same as the IntersectionSignalRingStatus data frame in TMDD 3.3.12.15.

Attribute Name	Type/Element	Reference	CC Required
Ring-Identifier	Element		Yes
Ring-Status	Element		Yes

3.5.2.8.5. IntersectionSignalStatus

This provides the status for a single intersection signal. This is based on the IntersectionSignalStatus data frame in TMDD 3.3.12.18.

Attribute Name	Type/Element	Reference	Description	CC Required
Device-Status-Header	Type: DeviceStatusHeader	TMDD 3.3.5.13		Yes
Signal-Control-Source	Element			Yes
Planned-Signal-Timing-Mode	Element			Yes
Current-Signal-Timing-Mode	Element			Yes
Section-Id	Element			Yes-when applicable
Planned-Signal-Timing-Mode-Description	Element			Yes-when applicable
Timing-Pattern-Id-Current	Element			Yes-when applicable
Timing-Pattern-Description	Element			Yes-when applicable
Actuation-Mode	Element			Yes-when applicable
Timing-Phase-Plan-Mode	Element			Yes-when applicable
Cycle-Length-Planned	Element			Yes-when applicable
Cycle-Length-Current	Element			Yes-when applicable
Cycle-Length-Previous	Element			Yes-when applicable
Cycle-Length-Master	Element			Yes-when applicable

Attribute Name	Type/Element	Reference	Description	CC Required
Cycle-Counter	Element			Yes-when applicable
Cycle-Counter-Master	Element			Yes-when applicable
Offset-Reference	Element			Yes-when applicable
Offset-Time-Planned	Element			Yes-when applicable
Offset-Time-Current	Element			Yes-when applicable
Offset-Time-Previous	Element			Yes-when applicable
Controller-Timestamp	Type: DateTimeZone	TMDD 3.3.10.1		Yes-when applicable
Phase-Split-List	Type: Sequence of "IntersectionSignalPhaseSplit" types	TMDD 3.3.12.11		Yes-when applicable
Ring-Status-List	Type: Sequence of "IntersectionSignalRingStatus" types	TMDD 3.3.12.15		Yes-when applicable
Phase-Status	Type: Sequence of "IntersectionSignalPhaseStatusGroup" types	TMDD 3.3.12.12		Yes-when applicable
Overlap-Status	Type: Sequence of "IntersectionSignalOverlapStatusGroup" types	TMDD 3.3.12.10		No
Active-Special-Functions-List	Element: Sequence of "Organization-resource-identifier" types			No
Preempt-Priority-Description	Element			No
Ab3418e-Controller (Extended)	Type: "ab3418eControllerExt" (Extended)		Contains status details for controllers designed to the AB3418E protocol	Yes-when applicable (Extended)
Operation-Agency	Element: Agency responsible for the operation of the intersection	System Requirements spec 8.7.1.3	For each signalized intersection under ICM management	Yes-when applicable
Maintenance-Agency	Element: Agency responsible for maintenance of the intersection	System Requirements spec 8.7.1.3	For each signalized intersection under ICM management	Yes-when applicable

Attribute Name	Type/Element	Reference	Description	CC Required
Operation-Alteration-Authorization	Element: Binary-unknown-flag (Extended)	System Requirements spec 8.5.2.2	Indicates whether changes to the operation of this signalized intersection are authorized.	Yes-when applicable
Signal-Status-Ext (Extended: cc-extension.xsd)	Type: IntersectionSignal StatusExt (Extended)		Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.5.2.8.6. ab3418eControllerExt

This extended data frame provides the status for a single intersection signal designed to the AB3814 protocol. This is based on the GetStatus8 Message from the AB3814E standard and these elements will be used instead of many of the elements in the IntersectionSignalStatus data frame in TMDD 3.3.12.18.

Attribute Name	Type/Element	Reference	Description	CC Required
flags	Element: Byte		additional flags Bit 0 <--> focus (default 0 - no focus) Bits 1-7 <--> reserved unused	Yes-when applicable
status	Element: Byte		format identical to AB3418 GetShortStatus "status" byte	Yes-when applicable
pattern	Element: Byte		format identical to AB3418 GetShortStatus "pattern" byte	Yes-when applicable
green-yellow-overlap	Element: Byte		Bits 0-3 <--> Green overlaps A-D Bits 4-7 <--> Yellow overlaps A-D	Yes-when applicable
preemption	Element: Byte		Bits 0-3 <--> EV A-D Bits 4-5 <--> RR 1-2 Bit 6 = pattern transition Bit 7 unused	Yes-when applicable
phase-call	Element: Byte		format identical to AB3418 GetShortStatus "green" byte	Yes-when applicable
ped-call	Element: Byte		format identical to AB3418 GetShortStatus "green" byte	Yes-when applicable
active-phase	Element: Byte		Bits 0-7 <--> Phases 1-8 Bit set true for phase active	Yes-when applicable

Attribute Name	Type/Element	Reference	Description	CC Required
interval	Element: Byte		Bits 0-3 <--> Ring 0 interval Bits 4-7 <--> Ring 1 interval Interval encoding: 0x00 = Walk 0x01 = Don't Walk 0x02 = Min Green 0x03 = (Unused) 0x04 = Added Initial 0x05 = Passage - Resting 0x06 = Max Gap 0x07 = Min Gap 0x08 = Red Rest 0x09 = Preemption 0x0A = Stop Time 0x0B = Red Revert 0x0C = Max Termination 0x0D = Gap Termination 0x0E = Force Off 0x0F = Red Clearance	Yes-when applicable
presence1	Element: Byte		Bits 0-7 <--> Detector 1-8 Presence bits set true for positive presence	Yes-when applicable
presence2	Element: Byte		Bits 0-7 <--> Detector 9-16	Yes-when applicable
presence3	Element: Byte		Bits 0-7 <--> Detector 17-24	Yes-when applicable
presence4	Element: Byte		Bits 0-3 <--> Detector 25-28 Bits 4-7 unused	Yes-when applicable
master-clock	Element: Byte		Master background cycle clock. Counts up to cycle length.	Yes-when applicable
local-clock	Element: Byte		Local cycle clock. Counts up to cycle length.	Yes-when applicable

3.5.2.8.7. IntersectionSignalStatusExt

This extended data frame contains additional data for the IntersectionSignalStatus data frame (TMDD 3.3.12.18).

Attribute Name	Type/Element	Description	CC Required
Signal-Status-Hub (Extended: cc-extension.xsd)	Type: AssetDataHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

Attribute Name	Type/Element	Description	CC Required
Signal-Status-Mccain (Extended)	Type: IntersectionSignalStatusMccain (Extended)	Additional information used in McCain implementations	Yes-when applicable Only for McCain implementations
Ab3418e-Controller (Extended)	Type: ab3418eControllerExt (Extended)	Contains status details for controllers designed to the AB3418E protocol	Yes - Only for CMS and Data Hub

3.5.2.8.8. IntersectionSignalStatusMccain

This extended data frame provides extra information in the IntersectionSignalStatusExt data frame for McCain implementations.

Attribute Name	Type/Element	Description	CC Required
Active-Interval	Element: PhaseNumber		Yes-when applicable (Extended)
Interval-Duration-Seconds	Element: Byte "IntervalDurationSecondsMccain" (Extended)		Yes-when applicable (Extended)
Interval-Duration-Percent	Element: Byte "IntervalDurationPercentMccain" (Extended)		Yes-when applicable (Extended)
Active-Alarm-List	Type: Sequence of elements: <ul style="list-style-type: none"> Active-Alarm (enumerated list of 75 values) "IntersectionSignalAlarmMccain" (Extended)		Yes-when applicable (Extended)

3.5.2.9. LCS Class

3.5.2.9.1. LCSStatus

This provides the status of a single lane control system device. This is similar to the LCSStatus data frame in TMDD 3.3.13.4.

Attribute Name	Type/Element	Reference	CC Required
Device-Status-Header	Element		Yes
Lane-Current-State	Element		Yes

Attribute Name	Type/Element	Reference	CC Required
Link-Direction	Element		Yes
LCS-Status-Ext (Extended: cc-extension.xsd)	Type: LCSStatusExtended (Extended)		Yes - Only for CMS and Data Hub

3.5.2.9.2. LCSStatusExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the LCSStatus data frame (TMDD 3.3.13.4).

Attribute Name	Type/Element	Description	CC Required
LCS-Status-Hub	Type: AssetDataHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.5.2.10. Link Class

3.5.2.10.1. LinkStatus

This provides the status of a list of links. This is the same as the LinkStatus data frame in TMDD 3.3.14.4.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization- Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Link-Status-List	Type: Sequence of "LinkStatusList" types	TMDD 3.3.14.5	Yes

3.5.2.10.2. LinkStatusList

This provides the status of an individual link. This is the same as the LinkStatusList data frame in TMDD 3.3.14.5.

Attribute Name	Type/Element	Reference	CC Required
Network-Id	Element		Yes
Link-Id	Element		Yes

Attribute Name	Type/Element	Reference	CC Required
Link-Name	Element		No
Link-Status	Element		Yes
Link-Direction	Element		No
Lanes-Number-Open	Element		No
Priority-Type	Element		No
Restriction-Axle-Count	Element		No
Restriction-Height	Element		No
Restriction-Length	Element		No
Restriction-Weight	Element		No
Restriction-Width	Element		No
Restriction-Weight-Axle	Element		No
Restriction-Units	Element		No
Surface-Condition	Element		No
Saturation-Flag	Element		No
Oversaturated-Threshold	Element		No
Level-Of-Service	Element		No
Lane-Numbers	Element: Sequence of "Link-lane-number" types		No
Link-Data-Stored	Element		No
Detection-Method	Element		No
Link-Traffic-Data-Algorithm	Element		No
Stops	Element		No
Delay	Element		No
Alternate-Route-Delay	Element		No
Headway	Element		No
Travel-Time	Element		No
Capacity-Existing	Element		No
Travel-Time-Increase	Element		No
Speed-Average	Element		No
Speed-Vehicle-Estimated	Element		No
Speed-Limit	Element		No
Advisory-Speed-Limit	Element		No
Truck-Speed-Limit	Element		No
Speed-Limit-Units	Element		No
Density	Element		No
Occupancy	Element		No
Volume	Element		No
Event-Description-Time	Element		No
Last-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes

3.5.2.11. Node Class

3.5.2.11.1. NodeStatus

This provides the status of a list of nodes. This is the same as the NodeStatus data frame in TMDD 3.3.15.3.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Node-Status-List	Type: Sequence of "NodeStatusList" types	TMDD 3.3.15.4	Yes

3.5.2.11.2. NodeStatusList

This provides the status of an individual node. This is the same as the NodeStatusList data frame in TMDD 3.3.15.4.

Attribute Name	Type/Element	Reference	CC Required
Network-Id	Element		Yes
Network-Name	Element		No
Node-Id	Element		Yes
Node-Name	Element		No
Node-Status	Element		Yes
Last-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes

3.5.2.12. Ramp Meter Classes

3.5.2.12.1. RampMeterLaneStatusDetails

This is the status of an individual ramp meter lane. This is based on the RampMeterLaneStatusDetails data frame in TMDD 3.3.17.7.

Attribute Name	Type/Element	Reference	Description	CC Required
Metered-Lane-Status-Header	Type: DeviceStatusHeader	TMDD 3.3.5.13		Yes
Meter-Implemented-Action	Element			Yes
Requested-Meter-Command-Source	Element			Yes-when applicable

Attribute Name	Type/Element	Reference	Description	CC Required
Implemented-Meter-Command-Source	Element			Yes-when applicable
Meter-Implemented-Plan	Element			Yes-when applicable
Meter-Implemented-Rate	Element			Yes-when applicable
Meter-Implemented-Vehicles-Per-Green	Element			No
Meter-Requested-Action	Element			Yes-when applicable
Meter-Requested-Plan	Element			Yes-when applicable
Meter-Requested-Rate	Element			Yes-when applicable
Meter-Requested-Vehicles-Per-Green	Element			No
Operational-Min-Meter-Rate	Element			No
Operational-Max-Meter-Rate	Element			No
Meter-Demand-Detector-Status	Element			Yes-when applicable
Meter-Passage-Detector-Status	Element			Yes-when applicable
Meter-Queue-Detector-Status	Element			Yes-when applicable
Meter-Cycle-Count	Element			No
Metered-Lane-Vehicle-Count	Element			Yes-when applicable
Meter-Queue-Detected-Flag	Element			Yes-when applicable
Metered-Lane-Violation-Count	Element			No
HOV-Allow-Meter-Bypass	Element: Yes/No	System Requirements spec 8.7.1.2	Indicates whether HOV vehicles are allowed to bypass the ramp meter	Yes-when applicable (Extended)

3.5.2.12.2. RampMeterStatus

This is the status of a single ramp meter device. This is based on the RampMeterStatus data frame in TMDD 3.3.17.10.

Attribute Name	Type/Element	Reference	Description	CC Required
Device-Status-Header	Type: DeviceStatusHeader	TMDD 3.3.5.13		Yes
Metered-Status-List	Type: Sequence of "RampMeterLaneStatusDetails" types	TMDD 3.3.17.7		Yes
Mainline-Flow-Rate	Element			Yes-when applicable
Mainline-Vehicle-Occupancy	Element			Yes-when applicable
Mainline-Vehicle-Speed	Element			Yes-when applicable
Operation-Alteration-Authorization	Element: Binary-unknown-flag (Extended)	System Requirements spec 8.5.2.2	Will indicate whether metering changes are authorized.	Yes-when applicable (Extended)
Ramp-Status-Ext (Extended: cc-extension.xsd)	Type: RampMeterStatusExtended (Extended)		Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.5.2.12.3. RampMeterStatusExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the RampMeterStatus data frame (TMDD 3.3.17.10).

Attribute Name	Type/Element	Description	CC Required
Ramp-Status-Hub	Type: AssetDataHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.5.2.13. Route Class

3.5.2.13.1. RouteStatus

This provides the status of a list of routes. This is the same as the RouteStatus data frame in TMDD 3.3.18.3.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Route-Status-List	Type: Sequence of "RouteStatusList" types	TMDD 3.3.18.4	Yes

3.5.2.13.2. RouteStatusList

This provides the status of an individual route. This is the same as the RouteStatusList data frame in TMDD 3.3.18.4.

Attribute Name	Type/Element	Reference	CC Required
Network-Id	Element		Yes
Route-Id	Element		Yes
Route-Status	Element		Yes
Route-Name	Element		Yes-when applicable
Detour-Route-In-Effect-Flag	Element		Yes-when applicable
Surface-Condition	Element		No
Route-Capacity	Element		No
Level-Of-Service	Element		No
Saturation-Flag	Element		No
Route-Data-Stored-Type	Element		No
Route-Traffic-Data-Algorithm	Element		No
Delay	Element		Yes-when applicable
Alternate-Route-Delay	Element		No
Headway	Element		No
Travel-Time	Element		Yes-when applicable
Travel-Time-Increase	Element		Yes-when applicable
Volume	Element		No

Attribute Name	Type/Element	Reference	CC Required
Speed-Average	Element		Yes-when applicable
Density	Element		No
Occupancy	Element		No
Current-Speed-Advisory	Element		No
Speed-Limit-Units	Element		No
Event-Description-Time	Element		No
Last-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes

3.5.2.14. Section Class

3.5.2.14.1. SectionControlResponse

This provides the acceptance or rejection of a section control request. This is the same as the SectionControlResponse data frame in TMDD 3.3.19.3.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Section-Id	Element		Yes
Request-Id	Element		Yes
Operator-Id	Element		Yes-when applicable
Request-Status	Element		Yes
Operator-Last-Revised	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Request-Control-Mode	Element		No
Timing-Pattern-Id	Element		Yes-when applicable

3.5.2.14.2. SectionControlStatusRequest

This contains the information describing the control status of an individual traffic signal section. This is the same as the SectionControlStatusRequest data frame in TMDD 3.3.19.5.

Attribute Name	Type/Element	Reference	CC Required
Authentication	Type: Authentication	TMDD 3.3.3.1	Yes-when applicable
Organization-Requesting	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Section-Id	Element		Yes
Request-Id	Element		Yes

3.5.2.15. VideoSwitch Class

3.5.2.15.1. VideoSwitchDeviceStatus

This provides the status of an individual video switch. This is similar to the VideoSwitchDeviceStatus data frame in TMDD 3.3.21.2.

Attribute Name	Type/Element	Reference	CC Required
Device-Status-Header	Type: DeviceStatusHeader	TMDD 3.3.5.13	Yes
Switched-Channel-List	Type: Sequence of "VSSwitchedChannelData" types	TMDD 3.3.21.4	Yes
Switch-Status-Ext (Extended: cc-extension.xsd)	Type: VideoSwitchDeviceStatusExtended (Extended)		Yes - Only for CMS and Data Hub

3.5.2.15.2. VSSwitchedChannelData

This provides the I/O channel assignments for a video switch. This is the same as the VSSwitchedChannelData data frame in TMDD 3.3.21.4.

Attribute Name	Type/Element	Reference	CC Required
Input-Channel-Id	Element		Yes
Output-Channel-Id	Element		Yes
Channel-Titling-Text	Element		No

3.5.2.15.3. VideoSwitchDeviceStatusExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the VideoSwitchDeviceStatus data frame (TMDD 3.3.21.2).

Attribute Name	Type/Element	Description	CC Required
Switch-Status-Hub	Type: AssetDataHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.6. LAYER: ASSET REAL-TIME DATA

This layer contains the real-time data reported by each device or asset such as the data contained in the PeMS and IEN data feed, and requests to control assets in the corridor. It is likely that during system design that system performance requirements, coupled with the high data volume and throughput requirements, will be the primary drivers of data transmission, persistence, and retrieval methods and formats. Actual formats may be significantly different than those listed in this section.

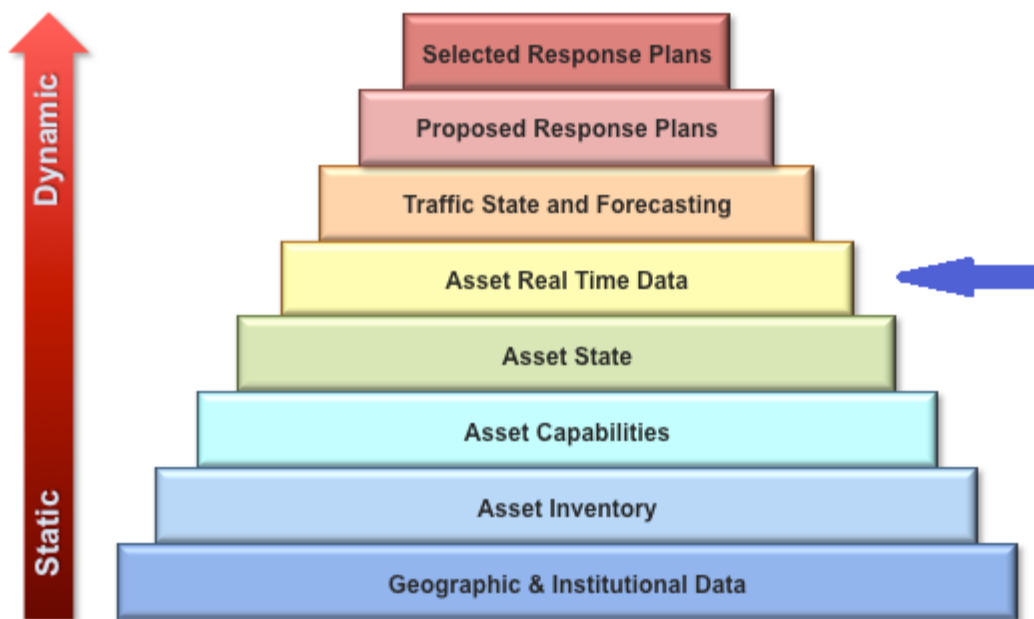


Figure 7 - Asset Real-Time Data Layer

3.6.1. Data Messages

TMDD Data Message Dialogs include the following:

Name	Reference	Description
dIldetectorDataRequest	TMDD 3.1.4.3	Request for detector data
dIldetectorDataSubscription	TMDD 3.1.4.4	Request for Subscription to detector data
dIldmsMessageAppearanceRequest	TMDD 3.1.6.5	Request for Status of Device Control Request
dIlessoObservationMetadataRequest	TMDD 3.1.7.3	Request for ESS Observation Metadata
dIlessoObservationReportRequest	TMDD 3.1.7.4	Request for ESS Observation Report

Name	Reference	Description
dlFullEventUpdateRequest	TMDD 3.1.8.1	Request for update on all events
dlEventIndexRequest	TMDD 3.1.8.2	Request for index of events
dlFullEventUpdateSubscription	TMDD 3.1.8.4	Request for subscription to event updates
dlEventIndexSubscription	TMDD 3.1.8.5	Request for subscription to event index
dlDetectorDataUpdate	TMDD 3.1.23.3	Request for detector data update
dlESSObservationReportUpdate	TMDD 3.1.25.3	Request for ESS observations
dlFullEventUpdateUpdate	TMDD 3.1.26.1	Event Update
dlEventIndexUpdate	TMDD 3.1.26.2	EventIndexUpdate

Other messaging dialogs required include the following:

Name	Reference	Description
TRANSIT	APTA TCIP-S-001 4.1.1 *	Contains location information for transit assets. May also contain ridership and rider capacity data if available.
FREIGHT	FRATIS **	Contains location information for freight assets.
PROBES	Dependent upon data provider(s) selected	Contains probe data including probe identity (anonymous), geospatial location, and speed.

* American Public Transportation Association Standard for Transit Communications Interface Profiles

** The standards used in the Freight Advanced Traveler Information Systems (FRATIS) bundle of applications.

3.6.2. Data Class Descriptions

Data Class Descriptions include data elements for basic objects. Classes may be referenced in other classes (parent classes), and may be referenced in multiple parent classes. These do not represent database structures, but instead are based primarily on TMDD, or are structured similarly. Database design is expected to occur during system design.

See the beginning of section 3 for a description of the "CC Required" column.

3.6.2.1. Detector Class

3.6.2.1.1. DetectorData

This provides the data for a single detector station or sensor. This is similar to the DetectorData data frame in TMDD 3.3.4.1.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Detector-Data-List	Type: Sequence of "DetectorDataDetail" types	TMDD 3.3.4.2	Yes
Detector-Data-Ext (Extended: cc-extension.xsd)	Type: DetectorDataExtended (Extended)	Additional detector data information used by CMS and the Data Hub	Yes - Only for CMS and Data Hub

3.6.2.1.2. DetectorDataDetail

This provides the detail information for an individual detector or station. This is the same as the DetectorDataDetail data frame in TMDD 3.3.4.2.

Attribute Name	Type/Element	Reference	CC Required
Station-Id	Element		Yes-when applicable
Detector-Id	Element		Yes
Detection-Time-Stamp	Type: DateTimeZone	TMDD 3.3.10.1	Yes
Vehicle-Count	Element		Yes-when applicable
Vehicle-Occupancy	Element		Yes-when applicable
Start-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
End-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Detector-Data-Type	Element		Yes-when applicable
Vehicle-Speed	Element		Yes-when applicable
Queue-Length	Element		Yes-when applicable
Vehicle-Stops	Element		Yes-when applicable

Attribute Name	Type/Element	Reference	CC Required
Vehicle-Count-Bin1	Element		No
Vehicle-Count-Bin2	Element		No
Vehicle-Count-Bin3	Element		No
Vehicle-Count-Bin4	Element		No
Vehicle-Count-Bin5	Element		No
Vehicle-Count-Bin6	Element		No
Vehicle-Count-Bin7	Element		No
Detector-Status	Element		Yes-when applicable

3.6.2.1.3. DetectorDataRequest

This provides information required for a request for detector data for one or more sensors or stations. This is the same as the DetectorDataRequest data frame in TMDD 3.3.4.3.

Attribute Name	Type/Element	Reference	CC Required
Device-Information-Request-Header	Type: DeviceInformationRequest	TMDD 3.3.5.6	Yes
Detector-Station-Id	Element		Yes-when applicable
Detector-Data-Type	Element		Yes-when applicable

3.6.2.1.4. DetectorDataHub

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional Data Hub-specific data for the DetectorDataExtended data frame.

Attribute Name	Type/Element	Description	CC Required
Hub-Org-Id	Element: Hash-Sequence-Id	Unique organization ID	Yes - Only for CMS and Data Hub
Hub-Sensor-Id	Element: Hash-Sequence-Id	Unique asset ID across all organizations	Yes - when applicable. Only for CMS and Data Hub
Inventory-Check	Element: Enumerated: Pass (1), Fail: In inventory but missing data (2) Fail: Not in inventory (3)	Indicates when inventory is not as expected	Yes - Only for CMS and Data Hub

Attribute Name	Type/Element	Description	CC Required
Flow-Balance-Check	Type: FlowBalanceResult (Extended)	Contains results of flow balance validation checks	Yes - when applicable. Only for CMS and Data Hub
Data-Value-Check	Type: Element: Enumerated: Pass (1), Fail (2)	Contains results of data value validation checks	Yes - when applicable. Only for CMS and Data Hub

3.6.2.1.5. FlowBalanceResult

This extended data frame is only for internal use in the Data Hub.

This extended data frame contains results of flow balance checks.

Attribute Name	Type/Element	Description	CC Required
Flow-Bal-Test-Id	Element: Integer	ID of the validation test	Yes - Only for CMS and Data Hub
Flow-Bal-Result	Element: Enumerated: Pass (1), Fail (2)	Validation test result	Yes - Only for CMS and Data Hub

3.6.2.1.6. DetectorDataExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the DetectorData data frame (TMDD 3.3.4.1).

Attribute Name	Type/Element	Description	CC Required
Detector-Data-Hub (Extended)	Type: DetectorDataHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.6.2.2. Device Class

3.6.2.2.1. DeviceReference

This provides a reference to a device via an identifier and type. This is the same as the DeviceReference data frame in TMDD 3.3.5.12.

Attribute Name	Type/Element	Reference	CC Required
Device-Id	Element		Yes
Device-Type	Element		Yes-when applicable

3.6.2.3. ESS Class

3.6.2.3.1. ESSClimateRecordDetail

This provides the monthly average low and high for a specific environmental sensor site. This is the same as the ESSClimateRecordDetail data frame in TMDD 3.3.7.1.

Attribute Name	Type/Element	Reference	CC Required
Climate-Observation-Month	Element		Yes
Climate-Observation-Month-Min-Value	Element		Yes
Climate-Month-Max-Value	Element		Yes

3.6.2.3.2. ESSImageInformation

This provides the metadata for an ESS image. This is the same as the ESSImageInformation data frame in TMDD 3.3.7.3.

Attribute Name	Type/Element	Reference	CC Required
Image-Description	Element		Yes
Image-Url	Element		Yes

3.6.2.3.3. ESSObservationDataSetMetadataDetail

This provides the ESS metadata for a specific station, sensor, climate record and site. This is the same as the ESSObservationDataSetMetadataDetail data frame in TMDD 3.3.7.6.

Attribute Name	Type/Element	Reference	CC Required
Ess-Data-Set-File-Name	Element		Yes
Ess-Data-Set-File-Directory-Path	Element		Yes
Ess-Data-Set-File-Access-Protocol	Element		Yes
Ess-Data-Set-File-Access-Address	Element		Yes
Ess-Data-Set-File-Access-Port-Address	Element		Yes
Ess-Observation-Collection-Frequency	Element		Yes
Ess-Observation-Collection-Offset	Element		Yes
Ess-Host-Server-Offset-Minutes	Element		Yes
Ess-Host-Server-Time-Zone	Element		Yes
Ess-Host-Server-Daylight-Savings-In-Effect-Flag	Element		Yes
User-Id	Element		No
Password	Element		No

3.6.2.3.4. ESSObservationMetadata

This provides the metadata for an individual ESS device. This is the same as the ESSObservationMetadata data frame in TMDD 3.3.7.7.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Ess-Observation-Data-Set-Metadata	Type: ESSObservationDataSetMetadataDetail	TMDD 3.3.7.6	Yes
Ess-Collector-Configuration	Type: Sequence of "ESSObservationMetadataItem" types	TMDD 3.3.7.8	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	No
Ess-Sensor-Metadata-List	Type: Sequence of "ESSSensorMetadataDetail" types	TMDD 3.3.7.12	No
Site-Information	Type: ESSSiteMetadataDetail	TMDD 3.3.7.14	No
Station-Information	Type: ESSStationMetadataDetail	TMDD 3.3.7.15	No
Climate-Record-Information	Type: ESSClimateRecordDetail	TMDD 3.3.7.1	No
Data-Collector-Information	Type: ESSDataCollectorInformation	TMDD 3.3.7.2	No
Image-Information	Type: ESSImageInformation	TMDD 3.3.7.3	No

3.6.2.3.5. ESSObservationMetadataItem

This provides an observation positional order, name, units, and scaling factor. This is the same as the ESSObservationMetadataItem data frame in TMDD 3.3.7.8.

Attribute Name	Type/Element	Reference	CC Required
Ess-Observation-Positional-Order	Element		Yes
Ess-Observation-Label	Element		Yes
Ess-Observation-Type	Element		No
Ess-Observation-Null-Value	Element		No
Ess-Observation-Units	Element		Yes
Ess-Observation-Decimal-Scaling-Factor	Element		Yes

3.6.2.3.6. ESSObservationReport

This provides the ESS observation reports for a specific set of devices. This is similar to the ESSObservationReport data frame in TMDD 3.3.7.9.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Station-Id	Element		Yes
Ess-Data-List	Type: Sequence of "ESSObservationReportDetail" types	TMDD 3.3.7.10	Yes
Sensor-Data-Ext (Extended: cc-extension.xsd)	Type: ESSObservationReportDetailExtended (Extended)		Yes - Only for CMS and Data Hub

3.6.2.3.7. ESSObservationReportDetail

This provides the ESS observation report detail information for an individual device. This is similar to the ESSObservationReportDetail data frame in TMDD 3.3.7.10.

Attribute Name	Type/Element	Reference	CC Required
Ess-Sensor-Id	Element		Yes
Ess-Observation-Timestamp	Type: DateTimeZone	TMDD 3.3.10.1	Yes

Attribute Name	Type/Element	Reference	CC Required
Ess-Observation-Type	Type: ESSObservationType	TMDD 3.3.7.11	Yes
Sensor-Data-Detail-Ext (Extended: cc-extension.xsd)	Type: ESSObservationReportDetailExtended (Extended)		Yes - Only for CMS and Data Hub

3.6.2.3.8. ESSObservationType

This provides a block of ESS observation data, either weather, pavement, or subsurface. This is the same as the ESSObservationType data frame in TMDD 3.3.7.11.

Attribute Name	Type/Element	Reference	CC Required
Weather-Data	Type: EssWeatherBlock	TMDD 3.6.4.6	Yes
Pavement-Data	Type: EssPavementBlock	TMDD 3.6.4.29	Yes
Subsurface-Data	Type: EssSubSurfaceData	TMDD 3.6.4.30	Yes

3.6.2.3.9. EssWeatherBlock

This provides a block of ESS weather data provided in an OER encoded string. This is the same as the EssWeatherBlock in TMDD 3.6.4.6.

Attribute Name	Type/Element	Reference	CC Required
EssWeatherBlock	Element		Yes

3.6.2.3.10. EssPavementBlock

This provides a block of ESS pavement data provided in an OER encoded string. This is the same as the EssPavementBlock in TMDD 3.6.4.29.

Attribute Name	Type/Element	Reference	CC Required
EssPavementBlock	Element		Yes

3.6.2.3.11. EssSubSurfaceData

This provides a block of ESS subsurface data provided in an OER encoded string. This is the same as the EssSubSurfaceData in TMDD 3.6.4.30.

Attribute Name	Type/Element	Reference	CC Required
EssSubSurfaceData	Element		Yes

3.6.2.3.12. ESSObservationReportDetailExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the ESSObservationReport data frame (TMDD 3.3.7.9) and the the ESSObservationReportDetail data frame (TMDD 3.3.7.10).

Attribute Name	Type/Element	Description	CC Required
Sensor-Data-Hub	Type: SensorDataHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.6.2.4. Event Class

3.6.2.4.1. AdditionalText

This provides additional event information, notes, comments, etc. This is the same as the AdditionalText data frame in TMDD 3.3.8.2.

Attribute Name	Type/Element	Reference	CC Required
Description	Element		Yes
Language	Element		No
Report-Medium	Element		No

3.6.2.4.2. AlternateRouteDetail

This provides an alternate route for an event. This is based on the AlternateRouteDetail data frame in TMDD 3.3.8.3.

Attribute Name	Type/Element	Reference	Description	CC Required
Alternate-Route-Type	Element			Yes
Destination	Type: LandmarkLocation	TMDD 3.3.8.33		No
Location-On-Alternate-Route	Type: Sequence of "LinkLocation" types	TMDD 3.3.8.34		No

3.6.2.4.3. AreaLocation

This provides area and location information for an event. This is the same as the AreaLocation data frame in TMDD 3.3.8.4.

Attribute Name	Type/Element	Reference	CC Required
Area-Id	Element		No
Area-Name	Element		No
Location-Rank	Element		No
Upward-Area-Reference	Type: AreaLocation	TMDD 3.3.8.4	No

3.6.2.4.4. DataExtent

This provides information regarding the spatial qualities of the event. This is the same as the DataExtent data frame in TMDD 3.3.8.5.

Attribute Name	Type/Element	Reference	CC Required
Length-Affected	Element		No
Proportion-Affected	Element		No
Above-Altitude	Element		No
Below-Altitude	Element		No

3.6.2.4.5. DataIncidentDetails

This provides vehicle and human injury/fatalities associated with the event. This is the same as the DataIncidentDetails data frame in TMDD 3.3.8.6.

Attribute Name	Type/Element	Reference	CC Required
Vehicles-Involved-Count	Element		Choice: select one
Cars-Involved-Count	Element		Choice: select one
Trucks-Involved-Count	Element		Choice: select one
Buses-Involved-Count	Element		Choice: select one
Human-Fatalities-Count	Element		Choice: select one
Human-Injuries-Count	Element		Choice: select one
Human-Major-Injuries-Count	Element		Choice: select one
Human-Minor-Injuries-Count	Element		Choice: select one

3.6.2.4.6. DataLinkRestrictions

This provides vehicle and speed restrictions on a road link. This is the same as the DataLinkRestrictions data frame in TMDD 3.3.8.7.

Attribute Name	Type/Element	Reference	CC Required
Speed-Limit-Advisory	Element		Choice: select one
Speed-Limit	Element		Choice: select one
Speed-Limit-Truck	Element		Choice: select one
Restriction-Length	Element		Choice: select one
Restriction-Height	Element		Choice: select one
Restriction-Width	Element		Choice: select one
Restriction-Weight-Vehicle	Element		Choice: select one
Restriction-Weight-Axle	Element		Choice: select one
Restriction-Axle-Count	Element		Choice: select one

3.6.2.4.7. DataLinkState

This provides the current state of a road link. This is the same as the DataLinkState data frame in TMDD 3.3.8.8.

Attribute Name	Type/Element	Reference	CC Required
Delay	Element		Choice: select one
Peak-Delay	Element		Choice: select one
Alternate-Route-Delay	Element		Choice: select one
Alternate-Route-Peak-Delay	Element		Choice: select one

Attribute Name	Type/Element	Reference	CC Required
Headway	Element		Choice: select one
Travel-Time	Element		Choice: select one
Capacity-Existing	Element		Choice: select one
Travel-Time-Increase	Element		Choice: select one
Speed-Average	Element		Choice: select one
Speed-Vehicle-Estimated	Element		Choice: select one
Description-Time	Element		Choice: select one
Density	Element		Choice: select one
Occupancy	Element		Choice: select one
Volume	Element		Choice: select one

3.6.2.4.8. DataParking

This provides the current state of parking. This is the same as the DataParking data frame in TMDD 3.3.8.9.

Attribute Name	Type/Element	Reference	CC Required
Parking-Spaces	Element		Choice: select one
Parking-Occupancy	Element		Choice: select one

3.6.2.4.9. DataRoadWeather

This provides the current state of weather. This is the same as the DataRoadWeather data frame in TMDD 3.3.8.10.

Attribute Name	Type/Element	Reference	CC Required
Avg-Wind-Direction	Element		Choice: select one
Avg-Wind-Speed	Element		Choice: select one
Avg-Wind-Gust-Speed	Element		Choice: select one
Air-Temperature	Element		Choice: select one
Dewpoint-Temp	Element		Choice: select one
Max-Temp	Element		Choice: select one
Min-Temp	Element		Choice: select one
Relative-Humidity	Element		Choice: select one
Atmospheric-Pressure	Element		Choice: select one
Precip-Rate	Element		Choice: select one
Snowfall-Accum-Rate	Element		Choice: select one
Visibility	Element		Choice: select one
Uv-Index	Element		Choice: select one
Probability	Element		Choice: select one

3.6.2.4.10. DataSurfaceConditions

This provides the current state of surface conditions. This is the same as the DataSurfaceConditions data frame in TMDD 3.3.8.11.

Attribute Name	Type/Element	Reference	CC Required
Water-Depth	Element		Choice: select one
Adjacent-Snow-Depth	Element		Choice: select one
Roadway-Snow-Depth	Element		Choice: select one
Roadway-Snow-Pack-Depth	Element		Choice: select one
Ice-Thickness	Element		Choice: select one
Surface-Temperature	Element		Choice: select one
Pavement-Temperature	Element		Choice: select one
Surface-Water-Depth	Element		Choice: select one
Surface-Salinity	Element		Choice: select one
Surface-Freeze-Point	Element		Choice: select one
Mobile-Friction	Element		Choice: select one

3.6.2.4.11. EventAdvice

This provides information regarding advisories associated with the event. This is the same as the EventAdvice data frame in TMDD 3.3.8.12.

Attribute Name	Type/Element	Reference	CC Required
Suggestion	Element		Choice: select one
Warning	Element		Choice: select one
Instruction-Recommendation	Element		Choice: select one
Instruction-Mandatory	Element		Choice: select one
Alternate-Route	Element		Choice: select one

3.6.2.4.12. EventComments

This provides event comment information. This is the same as the EventComments data frame in TMDD 3.3.8.13.

Attribute Name	Type/Element	Reference	CC Required
Event-Comment	Element		Yes
Operator-Id	Element		No
Operator-Comment	Element		No
Language	Element		No

3.6.2.4.13. EventDescription

This is the same as the EventDescription data frame in TMDD 3.3.8.14.

Attribute Name	Type/Element	Reference	CC Required
Phrase	Type: EventType	TMDD 3.3.8.29	Choice: select one
Cause	Type: EventType	TMDD 3.3.8.29	Choice: select one
Advice	Type: EventAdvice	TMDD 3.3.8.12	Choice: select one
Qualifier	Type: EventQualifier	TMDD 3.3.8.23	Choice: select one
Quantity	Type: EventQuantity	TMDD 3.3.8.24	Choice: select one
Related-Landmark	Type: LandmarkLocation	TMDD 3.3.8.33	Choice: select one
Detour	Type: AlternateRouteDetail	TMDD 3.3.8.3	Choice: select one
Additional-Text	Type: AdditionalText	TMDD 3.3.8.2	Choice: select one
Qualifier-Time	Type: DateTimeZone	TMDD 3.3.10.1	Choice: select one

3.6.2.4.14. EventElementDetail

This is based on the EventElementDetail data frame in TMDD 3.3.8.15.

Attribute Name	Type/Element	Reference	Description	CC Required
Element-Id	Element			No
Schedule-Element-Id	Element			No
Event-Category	Element			Yes-when applicable
Event-Source	Type: EventSource	TMDD 3.3.8.26		No
Event-Descriptions	Type: Sequence of "EventDescription" types	TMDD 3.3.8.14		Yes-when applicable
Event-Locations	Type: Sequence of "EventLocation" types	TMDD 3.3.8.21		Yes-when applicable
Event-Times	Type: EventTimes	TMDD 3.3.8.27		Yes
Event-Name	Element			Yes-when applicable
Event-Lanes	Type: Sequence of "EventLane" types	TMDD 3.3.8.20		Yes-when applicable
Event-Transit-Locations	Type: Sequence of "EventTransitLocation" types	TMDD 3.3.8.28		No
Event-Hazmat-Details	Type: Sequence of "Hazmat" types	TMDD 3.3.8.32		No
Confidence-Level	Element			No
Access-Level	Element			No

Attribute Name	Type/Element	Reference	Description	CC Required
Event-Zone-Of-Influence	Type: GeometrySpatialData	Custom type; see Global Data Elements Per System Requirements specs 8.4.4, 8.4.5 and 8.5.2.4	Contains coordinates of region covering the zone of influence.	Yes-when applicable (Extended)

3.6.2.4.15. EventFilterRequest

This is the same as the EventFilterRequest data frame in TMDD 3.3.8.16.

Attribute Name	Type/Element	Reference	CC Required
Authentication	Type: Authentication	TMDD 3.3.3.1	Yes - when applicable
Request-Header	Type: RequestHeader	TMDD 3.3.8.41	Yes
Request-Type	Type: RequestType	TMDD 3.3.8.44	Yes
Request-Filters	Type: Sequence of "RequestFilter" types	TMDD 3.3.8.40	No
Request-Locations	Type: Sequence of "RequestLocation" types	TMDD 3.3.8.42	No
Request-Times	Type: RequestTimes	TMDD 3.3.8.43	No

3.6.2.4.16. EventHeadline

This is the same as the EventHeadline data frame in TMDD 3.3.8.17.

Attribute Name	Type/Element	Reference	CC Required
Headline	Type: EventType	TMDD 3.3.8.29	Yes
Headline-Element	Element		Yes-when applicable

3.6.2.4.17. EventIndex

This is similar to the EventIndex data frame in TMDD 3.3.8.18.

Attribute Name	Type/Element	Reference	CC Required
Feu-Url	Type: UrlReference	TMDD 3.3.10.2	Yes
File-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	No

Attribute Name	Type/Element	Reference	CC Required
Event-Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes
Event-Id	Element		Yes
Event-Update	Element		Yes
Status	Element		Yes
Event-Ext (Extended: cc-extension.xsd)	Type: EventIndexExtended (Extended)		Yes - Only for CMS and Data Hub

3.6.2.4.18. EventIndicator

This is the same as the EventIndicator data frame in TMDD 3.3.8.19.

Attribute Name	Type/Element	Reference	CC Required
Status	Element		Choice: select one
Duration-Exceeded-Flag	Element		Choice: select one
Priority-Level	Element		Choice: select one
Severity	Element		Choice: select one
Impact-Level	Element		Choice: select one
Active-Flag	Element		Choice: select one
Planned-Event-Class	Element		Choice: select one

3.6.2.4.19. EventLane

This is similar to the EventLane data frame in TMDD 3.3.8.20.

Attribute Name	Type/Element	Reference	CC Required
Lanes-Type	Element		Yes-when applicable
Link-Direction	Element		Yes-when applicable
Lanes-Total-Original	Element		Yes-when applicable
Lanes-Total-Affected	Element		Yes-when applicable
Event-Lanes-Affected	Element: Sequence of "Link-lane-number" types		Yes-when applicable
Lanes-Status	Element		Yes-when applicable
Event-Lane-Ext (Extended: cc-extension.xsd)	Type: EventLaneExtended (Extended)		Yes-when applicable Only for CMS and Data Hub

3.6.2.4.20. EventLocation

This is the same as the EventLocation data frame in TMDD 3.3.8.21.

Attribute Name	Type/Element	Reference	CC Required
Area-Location	Type: AreaLocation	TMDD 3.3.8.4	No
Location-On-Link	Type: LinkLocation	TMDD 3.3.8.34	Choice: select one
Landmark	Type: LandmarkLocation	TMDD 3.3.8.33	Choice: select one
Geo-Location	Type: GeoLocation	TMDD 3.6.9.4	Choice: select one

3.6.2.4.21. EventPeriod

This is the same as the EventPeriod data frame in TMDD 3.3.8.22.

Attribute Name	Type/Element	Reference	CC Required
Days-Of-The-Week	Element		Yes
Effective-Period-Qualifier	Element		No
Holiday-Day	Element		No

3.6.2.4.22. EventQualifier

This is the same as the EventQualifier data frame in TMDD 3.3.8.23.

Attribute Name	Type/Element	Reference	CC Required
Qualifier-Generic	Element		Choice: select one
Location-Generic	Element		Choice: select one
Lane-Roadway	Element		Choice: select one
Transit-Mode	Element		Choice: select one
Vehicle-Group-Affected	Element		Choice: select one
Traveler-Group-Affected	Element		Choice: select one
Responder-Group-Affected	Element		Choice: select one
Incident-Response-Equipment	Element		Choice: select one
Transit-Locations	Element		Choice: select one
Incident-Response-Status	Element		Choice: select one

3.6.2.4.23. EventQuantity

This is the same as the EventQuantity data frame in TMDD 3.3.8.24.

Attribute Name	Type/Element	Reference	CC Required
Extent	Type: DataExtent	TMDD 3.3.8.5	Choice: select one
Link-State	Type: DataLinkState	TMDD 3.3.8.8	Choice: select one
Incident-Details	Type: DataIncidentDetails	TMDD 3.3.8.6	Choice: select one
Road-Weather	Type: DataRoadWeather	TMDD 3.3.8.10	Choice: select one
Parking-Data	Type: DataParking	TMDD 3.3.8.9	Choice: select one
Surface-Conditions	Type: DataSurfaceConditions	TMDD 3.3.8.11	Choice: select one
Link-Restrictions	Type: DataLinkRestrictions	TMDD 3.3.8.7	Choice: select one

3.6.2.4.24. EventReference

This is the same as the EventReference data frame in TMDD 3.3.8.25.

Attribute Name	Type/Element	Reference	CC Required
Event-Id	Element		Yes
Event-Update	Element		Yes
Response-Plan-Id	Element		Yes-when applicable
Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes

3.6.2.4.25. EventSource

This is the same as the EventSource data frame in TMDD 3.3.8.26.

Attribute Name	Type/Element	Reference	CC Required
Information-Source	Type: OrganizationInformation	TMDD 3.3.16.3	No
Event-Detection-Method	Element		No

3.6.2.4.26. EventTimes

This is the same as the EventTimes data frame in TMDD 3.3.8.27.

Attribute Name	Type/Element	Reference	CC Required
Update-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes

Attribute Name	Type/Element	Reference	CC Required
Valid-Period	Type: ValidPeriod	TMDD 3.3.8.45	Yes-when applicable
Schedule-Element-Ids	Element: Sequence of "Event-schedule-element-identifier" types		No
Sequence-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Start-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Alternate-Start-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Alternate-End-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Expected-Start-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Expected-End-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Recurrent-Times	Type: Sequence of "RecurrentTime" types	TMDD 3.3.8.39	Yes-when applicable
Planned-Event-Continuous-Flag	Element		Yes-when applicable

3.6.2.4.27. EventTransitLocation

This is the same as the EventTransitLocation data frame in TMDD 3.3.8.28.

Attribute Name	Type/Element	Reference	CC Required
Transit-Route-Id	Element		Yes
Transit-Direction	Element		No
Transit-Stop-Detail	Element		No
Transit-Location-Text	Element		No

3.6.2.4.28. EventType

This is the same as the EventType data frame in TMDD 3.3.8.29.

Attribute Name	Type/Element	Reference	CC Required
Traffic-Conditions	Element		Choice: select one
Accidents-And-Incidents	Element		Choice: select one
Closures	Element		Choice: select one
Roadwork	Element		Choice: select one
Obstruction	Element		Choice: select one

Attribute Name	Type/Element	Reference	CC Required
Delay-Status-Cancellation	Element		Choice: select one
Unusual-Driving	Element		Choice: select one
Mobile-Situation	Element		Choice: select one
Device-Status	Element		Choice: select one
Restriction-Class	Element		Choice: select one
Incidentresponsestatus	Element		Choice: select one
Disasters	Element		Choice: select one
Disturbances	Element		Choice: select one
Sporting-Events	Element		Choice: select one
Special-Events	Element		Choice: select one
Parking-Information	Element		Choice: select one
System-Information	Element		Choice: select one
Weather-Conditions	Element		Choice: select one
Precipitation	Element		Choice: select one
Winds	Element		Choice: select one
Visibility-And-Air-Quality	Element		Choice: select one
Temperature	Element		Choice: select one
Pavement-Conditions	Element		Choice: select one
Winter-Driving-Restrictions	Element		Choice: select one
Winter-Driving-Index	Element		Choice: select one
Suggestionadvice	Element		Choice: select one
Warningadvice	Element		Choice: select one
Adviceinstructionsrecommendations	Element		Choice: select one
Adviceinstructionsmandatory	Element		Choice: select one
Laneroadway	Element		Choice: select one
Alternateroute	Element		Choice: select one
Transitmode	Element		Choice: select one
Vehiclegroupaffected	Element		Choice: select one
Travelergroupaffected	Element		Choice: select one
Respondergroupaffected	Element		Choice: select one
Incidentresponseequipment	Element		Choice: select one
Transitoperations	Element		Choice: select one
Transitincident	Element		Choice: select one
Transitconstruction	Element		Choice: select one

3.6.2.4.29. FullEventUpdate

This is similar to the FullEventUpdate data frame in TMDD 3.3.8.30.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Message-Header	Type: MessageHeader	TMDD 3.3.8.35	Yes
Event-Reference	Type: EventReference	TMDD 3.3.8.25	Yes-when applicable

Attribute Name	Type/Element	Reference	CC Required
Project-References	Type: Sequence of "ProjectReference" types	TMDD 3.3.8.38	No
Event-Indicators	Type: Sequence of "EventIndicator" types	TMDD 3.3.8.19	Yes-when applicable
Other-References	Type: Sequence of "OtherReference" types	TMDD 3.3.8.36	Yes-when applicable
Event-Headline	Type: EventHeadline	TMDD 3.3.8.17	Yes-when applicable
Event-Element-Details	Type: Sequence of "EventElementDetail" types	TMDD 3.3.8.15	Yes-when applicable
Event-Comments	Type: EventComments	TMDD 3.3.8.13	No
Full-Report-Texts	Type: Sequence of "FullReportText" types	TMDD 3.3.8.31	No
Full-Event-Update-Ext (Extended: cc-extension.xsd)	Type: FullEventUpdateExtended (Extended)		Yes - Only for CMS and Data Hub

3.6.2.4.30. FullReportText

This is the same as the FullReportText data frame in TMDD 3.3.8.31.

Attribute Name	Type/Element	Reference	CC Required
Report-Medium	Element		Yes
Description	Element		Yes
Language	Element		No

3.6.2.4.31. Hazmat

This is the same as the Hazmat data frame in TMDD 3.3.8.32.

Attribute Name	Type/Element	Reference	CC Required
Hazmat-Code	Element		No
Placard-Code	Element		No
Placard-Displayed-Accuracy	Element		No

3.6.2.4.32. LandmarkLocation

This is similar to the LandmarkLocation data frame in TMDD 3.3.8.33.

Attribute Name	Type/Element	Reference	CC Required
Landmark-Type	Element		Yes
Landmark-Name	Element		Yes
Landmark-Point-Name	Element		No
Location-Rank	Element		No
Geo-Location	Type: GeoLocation	TMDD 3.6.9.4	Yes-when applicable
Upward-Area-Reference	Type: AreaLocation	TMDD 3.3.8.4	No
Landmark-Location-Ext (Extended: cc-extension.xsd)	Type: LandmarkLocationExtended (Extended)		Yes - when applicable Only for CMS and Data Hub

3.6.2.4.33. LinkLocation

This is similar to the LinkLocation data frame in TMDD 3.3.8.34.

Attribute Name	Type/Element	Reference	CC Required
Link-Ownership	Element		Yes-when applicable
Link-Designator	Element		Yes-when applicable
Second-Link-Designator	Element		No
Link-Id	Element		No
Link-Name	Element		Yes-when applicable
Primary-Location	Type: PointOnLink	TMDD 3.3.8.37	Yes
Secondary-Location	Type: PointOnLink	TMDD 3.3.8.37	No
Link-Direction	Element		No
Link-Alignment	Element		No
Linear-Reference-Version	Element		No
Alternate-Designations	Type: Sequence of "LinkLocation" types	TMDD 3.3.8.34	Yes-when applicable
Link-Location-Ext (Extended: cc-extension.xsd)	Type: LinkLocationExtended (Extended)		Yes - when applicable Only for CMS and Data Hub

3.6.2.4.34. MessageHeader

This is the same as the MessageHeader data frame in TMDD 3.3.8.35.

Attribute Name	Type/Element	Reference	CC Required
Organization-Sending	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Organizations-Receiving	Type: Sequence of "OrganizationInformation" types	TMDD 3.3.16.3	Yes-when applicable
Organizations-Responding	Type: Sequence of "OrganizationInformation" types	TMDD 3.3.16.3	No
Message-Type-Version	Element		Yes
Message-Number	Element		Yes
Message-Time-Stamp	Type: DateTimeZone	TMDD 3.3.10.1	Yes
Message-Expiry-Time	Type: DateTimeZone	TMDD 3.3.10.1	No

3.6.2.4.35. OtherReference

This is the same as the OtherReference data frame in TMDD 3.3.8.36.

Attribute Name	Type/Element	Reference	CC Required
Trip-Reference	Element		Choice: select one
Responsible-Event	Type: EventReference	TMDD 3.3.8.25	Choice: select one
Related-Event	Type: EventReference	TMDD 3.3.8.25	Choice: select one
Previous-Event	Type: EventReference	TMDD 3.3.8.25	Choice: select one
Split-Event	Type: EventReference	TMDD 3.3.8.25	Choice: select one
Merged-Event	Type: EventReference	TMDD 3.3.8.25	Choice: select one
Sibling-Event	Type: EventReference	TMDD 3.3.8.25	Choice: select one
Associated-Device	Type: DeviceReference	TMDD 3.3.5.12	Choice: select one
Associated-Url	Type: UrlReference	TMDD 3.3.10.2	Choice: select one

3.6.2.4.36. PointOnLink

This is the same as the PointOnLink data frame in TMDD 3.3.8.37.

Attribute Name	Type/Element	Reference	CC Required
Geo-Location	Type: GeoLocation	TMDD 3.6.9.4	Yes
Linear-Reference	Element		Yes-when applicable
Link-Name	Element		No
Point-Name	Element		Yes-when applicable

Attribute Name	Type/Element	Reference	CC Required
Cross-Street-Designator	Element: Sequence of "Transportation-network-identifier" types		No
Cross-Street-Name	Element: Sequence of "Transportation-network-name" types		Yes-when applicable
Signed-Destination	Element: Sequence of "Event-signed-destination" types		No
Location-Rank	Element		No
Landmark-Type	Element		No
Upward-Area-Reference	Type: AreaLocation	TMDD 3.3.8.4	No

3.6.2.4.37. ProjectReference

This is the same as the ProjectReference data frame in TMDD 3.3.8.38.

Attribute Name	Type/Element	Reference	CC Required
Project-Reference	Element		Choice: select one
Permit-Reference	Element		Choice: select one
Project-Contacts	Type: OrganizationInformation	TMDD 3.3.16.3	Choice: select one
Project-Description	Element		Choice: select one

3.6.2.4.38. RecurrentTime

This is the same as the RecurrentTime data frame in TMDD 3.3.8.39.

Attribute Name	Type/Element	Reference	CC Required
Recurrent-Period	Type: EventPeriod	TMDD 3.3.8.22	Yes
Schedule-Times	Element: Sequence of "Event-timeline-schedule-times" types		Yes-when applicable
Utc-Offset	Element		Yes

3.6.2.4.39. RequestFilter

This is the same as the RequestFilter data frame in TMDD 3.3.8.40.

Attribute Name	Type/Element	Reference	CC Required
Category	Element		No

Attribute Name	Type/Element	Reference	CC Required
Priority-Level	Element		No
Confidence-Level	Element		No
Access-Level	Element		No
Action-Request-Flag	Element		No
Severity	Element		No
Hazmat-Code	Element: Sequence of "Event-hazmat-code" types		No
Placard-Code	Element: Sequence of "Event-placard-code" types		No
Organizations-Requested	Type: Sequence of "OrganizationInformation" types	TMDD 3.3.16.3	No
Headline	Type: EventType	TMDD 3.3.8.29	No

3.6.2.4.40. RequestHeader

This is the same as the RequestHeader data frame in TMDD 3.3.8.41.

Attribute Name	Type/Element	Reference	CC Required
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Organization-Requesting	Type: Sequence of "OrganizationInformation" types	TMDD 3.3.16.3	No
Message-Type-Id	Element		Yes
Message-Type-Version	Element		Yes
Message-Number	Element		No
Message-Time-Stamp	Type: DateTimeZone	TMDD 3.3.10.1	Yes

3.6.2.4.41. RequestLocation

This is the same as the RequestLocation data frame in TMDD 3.3.8.42.

Attribute Name	Type/Element	Reference	CC Required
Area-Locations	Type: AreaLocation	TMDD 3.3.8.4	No
Link-Categories	Element		No
Link-Designator	Element: Sequence of "Link-route-designator" types		No

3.6.2.4.42. RequestTimes

This is the same as the RequestTimes data frame in TMDD 3.3.8.43.

Attribute Name	Type/Element	Reference	CC Required
Start-Time	Type: DateTimeZone	TMDD 3.3.10.1	No
End-Time	Type: DateTimeZone	TMDD 3.3.10.1	No

3.6.2.4.43. RequestType

This is the same as the RequestType data frame in TMDD 3.3.8.44.

Attribute Name	Type/Element	Reference	CC Required
Request-Focus	Element		Yes
Event-Ids	Element: Sequence of "Organization-resource-identifier" types		No
Response-Plan-Ids	Element: Sequence of "Organization-resource-identifier" types		No

3.6.2.4.44. ValidPeriod

This is the same as the ValidPeriod data frame in TMDD 3.3.8.45.

Attribute Name	Type/Element	Reference	CC Required
Expected-End-Time	Type: DateTimeZone	TMDD 3.3.10.1	Choice: select one
Estimated-Duration	Element		Choice: select one
Effective-Periods	Type: Sequence of "EventPeriod" types	TMDD 3.3.8.22	Choice: select one

3.6.2.4.45. FullEventUpdateHub

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional Data Hub-specific data for the FullEventUpdateExtended data frame.

Attribute Name	Type/Element	Description	CC Required
Hub-Org-Sending-Id	Element: Hash-Sequence-Id	Unique organization ID	Yes - Only for CMS and Data Hub
Hub-Org-Receiving-Id	Element: Hash-Sequence-Id	Unique organization ID	Yes - when applicable Only for CMS and Data Hub
Hub-Event-Id	Element: Hash-Sequence-Id	Unique event ID	Yes - when applicable Only for CMS and Data Hub

3.6.2.4.46. LandmarkLocationHub

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional Data Hub-specific data for the LandmarkLocationExtended data frame.

Attribute Name	Type/Element	Description	CC Required
Hub-Network-Id	Element: Transportation-network-identifier	The network-id for the road network	Yes - Only for CMS and Data Hub
Hub-Node-Id	Element: Transportation-network-identifier	The location's node-id from the Node-Inventory.Node-Inventory-List	Yes - Only for CMS and Data Hub

3.6.2.4.47. LinkLocationHub

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional Data Hub-specific data for the LinkLocationExtended data frame.

Attribute Name	Type/Element	Description	CC Required
Hub-Network-Id	Element: Transportation-network-identifier	The network-id for the road network	Yes - Only for CMS and Data Hub
Hub-Link-Id	Element: Transportation-network-identifier	The location's link-id from the Link-Inventory.Link-Inventory-List	Yes - Only for CMS and Data Hub

3.6.2.4.48. EventLaneHub

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional Data Hub-specific data for the EventLaneExtended data frame.

Attribute Name	Type/Element	Description	CC Required
Hub-Link-Id	Element: Transportation-network-identifier	The lane's link-id from the Link-Inventory.Link-Inventory-List	Yes - Only for CMS and Data Hub

3.6.2.4.49. EventIndexExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the EventIndex data frame (TMDD 3.3.8.18).

Attribute Name	Type/Element	Description	CC Required
Event-Index-Hub	Type: OrganizationInformationHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.6.2.4.50. FullEventUpdateCMS

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional CMS-specific data for the FullEventUpdateExtended data frame.

Attribute Name	Type/Element	Description	CC Required
Mock-Event-Flag	Element: Binary-Flag	When "yes", indicates the incident is for testing only and device control requests should not be sent to agencies.	Yes - Only for CMS and Data Hub

3.6.2.4.51. FullEventUpdateExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the FullEventUpdate data frame (TMDD 3.3.8.30).

Attribute Name	Type/Element	Description	CC Required
Event-Hub (Extended: cc-extension.xsd)	Type: FullEventUpdateHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub
Event-CMS (Extended: cc-extension.xsd)	Type: FullEventUpdateCMS (Extended)	Additional information for this dataframe	Yes - when applicable Only for CMS and Data Hub

3.6.2.4.52. LandmarkLocationExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the LandmarkLocation data frame (TMDD 3.3.8.33).

Attribute Name	Type/Element	Description	CC Required
Landmark-Location-Hub	Type: LandmarkLocationHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.6.2.4.53. LinkLocationExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the LinkLocation data frame (TMDD 3.3.8.34).

Attribute Name	Type/Element	Description	CC Required
Link-Location-Hub	Type: LinkLocationHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.6.2.4.54. EventLaneExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the EventLane data frame (TMDD 3.3.8.20).

Attribute Name	Type/Element	Description	CC Required
Event-Lane-Hub	Type: EventLaneHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.7. LAYER: TRAFFIC STATE AND FORECASTING DATA

This layer contains the current traffic state and traffic forecast data.

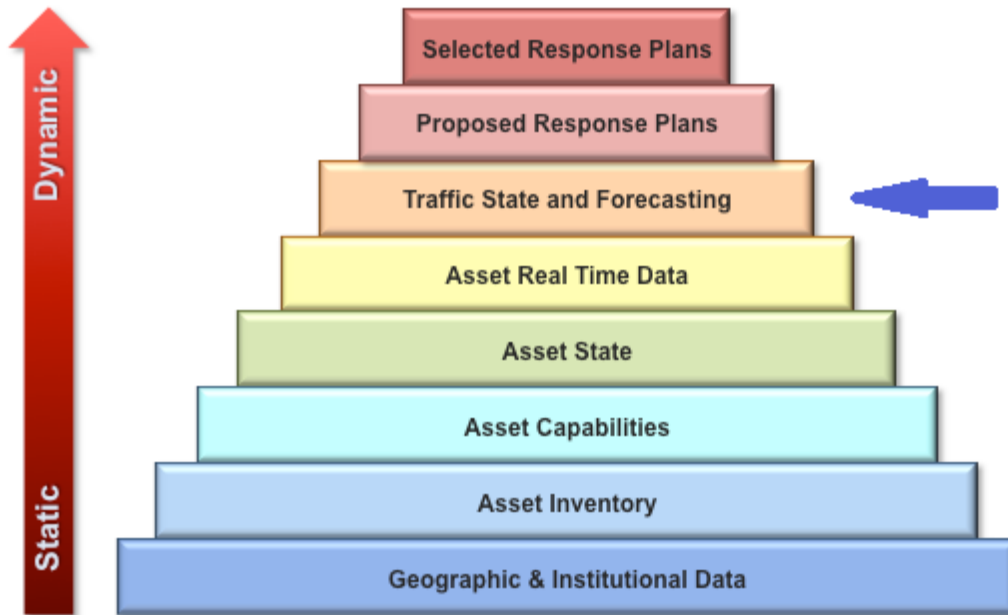


Figure 8 - Traffic State & Forecasting Layer

3.7.1. Data Messages

There are no applicable TMDD data messages. Information that will be contained in this layer include:

Name	Reference	Description
Traffic Current Link State		Includes link identifier, capacity, lanes available, closed lane identifiers, speed, flow, and density, start date/time, duration
Traffic Predicted Link State		Includes link identifier, capacity, lanes available, closed lane identifiers, speed, flow, and density, start date/time, duration
Traffic Current Approach Turn State		Includes approach link identifier, exit link identifiers, start date/time, duration, approach volume, and for each exit link identifier, a turn volume and turn ratio
Traffic Predicted Approach Turn State		Includes approach link identifier, exit link identifiers, start date/time, duration, approach volume, and for each exit link identifier, a turn volume and turn ratio

Name	Reference	Description
Traffic Current State Quality Index		Estimation of the quality of the traffic state estimation
Traffic State Prediction Quality Index		Estimation of the quality of the traffic state prediction
Route Current Delay		Total traveller delay for a specified route and mode (total travellers, fleet, automobile, transit) based on current traffic conditions
Routed Predicted Delay		Total traveller delay for a specified route and mode (total travellers, fleet, automobile, transit) based on predicted traffic conditions at a specified point in time
Aggregated Current Delay		Total traveller delay for a specified geographic area (corridor, city, county, region) and mode (total travellers, fleet, automobile, transit) based on current traffic conditions
Aggregated Predicted Delay		Total traveller delay for a specified geographic area (corridor, city, county, region) and mode (total travellers, fleet, automobile, transit) based on predicted traffic conditions at a specified point in time
Route Current Vehicle Miles Travelled		VMT for a specific route and mode (total travellers, fleet, automobile, transit) based on current traffic conditions
Route Predicted Vehicle Miles Travelled		VMT for a specific route and mode (total travellers, fleet, automobile, transit) based on predicted traffic conditions at a specific point in time
Aggregated Current Vehicle Miles Travelled		Aggregated VMT for a specified geographic area (corridor, city, county, region) and mode (total travellers, fleet, automobile, transit) based on current traffic conditions
Aggregated Predicted Vehicle Miles Travelled		Aggregated VMT for a specified geographic area (corridor, city, county, region) and mode (total travellers, fleet, automobile, transit) based on predicted traffic conditions at a specific point in time
Route Current Person Miles Travelled		PMT for a specific route and mode (total travellers, fleet, automobile, transit) based on current traffic conditions
Route Predicted Person Miles Travelled		PMT for a specific route and mode (total travellers, fleet, automobile, transit) based on predicted traffic conditions at a specific point in time
Aggregated Current Person Miles Travelled		Aggregated PMT for a specified geographic area (corridor, city, county, region) and mode (total travellers, fleet, automobile, transit) based on current traffic conditions

Name	Reference	Description
Aggregated Predicted Person Miles Travelled		Aggregated PMT for a specified geographic area (corridor, city, county, region) and mode (total travellers, fleet, automobile, transit) based on predicted traffic conditions at a specific point in time
Route Current Vehicle Hours Travelled		VHT for a specific route and mode (total travellers, fleet, automobile, transit) based on current traffic conditions
Route Predicted Vehicle Hours Travelled		VHT for a specific route and mode (total travellers, fleet, automobile, transit) based on predicted traffic conditions at a specific point in time
Aggregated Current Vehicle Hours Travelled		Aggregated VHT for a specified geographic area (corridor, city, county, region) and mode (total travellers, fleet, automobile, transit) based on current traffic conditions
Aggregated Predicted Vehicle Hours Travelled		Aggregated VHT for a specified geographic area (corridor, city, county, region) and mode (total travellers, fleet, automobile, transit) based on predicted traffic conditions at a specific point in time
Route Current Person Hours Travelled		PHT for a specific route and mode (total travellers, fleet, automobile, transit) based on current traffic conditions
Route Predicted Person Hours Travelled		PHT for a specific route and mode (total travellers, fleet, automobile, transit) based on predicted traffic conditions at a specific point in time
Aggregated Current Person Hours Travelled		Aggregated PHT for a specified geographic area (corridor, city, county, region) and mode (total travellers, fleet, automobile, transit) based on current traffic conditions
Aggregated Predicted Person Hours Travelled		Aggregated PHT for a specified geographic area (corridor, city, county, region) and mode (total travellers, fleet, automobile, transit) based on predicted traffic conditions at a specific point in time

3.8. LAYER: PROPOSED RESPONSE PLANS

This layer includes details of the proposed response plans, including the properties of each plan and model prediction results.

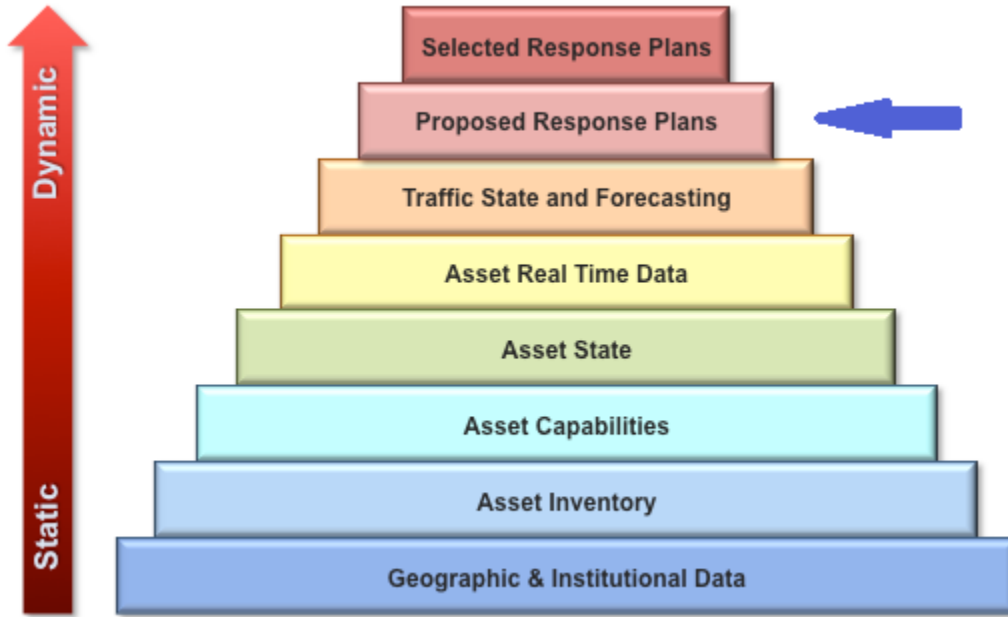


Figure 9 - Proposed Response Plans Layer

3.8.1. Data Messages

TMDD Data Message Dialogs include the following:

Name	Reference	Description
dlDeviceCancelControlRequest	TMDD 3.1.5.1	Request for device control cancellation
dlDMSControlRequest	TMDD 3.1.6.7	Request for Status of Device Control Request
dlDMSPriorityQueueRequest	TMDD 3.1.6.8	Request for DMS priority queue
dlHARControlRequest	TMDD 3.1.10.4	Request for HAR control
dlHARControlScheduleRequest	TMDD 3.1.10.5	Request for HAR Control Schedule
dlHARPriorityQueueRequest	TMDD 3.1.10.6	Request for HAR Priority Queue
dlIntersectionSignalControlRequest	TMDD 3.1.11.5	Request for intersection signal control
dlIntersectionSignalControlScheduleRequest	TMDD 3.1.11.6	Request for intersection signal Control Schedule
dlIntersectionSignalPriorityQueueRequest	TMDD 3.1.11.7	Request for intersection signal Priority Queue
dlLCSControlRequest	TMDD 3.1.12.3	Request for LCS control

Name	Reference	Description
dlLCSControlScheduleRequest	TMDD 3.1.12.4	Request for LCS Control Schedule
dlRampMeterControlRequest	TMDD 3.1.16.3	Request for ramp meter control
dlRampMeterControlScheduleRequest	TMDD 3.1.16.4	Request for ramp meter Control Schedule
dlRampMeterPriorityQueueRequest	TMDD 3.1.16.5	Request for ramp meter Priority Queue
dlSectionControlRequest	TMDD 3.1.18.2	Request for section control
dlSectionControlScheduleRequest	TMDD 3.1.18.3	Request for section Control Schedule
dlSectionPriorityQueueRequest	TMDD 3.1.18.5	Request for section Priority Queue
dlHARControlScheduleUpdate	TMDD 3.1.28.4	HAR Control Schedule update
dlResponsePlanApprovalRequest	New	Contains a request for a response plan approval decision
dlResponsePlanApprovalSubscription	New	Contains a request for a subscription for response plan approval decisions
dlResponsePlanApprovalUpdate	New	Contains the decision of whether or not a response plan is accepted
dlResponsePlanStatusRequest	New	Contains a request for a response plan approval status update
dlResponsePlanStatusSubscription	New	Contains a request for a subscription for response plan approval status updates
dlResponsePlanStatusUpdate	New	Contains the decision of whether or not a response plan is accepted, to be pushed to other agencies
dlResponsePlanRequest	New	Contains a request for a response plan
dlResponsePlanSubscription	New	Contains a request for a subscription for new response plans
dlResponsePlanUpdate	New	Contains a new proposed response plan

Other information that will be contained in this layer includes:

Name	Reference	Description
Proposed Response Plan Traffic Forecast Summary		Contains summary of response plan traffic forecast
Proposed Response Plan Current Traffic State		Contains the current traffic state that was used to initiate the forecast
Proposed Response Plan Traffic Forecast Details		Contains details of response plan traffic forecast

3.8.2. Data Class Descriptions

Data Class Descriptions include data elements for basic objects. Classes may be referenced in other classes (parent classes), and may be referenced in multiple parent classes. These do not represent database structures, but instead are based primarily on TMDD, or are structured similarly. Database design is expected to occur during system design.

See the beginning of section 3 for a description of the "CC Required" column.

3.8.2.1. CCTV Class

3.8.2.1.1. CCTVControlDetails

This is the same as the CCTVControlDetails data frame in TMDD 3.3.2.1.

Attribute Name	Type/Element	Reference	CC Required
Cctv-Position-Preset	Element		Yes
Cctv-Position-Pan	Element		Yes
Cctv-Position-Tilt	Element		Yes
Cctv-Position-Zoom-Lens	Element		Yes
Cctv-Position-Iris-Lens	Element		Yes
Cctv-Position-Focus-Lens	Element		Yes
Cctv-Environment	Element		Yes
Cctv-Text	Element		Yes
Cctv-Lock	Element		Yes

3.8.2.1.2. CCTVControlRequest

This is similar to the CCTVControlRequest data frame in TMDD 3.3.2.2.

Attribute Name	Type/Element	Reference	CC Required
Device-Control-Request-Header	Type: DeviceControlRequestHeader	TMDD 3.3.5.2	Yes
Cctv-Request-Command	Element		Yes
Cctv-Command-Parameters	Type: CCTVControlDetails	TMDD 3.3.2.1	Yes
Cctv-Control-Ext (Extended: cc-extension.xsd)	Type: CCTVControlRequestExtended (Extended)		Yes - Only for CMS and Data Hub

3.8.2.1.3. CCTVControlRequestExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the CCTVControlRequest data frame (TMDD 3.3.2.2).

Attribute Name	Type/Element	Description	CC Required
Cctv-Control-Hub	Type: AssetControlHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.8.2.1.4. AssetControlHub

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional Data Hub -specific data for device control requests.

Attribute Name	Type/Element	Description	CC Required
Target-Hub-Org-Id	Element: Hash-Sequence-Id	Used in device control requests in response plans and represents the organization which will receive the device control request.	Yes - Only for CMS and Data Hub

3.8.2.2. Device Class

3.8.2.2.1. DeviceCancelControlRequest

This is similar to the DeviceCancelControlRequest data frame in TMDD 3.3.5.1.

Attribute Name	Type/Element	Reference	CC Required
Authentication	Type: Authentication	TMDD 3.3.3.1	Yes
Organization-Requesting	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Device-Id	Element		Yes
Request-Id	Element		Yes
Device-Cancel-Control-Ext (Extended: cc-extension.xsd)	Type: DeviceCancelControlRequestExtended (Extended)		Yes - Only for CMS and Data Hub

3.8.2.2.2. DeviceControlRequestHeader

This is the same as the DeviceControlRequestHeader data frame in TMDD 3.3.5.2.

Attribute Name	Type/Element	Reference	CC Required
Authentication	Type: Authentication	TMDD 3.3.3.1	Yes
Organization-Requesting	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Device-Id	Element		Yes
Request-Id	Element		Yes
Event-Id	Element		Yes-when applicable
Response-Plan-Id	Element		Yes-when applicable
Command-Request-Priority	Element		Yes-when applicable
Command-Start-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Command-End-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Command-Request-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable

3.8.2.2.3. DeviceControlResponse

This is the same as the DeviceControlResponse data frame in TMDD 3.3.5.3.

Attribute Name	Type/Element	Reference	CC Required
Organization-Information	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Device-Id	Element		Yes
Request-Id	Element		Yes
Operator-Id	Element		Yes-when applicable
Operator-Lock-Id	Element		No
Request-Status	Element		Yes
Operator-Last-Revised	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable

3.8.2.2.4. DevicePriorityQueueHeader

This is the same as the DevicePriorityQueueHeader data frame in TMDD 3.3.5.9.

Attribute Name	Type/Element	Reference	CC Required
Restrictions	Type: Restrictions	TMDD 3.3.16.5	No
Device-Id	Element		Yes
Device-Type	Element		Yes
Current-Device-Priority	Element		Yes
Device-Priority-Queue-List	Type: Sequence of "DevicePriorityQueueItem" types	TMDD 3.3.5.10	Yes

3.8.2.2.5. DevicePriorityQueueItem

This is the same as the DevicePriorityQueueItem data frame in TMDD 3.3.5.10.

Attribute Name	Type/Element	Reference	CC Required
Organization-Requesting	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Command-Request-Priority	Element		Yes
Operator-Id	Element		Yes-when applicable
Request-Id	Element		Yes-when applicable
Event-Id	Element		Yes-when applicable
Response-Plan-Id	Element		Yes-when applicable
Command-Start-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Command-End-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable

3.8.2.2.6. DevicePriorityQueueRequest

This is the same as the DevicePriorityQueueRequest data frame in TMDD 3.3.5.11.

Attribute Name	Type/Element	Reference	CC Required
Authentication	Type: Authentication	TMDD 3.3.3.1	Yes - when applicable
Organization-Requesting	Type: OrganizationInformation	TMDD 3.3.16.3	Yes

Attribute Name	Type/Element	Reference	CC Required
Device-Id-List	Element: Sequence of "Organization-resource-identifier" types		Yes

3.8.2.2.7. DeviceCancelControlRequestExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the DeviceCancelControlRequest data frame (TMDD 3.3.5.1).

Attribute Name	Type/Element	Description	CC Required
Device-Cancel-Control-Hub	Type: AssetControlHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.8.2.3. DMS Class

3.8.2.3.1. DMSControlDetails

This is the same as the DMSControlDetails data frame in TMDD 3.3.6.2.

Attribute Name	Type/Element	Reference	CC Required
Dms-Message	Element		Choice: select one
Message-Number	Element		Choice: select one

3.8.2.3.2. DMSControlRequest

This is similar to the DMSControlRequest data frame in TMDD 3.3.6.3.

Attribute Name	Type/Element	Reference	CC Required
Device-Control-Request-Header	Type: DeviceControlRequestHeader	TMDD 3.3.5.2	Yes
Dms-Request-Command	Element		Yes
Dms-Command-Parameters	Type: DMSControlDetails	TMDD 3.3.6.2	Yes
Dms-Beacon-Control	Element		No

Attribute Name	Type/Element	Reference	CC Required
Dms-Control-Ext (Extended: cc-extension.xsd)	Type: DMSControlRequestExtended (Extended)		Yes - Only for CMS and Data Hub

3.8.2.3.3. DMSPriorityQueue

This is similar to the DMSPriorityQueue data frame in TMDD 3.3.6.12.

Attribute Name	Type/Element	Reference	CC Required
Device-Priority-Queue-Header	Type: DevicePriorityQueueHeader	TMDD 3.3.5.9	Yes
Dms-Request-Command	Element		Yes
Dms-Queue-Parameters	Type: DMSControlDetails	TMDD 3.3.6.2	Yes
Dms-Queue-Ext (Extended: cc-extension.xsd)	Type: DMSPriorityQueueExtended (Extended)		Yes - Only for CMS and Data Hub

3.8.2.3.4. DMSPriorityQueueExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the DMSPriorityQueue data frame (TMDD 3.3.6.12).

Attribute Name	Type/Element	Description	CC Required
DMS-Queue-Hub	Type: AssetDataHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.8.2.3.5. DMSControlRequestExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the DMSControlRequest data frame (TMDD 3.3.6.3).

Attribute Name	Type/Element	Description	CC Required
Dms-Control-Hub	Type: AssetControlHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.8.2.4. HAR Class

3.8.2.4.1. HARControlDetails

This is the same as the HARControlDetails data frame in TMDD 3.3.11.1.

Attribute Name	Type/Element	Reference	CC Required
Har-Message	Element		No
Har-Message-Number	Element		No

3.8.2.4.2. HARControlRequest

This is similar to the HARControlRequest data frame in TMDD 3.3.11.2

Attribute Name	Type/Element	Reference	CC Required
Device-Control-Request-Header	Type: DeviceControlRequestHeader	TMDD 3.3.5.2	No
Har-Request-Command	Element		No
Har-Command-Parameters	Type: HARControlDetails	TMDD 3.3.11.1	No
Har-Control-Ext (Extended: cc-extension.xsd)	Type: HARControlRequestExtended (Extended)		Yes - Only for CMS and Data Hub

3.8.2.4.3. HARControlSchedule

This is the same as the HARControlSchedule data frame in TMDD 3.3.11.3.

Attribute Name	Type/Element	Reference	CC Required
Device-Control-Schedule-Header	Type: DeviceControlScheduleHeader	TMDD 3.3.5.4	No
Message-Number	Element		No

3.8.2.4.4. HARPriorityQueue

This is the same as the HARPriorityQueue data frame in TMDD 3.3.11.6

Attribute Name	Type/Element	Reference	CC Required
Device-Priority-Queue-Header	Type: DevicePriorityQueueHeader	TMDD 3.3.5.9	No
Har-Request-Command	Element		No
Har-Queue-Parameters	Type: HARControlDetails	TMDD 3.3.11.1	No

3.8.2.4.5. HARControlRequestExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the HARControlRequest data frame (TMDD 3.3.11.2).

Attribute Name	Type/Element	Description	CC Required
Har-Control-Hub	Type: AssetControlHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.8.2.5. IntersectionSignal Class

3.8.2.5.1. IntersectionSignalControlDetails

This is the same as the IntersectionSignalControlDetails data frame in TMDD 3.3.12.1.

Attribute Name	Type/Element	Reference	CC Required
Request-Timing-Mode	Element		Yes - when applicable
Timing-Pattern-Id	Element		Yes - when applicable
Offset-Adjustment	Element		Yes - when applicable

3.8.2.5.2. IntersectionSignalControlRequest

This is similar to the IntersectionSignalControlRequest data frame in TMDD 3.3.12.2.

Attribute Name	Type/Element	Reference	CC Required
Device-Control-Request-Header	Type: DeviceControlRequestHeader	TMDD 3.3.5.2	Yes
Intersection-Request-Command	Element		Yes
Intersection-Command-Parameters	Type: IntersectionSignalControlDetails	TMDD 3.3.12.1	Yes
Signal-Control-Ext (Extended: cc-extension.xsd)	Type: IntersectionSignalControlRequestExtended (Extended)		Yes - Only for CMS and Data Hub

3.8.2.5.3. IntersectionSignalControlResponse

This is the same as the IntersectionSignalControlResponse data frame in TMDD 3.3.12.3.

Attribute Name	Type/Element	Reference	CC Required
Device-Control-Response-Header	Type: DeviceControlResponse	TMDD 3.3.5.3	Yes
Section-Id	Element		Yes - when applicable
Request-Control-Mode	Element		Yes - when applicable

Attribute Name	Type/Element	Reference	CC Required
Timing-Pattern-Id	Element		Yes - when applicable
Offset-Adjustment	Element		Yes - when applicable

3.8.2.5.4. IntersectionSignalPriorityQueue

This is similar to the IntersectionSignalPriorityQueue data frame in TMDD 3.3.12.13.

Attribute Name	Type/Element	Reference	CC Required
Device-Priority-Queue-Header	Type: DevicePriorityQueueHeader	TMDD 3.3.5.9	Yes
Intersection-Request-Command	Element		Yes
Intersection-Queue-Parameters	Type: IntersectionSignalControlDetails	TMDD 3.3.12.1	Yes
Signal-Queue-Ext (Extended: cc-extension.xsd)	Type: IntersectionSignalPriorityQueueExtended (Extended)		Yes - Only for CMS and Data Hub

3.8.2.5.5. IntersectionSignalPriorityQueueExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the IntersectionSignalPriorityQueue data frame (TMDD 3.3.12.13).

Attribute Name	Type/Element	Description	CC Required
Signal-Queue-Hub	Type: AssetDataHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.8.2.5.6. IntersectionSignalControlRequestExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the IntersectionSignalControlRequest data frame (TMDD 3.3.12.2).

Attribute Name	Type/Element	Description	CC Required
Signal-Control-Hub	Type: AssetControlHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.8.2.6. LCS Class

3.8.2.6.1. LCSControlRequest

This is similar to the LCSControlRequest data frame in TMDD 3.3.13.1.

Attribute Name	Type/Element	Reference	CC Required
Device-Control-Request-Header	Type: DeviceControlRequestHeader	TMDD 3.3.5.2	Yes
Lcs-Request-Command	Element		Yes
Lcs-Control-Ext (Extended: cc-extension.xsd)	Type: LCSControlRequestExtended (Extended)		Yes - Only for CMS and Data Hub

3.8.2.6.2. LCSControlRequestExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the LCSControlRequest data frame (TMDD 3.3.13.1).

Attribute Name	Type/Element	Description	CC Required
Lcs-Control-Hub	Type: AssetControlHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.8.2.7. RampMeter Class

3.8.2.7.1. RampControlDetails

This is the same as the RampControlDetails data frame in TMDD 3.3.17.1.

Attribute Name	Type/Element	Reference	CC Required
Meter-Requested-Plan	Element		Yes-when applicable
Meter-Requested-Rate	Element		Yes-when applicable

3.8.2.7.2. RampMeterControlRequest

This is similar to the RampMeterControlRequest data frame in TMDD 3.3.17.2.

Attribute Name	Type/Element	Reference	CC Required
Device-Control-Request-Header	Type: DeviceControlRequestHeader	TMDD 3.3.5.2	Yes
Metered-Lane-List	Type: RampMeterLaneControlDetails	TMDD 3.3.17.6	Yes
Ramp-Control-Ext (Extended: cc-extension.xsd)	Type: RampMeterControlRequestExtended (Extended)		Yes - Only for CMS and Data Hub

3.8.2.7.3. RampMeterLaneControlDetails

This is the same as the RampMeterLaneControlDetails data frame in TMDD 3.3.17.6.

Attribute Name	Type/Element	Reference	CC Required
Metered-Lane-Identifier	Element		Yes
Meter-Request-Command	Element		Yes
Meter-Command-Parameters	Type: RampControlDetails	TMDD 3.3.17.1	Yes-when applicable

3.8.2.7.4. RampMeterPriorityQueue

This is similar to the RampMeterPriorityQueue data frame in TMDD 3.3.17.9.

Attribute Name	Type/Element	Reference	CC Required
Device-Priority-Queue-Header	Type: DevicePriorityQueueHeader	TMDD 3.3.5.9	Yes
Metered-Lane-Identifier	Element		No
Meter-Request-Command	Element		Yes
Meter-Queue-Parameters	Type: RampControlDetails	TMDD 3.3.17.1	No
Ramp-Queue-Ext (Extended: cc-extension.xsd)	Type: RampMeterPriorityQueueExtended (Extended)		Yes - Only for CMS and Data Hub

3.8.2.7.5. RampMeterPriorityQueueExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the RampMeterPriorityQueue data frame (TMDD 3.3.17.9).

Attribute Name	Type/Element	Description	CC Required
Ramp-Queue-Hub	Type: AssetDataHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.8.2.7.6. RampMeterControlRequestExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the RampMeterControlRequest data frame (TMDD 3.3.17.2).

Attribute Name	Type/Element	Description	CC Required
Ramp-Control-Hub	Type: AssetControlHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.8.2.8. Section Class

3.8.2.8.1. SectionControlDetails

This is the same as the SectionControlDetails data frame in TMDD 3.3.19.1.

Attribute Name	Type/Element	Reference	CC Required
Request-Control-Mode	Element		No
Timing-Pattern-Id	Element		Yes-when applicable
Section-Offset-Adjustment	Element		Yes-when applicable

3.8.2.8.2. SectionControlRequest

This is similar to the SectionControlRequest data frame in TMDD 3.3.19.2.

Attribute Name	Type/Element	Reference	CC Required
Authentication	Type: Authentication	TMDD 3.3.3.1	Yes
Organization-Requesting	Type: OrganizationInformation	TMDD 3.3.16.3	Yes
Section-Id	Element		Yes
Request-Id	Element		Yes
Section-Request-Command	Element		Yes
Section-Command-Parameters	Type: SectionControlDetails	TMDD 3.3.19.1	Yes
Event-Id	Element		Yes-when applicable
Response-Plan-Id	Element		Yes-when applicable
Command-Request-Priority	Element		No
Command-Begin-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Command-End-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Command-Request-Time	Type: DateTimeZone	TMDD 3.3.10.1	Yes-when applicable
Section-Control-Ext (Extended: cc-extension.xsd)	Type: SectionControlRequestExtended (Extended)		Yes - Only for CMS and Data Hub

3.8.2.8.3. SectionPriorityQueue

This is similar to the SectionPriorityQueue data frame in TMDD 3.3.19.6.

Attribute Name	Type/Element	Reference	CC Required
Device-Priority-Queue-Header	Type: DevicePriorityQueueHeader	TMDD 3.3.5.9	Yes
Section-Request-Command	Element		Yes
Section-Queue-Parameters	Type: SectionControlDetails	TMDD 3.3.19.1	Yes
Section-Queue-Ext (Extended: cc-extension.xsd)	Type: SectionPriorityQueueExtended (Extended)		Yes - Only for CMS and Data Hub

3.8.2.8.4. SectionPriorityQueueExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the SectionPriorityQueue data frame (TMDD 3.3.19.6).

Attribute Name	Type/Element	Description	CC Required
Section-Queue-Hub	Type: AssetDataHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.8.2.8.5. SectionControlRequestExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the SectionControlRequest data frame (TMDD 3.3.19.2).

Attribute Name	Type/Element	Description	CC Required
Section-Control-Hub	Type: AssetControlHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.8.2.9. VideoSwitch Class

3.8.2.9.1. VideoSwitchControlRequest

This is the same as the VideoSwitchControlRequest data frame in TMDD 3.3.21.1.

Attribute Name	Type/Element	Reference	CC Required
Device-Control-Request-Header	Type: DeviceControlRequestHeader	TMDD 3.3.5.2	Yes
Input-Channel-Id	Element		Yes
Output-Channel-Id	Element		Yes
Channel-Titling-Text	Element		No
Set-Output-Channel-Lock	Element		No
Frames-Per-Second	Element		No
Frame-Height-Pixels	Element		No
Frame-Width-Pixels	Element		No
Video-Format	Element		No

3.8.2.10. ResponsePlan Class

This is a new class to handle response plan objects.

3.8.2.10.1. ResponsePlanDetails

This is a new object representing each developed response plan and termination plan.

Attribute Name	Type/Element	Reference	Description	CC Required
Response-Plan-Request-Header	Type: ResponsePlanRequestHeader	Custom type; see "Proposed Response Plans" layer		Yes
Response-Plan-Header	Type: ResponsePlanHeader	Custom type; see "Proposed Response Plans" layer		Yes
Activity-Start-Time	Type: DateTimeZone	TMDD 3.3.10.1 System Requirements spec 8.7.1.6	Time when response planning activities were initiated.	Yes-when applicable
Activity-End-Time	Type: DateTimeZone	TMDD 3.3.10.1 System Requirements spec 8.7.1.6	Time when response planning activities were terminated.	Yes-when applicable

Attribute Name	Type/Element	Reference	Description	CC Required
Agency-List	Type: Sequence of Organization Information types	TMDD 3.3.16.3 System Requirements specs 8.7.1.6 and 8.5.2.4	Agencies involved in the implementation of the response plan.	Yes-when applicable
Detour-List	Type: Sequence of RouteInventoryList types	TMDD 3.3.18.2 System Requirements specs 8.7.1.6 and 8.5.2.4	Recommended alternate route(s) around the incident or event.	Yes-when applicable
Ramp-Metering-Control-Action-List	Type: Sequence of RampMeterControl Request types	TMDD 3.3.17.3 System Requirements specs 8.7.1.6 and 8.5.2.4	Recommended metering actions at each affected freeway on-ramp.	Yes-when applicable
Intersection-Control-List	Type: Sequence of IntersectionSignal ControlRequest types	TMDD 3.3.12.4 System Requirements specs 8.7.1.6 and 8.5.2.4	Recommended signal timing plan to activate at each affected signalized intersection.	Yes-when applicable
DMS-Message-List	Type: Sequence of DMSControlRequest types	TMDD 3.3.6.2 System Requirements specs 8.7.1.6 and 8.5.2.4	Information dissemination strategy: Messages to post on fixed and portable DMSs.	Yes-when applicable
HAR-Message-List	Type: Sequence of HARControlRequest types	TMDD 3.3.11.1 System Requirements specs 8.7.1.6 and 8.5.2.4	Information dissemination strategy: Which HARs to activate and what message to broadcast on them.	Yes-when applicable
Informational-Message-List	Type: Sequence of InformationalMessage types	Custom type; see "Proposed Response Plans" layer System Requirements specs 8.7.1.6 and 8.5.2.4	Information dissemination strategy: Information to disseminate to 511 systems, and information to make available to third-party information providers and mobile travel application developers.	Yes-when applicable

Attribute Name	Type/Element	Reference	Description	CC Required
LCS-Schedule-Cancellation-List	Type: Sequence of DeviceCancelControl Request types	TMDD 3.3.5.1	Request to cancel a previously scheduled lane closure when a response plan requires that the lane remain open.	Yes-when applicable
Personnel-Deployment-List	Type: Sequence of ResponsePlan PersonnelDeployment types	Custom type; see "Proposed Response Plans" layer System Requirements specs 8.7.1.6 and 8.5.2.4	Will include details about personnel requested to be deployed to specific corridor locations.	Yes-when applicable
Device-Cancellation-List	Type: Sequence of DeviceCancelControl Request types	TMDD 3.3.5.1	Request to cancel previous control change requests. Used in a Response Plan and/or Termination Plan.	Yes-when applicable
Aggregate-Approval-Decision	Type: ResponsePlanAgency Approval	Custom type; see "Proposed Response Plans" layer	Indicates whether the proposed response plan was approved by all agencies.	Yes-when applicable
Agency-Approval-Decision-List	Type: Sequence of "ResponsePlanAgency Approval" types	Custom type; see "Proposed Response Plans" layer	Approval decisions of each agency.	Yes-when applicable
Response-Plan-Implementation	Type: ResponsePlan Implementation	Custom type; see "Selected Response Plans" layer	Only applies to response plans that are selected for implementation.	Yes-when applicable
Log-Detail-List	Type: Sequence of "ResponsePlanLog Details" types	Custom type; see "Selected Response Plans" layer	Only applies to response plans that are selected for implementation.	Yes-when applicable

3.8.2.10.2. InformationalMessage

This is a new data frame for information to be disseminated to other systems and parties per Systems Requirements spec 8.7.1.6. It will include information to disseminate to 511 systems and information to make available to third-party information providers and mobile travel application developers.

Attribute Name	Type/Element	Reference	Description	CC Required
Recipient	Type: OrganizationInformation	TMDD 3.3.16.3		Yes
Informational-Text	Element: Text		Text of informational message	Yes

3.8.2.10.3. ResponsePlanRequestHeader

This is a new object containing the information content header related to requests for response plan content.

Attribute Name	Type/Element	Reference	Description	CC Required
Organization-Sending	Type: OrganizationInformation	TMDD 3.3.16.3		Yes
Organization-Receiving	Type: OrganizationInformation	TMDD 3.3.16.3		Yes
Request-Id	Element: Organization-resource-identifier			Yes
Request-Time	Type: DateTimeZone	TMDD 3.3.10.1	Will be blank in subscription requests.	Yes-when applicable
Corridor-Id	Element: Organization-resource-identifier			Yes

3.8.2.10.4. ResponsePlanHeader

This is a new object containing the information content header related to response plan content.

Attribute Name	Type/Element	Reference	Description	CC Required
Event-Id	Element: Organization- resource-identifier	System Requirements spec 8.7.1.6		Yes
Response-Plan- Id	Element: Organization- resource-identifier			Yes
Plan-Type	Element: Enumerated: Response Plan (0), Termination Plan (1)		The "ResponsePlanDetails" data structure is also used for termination plans.	Yes
Evaluation-Cycle	Element: Integer		Sequence starting at 1 for the initial set of response plans and incrementing for each 30- or 15-minute refresh cycle, incident update or termination plan request.	Yes
Response-Plan- Rank	Element: Integer		Rank of response plan within the evaluation cycle.	Yes-when applicable
Submission- Time	Type: DateTimeZone		Time when the response plan is submitted for approval Will be blank if the response plan is generated but never submitted for approval	Yes-when applicable

3.8.2.10.5. EvaluationCycleDetails

This is a new data frame containing the evaluation, ranking, risk and other metrics related to a response plan. **More data elements will be added in the future.**

Attribute Name	Type/Element	Reference	Description	CC Required
Evaluation-Cycle	Element: Integer		Sequence starting at 1 for the initial set of response plans and incrementing for each 30- or 15-minute refresh cycle, incident update or termination plan request.	Yes
Evaluation-Cycle-Reason	Element: Enumerated: new incident (0), end of 30-minute window (1), end of 15-minute window (2), incident update (3), termination plan request (4)		The reason for starting a new evaluation cycle.	Yes
Evaluation-Start-Time	Type: DateTimeZone		Time when the evaluation cycle started	Yes
Evaluation-Cycle-Duration	Element: Integer		Time in seconds from when the DataHub receives a new incident, incident update or termination request until the DataHub delivers a response plan or termination plan.	Yes
Ranked-Response-Plan-Count	Element: Integer		The number of response plans that were ranked within the evaluation cycle. Will be zero if there weren't any response plans generated for the evaluation cycle.	Yes

Attribute Name	Type/Element	Reference	Description	CC Required
Submitted-Response-Plan-Count	Element: Integer		The number of response plans in the evaluation cycle that were submitted to the CMS. Can be zero if an incident update or termination plan request is received before a response plan is submitted. Can increase if the response plans in the evaluation cycle are submitted to CMS over time instead of all at once.	Yes
Event-Details	Type: EventDetails	Custom type; see "Proposed Response Plans" layer		Yes
Traffic-State	Type: String		Contains information about the traffic state at the time the evaluation cycle started	Yes-when applicable
Response-Plan-List	Type: Sequence of "ResponsePlanDetails" types	Custom type; see "Proposed Response Plans" layer	The response plans (including termination plans) that were generated during the evaluation cycle. Will be empty if there weren't any response plans generated for the cycle.	Yes-when applicable

3.8.2.10.6. ResponsePlanRequest

This is a new object containing a request for a response plan.

Attribute Name	Type/Element	Reference	Description	CC Required
Authentication	Type: Authentication	TMDD 3.3.3.1		Yes
Response-Plan-Request-Header	Type: ResponsePlanRequestHeader	Custom type; see "Proposed Response Plans" layer		Yes

Attribute Name	Type/Element	Reference	Description	CC Required
Response-Plan-Request-Filter	Type: ResponsePlanRequestFilter	Custom type; see "Proposed Response Plans" layer	Optional; To request a previously generated response plan	Yes-when available

3.8.2.10.7. ResponsePlanRequestFilter

This is a new object used to provide a filter for subscription and request dialogs related to response plans.

Attribute Name	Type/Element	Reference	Description	CC Required
Event-Id	Element		Required	Yes
Evaluation-Cycle-List	Element: Sequence of integers		Optional	Yes-when available
Response-Plan-Rank-List	Element: Sequence of integers		Optional	Yes-when available
Response-Plan-Id-List	Element: Sequence of "Organization-resource-identifier" types		Optional	Yes-when available
Plan-Type	Element: Enumerated: Response Plan (0), Termination Plan (1)		Optional	Yes-when available
Response-Plan-Status-List	Element: Sequence of "Response-plan-status" types		Optional	Yes-when available

3.8.2.10.8. ResponsePlanApprovalRequest

This is a new object containing a request of an approval decision for a proposed response plan..

Attribute Name	Type/Element	Reference	Description	CC Required
Authentication	Type: Authentication	TMDD 3.3.3.1		Yes
Response-Plan-Request-Header	Type: ResponsePlanRequestHeader	Custom type; see "Proposed Response Plans" layer		Yes
Response-Plan-Request-Filter	Type: ResponsePlanRequestFilter	Custom type; see "Proposed Response Plans" layer	Optional	Yes

3.8.2.10.9. ResponsePlanApproval

This is a new object for the aggregate approval of a response plan or termination plan by all agencies. There may be multiple rounds of proposed modifications before a response plan is approved.

Attribute Name	Type/Element	Reference	Description	CC Required
Response-Plan-Request-Header	Type: ResponsePlanRequestHeader	Custom type; see "Proposed Response Plans" layer		Yes
Response-Plan-Header	Type: ResponsePlanHeader	Custom type; see "Proposed Response Plans" layer		Yes
Aggregate-Approval-Decision	Type: ResponsePlanAgencyApproval	Custom type; see "Proposed Response Plans" layer	Indicates whether the proposed response plan was approved by all agencies.	Yes
Agency-Approval-Decision-List	Type: Sequence of "ResponsePlanAgencyApproval" types	Custom type; see "Proposed Response Plans" layer	Approval decisions of each agency.	Yes

3.8.2.10.10. ResponsePlanAgencyApproval

This is a new object for the approval of a response plan or termination plan by a specific agency.

Attribute Name	Type/Element	Reference	Description	CC Required
Organization-Approving	Type: Organization Information	TMDD 3.3.16.3	Indicates approval from a specific agency. Specify the CMS for the aggregate decision.	Yes
Approval-Decision	Element: Enumerated: approved (0), rejected (1), decision-not-received (2)		Indicates whether the proposed response plan was approved.	Yes

Attribute Name	Type/Element	Reference	Description	CC Required
Decision-Time	Type: DateTimeZone	TMDD 3.3.10.1 System Requirements spec 8.7.1.6	Time when the decision for approving the recommended response plan was received. Will be blank if the decision has not been received.	Yes-when applicable
Approval-Automation-Level	Type: Enumerated: manual approval required (0), automated approval permitted (1)	System Requirements specs 8.5.3 and 8.5.4	Indicates whether recommended response plans should require manual approval or whether the approval can be granted automatically.	Yes

3.8.2.10.11. ResponsePlanStatusRequest

This is a new object containing a request for the status of a response plan.

Attribute Name	Type/Element	Reference	Description	CC Required
Authentication	Type: Authentication	TMDD 3.3.3.1		Yes
Response-Plan-Request-Header	Type: ResponsePlanRequestHeader	Custom type; see "Proposed Response Plans" layer		Yes
Response-Plan-Request-Filter	Type: ResponsePlanRequestFilter	Custom type; see "Proposed Response Plans" layer		Yes

3.8.2.10.12. ResponsePlanStatus

This is a new object containing the statuses of a set of response plans.

Attribute Name	Type/Element	Reference	Description	CC Required
Response-Plan-Request-Header	Type: ResponsePlanRequestHeader	Custom type; see "Proposed Response Plans" layer		Yes
Response-Plan-Status-Details-List	Type: Sequence of "ResponsePlanStatusDetails" types	Custom type; see "Proposed Response Plans" layer	Individual response plan statuses	Yes

3.8.2.10.13. ResponsePlanPersonnelDeployment

This is a new object containing personnel deployment details for a response plan.

Attribute Name	Type/Element	Reference	Description	CC Required
Personnel-Organization	Type: OrganizationInformation	TMDD 3.3.16.3	Personnel's organization	Yes
Personnel-Contact-Details	Type: ContactDetails	TMDD 3.3.16.1		Yes
Activity-Start-Time	Type: DateTimeZone	TMDD 3.3.10.1		Yes
Activity-End-Time	Type: DateTimeZone	TMDD 3.3.10.1		Yes-when applicable
Deployment-Location	Type: GeoLocation	TMDD 3.6.9.4	Where the personnel is supposed to go	Yes-when applicable
Deployment-Instructions	Element: Text		Instructions for the assignment	Yes
Contact-For-Questions	Type: ContactDetails	TMDD 3.3.16.1	Person they can contact for questions; may be blank	Yes
Contact-On-Site	Type: ContactDetails	TMDD 3.3.16.1	Person to contact at the location; may be blank	Yes

3.8.2.10.14. IncidentResponse

This is a new data frame containing details about an incident and its associated response plans.

Attribute Name	Type/Element	Reference	Description	CC Required
Event-Id	Element			Yes
Evaluation-Cycle-List	Type: Sequence of "EvaluationCycleDetails" types	Custom type; see "Proposed Response Plans" layer		Yes

3.8.2.10.15. EventDetails

This is a new data frame containing details about the event.

Attribute Name	Type/Element	Reference	Description	CC Required
Event-Id	Element			Yes
Start-Time	Type: DateTimeZone		Time when the event started	Yes
End-Time	Type: DateTimeZone		Time when the event ended	Yes-when applicable
Full-Event-Update	Type: FullEventUpdate	TMDD 3.3.8.30		Yes

3.8.2.10.16. ResponsePlanStatusDetails

This is a new object containing the status of a response plan.

Attribute Name	Type/Element	Reference	Description	CC Required
Response-Plan-Header	Type: ResponsePlanHeader	Custom type; see "Proposed Response Plans" layer		Yes
Response-Plan-Status	Element: Enumerated: generated (0), submitted-for-approval (1), being-implemented (2), implemented (3), completed (4), rejected (5)		Statuses "being-implemented", "implemented" and "completed" are for a response plan that was accepted	Yes
Status-Last-Revised	Type: DateTimeZone	TMDD 3.3.10.1		Yes

3.9. LAYER: SELECTED RESPONSE PLANS

This layer includes details of the selected response plan, regardless of whether the plan is implemented or not. It also includes the real time implementation results of any deployed response plan.

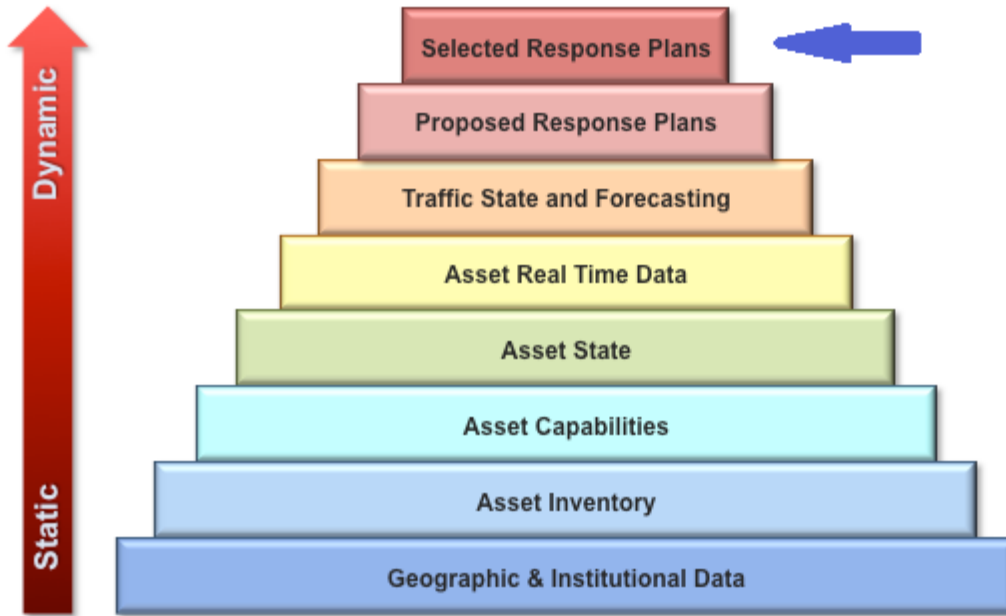


Figure 10 - Selected Response Plans Layer

3.9.1. Data Messages

TMDD Data Message Dialogs include the following:

Name	Reference	Description
dIDeviceCancelControlRequest	TMDD 3.1.5.1	Request for device control cancellation, including to cancel a previously scheduled lane closure when a response plan requires that the lane remain open
dIDMSControlRequest	TMDD 3.1.6.7	Request for Status of Device Control Request
dIDMSPriorityQueueRequest	TMDD 3.1.6.8	Request for DMS priority queue
dIHARControlRequest	TMDD 3.1.10.4	Request for HAR control
dIHARControlScheduleRequest	TMDD 3.1.10.5	Request for HAR Control Schedule
dIHARPriorityQueueRequest	TMDD 3.1.10.6	Request for HAR Priority Queue
dIIntersectionSignalControlRequest	TMDD 3.1.11.5	Request for intersection signal control

Name	Reference	Description
dlIntersectionSignalControlScheduleRequest	TMDD 3.1.11.6	Request for intersection signal Control Schedule
dlIntersectionSignalPriorityQueueRequest	TMDD 3.1.11.7	Request for intersection signal Priority Queue
dlLCSControlRequest	TMDD 3.1.12.3	Request for LCS control
dlLCSControlScheduleRequest	TMDD 3.1.12.4	Request for LCS Control Schedule
dlRampMeterControlRequest	TMDD 3.1.16.3	Request for ramp meter control
dlRampMeterControlScheduleRequest	TMDD 3.1.16.4	Request for ramp meter Control Schedule
dlRampMeterPriorityQueueRequest	TMDD 3.1.16.5	Request for ramp meter Priority Queue
dlSectionControlRequest	TMDD 3.1.18.2	Request for section control
dlSectionControlScheduleRequest	TMDD 3.1.18.3	Request for section Control Schedule
dlSectionPriorityQueueRequest	TMDD 3.1.18.5	Request for section Priority Queue
dlHARControlScheduleUpdate	TMDD 3.1.28.4	HAR Control Schedule update
dlResponsePlanLogRequest	New	Contains a request for a logged response plan implementation command
dlResponsePlanLogSubscription	New	Request for a subscription for logging commands used to implement a response plan
dlResponsePlanLogUpdate	New	Contains commands used to implement a response plan
dlResponsePlanTerminationRequest	New	Contains the decision of whether or not a response plan is accepted, to be pushed to other agencies

Other information that will be contained in this layer include:

Name	Reference	Description
Proposed Response Plan Traffic Forecast Summary		Contains summary of response plan traffic forecast
Proposed Response Plan Current Traffic State		Contains the current traffic state that was used to initiate the forecast and a snapshot of each current traffic state captured during response plan execution
Proposed Response Plan Traffic Forecast Details		Contains details of response plan traffic forecast

3.9.2. Data Class Descriptions

Data Class Descriptions include data elements for basic objects. Classes may be referenced in other classes (parent classes), and may be referenced in multiple parent classes. These do not represent database structures, but instead are based primarily on TMDD, or are structured similarly. Database design is expected to occur during system design.

See the beginning of section 3 for a description of the "CC Required" column.

3.9.2.1. ResponsePlan Class

This is a new class to handle response plan objects.

3.9.2.1.1. ResponsePlanImplementation

This is a new data frame for the implementation of a selected and approved response plan.

Attribute Name	Type/Element	Reference	Description	CC Required
Plan-Implementation-Status	Element: Text	System Requirements spec 8.6.6	Indicates status of response plan implementation so that a notification can be sent when the response plan has been implemented in its entirety or if the response plan cannot be implemented.	Yes
Implementation-Time	Type: DateTimeZone	TMDD 3.3.10.1 System Requirements spec 8.7.1.6	Time the approved response plan was implemented.	Yes-when applicable
Implementation-Termination-Time	Type: DateTimeZone	TMDD 3.3.10.1 System Requirements spec 8.7.1.6	Time the implemented response plan was terminated.	Yes-when applicable
Event-Termination-Status	Element: Enumerated: not-started (0), in-progress (1), complete (2)	System Requirements specs 8.4.6 and 8.5.5	Indicates status of event termination, so the Response Plan can be terminated after the event is officially terminated.	Yes

Attribute Name	Type/Element	Reference	Description	CC Required
Response-Plan-Termination-Approval-Level	Type: Enumerated: manual approval required (0), automated approval permitted (1)	System Requirements spec 8.5.5	Indicates whether active response plans can be automatically terminated or whether approval from all agencies involved in its implementation is required before termination,.	Yes
Response-Plan-Termination-Approval-Status	Type: Enumerated: not requested (0), requested (1), approved (2), rejected (3)	System Requirements spec 8.5.5	Authorized users from the agency will specify whether active response plans can be automatically terminated or whether approval from all agencies involved in its implementation is required before termination, and periods during which manual approval is required and periods during which automated approval is possible.	Yes
Response-Plan-Termination-Status	Element: Enumerated: not-started (0), in-progress (1), complete (2)	System Requirements spec 8.5.5	While a response plan is being terminated this status will indicate the termination is in-progress. When all control devices have returned to normal operation then this status will indicate that the response plan termination is officially complete.	Yes

3.9.2.1.2. ResponsePlanLogRequest

This is a new object containing a request for the response plan implementation commands from the log.

Attribute Name	Type/Element	Reference	Description	CC Required
Authentication	Type: Authentication	TMDD 3.3.3.1		Yes
Response-Plan-Request-Header	Type: ResponsePlanRequestHeader	Custom type; see "Proposed Response Plans" layer		Yes

Attribute Name	Type/Element	Reference	Description	CC Required
Response-Plan-Request-Filter	Type: ResponsePlanRequestFilter	Custom type; see "Proposed Response Plans" layer	Optional	Yes

3.9.2.1.3. ResponsePlanLog

This is a new object containing the logged implementation commands for a response plan

Attribute Name	Type/Element	Reference	Description	CC Required
Response-Plan-Request-Header	Type: ResponsePlanRequestHeader	Custom type; see "Proposed Response Plans" layer		Yes
Response-Plan-Header	Type: ResponsePlanHeader	Custom type; see "Proposed Response Plans" layer		Yes
Log-Detail-List	Type: Sequence of "ResponsePlanLogDetails" types	Custom type; see "Selected Response Plans" layer		Yes

3.9.2.1.4. ResponsePlanTerminationRequest

This is a new object containing a request to terminate an active response plan.

Attribute Name	Type/Element	Reference	Description	CC Required
Authentication	Type: Authentication	TMDD 3.3.3.1		Yes
Response-Plan-Request-Header	Type: ResponsePlanRequestHeader	Custom type; see "Proposed Response Plans" layer		Yes
Event-Id	Element: Organization-resource-identifier	System Requirements spec 8.7.1.6		Yes

Attribute Name	Type/Element	Reference	Description	CC Required
Response-Plan-Id-List	Element: Sequence of "Organization-resource-identifier" types		If blank then all active response plans will be terminated	Yes-when applicable
Response-Plan-Term-Request-Ext (Extended: cc-extension.xsd)	Type: ResponsePlanTermRequestExtended (Extended)		Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.9.2.1.5. ResponsePlanTermination

This is a new object containing a response to a request to terminate an active response plan.

Attribute Name	Type/Element	Reference	Description	CC Required
Response-Plan-Request-Header	Type: ResponsePlanRequestHeader	Custom type; see "Proposed Response Plans" layer		Yes
Event-Id	Element: Organization-resource-identifier	System Requirements spec 8.7.1.6		Yes
Response-Plan-Id	Element: Organization-resource-identifier		Id of the response plan being terminated	Yes
Request-Status	Element: Enumerated: requested-changes-completed (0), requested-changes-in-progress (1), request-rejected-invalid-command-parameters (2), request-rejected-insufficient-privileges-of-the-requesting-operator (3), request-queued-not-implemented (4), other (5)			Yes
Status-Last-Revised	Type: DateTimeZone	TMDD 3.3.10.1		Yes-when applicable

3.9.2.1.6. ResponsePlanLogDetails

This is a new object containing details of a logged response plan implementation command.

Attribute Name	Type/Element	Reference	Description	CC Required
Command-Status	Element: Enumerated: acknowledgement-received (0), acknowledgement-not-received (1), command-not-successfully-sent (2), command-rejected (3)			Yes
Object-Type	Element: Enumerated: Ramp-Metering-Control (0), Intersection-Control (1), DMS (2), HAR (3), Informational-Message (4), LCS-Schedule-Cancellation (5), Personnel-Deployment (6), Other (7)			Yes
Object-Id	Element: Organization-resource- identifier			Yes
Command-Text	Type: Text		Text of command message as a CLOB	Yes
Command- Acknowledgement- Text	Type: Text		Text of acknowledg ement message as a CLOB	Yes
Command-Sent- Time	Type: DateTimeZone	TMDD 3.3.10.1		Yes-when applicable
Acknowledgement- Received-Time	Type: DateTimeZone	TMDD 3.3.10.1		Yes-when applicable

3.9.2.1.7. ResponsePlanTermRequestHub

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional Data Hub-specific data for the ResponsePlanTermRequestExtended data frame.

Attribute Name	Type/Element	Description	CC Required
Hub-Event-Id	Element: Hash-Sequence-Id	Unique event ID	Yes - Only for CMS and Data Hub

3.9.2.1.8. ResponsePlanTermRequestExtended

This extended data frame only applies to the Corridor Management System (CMS).

This extended data frame contains additional data for the ResponsePlanTerminationRequest data frame.

Attribute Name	Type/Element	Description	CC Required
Term-Request-Hub	Type: ResponsePlanTermRequestHub (Extended)	Additional information for this dataframe	Yes - Only for CMS and Data Hub

3.10. SYSTEM DATA CLASSES

3.10.1. Data Messages

There are no applicable TMDD data messages. Information that will be contained in this layer include:

Name	Reference	Description
Alert	System Requirements spec 8.7.2, 8.4.1 and 8.4.5	Includes source, message (which may be text or may be an object type, for example ContactDetails), priority, severity
Response Plan Activity Log	System Requirements spec 8.7.1.6	Includes ID number of incident or event, time when response planning activities were initiated, time when a recommended response plan was proposed, ID number of recommended response plan, response plan evaluation score, time response plan was approved, time response plan was implemented, time response plan was replaced by another plan or terminated, time when response planning activities were terminated
Maintenance Log	System Requirements spec 8.7.1.8	Includes all maintenance alerts and notifications generated by the ICM system, and all maintenance activity logs entered by participating agencies
Event Log	System Requirements spec 8.4.1	Includes all identified incidents/events

3.10.2. System Data Class Elements

System class elements are classes and types that are used to ensure proper operation of the ICM system. These will include the following:

3.10.2.1. Security and User Data Classes

These class elements describe very high level descriptions of basic security types of information. This list of classes is subject to significant change as security design is developed for the ICM system.

Name	Reference	Description
User		Contains information describing a user, such as their name, contact details, parent organization, title
Security Group		Contains the information describing a system security group
Security Group Members List		Contains a list of security group members
Security Role		Contains a description of a specific security role
Security Permissions		Contains security privilege information
Security Role Permissions List		Contains a list of permissions belonging to a security role
Security Group Role List		Contains a list of security roles for a specific security group.
Authentication		Contains information regarding the authentication of the user accessing the system
Authorization		Contains information regarding the authorization of the user to perform a specific action or access a specific piece of information
Authentication Provider		Contains information regarding the provider of authentication services for the user
Authorization Provider		Contains information regarding the provider of authorization services for the user
Security Exception Log		Contains a system security exception log information, including name, system application or component owner
Security Exception		Contains a security exception, such as failed login attempt

3.10.2.2. User Activity Log Data Classes

These class elements describe very high level descriptions of basic activity log information. This list of classes is subject to significant change as security design is developed for the ICM system.

Name	Reference	Description
User Activity Log		Contains information describing a user activity log, including name, application, description
User Activity Log Entry Type		Contains information describing a type of user activity
User Activity Log Inventory		Contains a full list of user activities for a specific user
User Activity Log Entry		Contains an individual user activity log entry

3.10.2.3. Systems Description Classes

These class elements describe the system components, primarily for reference by other information classes.

Name	Reference	Description
Application		Contains information describing an application, including name, organizational owner, contact information, application host, application type, description.
Application Component		Contains information describing an application component, including name, organizational owner, contact information, component host, component type, description.
Application Log		Contains information describing log information for an application or component, including name, description, location, type

3.10.2.4. Systems State Classes

These class elements describe the system application and component state. These are again, very high level and subject to change based on system design.

Name	Reference	Description
Application State		Contains information describing an application's state, including working status.
Component State		Contains information describing an application component's state, including working status

Application Log Activity		Contains the application or component log activity
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3.10.2.5. Systems Maintenance Classes

These class elements describe the system maintenance actions and state. These are again, very high level and subject to change based on system design.

Name	Reference	Description
Application Maintenance Log		Contains information describing an application's maintenance log, including name, description, type, and last date of update
Application Maintenance Activity		Contains information for a specific application or component maintenance activity, including description, type, start date/time, end date/time, result and any error information
Application Maintenance Activity Result		Contains the details of any application or component maintenance action
Application Maintenance Activity Error		Contains the details of any application or component maintenance error

3.10.2.6. Systems Rules Engine Classes

These class elements describe the system rule engine classes. This is really just a placeholder until a rules engine is selected.

Name	Reference	Description
Rule set		Contains a set of rules.
Rule		Contains an individual rule.
Rule Owner		Contains a record of the owner of a rule
Rule Execution		Contains a rules execution instance
Rule Result		Contains a rules execution instance result

4. DEFINITION OF TERMS

Term	Definition
Alert	Notification sent by the ICM system to individuals or units. Alerts may be displayed on screen, sent by email, sent by text message, sent by radio message, or sent by telephone.
Archive	Data that has been stored for historical purposes and can be retrieved upon request, usually to a location and using a storage method that has large capacity and slower retrieval times.
Area of Impact (area of influence)	The road network elements impacted by an incident or event.
Asset	See <i>Corridor Asset</i> .
Asset Inventory	An inventory of corridor assets taken at any point in time. Asset inventory includes locations of fixed position assets, and types of corridor assets. Can be specified for a type of assets, such as intersection signal asset inventory. Also includes the attributes of each individual asset, such as intersection or ramp meter signal capabilities and currently available signal/ramp meter plans.
Asset State	The condition of a corridor asset at a point in time. This condition includes working state (usually operational, failed, or some degraded operational state), location of mobile assets, signal or ramp meter plan that is in operation at the point in time, and all most recent data received by the asset at the point in time.
Authentication	Verifying a user's identity.
Authorization	Verifying a user's permissions to view specific data elements or perform specific functions.
Availability	A description of whether an asset is available for use in a response plan or not.
Backward Chaining Rules	Rules that are defined so that a specific goal is specified, and the possible alternatives that will achieve that goal are identified by execution of the rule. A potential ICM-related example would be rules that are defined to create a list of alternative routes between two defined points and set limitations on what road links can be used at various times for the route creation. In this example, the goal is a route between the two points. The rules are executed to find all the possible alternatives, essentially working backwards to find solutions that fit the rules given to achieve the goal.
CMS	Changeable message sign. Includes both fixed and mobile devices.
Configuration Management	Maintaining a timeline of changes to an entity, ensuring traceability of changes in time, content, and author of the change.

Term	Definition
Contact Details	Information for a specific individual or organizational unit, including names, phone numbers, email addresses, physical address, specific to the type of contact methods available for the individual or unit.
Corridor Asset	<p>Any corridor element available for use within a response plan or that provides information to the ICM system. Assets include the following types of elements:</p> <ul style="list-style-type: none"> • Intersection traffic signals • Ramp meters • Organizational units or individuals (people resources) • Equipment • Mobile or stationary CMS elements • Traffic sensors and other measurement devices • Communication elements (511, HAR, third party information providers) • Parking facilities • Transit elements
Corridor State	<p>Information describing the state of the corridor at a specific point in time. State information includes:</p> <ul style="list-style-type: none"> • Corridor road network closures • Corridor road network lane blockages • Incident information • Event information • Asset inventory • Asset state • Sensor information • Transit information • Transit state • Traffic conditions (density, flow, velocity) on the road network • Response plans currently implemented or in the process of being implemented
Current Traffic State	Determining a value of traffic density, flow, and velocity for each link in the road network at the current time and with the data available at the current time. Also includes values for current turn volumes and ratios at each turn movement within the road network.
Data Hub	A core component of the ICM system which has primary responsibility for receiving, processing, storing, and providing data for all ICM system components.

Term	Definition
Data Quality	<p>A measure of the quality of data being received by the ICM system. Factors considered in data quality of a specific asset or type of assets include:</p> <ul style="list-style-type: none"> • Percent of working assets • Individual asset state, including level of asset degradation • Percent of time reliable data is provided by the asset • Specific filtering or algorithmic verification of incoming data specific to the asset or asset type
Data Restoration	Restoration of data to service in the event of system or component failure.
Decision Support	A core component of the ICM system, providing traffic conditions, incident and event information, forecasts of traffic, proposed response plans and associated traffic forecasts, asset inventories and asset availability, maintenance information, organizational information, road network conditions, and previous corridor planning and study information to users to support corridor operations and decision making.
Delay	A measure of the typical time a traveler would experience along a route over and above the time the traveler would experience at free-flow traffic conditions.
Demand	A measure of traffic demand (flow) at an entrance to the road network or between specify entry and exit points.
Deterministic	A solution to an algorithm or rule execution for which the execution of the algorithm or rule, given the same input data, will always provide the same answer at any point in time.
Device State	See <i>Asset State</i> .
Disaster Recovery Plan	A plan developed that provides procedures, operations, and actions that are taken in the event of system failure or loss of capabilities, including any required system shutdown procedures, data protection actions, system and data recovery actions, procedures for restoration of the system to operational state, and post-event actions to be taken.
DMS	Dynamic Message Sign. This is the same as a <i>CMS</i> (see above).
Do Nothing Response	A response plan that includes no changes to any corridor assets' normal, preprogrammed, responses to traffic behavior.
Downtime	The amount of time a system is not fully operational over a specified time interval.
Drill Down	The ability of the user to select an element of information on a display and retrieve additional details related to the information selected.
ESS	Environmental Sensor Station.

Term	Definition
Event	A planned or unplanned occasion or activity occurring within the corridor that is not caused by traffic activity but affects traffic conditions. Examples include road maintenance activity, a major sports event, a public event such as a parade, and a concert or arts activity.
Event-Driven Process	A process or action that is driven by notification or detection of a previous action or set of actions.
Forward Chaining Rules	Rules that are defined to be executed from a set of pre-defined inputs, to achieve an answer by executing the rule against those inputs. An ICM-related example might be a rule that states that any response plan that achieves a delay time improvement over the do-nothing response plan of 25% shall be submitted for selection by the corridor manager.
Geospatial	Relating to location on the earth.
Geospatial Display	Display of information on a map.
GTFS	General Transit Feed Specification. This is a data format used to represent transit routes and schedules on electronic maps.
HAR	Highway Advisory Radio, used for communicating to travelers.
Incident	Traffic-related incident, such as an accident or disabled vehicle.
Incident Confirmation	Positive confirmation within the system of an identified traffic incident.
Incident Identification	Identification of a traffic incident.
Inventory	A collection of assets.
Jurisdiction	Geographic and asset ownership or control by a specific organizational or governmental entity.
Jurisdictional Restriction	A restriction, generally on a corridor asset or road network element, imposed by an organizational or governmental agency.
LCS	Lane Control Signal. Same acronym is also used for Lane Closure System.
Link	A defined section of road.
Node	A point of connection between two or more links, often located at intersections, freeway ramp diversions or ends, changes in lane configuration, or changes in road attributes (such as speed limits).
Non-deterministic	A solution to an algorithm or rule execution for which the execution of the algorithm or rule, given the same input data, will not always provide the same answer at any point in time.
Operational Status	The working state of a corridor asset—generally working, degraded, or not functional, depending upon the capabilities of the asset.
Persistence	Storage of information in a permanent store, such as a database or file system.

Term	Definition
PHT	Person Hours Traveled. The product of the number of travelers (people) and the hours traveled over a specified period of time and within a specified geographic boundary.
Plot-Based Display	Display of information using two- and three-dimensional graphing techniques.
PMT	Person Miles Traveled. The product of the number of travelers (people) and the miles traveled over a specified period of time and within a specified geographic boundary.
Post-event	An event or action taken after a traffic incident and removal or release of response plan elements and after the end of the response plan duration.
Probe Vehicle	A vehicle equipped with sensors allowing them to record the position, speed, and travel direction of the vehicle at regular intervals or when coming into proximity of roadside devices.
Reactive Transitive Query	A type of rules execution where the rule being executed does not find a solution but is still listening to the facts being provided and, upon a change of the facts provided, will re-evaluate automatically and provide a solution if a solution exists. A possible ICM example is a rule that is provided and checks the difference between the current traffic state density and the "historical normal" density on the traffic network. At any time, the difference may not be above a threshold specified by the rule. However, when the difference is updated, the rule will evaluate again without a direction to execute, and if the threshold is exceeded, the rule action (perhaps notification of a potential incident) will be executed.
Real-Time Data	Real-time data denotes information that is delivered immediately after measurement. Depending on the system providing the data, this may include data that was measured a few seconds or a few minutes ago. In transportation systems, this typically means data 15-minutes old or less.
Recovery Point Objective	The maximum amount of time for which data may be lost in the event of a system or component failure. The time measure does not include the recovery time (see <i>Recovery Time Objective</i>).
Recovery Time Objective	The maximum amount of time a system or component may be out of service in the event of a system or component failure.
Redundant Capability	A capability of a system function or component to continue operating in the event of loss of a primary dependency or system capability by use of duplicate capacity or function.
Reroute	An alternative route defined within the ICM system chosen for traffic to follow in response to an event or incident.

Term	Definition
Response Crew	Any organizational (human and equipment) assets that respond to an incident or event.
Response Plan	<p>A collection of actions prepared and evaluated by the ICM system for implementation in response to an event or incident. Response plans may be in the following states:</p> <ul style="list-style-type: none"> • Development - The selection and assembly of response plan elements • Evaluation - System generation of traffic forecast based on the response plan and analysis of the forecast and other response plan components • Proposed - Recommended by the system for implementation based on the evaluation of the plan • Selection - Selection of a plan to be submitted for approval • Active - Approved and in implementation <p>Response plans may include one or more of the following deployment elements:</p> <ul style="list-style-type: none"> • Recommended traffic reroutes around an incident or event • Intersection traffic signal changes • Ramp meter changes • Organizational asset deployments • Equipment deployments • CMS changes • Communications <p>Required additional supporting elements of a response plan include:</p> <ul style="list-style-type: none"> • Approval requests and responses (if the response plan is proposed for implementation) • Traffic state at the time of response plan development initiation • Traffic forecast based on the response plan deployment elements • Geographic area of impact (also known as area of influence) • Corridor asset state at the time of response plan development initiation • Initiating incident or event information • Implementation results, including success or failure of each response plan action and traffic state information throughout the response plan duration (if the response plan is deployed)
Response Plan Development	Creation of one or more response plans in response to an incident or event by the ICM system.
Response Plan Implementation	Execution of response plan deployment elements.

Term	Definition
Road Capacity	The maximum number of vehicles a road, road segment, or link is capable of carrying at free-flow speeds over a one-hour period.
Route	An interconnected collection of road links that create a single continuous path between any two points in the road network.
Rule	A single element of logic, expressed within a format and dialog that the rules engine can understand and process.
Rule Action	A resulting action from execution of a rule.
Rule Condition	A condition that a rule checks during rule execution.
Rule Dependency	A dependency between two rules, usually enforced by rule categorization, grouping, or priority.
Rule Fact	A collection of information provided for a rule to use in its execution.
Rule set	A collection of rules and any instructions for their execution intended to be executed as a group within the rules engine.
Rules Engine	A core component of the ICM system that includes an off-the-shelf (commercial or open-source) software system that allows users to define, edit, or delete rules that govern specific logic applied to specific processes. The rules engine executes those rules at run time in the context of a process when the process is invoked. A rules engine is specified within the ICM system to allow users to define identification of traffic incidents, when response plans are to be developed, what response plan elements will be included within a response plan, and to allow the logic of these processes to be redefined by the users over the lifetime of the system.
Scheduled-Driven Process	An action or process that is initiated based on a pre-defined time-based schedule.
Sensor	A corridor asset that senses and reports to the ICM system a measurement of the state of the asset or traffic.
Tabular Display	Display of information in tables.
TMDD	Traffic Management Data Dictionary, which is a standard for communications between traffic centers.
Total Delay	The sum of all delay within a road network over a specified period of time.
Traffic Forecast	A prediction of the future state of traffic density, velocity, and flow for each link in the road network.
Traffic State	The current traffic density, velocity, and flow for each link in the road network.
Transit State	The state of one or more transit providers, including the transit inventory in operation, the working state of each asset, and each asset's location.

Term	Definition
Travel Time	<p>The time it takes to travel between two defined points along a specified route on the traffic network. Three types of travel time can be distinguished:</p> <ul style="list-style-type: none"> • Point travel time—Travel time observed at a given point in time within the road network • Predicted travel time—Expected future travel time along a given route based on a traveler or vehicle starting a trip at the current time and encountering various predicted traffic conditions along his trip • Experienced travel time—Travel time obtained by measuring the time it actually took for a person or vehicle to travel along a given route.
Turn Movement	<p>A split in the traffic flow at a node in the road network. Each possible link pair at the node in the direction of traffic flow is defined as a turn movement.</p>
Turn Ratio	<p>The flow from the input link to one output link of a turn movement divided by the total flow of the input link at a point in time.</p>
Turn Volume	<p>The traffic volume for a specific turn movement at a point in time.</p>
Two-Factor Authentication	<p>Authentication method that requires two forms of identification. A common two-factor authentication method is to use a username/password combination with an additional method, such as an additional hardware key device.</p>
Unbound Rule Arguments	<p>Arguments specified within a rule condition that are data-dependent.</p>
Uptime	<p>The amount of time a system is fully operational divided by the total period time over a specified time interval. For the purposes of the ICM system, fully operational is defined as reporting as working with no asset degradation and as the ICM system being unable to detect any behavior indicating asset failure or degraded operation.</p>
VHT	<p>Vehicle Hours Traveled. The product of the number of vehicles and the hours traveled over a specified period of time and within a specified geographic boundary.</p>
Visualization	<p>The collection and display of information by the system for the user.</p>
VMT	<p>Vehicle Miles Traveled. The product of the number of vehicles and the miles traveled over a specified period of time and within a specified geographic boundary.</p>

5. APPENDICES

5.1. DIALOG AND MESSAGE LIST

Gray highlights indicate objects defined by PATH.

Dialog and Message Names	Defined By
dlCCTVControlRequest	
Input: MSG_CCTVControlRequest	TMDD
Output: MSG_DeviceControlResponse	TMDD
Error: MSG_ErrorReport	TMDD
dlCCTVInventoryRequest	
Input: MSG_CCTVInventoryRequest	PATH
Output: MSG_CCTVInventory	TMDD
Error: MSG_ErrorReport	TMDD
dlCCTVInventoryUpdate	
Input: MSG_CCTVInventoryUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlCCTVStatusRequest	
Input: MSG_CCTVStatusRequest	PATH
Output: MSG_CCTVStatus	TMDD
Error: MSG_ErrorReport	TMDD
dlCCTVStatusUpdate	
Input: MSG_CCTVStatusUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlCenterActiveVerificationRequest	
Input: MSG_CenterActiveVerificationRequest	TMDD
Output: MSG_CenterActiveVerificationResponse	TMDD
Error: MSG_ErrorReport	TMDD
dlCenterActiveVerificationSubscription	
Input: MSG_CenterActiveVerificationSubscription	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlCenterActiveVerificationUpdate	
Input: MSG_CenterActiveVerificationUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlDetectorDataRequest	
Input: MSG_DetectorDataRequest	TMDD
Output: MSG_DetectorData	TMDD
Error: MSG_ErrorReport	TMDD

Dialog and Message Names	Defined By
dlDetectorDataSubscription	
Input: MSG_DetectorDataSubscription	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlDetectorDataUpdate	
Input: MSG_DetectorDataUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlDetectorInventoryRequest	
Input: MSG_DetectorInventoryRequest	PATH
Output: MSG_DetectorInventory	TMDD
Error: MSG_ErrorReport	TMDD
dlDetectorInventoryUpdate	
Input: MSG_DetectorInventoryUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlDetectorMaintenanceHistoryRequest	
Input: MSG_DetectorMaintenanceHistoryRequest	TMDD
Output: MSG_DetectorMaintenanceHistory	TMDD
Error: MSG_ErrorReport	TMDD
dlDetectorStatusRequest	
Input: MSG_DetectorStatusRequest	PATH
Output: MSG_DetectorStatus	TMDD
Error: MSG_ErrorReport	TMDD
dlDetectorStatusUpdate	
Input: MSG_DetectorStatusUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlDeviceCancelControlRequest	
Input: MSG_DeviceCancelControlRequest	TMDD
Output: MSG_DeviceControlResponse	TMDD
Error: MSG_ErrorReport	TMDD
dlDeviceControlStatusRequest	
Input: MSG_DeviceControlStatusRequest	TMDD
Output: MSG_DeviceControlResponse	TMDD
Error: MSG_ErrorReport	TMDD
dlDeviceInformationSubscription	
Input: MSG_DeviceInformationSubscription	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlDMSControlRequest	
Input: MSG_DMSControlRequest	TMDD
Output: MSG_DeviceControlResponse	TMDD
Error: MSG_ErrorReport	TMDD

Dialog and Message Names	Defined By
dIDMSInventoryRequest	
Input: MSG_DMSInventoryRequest	PATH
Output: MSG_DMSInventory	TMDD
Error: MSG_ErrorReport	TMDD
dIDMSInventoryUpdate	
Input: MSG_DMSInventoryUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dIDMSMessageAppearanceRequest	
Input: MSG_DMSMessageAppearanceRequest	TMDD
Output: MSG_DMSMessageAppearance	TMDD
Error: MSG_ErrorReport	TMDD
dIDMSMessageInventoryRequest	
Input: MSG_DMSMessageInventoryRequest	TMDD
Output: MSG_DMSMessageInventory	TMDD
Error: MSG_ErrorReport	TMDD
dIDMSMessageInventorySubscription	
Input: MSG_DMSMessageInventorySubscription	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dIDMSMessageInventoryUpdate	
Input: MSG_DMSMessageInventoryUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dIDMSPriorityQueueRequest	
Input: MSG_DMSPriorityQueueRequest	PATH
Output: MSG_DMSPriorityQueue	TMDD
Error: MSG_ErrorReport	TMDD
dIDMSStatusRequest	
Input: MSG_DMSStatusRequest	PATH
Output: MSG_DMSStatus	TMDD
Error: MSG_ErrorReport	TMDD
dIDMSStatusUpdate	
Input: MSG_DMSStatusUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dIESSInventoryRequest	
Input: MSG_ESSInventoryRequest	PATH
Output: MSG_ESSInventory	TMDD
Error: MSG_ErrorReport	TMDD
dIESSInventoryUpdate	
Input: MSG_ESSInventoryUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD

Dialog and Message Names	Defined By
dIESSObservationMetadataRequest	
Input: MSG_ESSObservationMetadataRequest	PATH
Output: MSG_ESSObservationMetadata	TMDD
Error: MSG_ErrorReport	TMDD
dIESSObservationReportRequest	
Input: MSG_ESSObservationReportRequest	PATH
Output: MSG_ESSObservationReport	TMDD
Error: MSG_ErrorReport	TMDD
dIESSObservationReportUpdate	
Input: MSG_ESSObservationReportUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dIESSStatusRequest	
Input: MSG_ESSStatusRequest	PATH
Output: MSG_ESSStatus	TMDD
Error: MSG_ErrorReport	TMDD
dIESSStatusUpdate	
Input: MSG_ESSStatusUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dIEventIndexRequest	
Input: MSG_EventIndexRequest	PATH
Output: MSG_EventIndex	TMDD
Error: MSG_ErrorReport	TMDD
dIEventIndexSubscription	
Input: MSG_EventIndexSubscription	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dIEventIndexUpdate	
Input: MSG_EventIndexUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dIFullEventUpdateRequest	
Input: MSG_FullEventUpdateRequest	PATH
Output: MSG_FullEventUpdate	TMDD
Error: MSG_ErrorReport	TMDD
dIFullEventUpdateSubscription	
Input: MSG_FullEventUpdateSubscription	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dIFullEventUpdateUpdate	
Input: MSG_FullEventUpdateUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD

Dialog and Message Names	Defined By
dlHARControlRequest	
Input: MSG_HARControlRequest	TMDD
Output: MSG_DeviceControlResponse	TMDD
Error: MSG_ErrorReport	TMDD
dlHARControlScheduleRequest	
Input: MSG_HARControlScheduleRequest	PATH
Output: MSG_HARControlSchedule	TMDD
Error: MSG_ErrorReport	TMDD
dlHARControlScheduleUpdate	
Input: MSG_HARControlScheduleUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlHARInventoryUpdate	
Input: MSG_HARInventoryUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlHARInventoryRequest	
Input: MSG_HARInventoryRequest	PATH
Output: MSG_HARInventory	TMDD
Error: MSG_ErrorReport	TMDD
dlHARMessageInventoryRequest	
Input: MSG_HARMessageInventoryRequest	PATH
Output: MSG_HARMessageInventory	TMDD
Error: MSG_ErrorReport	TMDD
dlHARMessageInventoryUpdate	
Input: MSG_HARMessageInventoryUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlHARPriorityQueueRequest	
Input: MSG_HARPriorityQueueRequest	PATH
Output: MSG_HARPriorityQueue	TMDD
Error: MSG_ErrorReport	TMDD
dlHARStatusRequest	
Input: MSG_HARStatusRequest	PATH
Output: MSG_HARStatus	TMDD
Error: MSG_ErrorReport	TMDD
dlHARStatusUpdate	
Input: MSG_HARStatusUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlIntersectionSignalControlRequest	
Input: MSG_IntersectionSignalControlRequest	TMDD
Output: MSG_IntersectionSignalControlResponse	TMDD
Error: MSG_ErrorReport	TMDD

Dialog and Message Names	Defined By
dlIntersectionSignalControlScheduleRequest	
Input: MSG_IntersectionSignalControlScheduleRequest	PATH
Output: MSG_IntersectionSignalControlSchedule	TMDD
Error: MSG_ErrorReport	TMDD
dlIntersectionSignalControlScheduleUpdate	
Input: MSG_IntersectionSignalControlScheduleUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlIntersectionSignalInventoryRequest	
Input: MSG_IntersectionSignalInventoryRequest	PATH
Output: MSG_IntersectionSignalInventory	TMDD
Error: MSG_ErrorReport	TMDD
dlIntersectionSignalInventoryUpdate	
Input: MSG_IntersectionSignalInventoryUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlIntersectionSignalPriorityQueueRequest	
Input: MSG_IntersectionSignalPriorityQueueRequest	PATH
Output: MSG_IntersectionSignalPriorityQueue	TMDD
Error: MSG_ErrorReport	TMDD
dlIntersectionSignalStatusRequest	
Input: MSG_IntersectionSignalStatusRequest	PATH
Output: MSG_IntersectionSignalStatus	TMDD
Error: MSG_ErrorReport	TMDD
dlIntersectionSignalStatusUpdate	
Input: MSG_IntersectionSignalStatusUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlIntersectionSignalTimingPatternInventoryRequest	
Input: MSG_IntersectionSignalTimingPatternInventoryRequest	TMDD
Output: MSG_IntersectionSignalTimingPatternInventory	TMDD
Error: MSG_ErrorReport	TMDD
dlIntersectionSignalTimingPatternInventorySubscription	
Input: MSG_IntersectionSignalTimingPatternInventorySubscription	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlIntersectionSignalTimingPatternInventoryUpdate	
Input: MSG_IntersectionSignalTimingPatternInventoryUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlLCSControlRequest	
Input: MSG_LCSControlRequest	TMDD
Output: MSG_DeviceControlResponse	TMDD
Error: MSG_ErrorReport	TMDD

Dialog and Message Names	Defined By
dLLCSControlScheduleRequest	
Input: MSG_CSControlScheduleRequest	PATH
Output: MSG_LCSControlSchedule	TMDD
Error: MSG_ErrorReport	TMDD
dLLCSControlScheduleUpdate	
Input: MSG_LCSControlScheduleUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dLLCSInventoryRequest	
Input: MSG_CSInventoryRequest	PATH
Output: MSG_LCSInventory	TMDD
Error: MSG_ErrorReport	TMDD
dLLCSInventoryUpdate	
Input: MSG_LCSInventoryUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dLLCSStatusRequest	
Input: MSG_CSStatusRequest	PATH
Output: MSG_LCSStatus	TMDD
Error: MSG_ErrorReport	TMDD
dLLCSStatusUpdate	
Input: MSG_LCSStatusUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dLLinkInventoryRequest	
Input: MSG_LinkInventoryRequest	PATH
Output: MSG_LinkInventory	TMDD
Error: MSG_ErrorReport	TMDD
dLLinkInventoryUpdate	
Input: MSG_LinkInventoryUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dLLinkStatusRequest	
Input: MSG_LinkStatusRequest	PATH
Output: MSG_LinkStatus	TMDD
Error: MSG_ErrorReport	TMDD
dLLinkStatusUpdate	
Input: MSG_LinkStatusUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dLNodeInventoryRequest	
Input: MSG_NodeInventoryRequest	PATH
Output: MSG_NodeInventory	TMDD
Error: MSG_ErrorReport	TMDD

Dialog and Message Names	Defined By
dlNodeInventoryUpdate	
Input: MSG_NodeInventoryUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlNodeStatusRequest	
Input: MSG_NodeStatusRequest	PATH
Output: MSG_NodeStatus	TMDD
Error: MSG_ErrorReport	TMDD
dlNodeStatusUpdate	
Input: MSG_NodeStatusUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlOrganizationInformationRequest	
Input: MSG_OrganizationInformationRequest	TMDD
Output: MSG_OrganizationInformation	TMDD
Error: MSG_ErrorReport	TMDD
dlOrganizationInformationSubscription	
Input: MSG_OrganizationInformationSubscription	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlOrganizationInformationUpdate	
Input: MSG_OrganizationInformationUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlRampMeterControlRequest	
Input: MSG_RampMeterControlRequest	TMDD
Output: MSG_DeviceControlResponse	TMDD
Error: MSG_ErrorReport	TMDD
dlRampMeterControlScheduleRequest	
Input: MSG_RampMeterControlScheduleRequest	PATH
Output: MSG_RampMeterControlSchedule	TMDD
Error: MSG_ErrorReport	TMDD
dlRampMeterControlScheduleUpdate	
Input: MSG_RampMeterControlScheduleUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlRampMeterInventoryRequest	
Input: MSG_RampMeterInventoryRequest	PATH
Output: MSG_RampMeterInventory	TMDD
Error: MSG_ErrorReport	TMDD
dlRampMeterInventoryUpdate	
Input: MSG_RampMeterInventoryUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD

Dialog and Message Names	Defined By
dlRampMeterPlanInventoryRequest	
Input: MSG_RampMeterPlanInventoryRequest	TMDD
Output: MSG_RampMeterPlanInventory	TMDD
Error: MSG_ErrorReport	TMDD
dlRampMeterPlanInventorySubscription	
Input: MSG_RampMeterPlanInventorySubscription	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlRampMeterPlanInventoryUpdate	
Input: MSG_RampMeterPlanInventoryUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlRampMeterPriorityQueueRequest	
Input: MSG_RampMeterPriorityQueueRequest	PATH
Output: MSG_RampMeterPriorityQueue	TMDD
Error: MSG_ErrorReport	TMDD
dlRampMeterStatusRequest	
Input: MSG_RampMeterStatusRequest	PATH
Output: MSG_RampMeterStatus	TMDD
Error: MSG_ErrorReport	TMDD
dlRampMeterStatusUpdate	
Input: MSG_RampMeterStatusUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlResponsePlanApprovalRequest (New)	PATH
Input: MSG_ResponsePlanApprovalRequest <i>Dataframe: ResponsePlanApprovalRequest</i>	PATH PATH
Output: MSG_ResponsePlanApprovalResponse <i>Dataframe: ResponsePlanApproval</i>	PATH PATH
Error: MSG_ErrorReport	TMDD
dlResponsePlanApprovalSubscription (New)	PATH
Input: MSG_ResponsePlanApprovalSubscription <i>Dataframe: ResponsePlanApprovalRequest</i>	PATH PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlResponsePlanApprovalUpdate (New)	PATH
Input: MSG_ResponsePlanApprovalUpdate <i>Dataframe: ResponsePlanApproval</i>	PATH PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD

Dialog and Message Names	Defined By
dlResponsePlanLogRequest (New)	PATH
Input: MSG_ResponsePlanLogRequest <i>Dataframe: ResponsePlanLogRequest</i>	PATH PATH
Output: MSG_ResponsePlanLogResponse <i>Dataframe: ResponsePlanLog</i>	PATH PATH
Error: MSG_ErrorReport	TMDD
dlResponsePlanLogSubscription (New)	PATH
Input: MSG_ResponsePlanLogSubscription <i>Dataframe: ResponsePlanLogRequest</i>	PATH PATH
Output: MSG_ConfirmationReceipt Error: MSG_ErrorReport	TMDD TMDD
dlResponsePlanLogUpdate (New)	PATH
Input: MSG_ResponsePlanLogUpdate <i>Dataframe: ResponsePlanLog</i>	PATH PATH
Output: MSG_ConfirmationReceipt Error: MSG_ErrorReport	TMDD TMDD
dlResponsePlanStatusRequest (New)	PATH
Input: MSG_ResponsePlanStatusRequest <i>Dataframe: ResponsePlanStatusRequest</i>	PATH PATH
Output: MSG_ResponsePlanStatusResponse <i>Dataframe: ResponsePlanStatus</i>	PATH PATH
Error: MSG_ErrorReport	TMDD
dlResponsePlanStatusSubscription (New)	PATH
Input: MSG_ResponsePlanStatusSubscription <i>Dataframe: ResponsePlanStatusRequest</i>	PATH PATH
Output: MSG_ConfirmationReceipt Error: MSG_ErrorReport	TMDD TMDD
dlResponsePlanStatusUpdate (New)	PATH
Input: MSG_ResponsePlanStatusUpdate <i>Dataframe: ResponsePlanStatus</i>	PATH PATH
Output: MSG_ConfirmationReceipt Error: MSG_ErrorReport	TMDD TMDD
dlResponsePlanRequest (New)	PATH
Input: MSG_ResponsePlanRequest <i>Dataframe: ResponsePlanRequest</i>	PATH PATH
Output: MSG_ResponsePlanResponse <i>Dataframe: IncidentResponse</i>	PATH PATH
Error: MSG_ErrorReport	TMDD
dlResponsePlanSubscription (New)	PATH
Input: MSG_ResponsePlanSubscription <i>Dataframe: ResponsePlanRequest</i>	PATH PATH
Output: MSG_ConfirmationReceipt Error: MSG_ErrorReport	TMDD TMDD

Dialog and Message Names	Defined By
dlResponsePlanTerminationRequest (New)	PATH
Input: MSG_ResponsePlanTerminationRequest <i>Dataframe: ResponsePlanTerminationRequest</i>	PATH PATH
Output: MSG_ResponsePlanTerminationResponse <i>Dataframe: ResponsePlanTermination</i>	PATH PATH
Error: MSG_ErrorReport	TMDD
dlResponsePlanUpdate (New)	PATH
Input: MSG_ResponsePlanUpdate <i>Dataframe: IncidentResponse</i>	PATH PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlRouteInventoryRequest	
Input: MSG_RouteInventoryRequest	PATH
Output: MSG_RouteInventory	TMDD
Error: MSG_ErrorReport	TMDD
dlRouteInventoryUpdate	
Input: MSG_RouteInventoryUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlRouteStatusRequest	
Input: MSG_RouteStatusRequest	PATH
Output: MSG_RouteStatus	TMDD
Error: MSG_ErrorReport	TMDD
dlRouteStatusUpdate	
Input: MSG_RouteStatusUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlSectionControlRequest	
Input: MSG_SectionControlRequest	TMDD
Output: MSG_SectionControlResponse	TMDD
Error: MSG_ErrorReport	TMDD
dlSectionControlScheduleRequest	
Input: MSG_SectionControlScheduleRequest	PATH
Output: MSG_SectionControlScheduleResponse	TMDD
Error: MSG_ErrorReport	TMDD
dlSectionControlScheduleUpdate	
Input: MSG_SectionControlScheduleUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlSectionControlStatusRequest	
Input: MSG_SectionControlStatusRequest	TMDD
Output: MSG_SectionControlResponse	TMDD
Error: MSG_ErrorReport	TMDD

Dialog and Message Names	Defined By
dlSectionPriorityQueueRequest	
Input: MSG_SectionPriorityQueueRequest	PATH
Output: MSG_SectionPriorityQueue	TMDD
Error: MSG_ErrorReport	TMDD
dlSectionSignalTimingPatternInventoryRequest	
Input: MSG_SectionSignalTimingPatternInventoryRequest	TMDD
Output: MSG_SectionSignalTimingPatternInventory	TMDD
Error: MSG_ErrorReport	TMDD
dlSectionSignalTimingPatternInventorySubscription	
Input: MSG_SectionSignalTimingPatternInventorySubscription	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlSectionSignalTimingPatternInventoryUpdate	
Input: MSG_SectionSignalTimingPatternInventoryUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlSectionStatusRequest	
Input: MSG_SectionStatusRequest	PATH
Output: MSG_SectionStatus	TMDD
Error: MSG_ErrorReport	TMDD
dlSectionStatusUpdate	
Input: MSG_SectionStatusUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlTrafficNetworkInformationSubscription	
Input: MSG_TrafficNetworkStatusSubscription	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlVideoSwitchInventoryRequest	
Input: MSG_VideoSwitchInventoryRequest	PATH
Output: MSG_VideoSwitchInventory	TMDD
Error: MSG_ErrorReport	TMDD
dlVideoSwitchInventoryUpdate	
Input: MSG_VideoSwitchInventoryUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD
dlVideoSwitchStatusRequest	
Input: MSG_VideoSwitchStatusRequest	PATH
Output: MSG_VideoSwitchStatus	TMDD
Error: MSG_ErrorReport	TMDD
dlVideoSwitchStatusUpdate	
Input: MSG_VideoSwitchStatusUpdate	PATH
Output: MSG_ConfirmationReceipt	TMDD
Error: MSG_ErrorReport	TMDD

5.2. EXPECTED PROPERTIES FOR REQUEST AND SUBSCRIPTION DIALOGS

The tables below define the properties and behaviors which are expected to be followed for the request and subscription dialogs, as well as which devices or assets are expected to be received in the corresponding response or update.

* Regarding which devices are included in a response or update: In addition to the request filter, the message should also be limited to devices belonging to the organization-id (if supplied) in the deviceInformationRequest.organization-information element.

5.2.1. Center Active Verification

Property	Request	Periodic Subscription	On-Change Subscription
Change trigger			
Field Element Polling Frequency		60 seconds	
TMDD Message Frequency	On request	One message every 60 seconds	
Devices in Message *	n/a	n/a	
Max Receipt Time	2 seconds	2 seconds	

5.2.2. Organization Information

Property	Request	Periodic Subscription	On-Change Subscription
Change trigger			
Field Element Polling Frequency		60 seconds	
TMDD Message Frequency	On request	One message every 60 seconds	
Devices in Message *	Only include the organization or centers specified in the request. If not specified then include all.	Only include the organization or centers specified in the request. If not specified then include all.	
Max Receipt Time	2 seconds	2 seconds	

5.2.3. Intersection Detector Data

Property	Request	Periodic Subscription	On-Change Subscription
Change trigger			Value changed or reported timestamp changed
Field Element Polling Frequency			For each controller: end of cycle or every 60 seconds
TMDD Message Frequency	On request		No more than one message each second
Devices in Message *	Defined in request filter. If not specified then include all.		a) Polling per cycle: Include all detectors belonging to controllers for which the cycle ended since the prior message. b) Time-based polling: Include all detectors that changed (based on "change trigger") in the polling intervals which ended since the prior message. Note: If all detectors are polled on the same 60-second interval then there will be one message every 60 seconds containing all detectors.
Max Receipt Time	2 seconds		2 seconds

5.2.4. Intersection Detector Inventory

Property	Request	Periodic Subscription	On-Change Subscription
Change trigger			
Field Element Polling Frequency		Once per day	
TMDD Message Frequency	On request	One message each day	
Devices in Message *	Defined in request filter. If not specified then include all.	All detectors, grouped by controller	
Max Receipt Time	2 seconds	2 seconds	

5.2.5. Intersection Detector Status

Property	Request	Periodic Subscription	On-Change Subscription
Change trigger			Value changed or reported timestamp changed

Property	Request	Periodic Subscription	On-Change Subscription
Field Element Polling Frequency			For each controller: end of cycle or every 60 seconds
TMDD Message Frequency	On request		No more than one message each second
Devices in Message *	Defined in request filter. If not specified then include all.		a) Polling per cycle: Include all detectors belonging to controllers for which the cycle ended since the prior message. b) Time-based polling: Include all detectors that changed (based on "change trigger") in the polling intervals which ended since the prior message. Note: If all detectors are polled on the same 60-second interval then there will be one message every 60 seconds containing all detectors.
Max Receipt Time	2 seconds		2 seconds

5.2.6. Intersection Signal Control Schedule

Property	Request	Periodic Subscription	On-Change Subscription
Change trigger			Control schedule changed
Field Element Polling Frequency		At least once just before Update message is created	For each controller: end of cycle or every 60 seconds
TMDD Message Frequency	On request	Not more frequently than once per day	No more than one message every 60 seconds
Devices in Message *	Defined in request filter. If not specified then include all.	All schedules for all controllers	All schedules for controllers that changed (based on "change trigger") during the polling intervals which ended since the prior message.
Max Receipt Time	10 seconds	10 seconds	2 seconds
Comments			Preferred over periodic subscription

5.2.7. Intersection Signal Inventory

Property	Request	Periodic Subscription	On-Change Subscription
Change trigger			
Field Element Polling Frequency		Once per day	

Property	Request	Periodic Subscription	On-Change Subscription
TMDD Message Frequency	On request	One message each day	
Devices in Message *	Defined in request filter. If not specified then include all.	All controllers	
Max Receipt Time	2 seconds	2 seconds	

5.2.8. Intersection Signal Status

Property	Request	Periodic Subscription	On-Change Subscription
Change trigger			Light changed
Field Element Polling Frequency			At least once per second
TMDD Message Frequency	On request		No more than one message each second
Devices in Message *	Defined in request filter. If not specified then include all.		Include all controllers that changed (based on "change trigger") since the prior message. If polling is more frequent than the message interval and a controller changes more than once since the prior message then each change (with different controller-timestamps) should be included in the message.
Max Receipt Time	2 seconds		2 seconds

5.2.9. Intersection Signal Timing Pattern Inventory

Property	Request	Periodic Subscription	On-Change Subscription
Change trigger			Timing pattern changed
Field Element Polling Frequency		At least once just before Update message is created	For each controller: end of cycle or every 60 seconds
TMDD Message Frequency	On request	Not more frequently than once per day	No more than one message every 60 seconds
Devices in Message *	Defined in request filter. If not specified then include all.	All timing patterns for all controllers	All timing patterns for controllers that changed (based on "change trigger") during the polling intervals which ended since the prior message.
Max Receipt Time	10 seconds	10 seconds	2 seconds
Comments			Preferred over periodic subscription

5.3. STARTUP PROCESS FOR ON-CHANGE SUBSCRIPTIONS

OnChange subscriptions generally will update just the assets which changed, so if a message is missed (due to a system outage, transmission failure, etc) then must be re-synchronized by re-starting the subscription.

The subscription startup process for on-change subscriptions is as follows:

- 1) Cancel the existing subscription (if it exists).
- 2) Send a Request/Response to get the current state for all assets. Some on-change subscription implementations send a current state for all assets in the first message. If on-change subscription first message does include current state for all assets, this request/response is not required.
- 3) Start a new on-change subscription for subsequent changes.

Note: The on-change subscription request will be sent immediately after the Request/Response in the prior step so that no changes will be missed, so updates can be sent even if the Request/Response response message is still being created.

5.4. DESCRIPTIONS OF WORKFLOWS RELATED TO RESPONSE PLANS

The workflows in this section describe how the ATMS, CMS (Corridor Management System) and Data Hub communicate with regard to incidents and response plans. Communication between ATMS and CMS is in the form of SOAP messages, and communication between CMS and Data Hub is in the form of ActiveMQ messaging (see notes below).

This appendix describes the following workflows:

Workflow 0: Initialize subscriptions

- a. Describes the initialization of the SOAP subscription channels between CMS and ATMS when the systems startup.

Workflow 1: Response plans for new incidents

This workflow describes the process for submitting a new incident and receiving initial response plans for:

- a. A new **freeway** incident reported by ATMS.
- b. A new **arterial** incident reported by CMS and the response plan affects ATMS assets.
- c. A new **arterial** incident reported by CMS and the response plan does **not** affect ATMS assets.

Multiple response plans may be generated and ranked, then the the most highly ranked response plan is sent to be reviewed and voted on. The process continues with Workflow 2 to vote on the proposed response plan.

Workflow 2: Voting to accept or reject a response plan

Response plans are reviewed one at a time and voted on. If it is unanimously accepted then it is implemented, otherwise it is rejected and the next most highly ranked response plan is sent for review. This process continues until a response plan is accepted or there are no more response plans to review.

This workflow describes the voting process for response plans in these mutually exclusive situations:

- a. The response plan is for a freeway incident or an arterial incident which affects ATMS assets, and all agencies **accept** the response plan.
- b. The response plan is for a freeway incident or an arterial incident which affects ATMS assets, and at least one agency **rejects** the response plan.
- c. The response plan is for an arterial incident which does **not** affect ATMS assets, and all agencies **accept** the response plan.

- d. The response plan is for an arterial incident which does **not** affect ATMS assets, and at least one agency **rejects** the response plan.

Workflow 3: Periodic re-evaluation of the incident

This workflow describes how the Data Hub automatically re-evaluates the incident every 30 or 15 minutes after a response plan is accepted. The first evaluation occurs 30 minutes after a response plan is accepted and subsequent cycles occur every 15 minutes.

Alternative response plans are evaluated and those that are ranked higher than keeping the currently active response plan are sent for review.

After a response plan is received for review then the process continues with Workflow 2 to vote on the proposed response plan.

Workflow 4: Incident updates

This workflow describes the process for updating an incident and getting new response plans for:

- a. A **freeway** incident updated by ATMS.
- b. An **arterial** incident updated by CMS and the response plan affects ATMS assets.
- c. An **arterial** incident updated by CMS and the response plan does **not** affect ATMS assets.

An incident update may be submitted at any time except after a request a response plan has been accepted. From this point the Data Hub will ignore all future requests related to changes of the incident or the response plan.

The incident updates are evaluated and those that are ranked higher than keeping the currently active response plan are sent for review.

After a response plan is received for review then the process continues with Workflow 2 to vote on the proposed response plan.

Workflow 5: Terminating a response plan

This workflow describes the process for terminating an active response plan for:

- a. A **freeway** incident.
- b. An **arterial** incident where the response plan affects ATMS assets.
- c. An **arterial** incident where the response plan does **not** affect ATMS assets.

One termination plan is generated and sent to be reviewed and voted on. The process continues with Workflow 6 to vote on the proposed termination plan.

Workflow 6: Voting to accept or reject a termination plan

This workflow describes the voting process to accept or reject a proposed termination plan. This process is almost identical to the process for voting on a response plan except there will only be one proposed termination plan, so if it is rejected then the currently active response plan remains active. The process varies according to these mutually exclusive situations:

- a. The termination plan is for a freeway incident or an arterial incident which affects ATMS assets, and all agencies **accept** the termination plan.
- b. The termination plan is for a freeway incident or an arterial incident which affects ATMS assets, and at least one agency **rejects** the termination plan.
- c. The termination plan is for an arterial incident which does **not** affect ATMS assets, and all agencies **accept** the termination plan.
- d. The termination plan is for an arterial incident which does **not** affect ATMS assets, and at least one agency **rejects** the termination plan.

Notes about the use of messaging protocols between the components:

This document assumes an ActiveMQ messaging environment between Data Hub and CMS, and a SOAP messaging environment between CMS and all agencies including ATMS. The descriptions below refer to dialog names for the SOAP messages or the end of the endpoint names for the ActiveMQ topics or queues as appropriate.

Workflow 0 (initializing subscription channels) describes subscriptions between CMS and ATMS in a SOAP environment and those subscriptions are always required.

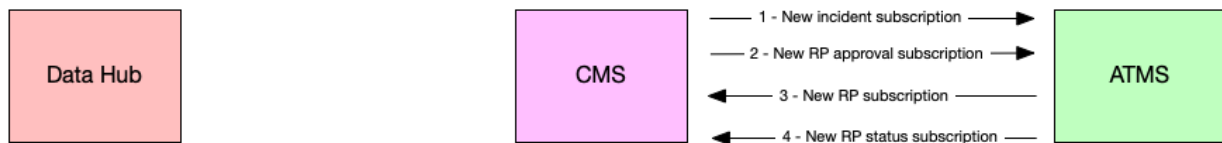
ActiveMQ does not have an acknowledgement mechanism so communications between Data Hub and CMS will require a monitoring process to look for expected actions resulting from a message, and a mechanism for resubmitting a request if the expected action does not occur in a reasonable amount of time.

5.4.0. Workflow 0: Initializing subscriptions

This workflow is used when the CMS and ATMS components startup to initialize the communications between them. These SOAP subscriptions stay open as long as the components are up, and the subscriptions handle response plan dialogs for all events and all response plans in the corridor.

In an ActiveMQ environment the subscriptions between the CMS and Data Hub described above are replaced with individual message queues so there is no need for subscription dialogs.

Initialize subscription channels on system startup



- 1 - dlFullEventUpdateSubscription
- 2 - dlResponsePlanApprovalSubscription
- 3 - dlResponsePlanSubscription
- 4 - dlResponsePlanStatusSubscription

Step	Messages and Actions
1	<p>Desc: Create a new event subscription so ATMS can send new incidents to CMS.</p> <p>Messages:</p> <p>CMS to ATMS: Dialog: dlFullEventUpdateSubscription CMS Action: Submit message MSG_EventSubscription to ATMS ATMS Response: Send receipt message MSG_ConfirmationReceipt to CMS ATMS Action: Open event subscription channel</p> <p>Error handling: If ATMS receipt isn't received within N seconds then CMS submits message again.</p>
2	<p>Desc: Create a new response plan approval subscription so ATMS can send its response plan approval decisions to CMS.</p> <p>Messages:</p> <p>CMS to ATMS: Dialog: dlResponsePlanApprovalSubscription CMS Action: Submit message MSG_ResponsePlanApprovalSubscription to ATMS ATMS Response: Send receipt message MSG_ConfirmationReceipt to CMS ATMS Action: Open response plan approval subscription channel</p> <p>Error handling: If ATMS receipt isn't received within N seconds then CMS submits message again.</p>

Step	Messages and Actions
3	<p>Desc: Create a new response plan subscription so CMS can send response plans to ATMS after CMS gets them from Data Hub.</p> <p>Messages: ATMS to CMS: Dialog: dlResponsePlanSubscription ATMS Action: Submit message MSG_ResponsePlanSubscription to CMS CMS Response: Send receipt message MSG_ConfirmationReceipt to ATMS CMS Action: Open response plan subscription channel</p> <p>Error handling: If CMS receipt isn't received within N seconds then ATMS submits message again.</p>
4	<p>Desc: Create a new response plan status subscription so CMS can send final response plan decisions to ATMS after CMS has aggregated all the individual agency decisions.</p> <p>Messages: ATMS to CMS: Dialog: dlResponsePlanStatusSubscription ATMS Action: Submit message MSG_ResponsePlanStatusSubscription to CMS CMS Response: Send receipt message MSG_ConfirmationReceipt to ATMS CMS Action: Open response plan status subscription channel</p> <p>Error handling: If CMS receipt isn't received within N seconds then ATMS submits message again.</p>

5.4.1. Workflow 1: Reporting a new incident

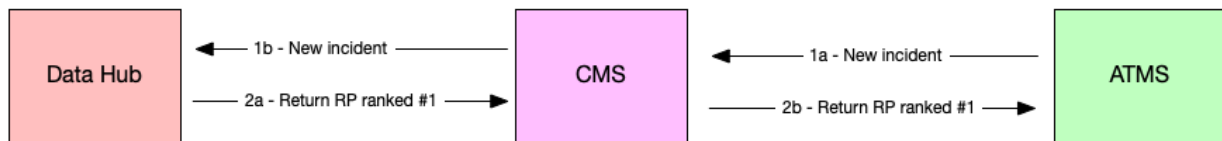
This workflow describes the process for reporting a new incident, and the process depends on whether the incident is on a freeway or arterial, and for an arterial incident it also depends on whether the proposed response plan affects ATMS assets.

Freeway incidents are expected to be reported by ATMS and arterial incidents are expected to be reported by CMS.

When the Data Hub receives a new incident it initiates the creation of a set of proposed response plans and sends the most highly ranked response plan to be reviewed. If there are no response plans that are better than "doing nothing" then Data Hub will still send a response plan message but the header will indicate that there are no ranked response plans to review. Otherwise the response plan will be reviewed and voted on.

After the proposed response plan is received, **continue with Workflow 2 for the response plan voting process.**

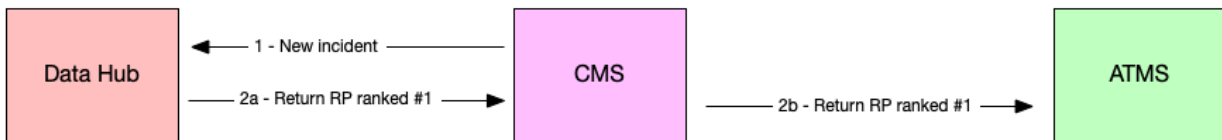
Situation A: New **freeway** incident reported by ATMS



- 1a - dlFullEventUpdateUpdate message
- 1b - Event.FullEventUpdate queue
- 2a - Event.IncidentResponse queue
- 2b - dlResponsePlanUpdate message

Then continue with Workflow 2 to vote on the response plan.

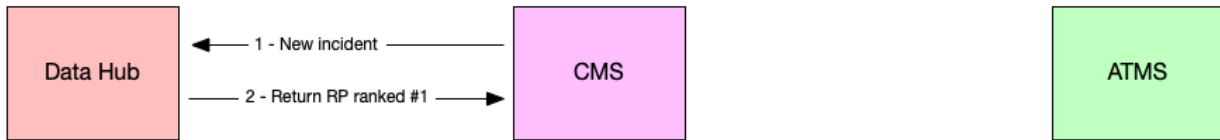
Situation B: New **arterial** incident reported by CMS and response plan affects ATMS assets



- 1 - Event.FullEventUpdate queue
- 2a - Event.IncidentResponse queue
- 2b - dlResponsePlanUpdate message

Then continue with Workflow 2 to vote on the response plan.

Situation C: New *arterial* incident reported by CMS and response plan does *not* affect ATMS assets



1 - Event.FullEventUpdate queue

2 - Event.IncidentResponse queue

Then continue with Workflow 2 to vote on the response plan.

Step	Messages and Actions
1	<p>Desc: Report new incident to Data Hub.</p> <p>Messages:</p> <p>a) ATMS to CMS (<i>only applies for a freeway incident</i>): Dialog: dlFullEventUpdateUpdate ATMS Action: Submit message MSG_FullEventUpdateUpdate to CMS CMS Response: Send receipt message MSG_ConfirmationReceipt to ATMS</p> <p>b) CMS to Data Hub: Message queue: Event.FullEventUpdate CMS Action: Submit dataframe FullEventUpdate to Data Hub</p>
2	<p>Desc: Data Hub initiates the creation of response plans and sends the highest ranked response plan to CMS.</p> <p>Dependencies: Wait for receipt of CMS message from step 1.</p> <p>Messages:</p> <p>a) Data Hub to CMS: Message queue: Event.IncidentResponse DH Action: Submit dataframe IncidentResponse to CMS</p> <p>b) CMS to ATMS (<i>only applies for freeway incidents or arterial incidents with a response plan that affects ATMS assets</i>): Dialog: dlResponsePlanUpdate CMS Action: Submit message MSG_ResponsePlanUpdate to ATMS ATMS Response: Send receipt message MSG_ConfirmationReceipt to CMS</p>

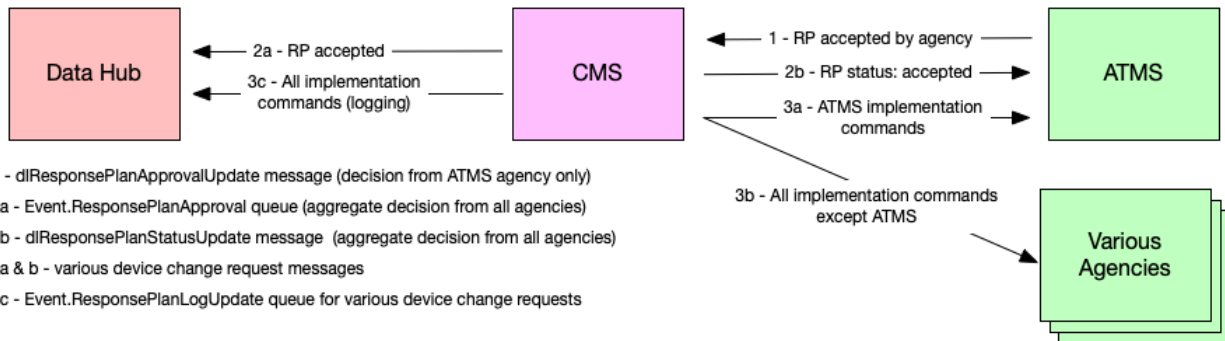
5.4.2. Workflow 2: Voting to accept or reject a response plan

This workflow describes the process for voting on a proposed response plan and the actions that occur if the response plan is accepted or rejected.

If the response plan is unanimously accepted then the control requests specified in the response plan are implemented. If the response plan is rejected by one or more agencies then the next most highly ranked response plan is submitted and voted on, and this process continues (ie, repeat this Workflow 2) until a response plan is accepted or there are no more response plans to evaluate.

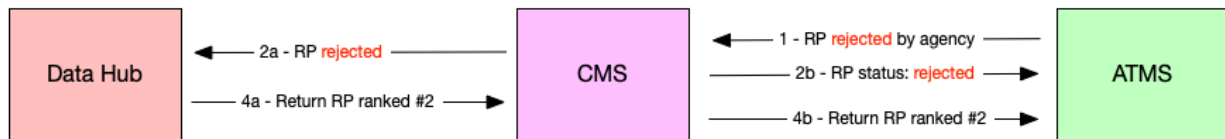
Situations A and B below represent a freeway or arterial incident with a response plan that **does** affect ATMS assets:

Situation A: Freeway or arterial incident which affects ATMS assets, **accepted** by all



- 1 - dlResponsePlanApprovalUpdate message (decision from ATMS agency only)
- 2a - Event.ResponsePlanApproval queue (aggregate decision from all agencies)
- 2b - dlResponsePlanStatusUpdate message (aggregate decision from all agencies)
- 3a & b - various device change request messages
- 3c - Event.ResponsePlanLogUpdate queue for various device change requests

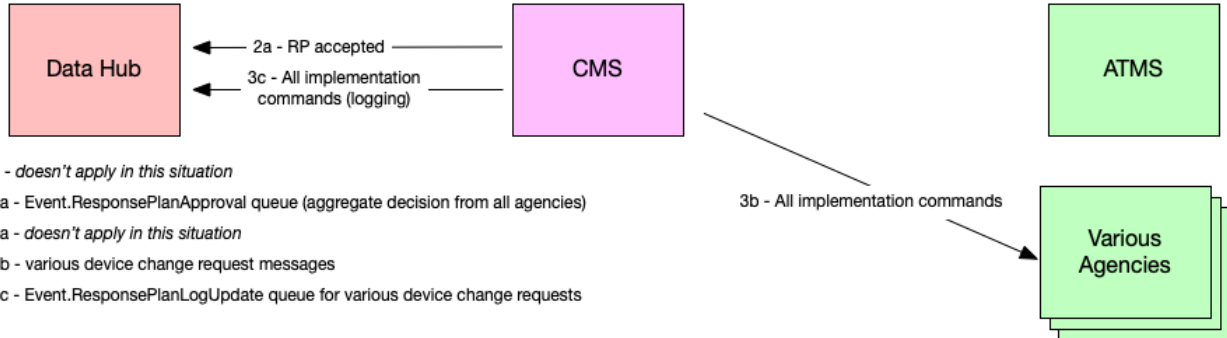
Situation B: Freeway or arterial incident which affects ATMS assets, **rejected** by at least one agency



- 1 - dlResponsePlanApprovalUpdate message (decision from ATMS agency only)
 - 2a - Event.ResponsePlanApproval queue (aggregate decision from all agencies)
 - 2b - dlResponsePlanStatusUpdate message (aggregate decision from all agencies)
 - 3 - doesn't apply in this situation
 - 4a - Event.IncidentResponse queue
 - 4b - dlResponsePlanUpdate message
- Then repeat this Workflow 2 to vote on the new response plan.
Repeat this process until a response plan is accepted or there are no more response plans to evaluate.

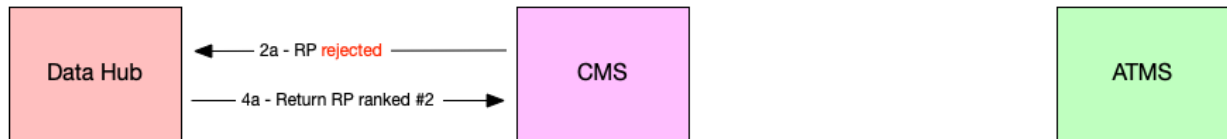
Situations C and D below represent an arterial incident with a response plan that does **not** affect ATMS assets:

Situation C: Arterial incident which does **not** affect ATMS assets, **accepted** by all



- 1 - *doesn't apply in this situation*
- 2a - Event.ResponsePlanApproval queue (aggregate decision from all agencies)
- 3a - *doesn't apply in this situation*
- 3b - various device change request messages
- 3c - Event.ResponsePlanLogUpdate queue for various device change requests

Situation D: Arterial incident which does **not** affect ATMS assets, **rejected** by at least one agency



- 1 - *doesn't apply in this situation*
 - 2a - Event.ResponsePlanApproval queue (aggregate decision from all agencies)
 - 3 - *doesn't apply in this situation*
 - 4a - Event.IncidentResponse queue
- Then repeat this Workflow 2 to vote on the new response plan.*
- Repeat this process until a response plan is accepted or there are no more response plans to evaluate.*

Step	Messages and Actions
1	<p><i>This step only applies for a freeway or arterial incident with a response plan that affects ATMS assets.</i></p> <p>Desc: ATMS sends approval decision to CMS.</p> <p>Dependencies: ATMS finishes evaluating the proposed response plan.</p> <p>Messages: ATMS to CMS: Dialog: dlResponsePlanApprovalUpdate ATMS Action: Submit message MSG_ResponsePlanApprovalUpdate to CMS CMS Response: Send receipt message MSG_ConfirmationReceipt to ATMS CMS Action: Combine ATMS decision with other agency decisions to determine whether proposed response plan is accepted or rejected.</p>
2	<p>Desc: CMS sends final approval decision to Data Hub and to ATMS.</p> <p>Dependencies: CMS finishes combining all agency decisions to determine whether proposed response plan is accepted or not in step 1.</p> <p>Messages: a) CMS to Data Hub: Message queue: Event.ResponsePlanApproval CMS Action: Submit dataframe ResponsePlanApproval to DH Data Hub Action: Log the decision in the incident history b) CMS to ATMS (<i>only applies for a freeway or arterial incident with a response plan that affects ATMS assets</i>): Dialog: dlResponsePlanStatusUpdate CMS Action: Submit message MSG_ResponsePlanStatusUpdate to ATMS ATMS Response: Send receipt message MSG_ConfirmationReceipt to CMS</p> <p><i>If response plan was accepted then proceed to step 3, otherwise proceed to step 4.</i></p>

Step	Messages and Actions
3	<p><i>This step only applies if the response plan is <u>accepted</u> (Situations A and C in the diagrams).</i></p> <p>Desc: CMS implements the response plan by sending control request messages to ATMS and other agencies.</p> <p>Dependencies: CMS sends the log messages to Data Hub after sending the control request messages to the agencies.</p> <p>Messages:</p> <p>a) CMS to ATMS (<i>only applies for a freeway or arterial incident with a response plan that affects ATMS assets</i>): CMS Action: Submit various control request messages to ATMS for ATMS assets ATMS Response: Send appropriate receipt messages to CMS ATMS Action: Implement the actions in the control request messages</p> <p>b) CMS to Other Agencies: CMS Action: Submit various control request messages to other agencies for their specific assets Other Agencies Responses: Send appropriate receipt messages to CMS Other Agencies Actions: Implement the actions in the control request messages</p> <p>c) CMS to Data Hub: Message queue: Event.ResponsePlanLogUpdate CMS Action: Submit <i>all</i> of the messages above (using dataframe ResponsePlanLogUpdate) to Data Hub for logging the changes Data Hub Action: Log the device changes in the incident history</p>
4	<p><i>This step only applies if the response plan is <u>rejected</u> (Situations B and D in the diagrams).</i></p> <p>Desc: Data Hub sends the next most highly ranked response plan ranked higher than "do nothing" (if it exists) to CMS.</p> <p>Dependencies: Data Hub waits for completion of step 2.</p> <p>Messages:</p> <p><u>Scenario (i):</u> <i>There is at least one more response plan ranked higher than "do nothing"</i></p> <p>a) Data Hub to CMS: Message queue: Event.IncidentResponse DH Action: Submit dataframe IncidentResponse to CMS</p> <p>b) CMS to ATMS (<i>only applies for freeway incidents or arterial incidents with a response plan that affects ATMS assets</i>): Dialog: dlResponsePlanUpdate CMS Action: Submit message MSG_ResponsePlanUpdate to ATMS ATMS Response: Send receipt message MSG_ConfirmationReceipt to CMS</p> <p><i>Repeat the voting process in this Workflow 2 using the next most highly ranked response plan</i></p> <p><u>Scenario (ii):</u> <i>There are not any more response plans that are ranked higher than "do nothing"</i> DH Action: No action End of workflow</p>

5.4.3. Workflow 3: Periodic re-evaluation of the incident

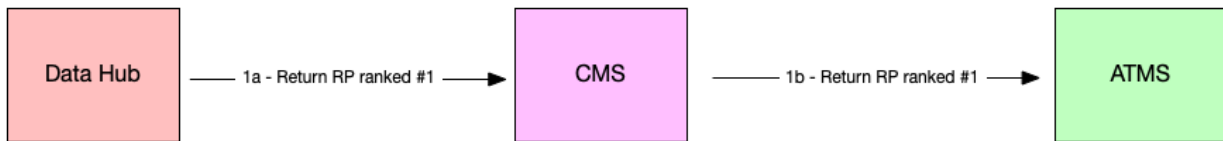
This workflow describes how the Data Hub automatically re-evaluates the incident every 30 or 15 minutes after a response plan is accepted. The first evaluation occurs 30 minutes after a response plan is accepted and subsequent cycles will be every 15 minutes thereafter.

The re-evaluation is not requested by either CMS or ATMS; this process is automatically initiated by Data Hub. When the 30- or 15-minute timer finishes, Data Hub evaluates the incident and generates a set of proposed response plans which only includes those that are ranked higher than the currently active response plan. If there are not any response which are better than "doing nothing" then Data Hub will start the timer for the next cycle and repeat this Workflow 3, otherwise Data Hub submits the most highly ranked proposed response plan to CMS (and ATMS if appropriate) to be voted on.

After the proposed response plan is received, **continue with Workflow 2 for the response plan voting process.**

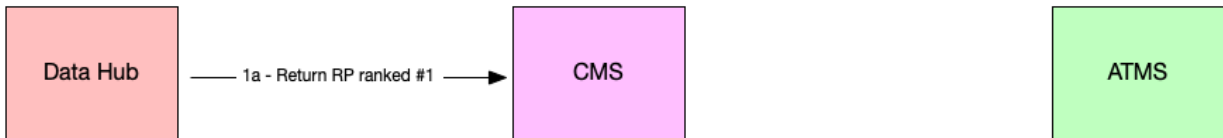
Whenever a new response plan is accepted the re-evaluation timer is restarted and this Workflow 3 starts over, with the first re-evaluation starting 30 minutes after the new response plan is accepted.

Situation A: Freeway or arterial incident which affects ATMS assets



1a - Event.IncidentResponse queue
 1b - dlResponsePlanUpdate message
 Then continue with Workflow 2 to vote on the response plan.

Situation B: Arterial incident which does *not* affect ATMS assets



1a - Event.IncidentResponse queue
 Then continue with Workflow 2 to vote on the response plan.

Step	Messages and Actions
1	<p>Desc: Data Hub creates a new set of proposed response plans and submits the most highly ranked response plan.</p> <p>Dependencies: Wait until 30 minutes after the first response plan is accepted, or 15 minutes for subsequent cycles.</p> <p>Messages:</p> <p>a) Data Hub to CMS: Message queue: Event.IncidentResponse DH Action: Submit dataframe IncidentResponse to CMS</p> <p>b) CMS to ATMS (<i>only applies for freeway incidents or arterial incidents with a response plan that affects ATMS assets</i>): Dialog: dlResponsePlanUpdate CMS Action: Submit message MSG_ResponsePlanUpdate to ATMS ATMS Response: Send receipt message MSG_ConfirmationReceipt to CMS</p>

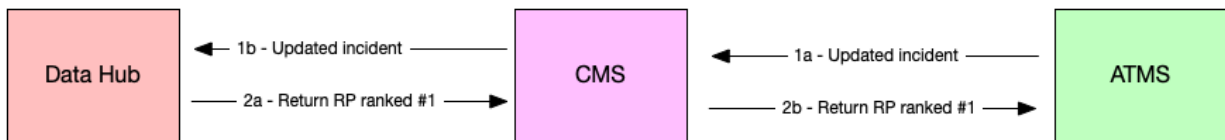
5.4.4. Workflow 4: Incident updates

This workflow describes the process for updating an existing incident, and the process is very similar to reporting a new incident. When the Data Hub receives an incident update it initiates the creation of a new set of proposed response plans based on the revised incident details. If there are no response plans that are better than leaving the currently active response plan in place then Data Hub will still send a response plan message but the header will indicate that there are no ranked response plans to review. Otherwise the response plan will be reviewed and voted on.

Freeway incident updates are expected to be reported by ATMS and arterial incident updates are expected to be reported by CMS.

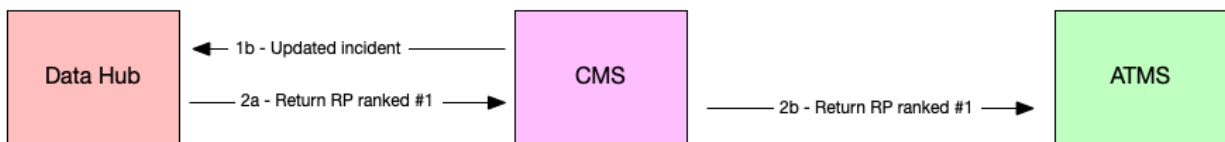
After the proposed response plan is received, **continue with Workflow 2 for the response plan voting process.**

Situation A: Freeway incident update reported by ATMS



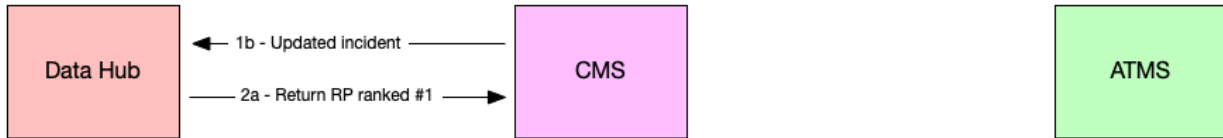
- 1a - dlFullEventUpdateUpdate message
 - 1b - Event.FullEventUpdate queue
 - 2a - Event.IncidentResponse queue
 - 2b - dlResponsePlanUpdate message
- Then continue with Workflow 2 to vote on the response plan.*

Situation B: Arterial incident update reported by CMS and response plan affects ATMS assets



- 1a - *doesn't apply in this situation*
 - 1b - Event.FullEventUpdate queue
 - 2a - Event.IncidentResponse queue
 - 2b - dlResponsePlanUpdate message
- Then continue with Workflow 2 to vote on the response plan.*

Situation C: Arterial incident update reported by CMS and response plan does **not** affect ATMS assets



1a - doesn't apply in this situation

1b - Event.FullEventUpdate queue

2a - Event.IncidentResponse queue

Then continue with Workflow 2 to vote on the response plan.

Step	Messages and Actions
1	<p>Desc: Report updated incident to Data Hub.</p> <p>Messages:</p> <p>a) ATMS to CMS (<i>only applies for a freeway incident</i>): Dialog: dlFullEventUpdateUpdate ATMS Action: Submit message MSG_FullEventUpdateUpdate to CMS CMS Response: Send receipt message MSG_ConfirmationReceipt to ATMS</p> <p>b) CMS to Data Hub: Message queue: Event.FullEventUpdate CMS Action: Submit dataframe FullEventUpdate to Data Hub</p>
2	<p>Desc: Data Hub initiates the creation of response plans and sends the highest ranked response plan to CMS.</p> <p>Dependencies: Wait for receipt of CMS message from step 1.</p> <p>Messages:</p> <p>a) Data Hub to CMS: Message queue: Event.IncidentResponse DH Action: Submit dataframe IncidentResponse to CMS</p> <p>b) CMS to ATMS (<i>only applies for freeway incidents or arterial incidents with a response plan that affects ATMS assets</i>): Dialog: dlResponsePlanUpdate CMS Action: Submit message MSG_ResponsePlanUpdate to ATMS ATMS Response: Send receipt message MSG_ConfirmationReceipt to CMS</p>

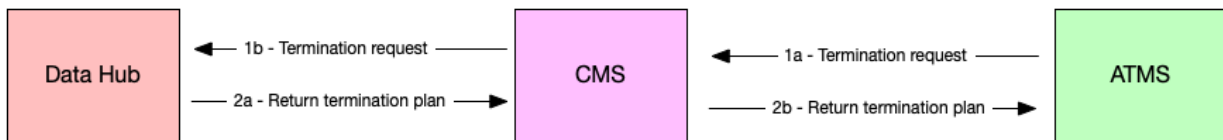
5.4.5. Workflow 5: Requesting to terminate a response plan

This workflow describes the process for requesting to terminate an active response plan. A termination plan is really a special case of a response plan with commands to cancel earlier requests or to reset assets to their normal operation.

Termination requests are expected to be initiated by ATMS for freeway incidents and by CMS for arterial incidents.

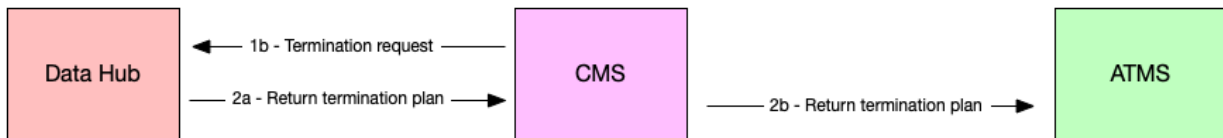
After the proposed termination plan is received, **continue with Workflow 6 for the termination plan voting process.**

Situation A: ATMS requests to terminate a response plan for a **freeway** incident



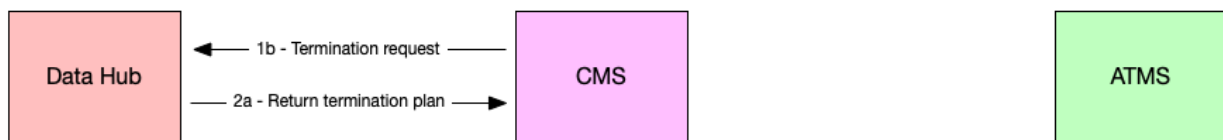
- 1a - dlResponsePlanTerminationRequest message
 - 1b - Event.ResponsePlanTerminationRequest queue
 - 2a - Event.IncidentResponse queue
 - 2b - dlResponsePlanUpdate message
- Then continue with Workflow 6 to vote on the termination plan.

Situation B: CMS requests to terminate a response plan for an **arterial** incident and the response plan affects ATMS assets



- 1a - doesn't apply in this situation
 - 1b - Event.ResponsePlanTerminationRequest queue
 - 2a - Event.IncidentResponse queue
 - 2b - dlResponsePlanUpdate message
- Then continue with Workflow 6 to vote on the termination plan.

Situation C: CMS requests to terminate a response plan for an **arterial** incident and the response plan does **not** affect ATMS assets



- 1a - doesn't apply in this situation
 - 1b - Event.ResponsePlanTerminationRequest queue
 - 2a - Event.IncidentResponse queue
- Then continue with Workflow 6 to vote on the termination plan.

Step	Messages and Actions
1	<p>Desc: Submit termination request.</p> <p>Messages:</p> <p>a) ATMS to CMS (<i>only applies for a freeway incident</i>): Dialog: dlResponsePlanTerminationRequest ATMS Action: Submit request message MSG_ResponsePlanTerminationRequest to CMS CMS Response: Send response message MSG_ResponsePlanTerminationResponse to ATMS</p> <p>b) CMS to Data Hub: Message queue: Event.ResponsePlanTerminationRequest CMS Action: Submit dataframe ResponsePlanTerminationRequest to Data Hub</p>
2	<p>Desc: Data Hub initiates the creation of a termination plan and sends it to CMS.</p> <p>Dependencies: Wait for receipt of CMS message from step 1.</p> <p>Messages:</p> <p>a) Data Hub to CMS: Message queue: Event.IncidentResponse DH Action: Submit dataframe IncidentResponse to CMS</p> <p>b) CMS to ATMS (<i>only applies for freeway incidents or arterial incidents with a response plan that affects ATMS assets</i>): Dialog: dlResponsePlanUpdate CMS Action: Submit message MSG_ResponsePlanUpdate to ATMS ATMS Response: Send receipt message MSG_ConfirmationReceipt to CMS</p>

5.4.6. Workflow 6: Voting to accept or reject a termination plan

This workflow describes the process for voting on a proposed termination plan and the actions that occur if the termination plan is accepted or rejected. These processes for a termination plan are very similar to those for a response plan except only one termination plan is generated. The agencies still vote on acceptance or rejection of the termination plan, but if it's rejected there are no more termination plans to evaluate and the incident lifecycle will continue as if no termination plan was rejected.

After a termination plan has been requested but before a final decision is submitted, the Data Hub will suspend all other processing for the incident:

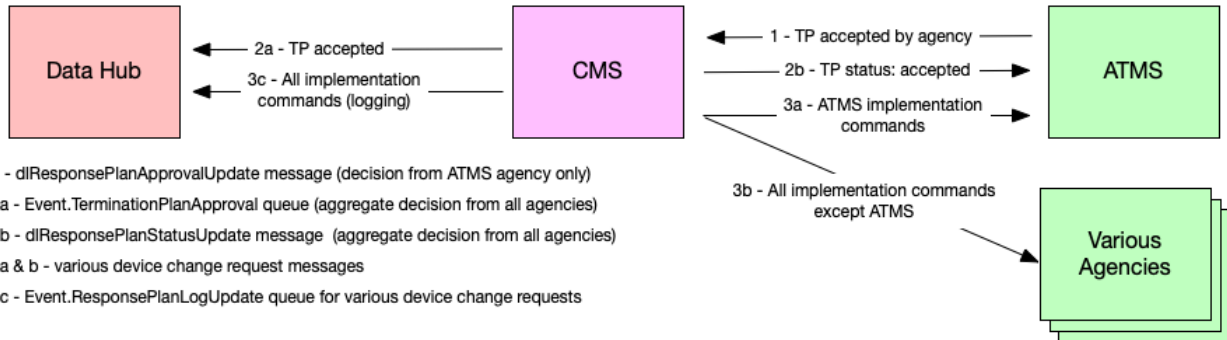
- Data Hub will still accept and save incident updates but it will not generate new response plans for those updates while it waits for the termination plan decision.
- If Data Hub's 30- or 15-minute timer for automatic incident re-evaluations expires then it will not perform the evaluation while it waits for the termination plan decision.

Similar to a response plan, if the termination plan is unanimously accepted then the control requests specified in the termination plan are implemented. The Data Hub will not process any further incident updates nor will it perform any more 30- or 15-minute automatic incident re-evaluations. If it turns out more response plan activity is needed for the incident then a new incident must be created.

Unlike a response plan, if the termination plan is rejected by one or more agencies then there are no more termination plans to evaluate. The currently active response plan remains active, and the Data Hub will process the suspended incident updates and will perform automatic incident re-evaluations for 30- or 15-minute timers that expired. Another termination plan can be requested at any time.

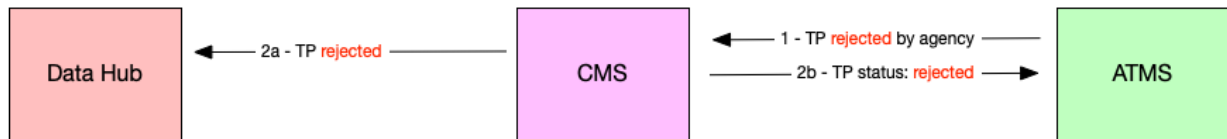
Situations A and B below represent a freeway or arterial incident with a response plan that *does* affect ATMS assets:

Situation A: Freeway or arterial incident which affects ATMS assets, *accepted* by all



- 1 - dlResponsePlanApprovalUpdate message (decision from ATMS agency only)
- 2a - Event.TerminationPlanApproval queue (aggregate decision from all agencies)
- 2b - dlResponsePlanStatusUpdate message (aggregate decision from all agencies)
- 3a & b - various device change request messages
- 3c - Event.ResponsePlanLogUpdate queue for various device change requests

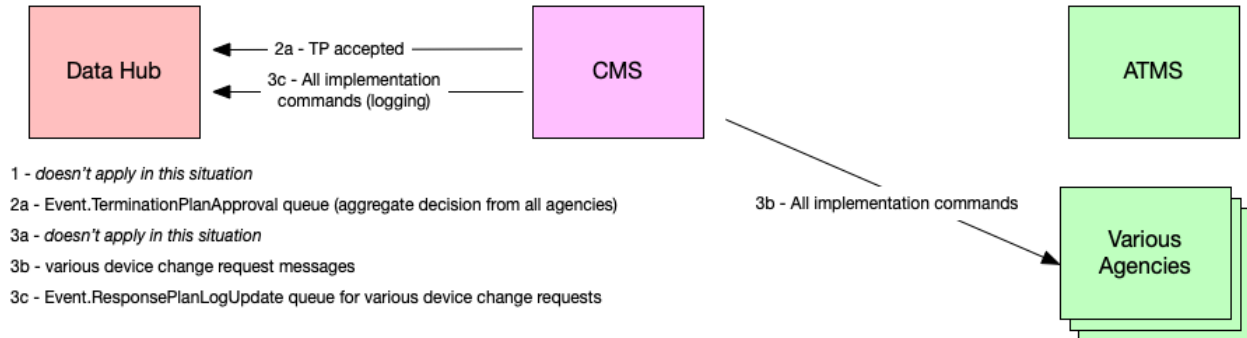
Situation B: Freeway or arterial incident which affects ATMS assets, *rejected* by at least one agency



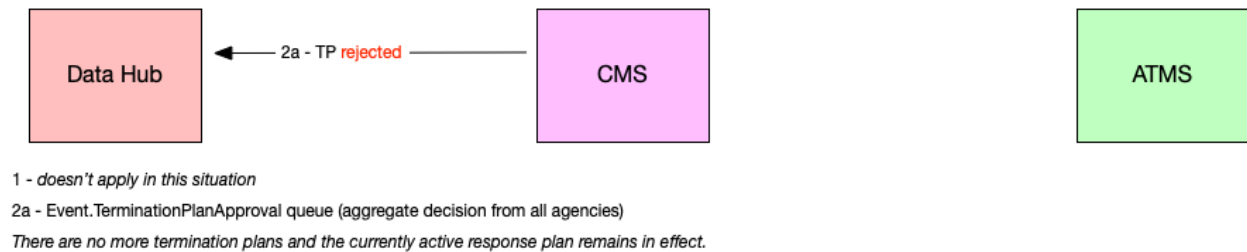
- 1 - dlResponsePlanApprovalUpdate message (decision from ATMS agency only)
 - 2a - Event.TerminationPlanApproval queue (aggregate decision from all agencies)
 - 2b - dlResponsePlanStatusUpdate message (aggregate decision from all agencies)
- There are no more termination plans and the currently active response plan remains in effect.*

Situations C and D below represent an arterial incident with a response plan that does **not** affect ATMS assets:

Situation C: Arterial incident which does **not** affect ATMS assets, **accepted** by all



Situation D: Arterial incident which does **not** affect ATMS assets, **rejected** by at least one agency



Step	Messages and Actions
1	<p><i>This step only applies for a freeway or arterial incident with a response plan that affects ATMS assets.</i></p> <p>Desc: ATMS sends approval decision to CMS.</p> <p>Dependencies: ATMS finishes evaluating the proposed termination plan.</p> <p>Messages: ATMS to CMS: Dialog: dlResponsePlanApprovalUpdate ATMS Action: Submit message MSG_ResponsePlanApprovalUpdate to CMS CMS Response: Send receipt message MSG_ConfirmationReceipt to ATMS CMS Action: Combine ATMS decision with other agency decisions to determine whether proposed termination plan is accepted or rejected.</p>
2	<p>Desc: CMS sends final approval decision to Data Hub and to ATMS.</p> <p>Dependencies: CMS finishes combining all agency decisions to determine whether proposed termination plan is accepted or not in step 1.</p> <p>Messages: a) CMS to Data Hub: Message queue: Event.ResponsePlanApproval CMS Action: Submit dataframe ResponsePlanApproval to DH Data Hub Action: Log the decision in the incident history b) CMS to ATMS (<i>only applies for a freeway or arterial incident with a response plan that affects ATMS assets</i>): Dialog: dlResponsePlanStatusUpdate CMS Action: Submit message MSG_ResponsePlanStatusUpdate to ATMS ATMS Response: Send receipt message MSG_ConfirmationReceipt to CMS</p> <p><i>If response plan was accepted then proceed to step 3, otherwise this workflow is complete.</i></p>

Step	Messages and Actions
3	<p><i>This step only applies if the termination plan is <u>accepted</u> (Situations A and C in the diagrams).</i></p> <p>Desc: CMS implements the termination plan by sending control request messages to ATMS and other agencies.</p> <p>Dependencies: CMS sends the log messages to Data Hub after sending the control request messages to the agencies.</p> <p>Messages:</p> <p>a) CMS to ATMS (<i>only applies for a freeway or arterial incident with a response plan that affects ATMS assets</i>):</p> <p> CMS Action: Submit various control request messages to ATMS for ATMS assets</p> <p> ATMS Response: Send appropriate receipt messages to CMS</p> <p> ATMS Action: Implement the actions in the control request messages</p> <p>b) CMS to Other Agencies:</p> <p> CMS Action: Submit various control request messages to other agencies for their specific assets</p> <p> Other Agencies Responses: Send appropriate receipt messages to CMS</p> <p> Other Agencies Actions: Implement the actions in the control request messages</p> <p>c) CMS to Data Hub:</p> <p> Message queue: Event.ResponsePlanLogUpdate</p> <p> CMS Action: Submit <i>all</i> of the messages above (using dataframe ResponsePlanLogUpdate) to Data Hub for logging the changes</p> <p> Data Hub Action: Log the device changes in the incident history</p>

**LOS ANGELES COUNTY ADVANCED TRAFFIC MANAGEMENT SYSTEM PHASE III
(BRC0000494)****THIRD-PARTY SOFTWARE**

Proposer is using the following Third Party Software for the ATMS:

Third Party Software:	Function:
Runtime Only:	
Windows 10 or later (with .Net 4.8)	Operating System
SQL Server 2016 or later	Central Database
Microsoft Edge WebView2 runtime	Integrated Browser Display
Microsoft Excel 2019 or later	Control Timing Import/Export

**SCHEDULE OF PRICES FOR
LOS ANGELES COUNTY ADVANCED TRAFFIC MANAGEMENT SYSTEM PHASE III
(BRC0000494)**

The undersigned Proposer offers to perform the Work described in the Request for Proposals (RFP) for the following price(s). The Proposer's prices shall include all administrative costs, labor, supervision, overtime, materials, transportation, taxes, equipment, and supplies. Proposers are to use the format provided below. The County reserves the right to negotiate all pricing, as well as the hourly rate for Additional Work before awarding a contract for the work.

By submission of this Proposal, Proposer certifies that the prices quoted herein have been arrived at independently without consultation, communication, or agreement with any other Proposer or competitor for the purpose of restricting competition.

TABLE 1 – IMPLEMENTATION WORK (TASKS 1-5)		
Tasks 1-5 must be Completed No Later Than One Year from Effective Date of Contract		
TASK	DESCRIPTION / DELIVERABLE	PROPOSED FIRM-FIXED PRICE
1	Project Plan & Project Management 1.1 Project Plan Document (PPD) 1.2 Meeting Minutes & Agendas, Presentation Materials, Participation in bi-weekly Project Status Meetings, Monthly Project Status Reports, Invoice Preparation/Submittal	<u>\$ 85,000</u>
2	Procurement 2.1 License to the Integrated System	<u>\$ 125,000</u>
3	Custom Programming Modifications 3.1 Excel Import/Export GUI Screen Mockups for MaxTime/D4	<u>\$ 60,000</u>
4	System Integration and Testing 4.1 License to the Integrated System for Additional Agencies	<u>\$ 125,000</u>
5	Training 5.1 Electronic Copies of Training Documentation 5.2 Forty (40) Hours of Hands-on Training	<u>\$ 25,000</u>
TOTAL COST FOR IMPLEMENTATION WORK		<u>\$ 420,000</u>

TABLE 2 – ANNUAL SYSTEM MAINTENANCE (TASK 6)

System Maintenance will begin following completion of Implementation Work and Final Acceptance of the System, and will be done using a VPN to remotely access System for 5 years during the Initial Term with optional Extended Terms of four (4) additional one-year options to be exercised in the sole discretion of the County.

	KITS System Maintenance
Year 1	\$ 140,000
Year 2	\$ 145,000
Year 3	\$ 150,000
Year 4	\$ 155,000
Year 5	\$ 160,000
OPTIONAL - Year 6	\$ 165,000
OPTIONAL - Year 7	\$ 170,000
OPTIONAL - Year 8	\$ 175,000
OPTIONAL - Year 9	\$ 180,000
TOTAL COST FOR SYSTEM MAINTENANCE (Years 1-9)	\$ 1,440,000

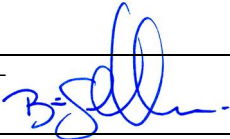
**SCHEDULE OF PRICES FOR
ADDITIONAL WORK**

The undersigned Proposer offers to perform Additional Work at the following firm Fixed Hourly Rate price(s). The Proposer's Firm Fixed Hourly Rate shall include all administrative costs, labor, supervision, overtime, materials, transportation, taxes, equipment, and supplies.

Firm Fixed Hourly Rate for Additional Work

Firm Fixed Hourly Rate for Additional Work	\$ <u>290</u> /hour
--	---------------------

SCORED PRICE	Amount
Total Cost for Implementation Work (Table 1)	\$ <u>420,000</u>
Total Cost for Annual System Maintenance (Table 2)	\$ <u>1,440,000</u>
Total Proposed Price	\$ <u>1,860,000</u>

LEGAL NAME OF PROPOSER KIMLEY-HORN AND ASSOCIATES, INC		
SIGNATURE OF PERSON AUTHORIZED TO SUBMIT PROPOSAL BRIAN SMALKOSKI, P.E., AICP, PTP, PTOE 		
TITLE OF AUTHORIZED PERSON VICE PRESIDENT		
DATE 7/30/25	STATE CONTRACTOR'S LICENSE NUMBER IF APPLICABLE N/A	LICENSE TYPE
PROPOSER'S ADDRESS: 1661 EAST CAMELBACK ROAD, SUITE 400, PHOENIX, AZ 85016		
PHONE 602.944.5500	FACSIMILE 602.944.7423	E-MAIL BRIAN.SMALKOSKI@KIMLEY-HORN.COM

ADDITIONAL COST OPTIONS		
TASK	DESCRIPTION / DELIVERABLE	PROPOSED FIRM-FIXED PRICE
1.1	Omni Firmware Support Includes: <ul style="list-style-type: none"> • Upload, download, batch compare operation • Controller timing export and printing • Support for Time Space Diagrams 	\$ <u>235,000</u>
1.2	Advanced Decision Support Configuration Includes: <ul style="list-style-type: none"> • Detector data and communication validation for up to 25 intersections • Create detector signatures for timing pattern selection • Validate automated plan selection based on detector data values • Validate failure thresholds for section operation 	\$ <u>65,000</u>
1.3	Advanced 2070 Controller Excel Import/Export Includes: <ul style="list-style-type: none"> • Customization of format for D4 and MaxTime controller Excel input and output sheets • Review format, style and automation with County staff 	\$ <u>75,000</u>
OPTIONAL KADENCE ADAPTIVE		
2.1	Kadence Installation, Training and Integration	\$ <u>55,000</u>
2.2	1 – 30 Signal Licenses	\$ <u>3,800 per signal</u>
2.3	Additional Signal Licenses	\$ <u>133,000 + \$ 3,000 per signal above 30</u>
2.4	Kadence per signal optional configuration implementation services Includes: <ul style="list-style-type: none"> • Detector validation • Phase mapping • Schedule configuration • Failure threshold configuration • Business logic configuration based on County input • Reporting and security settings 	\$ <u>2,000 per signal</u>
3	Optional Traction Travel Premium <ul style="list-style-type: none"> • TRAJECTORY TRAVEL TIME DATA: Unlimited trips using the mobile app • CROWD-SOURCED TRAVEL TIME DATA PER MONTH: Max quantity per month listed for one source exclusively. Varies if combining multiple sources • GOOGLE: 6,000 travel times • MICROSOFT AZURE: 60,000 travel times • WAZE: 600,000 travel times • Waze alerts, irregularities, and jams for agencies part of the Waze for Cities program 	\$ <u>3,000 per month annual commitment</u> or \$ <u>3,500 per month with monthly commitment</u>
4	Optional Traction Live Premium <ul style="list-style-type: none"> • DEVICE STATUS MAP (coming soon): For ATMS with up to 1,000 signals • KITS signal status in the mobile app • Crowd-sourced travel time and data integrations: • Posting on DMS in KITS • Linkages to KITS decision support system • Crowd-sourced travel time data as a trigger for KITS decision support system 	\$ <u>2,000 per month annual commitment</u> or \$ <u>2,500 per month with monthly commitment</u>
5.1	Pilot Traction Priority Implementation Includes: <ul style="list-style-type: none"> • Pilot integration of 1 AVL feed • 6-Months of hosting and support Integration of up to 5 TSP signals	\$ <u>105,000</u>

5.2	Annual Traction Priority Cloud Hosting • Subject to increase based on signal and vehicle counts	\$ <u>20,000</u>
5.3	Annual Traction Priority Support • Subject to increase based on signal and vehicle counts	\$ <u>25,000</u>
5.4	Additional Traction Priority Signals License	\$ <u>3,000 per signal</u>
5.5	Additional Traction Priority Signals Integration	\$ <u>1,000 per signal</u>
OPTIONAL TRACTION METRICS FEES		
6.1	UDOT ATSPM and Traction Metrics: On-Premise Installation	\$ <u>25,000</u>
6.2	UDOT ATSPM and Traction Metrics: Signal Configuration	\$ <u>500 per signal</u>
OPTIONAL ADDITIONAL MODULE LICENSE FEES		
7.1	DMS Module	\$ <u>50,000</u>
7.2	CCTV	\$ <u>45,000</u>

SCHEDULE B.2

ADDITIONAL WORK SCHEDULE

FOR

**LOS ANGELES COUNTY ADVANCED TRAFFIC MANAGEMENT SYSTEM
PHASE III**

(ATMS PHASE III)

EXHIBIT C

SYSTEM MAINTENANCE

FOR

LOS ANGELES COUNTY ADVANCED TRAFFIC MANAGEMENT SYSTEM

PHASE III

(ATMS PHASE III)

1. GENERAL

This Exhibit C sets forth the scope of, and Contractor’s service level commitment regarding System Maintenance following Final Acceptance, which provides for the maintenance, operational support, and monitoring of the System, including, but not limited to, service levels consisting of Maintenance Services, Support Services, correction of Deficiencies and County’s remedies for Contractor’s failure to meet the service level commitment specified herein. Capitalized terms used in this Exhibit C without definition shall have the meanings given to such terms in the Base Agreement.

Throughout the term of the Agreement and in exchange for the payment of the Service Fees in the amounts set forth in Exhibit B (Project and Payment Schedule), Contractor shall provide System Maintenance, including Maintenance Services and Support Services, for the System Software pursuant to the applicable terms of the Agreement, including this Exhibit C, Monday through Friday from 7 A.M. to 6 P.M. Pacific Time (“PT”) (hereinafter “Business Hours”). Requests for System Maintenance during Business Hours shall be made by email to Contractor’s email address or by calling Contractor’s phone number. Contractor shall be available via electronic mail during all other hours to respond to any request for System Maintenance arising from a Level 1 Severity Deficiency. Contractor shall contact County by 10 A.M. following receipt of a Level 1 Severity Deficiency occurring outside of the Business Hours. County’s Project Manager will submit a request for System Maintenance via electronic mail (email). System Maintenance emails reporting System Software Deficiencies will be followed up by the Contractor’s Project Manager via electronic mail (email). System Maintenance Services provided by Contractor under the Agreement shall include performing the tasks set forth below in this Exhibit C.

2. SYSTEM MAINTENANCE

- 2.1 County shall endeavor to reasonably provide Contractor with information and assistance necessary to detect, simulate, reproduce and correct Deficiencies; however, regardless of the level of assistance provided by County, Contractor will provide support services by means judged appropriate by Contractor. Such means may include, without limitation, remote access to County computer(s), remote telephone consultations, and the provision of written documentation and other materials to County, by mail or electronic means. County is responsible for maintaining a virtual private network (“VPN”) connection into the traffic network for remote access to the System by Contractor. Contractor shall provide downloadable electronic Software Updates to provide County with avoidance procedures including related Documentation, if necessary, to correct any Deficiencies to the System Software; provided that County shall not be responsible for System Software errors or malfunctions resulting from downloading or installing such Software Updates. In the event that Contractor identifies a fault or failure in software or hardware not covered under this Agreement, which affects the operation of the System Software, then County will take action to correct such faults and failures. Upon correction of said failures, Contractor shall ensure that the System Software and System Data is restored and operational within five (5) Business Days.
- 2.2 Contractor shall notify County as Software Updates to the System Software become available. Such Software Updates to the System Software shall be available for County for downloading or otherwise installing without additional License fees or Service Fees. Software Updates that do not require integration into the System will be provided at no additional cost to County. Any Software Updates necessary to remedy security problems in the System (e.g., closing “back doors” or other intrusion-related problems), whether identified by Contractor, County or a third party,

shall be provided to County within ten (10) calendar days of Contractor’s knowledge of the existence of such security problems. A Major Version Release may require additional System Hardware and Third Party Software (e.g. operating systems, database servers, drivers, etc.) upgrades to ensure the performance and functionality of the System Software. Contractor will provide details of minimum System requirements, and the System will be upgraded at County’s cost at least one (1) week prior to the implementation of the Major Version Release to meet or exceed these requirements. Notwithstanding the foregoing, County and Participating Agencies shall not be required to install the most current Major Version Release of System Software as long as the currently operating Version Release is within two (2) Major Version Releases from the most recent Version Release.

- 2.3 Contractor shall notify County within seven (7) calendar days of Contractor’s decision to update a Microsoft or another third party vendor of any security patch for the operating system software. Contractor shall test the compatibility of the security patch with the System Software in its laboratory facility, and shall confirm compatibility and report its findings to County within fourteen (14) calendar days after the release of such security patch and shall, at no additional cost to County beyond the Service Fees, provide Software Updates to the System Software necessary to make such operating system software security patch compatible with the System within thirty (30) calendar days after the release of the security patch by Microsoft or another third party vendor, as applicable. In the event it is determined during testing that the operating system security patch is not compatible with a Third Party Software or Product, Contractor shall provide County with an operational plan to protect the integrity of the System Software until such time as the Third Party Software or Product is modified by the third party vendor.
- 2.4 Contractor shall notify County thirty calendar (30) days prior to the planned installation of any service packs, Third Party Software updates or system upgrades to the existing version of operating system software or Third Party Software. Contractor shall verify the compatibility of the service pack, Third Party Software update or system upgrade with the System Software in its laboratory facility and report its findings to the County within fourteen (14) calendar days after notification from County of its planned installation of the service pack, third party software update or system upgrade, and shall, at no additional cost to County beyond the Service Fees, provide Software Updates to the System Software necessary to make such operating system software service packs, Third Party Software update or system upgrade compatible with the System Software within forty-five (45) calendar days after the notification by County. In the event it is determined during testing that the operating system service pack, Third Party Software update or System upgrade is not compatible with another Third Party Software or Product, Contractor shall provide County with an operational plan to protect the integrity of the System Software until such time as the Third Party Software or Product is modified by the third party vendor. This System Maintenance task includes making updates to the System Software as required because of Third Party Software changes and providing the updated version of the Core Software. In the event that during the Initial Term of the Agreement System Hardware, operating system or Third Party Software provided by County or a Participating Agency (hereinafter in this Section 2.4 “the agency”) is deemed by Contractor not to be sufficient for installation of a Major Version Release, then the agency shall be responsible for the cost of the replacement or upgrade/update of the hardware or software as may be required. A Software Update resulting in a Major Version Release may not support all the non-core functionality of the previous Major Version Release of the System Software. Prior to the upgrade, Contractor will provide agency with release notes for the new product that describes new and modified functionality.

- 2.5 Contractor shall provide System Maintenance for Third Party Software that is deemed to be part of the System Software, at no additional cost to County beyond the Service Fees, regardless of whether the license to such Third Party Software is obtained through Contractor or through an extension of an existing County license with such Third Party Software provider.
- 2.6 If County submits a request for such System Maintenance, Contractor shall diagnose the Deficiency and determine whether it is caused by the System Software. Such diagnosis and determination shall be included in the scope of System Maintenance hereunder and provided without additional charge beyond the applicable Service Fees, even if the condition is ultimately determined to be caused by System Hardware, operating system software or user error and not by the System Software. Contractor shall be responsible for fixing Deficiencies that arise as a result of modifications made to the current version of operating system software in use by County as of the Effective Date or as updated by mutual agreement of County and Contractor. Contractor shall specify the item of such System Hardware or operating system software that caused the apparent Deficiency.
- 2.7 System Maintenance requests must be initiated by email to a Contractor-created unique email address for the sole use of County to send problem reports containing the information set forth in items (a) through (k) below. Such information shall be required if Deficiency Credits are to be applied. Contractor shall provide monthly reports to County, which shall include the following data:
- (a) Problem Number-to be completed by Contractor;
 - (b) Date and time reported;
 - (c) Person reporting the problem and phone number;
 - (d) Facility or program location where problem occurred;
 - (e) Location of the problem;
 - (f) Sequence of events before the problem was found;
 - (g) Description of the problem;
 - (h) Video, Screen shot, or “Snag it” of problem, if applicable;
 - (i) Problem Severity Level;
 - (j) Resolution status and estimated fix date
 - (k) Resolution plan and results

3. CORRECTIVE MAINTENANCE

- 3.1 As part of System Maintenance, Contractor shall perform corrective maintenance to correct any failure of the Application Software and to remedy Deficiencies (collectively, “Corrective Maintenance”), such that the System Software operates in accordance with Exhibit A (Statement of Work).
- 3.2 In the event that Corrective Maintenance is required of Contractor, County will notify Contractor of the need for Corrective Maintenance, and County’s Project Manager, in County’s Project Manager’s sole judgment, will determine if the error or malfunction is a Level 1 Severity, Level 2 Severity or Level 3 Severity (each, a “Problem Severity Level”) as follows:

- “Level 1 Severity” means an error or malfunction, including a Deficiency, that causes the System Software or a component or application of the System Software to halt processing, and for which no reasonable workaround, other than a workaround developed by Contractor under Section 3 (Corrective Maintenance) of this Exhibit C, as part of System Maintenance, is available.
- “Level 2 Severity” means an error or malfunction, including a Deficiency, that prohibits required functionality, but at the time of the error or malfunction, a reasonable workaround is available to proceed, and such workaround does not substantially impair County’s normal business operations.
- “Level 3 Severity” means an error or malfunction, including a Deficiency, which is inconvenient or an annoyance but does not affect functionality.

3.3 Following a report of a problem, Contractor shall provide expedient action to determine if there is a Deficiency. If Contractor reasonably determines that there is a Deficiency, Contractor shall provide continuous action to correct the Deficiency. Contractor shall provide Corrective Maintenance in accordance with this Section 3 (Corrective Maintenance) to correct all Deficiencies as described below:

- For Level 1 Severity Deficiencies, Contractor shall (i) within one (1) Business Day, provide a workaround restoring functionality or, in the case of Third Party Products, provide a timeframe for a workaround; and (ii) within twenty (20) Business Days, correct the Deficiency.
- For Level 2 Severity Deficiencies, Contractor shall (i) within seven (7) Business Days, provide a workaround restoring functionality or, in the case of Third Party Products, provide a timeframe for a workaround; and (ii) within forty (40) Business Days, correct the Deficiency.
- For Level 3 Severity Deficiencies, Contractor shall (i) within twenty (20) Business Days, in the case of Third Party Products, provide a timeframe for a workaround; and (ii) within sixty (60) Business Days, correct the Deficiency.

4. DEFICIENCY CREDITS

4.1 GENERAL

Deficiency Credits shall apply when a Deficiency continues without a workaround or resolution in excess of the amount of time permitted to resolve the Deficiency pursuant to Section 3 (Corrective Maintenance) of this Exhibit C. Deficiency Credits shall accrue under this Exhibit C for Contractor’s failure to maintain System Software’s reliability, for failure to timely correct Deficiencies or workarounds and for the System’s failure to satisfy Response Time Tests (as defined below), all as described in more detail below (collectively and individually, “Deficiency Credits”). The amount of the Deficiency Credits will depend on the extent and duration of Contractor’s continuing failures. Time elapsed shall only accrue during Business Days. Deficiency Credits can only be applied if (and during such period as when) County maintains VPN connectivity into the traffic network. County may not initiate a Level 3 Severity service request on functionality contained within the System Software that otherwise meets the requirements and specifications set forth in Exhibit A (Statement of Work). Such Deficiency Credits only applies to System Software failures. Hardware failures are not subject to Deficiency Credits.

4.2 DEFICIENCY CREDITS – CORRECTIVE MAINTENANCE RESPONSE TIME FAILURES

If Contractor fails to provide Corrective Maintenance by providing a workaround or resolution within the applicable timeframes as specified in Section 3 (Corrective Maintenance) of this Exhibit C, including Section 3.3, then in each instance Deficiency Credits shall accrue for the benefit of County, calculated as set forth below:

- For Level 1 Severity Deficiencies, Deficiency Credits equal to one thirtieth (1/30) of the aggregate monthly Service Fee for each twenty-four (24) hours the Level 1 Severity Deficiency continues: (a) without a workaround beyond one(1) Business Day from notice by County of such error or malfunction, or (b) without a resolution beyond twenty (20) Business Days from notice by County of such Deficiency. Once the Level 1 Severity Deficiency is resolved, the Deficiency Credits total accrual will be deducted from the current monthly maintenance invoice submitted by Contractor to County for payment.
- For Level 2 Severity Deficiencies, Deficiency Credits will not be applied. Instead, the County will delay payment of the current monthly maintenance invoice if the Level 2 Severity Deficiency continues: (a) without a workaround beyond seven (7) Business Days from notice by County of such error or malfunction, or (b) without a resolution beyond forty (40) Business Days from notice by County of such Deficiency. Once the Level 2 Severity Deficiency is resolved, County will pay Contractor’s current monthly maintenance invoice in full.
- For Level 3 Severity Deficiencies, Deficiency Credits will not be applied. However, the County will delay payment of current monthly maintenance invoice if the Level 3 Severity Deficiency continues without a workaround beyond sixty (60) Business Days from notice by County of such Deficiency. Once the Level 3 Severity Deficiency is resolved, County will pay Contractor’s current monthly maintenance invoice in full.

Notwithstanding the foregoing, the County may determine that numerous and/or severe Deficiencies of Level 2 Severity or Level 3 Severity, in the aggregate, amount to a Deficiency of Level 1 Severity, in which case Contractor’s resolution of such Deficiencies shall be subject to assessment of Deficiency Credits for Severity Level 1. In this event, County shall submit notification of this determination in writing to Contractor; and Contractor shall provide continuous corrective action in correlation with Level 1 Severity Deficiencies from the date and time of such notification.

4.3 DEFICIENCY CREDITS – SYSTEM SOFTWARE RESPONSE TIME

Any Deficiencies which are identified as a result of the Response Time monitoring procedures set forth in Paragraph 5 (Response Time Warranty) shall be considered Level 2 Severity Deficiencies. Deficiency Credits for Contractor’s failure to remedy the Deficiency causing the System to fail to meet Response Times shall accrue as set forth in Section 4 (Deficiency Credits) above.

5. RESPONSE TIME WARRANTY

- 5.1 “Response Time” means the elapsed time from the entry of a query in a web-based user interface session, to the time the web-based user interface session fully displays the complete response.
- 5.2 Transactional queries, shall be defined as the retrieval of real time intersection data from any System workstation, must have a Response Time of not more than 5 seconds.
- 5.3 The Response Time for report and transactional queries shall be defined during Acceptance testing as specified in Task 6 (Acceptance Test Plan) of Exhibit A (Statement of Work). It is understood

that the Response Time for the reports shall be dependent on the complexity of the report and the number of the records contained within the related database tables. If there is a significant increase in Response Time, County may report this as a Response Time Deficiency.

- 5.4 County shall determine Response Time Deficiencies in accordance with a mutually agreed upon Response Time verification procedure.
- 5.5 County shall report Response Time Deficiencies as Level 2 Severity. Contractor shall be responsible to resolve all hardware compatibility and software issues causing Response Time Deficiencies, excluding connectivity latencies.

6. SYSTEM AVAILABILITY

SYSTEM PERFORMANCE REQUIREMENTS:

Contractor represents, warrants, covenants and agrees that: (a) the System shall meet the System Availability requirements as further specified herein.

System Performance Category	System Performance Requirement
System Availability	Ninety-nine point nine percent (99.9%)

The following criteria shall be applied with regards to System Performance Requirements:

System Availability

System Availability shall be calculated as follows:

$$\text{System Availability} = \frac{(\text{Total Monthly Time} - \text{Unscheduled Downtime})}{\text{Total Monthly Time}}$$

REMEDIES

Credits shall accrue for Unscheduled Downtime in accordance with the Service Credits for Contractor's failure to meet the System Availability requirements (hereinafter "Service Credit(s)"). For purposes of assessing Service Credits, "Unscheduled Downtime" shall mean the total amount of time during any calendar month, measured in minutes, during which the System has a Deficiency that is unresolved by Contractor, excluding Scheduled Downtime.

Service Credits

Without limiting any other rights and remedies available to County, either pursuant to this Agreement, by law or in equity, County shall be entitled to Service Credits calculated based on the length of Unscheduled Downtime as provided below.

Service Credits for Unscheduled Downtime:

LENGTH OF CONTINUOUS UNSCHEDULED DOWNTIME	SERVICE CREDITS
3.0 hours or more but less than 5 hours	30% of monthly owed Service Fees
5.1 hours or more but less than 10 hours	50% of monthly owed Service Fees
10.1 hours or more but less than 24 hours	60% of monthly owed Service Fees
24 hours or more	100% of monthly owed Service Fees

7. ADDITIONAL PROVISIONS

- 7.1 The Contractor shall provide all raw System Data to the County when requested.
- 7.2 The Contractor shall have a clear protocol to address how data and system security are protected from disruption and loss in the event of disaster, emergency, and security breaches.
- 7.3 The Contractor shall provide a Service Organization Control (SOC) 2 Type 2 Report by a third party when requested.
- 7.4 The Contractor shall require annual cyber security awareness training for all Contractor staff with access to the System.

EQUAL EMPLOYMENT OPPORTUNITY CERTIFICATION

Proposer's Name	Kimley-Horn and Associates, Inc.
Address	660 S. Figueroa St., Suite 2050, Los Angeles, CA 90017
Internal Revenue Service Employer Identification Number	56-0885615

In accordance with Los Angeles County Code, Section 4.32.010, the Proposer certifies and agrees that all persons employed by it, its affiliates, subsidiaries, or holding companies are and will be treated equally by the firm without regard to or because of race, religion, ancestry, national origin, or sex and in compliance with all antidiscrimination laws of the United States of America and the State of California.

1.	The proposer has a written policy statement prohibiting any discrimination in all phases of employment.	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
2.	The proposer periodically conducts a self-analysis or utilization analysis of its work force.	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
3.	The proposer has a system for determining if its employment practices are discriminatory against protected groups.	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
4.	Where problem areas are identified in employment practices, the proposer has a system for taking reasonable corrective action to include establishment of goals and timetables.	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO

ADMINISTRATION OF AGREEMENT

COUNTY'S ADMINISTRATION

CONTRACT NO. _____

COUNTY PROJECT DIRECTOR:

Name: _____

Title: _____

Address: _____

Telephone: _____ Facsimile: _____

E-Mail Address: _____

COUNTY PROJECT MANAGER:

Name: _____

Title: _____

Address: _____

Telephone: _____ Facsimile: _____

E-Mail Address: _____

COUNTY CONTRACT PROJECT MONITOR:

Name: _____

Title: _____

Address: _____

Telephone: _____ Facsimile: _____

E-Mail Address: _____

CONTRACTOR'S ADMINISTRATION

CONTRACTOR'S NAME: _____

CONTRACT NO: _____

CONTRACTOR'S PROJECT MANAGER: _____

Name: _____

Title: _____

Address: _____

Telephone: _____ Facsimile: _____

E-Mail Address: _____

CONTRACTOR'S AUTHORIZED OFFICIAL(S)

Name: _____

Title: _____

Address: _____

Telephone: _____ Facsimile: _____

E-Mail Address: _____

Name: _____

Title: _____

Address: _____

Telephone: _____ Facsimile: _____

E-Mail Address: _____

Notices to Contractor shall be sent to the following:

Name: _____

Title: _____

Address: _____

Telephone: _____ Facsimile: _____

E-Mail Address: _____

PERFORMANCE REQUIREMENTS SUMMARY

The items listed under this Performance Requirements Summary (PRS) are not all encompassing, and any conflict or discrepancy between the requirements specified in Exhibits A through N, inclusive, of this Contract (Exhibits A-N) and this PRS, Exhibits A-N shall control. The County reserves the right to modify this PRS at any time consistent with the requirements set forth in Exhibits A-N, to clarify Performance Requirements, or to monitor of any part of this Contract.

Required Service/Tasks	Performance Indicator	Deductions / Consequences for Failure to Meet Performance Indicator*	Compliance	Comments
A. SCOPE OF WORK				
1. Fines by Regulatory and Governmental Agencies	Fined by a local, regional, State, or Federal regulatory or governmental agency as a result of the Contractor's negligence or failure to comply with any Federal, State, or local rules, regulations, or requirements.	\$500 per occurrence plus any fine(s) charged to the County by a regulatory or governmental agency; possible suspension; possible termination for default of contract.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
2. Violation of the National Pollutant Discharge Elimination System	Discharge of debris into storm drains and/or gutter.	\$500 per occurrence plus any fines by regulatory and governmental agencies plus any remediation cost; possible suspension; possible termination for default of contract.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
B. REPORTS/DOCUMENTATIONS				
1. Daily/Weekly/Monthly/ Quarterly Reports	Submitted to Contract Manager daily/weekly/monthly report.	\$50 per day per report that is late or not submitted.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
2. Special Reports As Needed	Filed within time frame requested.	\$50 per day per report that is late or not submitted.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	

*Deductions may be imposed in addition to the Liquidated Damages at the sole discretion of the Contract Manager.

PERFORMANCE REQUIREMENTS SUMMARY

The items listed under this Performance Requirements Summary (PRS) are not all encompassing, and any conflict or discrepancy between the requirements specified in Exhibits A through N, inclusive, of this Contract (Exhibits A-N) and this PRS, Exhibits A-N shall control. The County reserves the right to modify this PRS at any time consistent with the requirements set forth in Exhibits A-N, to clarify Performance Requirements, or to monitor of any part of this Contract.

Required Service/Tasks	Performance Indicator	Deductions / Consequences for Failure to Meet Performance Indicator*	Compliance	Comments
C. EMPLOYEES				
1. Contractor's Employee Criminal Background Investigation	Prior to the start of the contract and continuation of the contract the contractor shall certify all employees who are in a designated sensitive position has passed a fingerprints background check submitted to the California Department of Justice to include State, local, and federal-level review, as required by the Contract. Employees who <u>do not</u> pass or is not certified shall be immediately removed.	\$100 per employee per day who is not certified as passing the background check.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
2. Employees Well Oriented To Job	Employees must have thorough knowledge of facility and its needs.	\$50 per error resulting from lack of orientation; possible suspension.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
3. Staffing	Staffing levels are equal or exceed contract requirements.	\$50 per occurrence.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
4. Photo I.D. Badges	Photo I.D. Badges worn by all employees on the job at all times.	\$50 per employee, per occurrence.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	

*Deductions may be imposed in addition to the Liquidated Damages at the sole discretion of the Contract Manager.

PERFORMANCE REQUIREMENTS SUMMARY

The items listed under this Performance Requirements Summary (PRS) are not all encompassing, and any conflict or discrepancy between the requirements specified in Exhibits A through N, inclusive, of this Contract (Exhibits A-N) and this PRS, Exhibits A-N shall control. The County reserves the right to modify this PRS at any time consistent with the requirements set forth in Exhibits A-N, to clarify Performance Requirements, or to monitor of any part of this Contract.

Required Service/Tasks	Performance Indicator	Deductions / Consequences for Failure to Meet Performance Indicator*	Compliance	Comments
5. Uniform	Uniforms worn by all day time employees on the job.	\$50 per employee, per occurrence.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
6. Training program	Document training of each employee.	\$250 per untrained employee.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
7. Maintain Knowledge of Safety Requirements	Completion of training of all accepted standards for safe practices related to the work.	\$50 per employee, per occurrence.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
D. SUPERVISOR/MANAGERS				
1. Change in Project Manager	Contractor shall notify the County in writing of any change in name or address of the Project Manager.	\$50 per occurrence.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
2. Respond to complaints, requests, and discrepancies.	Respond within the time frame outlined in the Contract.	\$50 per complaint not responded to within the time frame outlined in the specifications.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
3. Makes Site Inspections	Facility inspected each shift or as required by Contract.	\$50 per occurrence.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
4. Competent Supervisory Staff	Responsiveness to complaints and requests; maintain good work records, and acceptable level of service.	\$200 per occurrence; possible suspension.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	

*Deductions may be imposed in addition to the Liquidated Damages at the sole discretion of the Contract Manager.

PERFORMANCE REQUIREMENTS SUMMARY

The items listed under this Performance Requirements Summary (PRS) are not all encompassing, and any conflict or discrepancy between the requirements specified in Exhibits A through N, inclusive, of this Contract (Exhibits A-N) and this PRS, Exhibits A-N shall control. The County reserves the right to modify this PRS at any time consistent with the requirements set forth in Exhibits A-N, to clarify Performance Requirements, or to monitor of any part of this Contract.

Required Service/Tasks	Performance Indicator	Deductions / Consequences for Failure to Meet Performance Indicator*	Compliance	Comments
5. Provide Adequate Supervision and Training	Contract specifications met.	\$50 per occurrence; possible suspension.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
6. Project Safety Official	Project Safety Official who shall be thoroughly familiar with the Contractor's Injury and Illness Prevention Program and Code of Safe Practices.	\$200 per occurrence.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
7. Supervisors speak, read, write, and understand English	On-site supervisor can communicate in English with County Contract Manager.	\$100 per day for use of non English-speaking supervisor; possible suspension.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
E. CONTRACT ADMINISTRATION				
1. Insurance Certifications	Certifications submitted before implementation of contract and on a timely basis there-after.	\$200 per day; work/contract; possible suspension; possible termination for default of contract.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
2. Provide Performance Bond	Valid bond is furnished and not allowed to lapse.	\$200 per day; possible suspension; possible termination for default of contract.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
3. Record Retention & Inspection/Audit Settlement	Maintain all required documents as specified in contract.	\$200 per occurrence.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
4. Use of Subcontractor without Approval and/or Authorization.	Obtain County's written approval prior to	\$500 per occurrence; possible suspension;	<input type="checkbox"/> Yes	

*Deductions may be imposed in addition to the Liquidated Damages at the sole discretion of the Contract Manager.

PERFORMANCE REQUIREMENTS SUMMARY

The items listed under this Performance Requirements Summary (PRS) are not all encompassing, and any conflict or discrepancy between the requirements specified in Exhibits A through N, inclusive, of this Contract (Exhibits A-N) and this PRS, Exhibits A-N shall control. The County reserves the right to modify this PRS at any time consistent with the requirements set forth in Exhibits A-N, to clarify Performance Requirements, or to monitor of any part of this Contract.

Required Service/Tasks	Performance Indicator	Deductions / Consequences for Failure to Meet Performance Indicator*	Compliance	Comments
	subcontracting any work.	possible termination for default of contract.	<input type="checkbox"/> No <input type="checkbox"/> N/A	
5. License and Certification	All license and certifications required to perform the work, if any.	\$200 per day; possible suspension; possible termination for default of contract.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
6. Assignment and Delegation	Contractor shall not assign its rights or delegate its duties under this Contract, or both, whether in whole or in part, without the prior written consent of County.	\$200 per day the County is not informed of this change; possible suspension; possible termination for default of contract.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
7. Safety Requirements	Comply with all applicable State of California Occupational Safety and Health Administration (Cal/OSHA).	\$500 per occurrence; possible suspension.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	

*Deductions may be imposed in addition to the Liquidated Damages at the sole discretion of the Contract Manager.

CONTRACTOR ACKNOWLEDGEMENT AND CONFIDENTIALITY AGREEMENT

(Note: This certification is to be executed and returned to County with Contractor's executed Contract. Work cannot begin on the Contract until County receives this executed document.)

CONTRACTOR NAME _____ Contract No. _____

GENERAL INFORMATION:

The Contractor referenced above has entered into a contract with the County of Los Angeles to provide certain services to the County. The County requires the Corporation to sign this Contractor Acknowledgement, Confidentiality, and Copyright Assignment Agreement.

CONTRACTOR ACKNOWLEDGEMENT:

Contractor understands and agrees that the Contractor employees, consultants, Outsourced Vendors and independent contractors (Contractor's Staff) that will provide services in the above referenced agreement are Contractor's sole responsibility. Contractor understands and agrees that Contractor's Staff must rely exclusively upon Contractor for payment of salary and any and all other benefits payable by virtue of Contractor's Staff's performance of work under the above-referenced contract.

Contractor understands and agrees that Contractor's Staff are not employees of the County of Los Angeles for any purpose whatsoever and that Contractor's Staff do not have and will not acquire any rights or benefits of any kind from the County of Los Angeles by virtue of my performance of work under the above-referenced contract. Contractor understands and agrees that Contractor's Staff will not acquire any rights or benefits from the County of Los Angeles pursuant to any agreement between any person or entity and the County of Los Angeles.

CONFIDENTIALITY AGREEMENT:

Contractor and Contractor's Staff may be involved with work pertaining to services provided by the County of Los Angeles and, if so, Contractor and Contractor's Staff may have access to confidential data and information pertaining to persons and/or entities receiving services from the County. In addition, Contractor and Contractor's Staff may also have access to proprietary information supplied by other vendors doing business with the County of Los Angeles. The County has a legal obligation to protect all such confidential data and information in its possession, especially data and information concerning health, criminal, and welfare recipient records. Contractor and Contractor's Staff understand that if they are involved in County work, the County must ensure that Contractor and Contractor's Staff, will protect the confidentiality of such data and information. Consequently, Contractor must sign this Confidentiality Agreement as a condition of work to be provided by Contractor's Staff for the County.

Contractor and Contractor's Staff hereby agrees that they will not divulge to any unauthorized person any data or information obtained while performing work pursuant to the above-referenced contract between Contractor and the County of Los Angeles. Contractor and Contractor's Staff agree to forward all requests for the release of any data or information received to County's Project Manager.

Contractor and Contractor's Staff agree to keep confidential all health, criminal, and welfare recipient records and all data and information pertaining to persons and/or entities receiving services from the County, design concepts, algorithms, programs, formats, documentation, Contractor proprietary information and all other original materials produced, created, or provided to Contractor and Contractor's Staff under the above-

EXHIBIT G

referenced contract. Contractor and Contractor's Staff agree to protect these confidential materials against disclosure to other than Contractor or County employees who have a need to know the information. Contractor and Contractor's Staff agree that if proprietary information supplied by other County vendors is provided to me during this employment, Contractor and Contractor's Staff shall keep such information confidential.

Contractor and Contractor's Staff agree to report any and all violations of this agreement by Contractor and Contractor's Staff and/or by any other person of whom Contractor and Contractor's Staff become aware.

Contractor and Contractor's Staff acknowledge that violation of this agreement may subject Contractor and Contractor's Staff to civil and/or criminal action and that the County of Los Angeles may seek all possible legal redress.

COPYRIGHT ASSIGNMENT AGREEMENT

Contractor and Contractor's Staff agree that all materials, documents, software programs and documentation, written designs, plans, diagrams, reports, software development tools and aids, diagnostic aids, computer processable media, source codes, object codes, conversion aids, training documentation and aids, and other information and/or tools of all types, developed or acquired by Contractor and Contractor's Staff in whole or in part pursuant to the above referenced contract, and all works based thereon, incorporated therein, or derived therefrom shall be the sole property of the County. In this connection, Contractor and Contractor's Staff hereby assign and transfer to the County in perpetuity for all purposes all my right, title, and interest in and to all such items, including, but not limited to, all unrestricted and exclusive copyrights, patent rights, trade secret rights, and all renewals and extensions thereof. Whenever requested by the County, Contractor and Contractor's Staff agree to promptly execute and deliver to County all papers, instruments, and other documents requested by the County, and to promptly perform all other acts requested by the County to carry out the terms of this agreement, including, but not limited to, executing an assignment and transfer of copyright in a form substantially similar to Exhibit M1, attached hereto and incorporated herein by reference.

The County shall have the right to register all copyrights in the name of the County of Los Angeles and shall have the right to assign, license, or otherwise transfer any and all of the County's right, title, and interest, including, but not limited to, copyrights, in and to the items described above.

Contractor and Contractor's Staff acknowledge that violation of this agreement may subject them to civil and/or criminal action and that the County of Los Angeles may seek all possible legal redress.

SIGNATURE: _____

DATE: ____/____/____

PRINTED NAME: _____

POSITION: _____

Title 2 ADMINISTRATION
Chapter 2.203.010 through 2.203.090
CONTRACTOR EMPLOYEE JURY SERVICE

2.203.010 Findings.

The board of supervisors makes the following findings. The county of Los Angeles allows its permanent, full-time employees unlimited jury service at their regular pay. Unfortunately, many businesses do not offer or are reducing or even eliminating compensation to employees who serve on juries. This creates a potential financial hardship for employees who do not receive their pay when called to jury service, and those employees often seek to be excused from having to serve. Although changes in the court rules make it more difficult to excuse a potential juror on grounds of financial hardship, potential jurors continue to be excused on this basis, especially from longer trials. This reduces the number of potential jurors and increases the burden on those employers, such as the county of Los Angeles, who pay their permanent, full-time employees while on juror duty. For these reasons, the county of Los Angeles has determined that it is appropriate to require that the businesses with which the county contracts possess reasonable jury service policies. (Ord. 2002-0015 § 1 (part), 2002)

2.203.020 Definitions.

The following definitions shall be applicable to this chapter:

- A. "Contractor" means a person, partnership, corporation or other entity which has a contract with the county or a subcontract with a county contractor and has received or will receive an aggregate sum of \$50,000 or more in any 12-month period under one or more such contracts or subcontracts.
- B. "Employee" means any California resident who is a full-time employee of a contractor under the laws of California.
- C. "Contract" means any agreement to provide goods to, or perform services for or on behalf of, the county but does not include:
 - 1. A contract where the board finds that special circumstances exist that justify a waiver of the requirements of this chapter; or
 - 2. A contract where federal or state law or a condition of a federal or state program mandates the use of a particular contractor; or
 - 3. A purchase made through a state or federal contract; or
 - 4. A monopoly purchase that is exclusive and proprietary to a specific manufacturer, distributor, or reseller, and must match and inter-member with existing supplies, equipment or systems maintained by the county pursuant to the Los Angeles County Purchasing Policy and Procedures Manual, Section P-3700 or a successor provision; or
 - 5. A revolving fund (petty cash) purchase pursuant to the Los Angeles County Fiscal Manual, Section 4.4.0 or a successor provision; or
 - 6. A purchase card purchase pursuant to the Los Angeles County Purchasing Policy and Procedures Manual, Section P-2810 or a successor provision; or
 - 7. A non-agreement purchase with a value of less than \$5,000 pursuant to the Los Angeles County Purchasing Policy and Procedures Manual, Section A-0300 or a successor provision; or
 - 8. A bona fide emergency purchase pursuant to the Los Angeles County Purchasing Policy and Procedures Manual, Section PP-1100 or a successor provision.

Title 2 ADMINISTRATION
Chapter 2.203.010 through 2.203.090
CONTRACTOR EMPLOYEE JURY SERVICE

- D. "Full time" means 40 hours or more worked per week, or a lesser number of hours if:
1. The lesser number is a recognized industry standard as determined by the chief administrative officer, or
 2. The contractor has a long-standing practice that defines the lesser number of hours as full time.
- E. "County" means the county of Los Angeles or any public entities for which the board of supervisors is the governing body. (Ord. 2002-0040 § 1, 2002: Ord. 2002-0015 § 1 (part), 2002)

2.203.030 Applicability.

This chapter shall apply to contractors who enter into contracts that commence after July 11, 2002. This chapter shall also apply to contractors with existing contracts which are extended into option years that commence after July 11, 2002. Contracts that commence after May 28, 2002, but before July 11, 2002, shall be subject to the provisions of this chapter only if the solicitations for such contracts stated that the chapter would be applicable. (Ord. 2002-0040 § 2, 2002: Ord. 2002-0015 § 1 (part), 2002)

2.203.040 Contractor Jury Service Policy.

A contractor shall have and adhere to a written policy that provides that its employees shall receive from the contractor, on an annual basis, no less than five days of regular pay for actual jury service. The policy may provide that employees deposit any fees received for such jury service with the contractor or that the contractor deduct from the employees' regular pay the fees received for jury service. (Ord. 2002-0015 § 1 (part), 2002)

2.203.050 Other Provisions.

- A. Administration. The chief administrative officer shall be responsible for the administration of this chapter. The chief administrative officer may, with the advice of county counsel, issue interpretations of the provisions of this chapter and shall issue written instructions on the implementation and ongoing administration of this chapter. Such instructions may provide for the delegation of functions to other county departments.
- B. Compliance Certification. At the time of seeking a contract, a contractor shall certify to the county that it has and adheres to a policy consistent with this chapter or will have and adhere to such a policy prior to award of the contract. (Ord. 2002-0015 § 1 (part), 2002)

2.203.060 Enforcement and Remedies.

For a contractor's violation of any provision of this chapter, the county department head responsible for administering the contract may do one or more of the following:

1. Recommend to the board of supervisors the termination of the contract; and/or,
2. Pursuant to chapter 2.202, seek the debarment of the contractor. (Ord. 2002-0015 § 1 (part), 2002)

Title 2 ADMINISTRATION
Chapter 2.203.010 through 2.203.090
CONTRACTOR EMPLOYEE JURY SERVICE

2.203.070. Exceptions.

- A. Other Laws. This chapter shall not be interpreted or applied to any contractor or to any employee in a manner inconsistent with the laws of the United States or California.
- B. Collective Bargaining Agreements. This chapter shall be superseded by a collective bargaining agreement that expressly so provides.
- C. Small Business. This chapter shall not be applied to any contractor that meets all of the following:
 - 1. Has ten or fewer employees during the contract period; and,
 - 2. Has annual gross revenues in the preceding twelve months which, if added to the annual amount of the contract awarded, are less than \$500,000; and,
 - 3. Is not an affiliate or subsidiary of a business dominant in its field of operation.

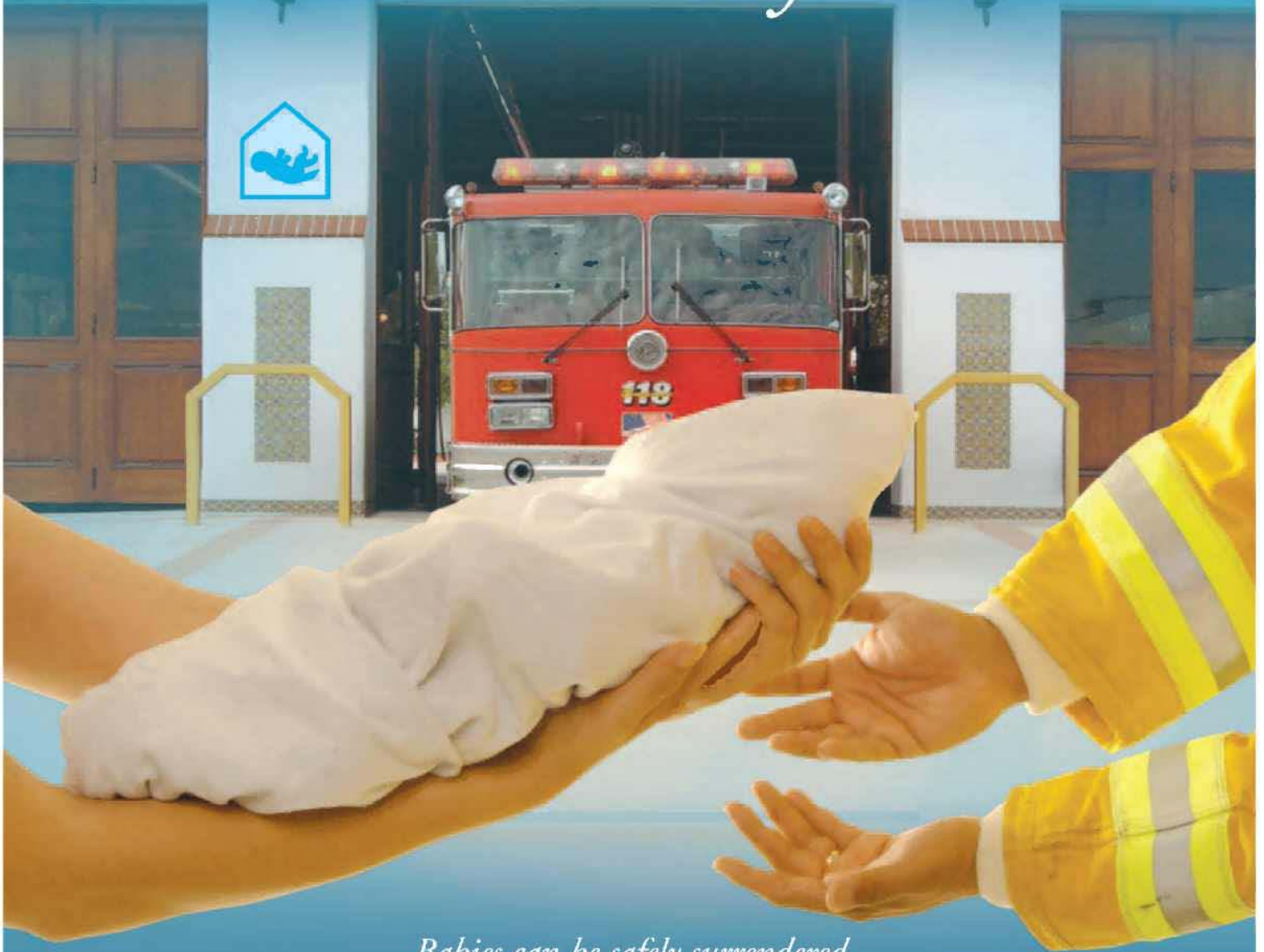
“Dominant in its field of operation” means having more than ten employees and annual gross revenues in the preceding twelve months which, if added to the annual amount of the contract awarded, exceed \$500,000.

“Affiliate or subsidiary of a business dominant in its field of operation” means a business which is at least 20 percent owned by a business dominant in its field of operation, or by partners, officers, directors, majority stockholders, or their equivalent, of a business dominant in that field of operation. (Ord. 2002-0015 § 1 (part), 2002)

2.203.090. Severability.

If any provision of this chapter is found invalid by a court of competent jurisdiction, the remaining provisions shall remain in full force and effect. (Ord. 2002-0015 § 1 (part), 2002)

Safely Surrendered *Baby Law*



*Babies can be safely surrendered
to staff at any hospital or fire station in Los Angeles County*

No shame. No blame. No names.

In Los Angeles County: 1-877-BABY SAFE • 1-877-222-9723

www.babysafela.org



Safely Surrendered Baby Law

What is the Safely Surrendered Baby Law?

California's Safely Surrendered Baby Law allows parents or other persons, with lawful custody, which means anyone to whom the parent has given permission to confidentially surrender a baby. As long as the baby is three days (72 hours) of age or younger and has not been abused or neglected, the baby may be surrendered without fear of arrest or prosecution.

Every baby deserves a chance for a healthy life. If someone you know is considering abandoning a baby, let her know there are other options. For three days (72 hours) after birth, a baby can be surrendered to staff at any hospital or fire station in Los Angeles County.

How does it work?

A distressed parent who is unable or unwilling to care for a baby can legally, confidentially, and safely surrender a baby within three days (72 hours) of birth. The baby must be handed to an employee at a hospital or fire station in Los Angeles County. As long as the baby shows no sign of abuse or neglect, no name or other information is required. In case the parent changes his or her mind at a later date and wants the baby back, staff will use bracelets to help connect them to each other. One bracelet will be placed on the baby, and a matching bracelet will be given to the parent or other surrendering adult.

What if a parent wants the baby back?

Parents who change their minds can begin the process of reclaiming their baby within 14 days. These parents should call the Los Angeles County Department of Children and Family Services at 1-800-540-4000.

Can only a parent bring in the baby?

No. While in most cases a parent will bring in the baby, the Law allows other people to bring in the baby if they have lawful custody.

Does the parent or surrendering adult have to call before bringing in the baby?

No. A parent or surrendering adult can bring in a baby anytime, 24 hours a day, 7 days a week, as long as the parent or surrendering adult surrenders the baby to someone who works at the hospital or fire station.

Does the parent or surrendering adult have to tell anything to the people taking the baby?

No. However, hospital or fire station personnel will ask the surrendering party to fill out a questionnaire designed to gather important medical history information, which is very useful in caring for the baby. The questionnaire includes a stamped return envelope and can be sent in at a later time.

What happens to the baby?

The baby will be examined and given medical treatment. Upon release from the hospital, social workers immediately place the baby in a safe and loving home and begin the adoption process.

What happens to the parent or surrendering adult?

Once the parent or surrendering adult surrenders the baby to hospital or fire station personnel, they may leave at any time.

Why is California doing this?

The purpose of the Safely Surrendered Baby Law is to protect babies from being abandoned, hurt or killed by their parents. You may have heard tragic stories of babies left in dumpsters or public bathrooms. Their parents may have been under severe emotional distress. The mothers may have hidden their pregnancies, fearful of what would happen if their families found out. Because they were afraid and had no one or nowhere to turn for help, they abandoned their babies. Abandoning a baby is illegal and places the baby in extreme danger. Too often, it results in the baby's death. The Safely Surrendered Baby Law prevents this tragedy from ever happening again in California.

A baby's story

Early in the morning on April 9, 2005, a healthy baby boy was safely surrendered to nurses at Harbor-UCLA Medical Center. The woman who brought the baby to the hospital identified herself as the baby's aunt and stated the baby's mother had asked her to bring the baby to the hospital on her behalf. The aunt was given a bracelet with a number matching the anklet placed on the baby; this would provide some identification in the event the mother changed her mind about surrendering the baby and wished to reclaim the baby in the 14-day period allowed by the Law. The aunt was also provided with a medical questionnaire and said she would have the mother complete and mail back in the stamped return envelope provided. The baby was examined by medical staff and pronounced healthy and full-term. He was placed with a loving family that had been approved to adopt him by the Department of Children and Family Services.



Ley de Entrega de Bebés *Sin Peligro*



Los recién nacidos pueden ser entregados en forma segura al personal de cualquier hospital o cuartel de bomberos del Condado de Los Ángeles

Sin pena. Sin culpa. Sin nombres.

En el Condado de Los Ángeles: 1-877-BABY SAFE • 1-877-222-9723

www.babysafela.org



Ley de Entrega de Bebés Sin Peligro

¿Qué es la Ley de Entrega de Bebés sin Peligro?

La Ley de Entrega de Bebés sin Peligro de California permite la entrega confidencial de un recién nacido por parte de sus padres u otras personas con custodia legal, es decir cualquier persona a quien los padres le hayan dado permiso. Siempre que el bebé tenga tres días (72 horas) de vida o menos, y no haya sufrido abuso ni negligencia, pueden entregar al recién nacido sin temor de ser arrestados o procesados.

Cada recién nacido se merece la oportunidad de tener una vida saludable. Si alguien que usted conoce está pensando en abandonar a un recién nacido, infórmele que tiene otras opciones. Hasta tres días (72 horas) después del nacimiento, se puede entregar un recién nacido al personal de cualquier hospital o cuartel de bomberos del condado de Los Angeles.

¿Cómo funciona?

El padre/madre con dificultades que no pueda o no quiera cuidar de su recién nacido puede entregarlo en forma legal, confidencial y segura dentro de los tres días (72 horas) del nacimiento. El bebé debe ser entregado a un empleado de cualquier hospital o cuartel de bomberos del Condado de Los Ángeles. Siempre que el bebé no presente signos de abuso o negligencia, no será necesario suministrar nombres ni información alguna. Si el padre/madre cambia de opinión posteriormente y desea recuperar a su bebé, los trabajadores utilizarán brazaletes para poder vincularlos. El bebé llevará un brazalete y el padre/madre o el adulto que lo entregue recibirá un brazalete igual.

¿Qué pasa si el padre/madre desea recuperar a su bebé?

Los padres que cambien de opinión pueden comenzar el proceso de reclamar a su recién nacido dentro de los 14 días. Estos padres deberán llamar al Departamento de Servicios para Niños y Familias (Department of Children and Family Services) del Condado de Los Ángeles al 1-800-540-4000.

¿Sólo los padres podrán llevar al recién nacido?

No. Si bien en la mayoría de los casos son los padres los que llevan al bebé, la ley permite que otras personas lo hagan si tienen custodia legal.

¿Los padres o el adulto que entrega al bebé deben llamar antes de llevar al bebé?

No. El padre/madre o adulto puede llevar al bebé en cualquier momento, las 24 horas del día, los 7 días de la semana, siempre y cuando entreguen a su bebé a un empleado del hospital o cuartel de bomberos.

¿Es necesario que el padre/madre o adulto diga algo a las personas que reciben al bebé?

No. Sin embargo, el personal del hospital o cuartel de bomberos le pedirá a la persona que entregue al bebé que llene un cuestionario con la finalidad de recabar antecedentes médicos importantes, que resultan de gran utilidad para cuidar bien del bebé. El cuestionario incluye un sobre con el sello postal pagado para enviarlo en otro momento.

¿Qué pasará con el bebé?

El bebé será examinado y le brindarán atención médica. Cuando le den el alta del hospital, los trabajadores sociales inmediatamente ubicarán al bebé en un hogar seguro donde estará bien atendido, y se comenzará el proceso de adopción.

¿Qué pasará con el padre/madre o adulto que entregue al bebé?

Una vez que los padres o adulto hayan entregado al bebé al personal del hospital o cuartel de bomberos, pueden irse en cualquier momento.

¿Por qué se está haciendo esto en California? ?

La finalidad de la Ley de Entrega de Bebés sin Peligro es proteger a los bebés para que no sean abandonados, lastimados o muertos por sus padres. Usted probablemente haya escuchado historias trágicas sobre bebés abandonados en basureros o en baños públicos. Los padres de esos bebés probablemente hayan estado pasando por dificultades emocionales graves. Las madres pueden haber ocultado su embarazo, por temor a lo que pasaría si sus familias se enteraran. Abandonaron a sus bebés porque tenían miedo y no tenían nadie a quien pedir ayuda. El abandono de un recién nacido es ilegal y pone al bebé en una situación de peligro extremo. Muy a menudo el abandono provoca la muerte del bebé. La Ley de Entrega de Bebés sin Peligro impide que vuelva a suceder esta tragedia en California.

Historia de un bebé

A la mañana temprano del día 9 de abril de 2005, se entregó un recién nacido saludable a las enfermeras del Harbor-UCLA Medical Center. La mujer que llevó el recién nacido al hospital se dio a conocer como la tía del bebé, y dijo que la madre le había pedido que llevara al bebé al hospital en su nombre. Le entregaron a la tía un brazalete con un número que coincidía con la pulsera del bebé; esto serviría como identificación en caso de que la madre cambiara de opinión con respecto a la entrega del bebé y decidiera recuperarlo dentro del período de 14 días que permite esta ley. También le dieron a la tía un cuestionario médico, y ella dijo que la madre lo llenaría y lo enviaría de vuelta dentro del sobre con franqueo pagado que le habían dado. El personal médico examinó al bebé y se determinó que estaba saludable y a término. El bebé fue ubicado con una buena familia que ya había sido aprobada para adoptarlo por el Departamento de Servicios para Niños y Familias.



Chapter 2.206 DEFAULTED PROPERTY TAX REDUCTION PROGRAM

- 2.206.010 Findings and declarations.
- 2.206.020 Definitions.
- 2.206.030 Applicability.
- 2.206.040 Required solicitation and Contract language.
- 2.206.050 Administration and compliance certification.
- 2.206.060 Exclusions/Exemptions.
- 2.206.070 Enforcement and remedies.
- 2.206.080 Severability.

2.206.010 Findings and declarations.

The Board of Supervisors finds that significant revenues are lost each year as a result of taxpayers who fail to pay their tax obligations on time. The delinquencies impose an economic burden upon the County and its taxpayers. Therefore, the Board of Supervisors establishes the goal of ensuring that individuals and businesses that benefit financially from Contracts with the County fulfill their property tax obligation. (Ord. No. 2009-0026 § 1 (part), 2009.)

2.206.020 Definitions.

The following definitions shall be applicable to this chapter:

- A. "Contractor" shall mean any person, firm, corporation, partnership, or combination thereof, which submits a bid or proposal or enters into a Contract or agreement with the County.
- B. "County" shall mean the County of Los Angeles or any public entities for which the Board of Supervisors is the governing body.
- C. "County Property Taxes" shall mean any property tax obligation on the County's secured or unsecured roll; except for tax obligations on the secured roll with respect to property held by a Contractor in a trust or fiduciary capacity or otherwise not beneficially owned by the Contractor.
- D. "Department" shall mean the County department, entity, or organization responsible for the solicitation and/or administration of the Contract.
- E. "Default" shall mean any property tax obligation on the secured roll that has been deemed defaulted by operation of law pursuant to California Revenue and Taxation Code section 3436; or any property tax obligation on the unsecured roll that remains unpaid on the applicable delinquency date pursuant to California Revenue and Taxation Code section 2922; except for any property tax obligation dispute pending before the Assessment Appeals Board.

- F. "Solicitation" shall mean the County's process to obtain bids or proposals for goods and services.
- G. "Treasurer-Tax Collector" shall mean the Treasurer and Tax Collector of the County of Los Angeles. (Ord. No. 2009-0026 § 1 (part), 2009.)

2.206.030 Applicability.

This chapter shall apply to all solicitations issued 60 days after the effective date of the ordinance codified in this chapter. This chapter shall also apply to all new, renewed, extended, and/or amended Contracts entered into 60 days after the effective date of the ordinance codified in this chapter. (Ord. No. 2009-0026 § 1 (part), 2009.)

2.206.040 Required solicitation and Contract language.

All solicitations and all new, renewed, extended, and/or amended Contracts shall contain language, which:

- A. Requires any Contractor to keep County Property Taxes out of Default status at all times during the term of an awarded Contract;
- B. Provides that the failure of the Contractor to comply with the provisions in this chapter may prevent the Contractor from being awarded a new Contract; and
- C. Provides that the failure of the Contractor to comply with the provisions in this chapter may constitute a material breach of an existing Contract, and failure to cure the breach within ten days of notice by the County by paying the outstanding County Property Tax or making payments in a manner agreed to and approved by the Treasurer-Tax Collector, may subject the Contract to suspension and/or termination. (Ord. No. 2009-0026 § 1 (part), 2009.)

2.206.050 Administration and compliance certification.

- A. The Treasurer-Tax Collector shall be responsible for the administration of this chapter. The Treasurer-Tax Collector shall, with the assistance of the Chief Executive Officer, Director of Internal Services, and County Counsel issue written instructions on the implementation and ongoing administration of this chapter. Such instructions may provide for the delegation of functions to other departments.
- B. Contractor shall be required to certify, at the time of submitting any bid or proposal to the County, or entering into any new Contract, or renewal, extension or amendment of an existing Contract with the County, that it is in compliance with this chapter is not in Default on any County Property Taxes or is current in

payments due under any approved payment arrangement (Ord. No. 2009-0026 § 1 (part), 2009.)

2.206.060 Exclusions/Exemptions.

A. This chapter shall not apply to the following Contracts:

1. Chief Executive Office delegated authority agreements under \$50,000;
2. A Contract where Federal or State law or a condition of a Federal or State program mandates the use of a particular Contractor;
3. A purchase made through a State or Federal Contract;
4. A Contract where State or Federal monies are used to fund service-related programs including, but not limited to, voucher programs, foster care, or other social programs that provide immediate direct assistance;
5. Purchase orders under a master agreement, where the Contractor was certified at the time the master agreement was entered into and at any subsequent renewal, extension and/or amendment to the master agreement;
6. Purchase orders issued by Internal Services Department under \$100,000 that is not the result of a competitive bidding process;
7. Program agreements that utilize Board of Supervisors' discretionary funds;
8. National Contracts established for the purchase of equipment and supplies for and by the National Association of Counties, U.S. Communities Government Purchasing Alliance, or any similar related group purchasing organization;
9. A monopoly purchase that is exclusive and proprietary to a specific manufacturer, distributor, reseller, and must match and intermember with existing supplies, equipment, or systems maintained by the County pursuant to the Los Angeles Purchasing Policy and Procedures Manual, Section P-3700 or a successor provision;
10. A revolving fund (petty cash) purchase pursuant to the Los Angeles County Fiscal Manual, Section 4.6.0 or a successor provision;
11. A purchase card purchase pursuant to the Los Angeles County Purchasing Policy and Procedures Manual, Section P-2810 or a successor provision;
12. A nonagreement purchase worth a value of less than \$5,000 pursuant to

the Los Angeles County Purchasing Policy and Procedures Manual, Section A-0300 or a successor provision; or

13. A bona fide emergency purchase pursuant to the Los Angeles County Purchasing Policy and Procedures Manual Section P-0900 or a successor provision;
 14. Other Contracts for mission critical goods and/or services where the Board of Supervisors determines that an exemption is justified.
- B. Other laws. This chapter shall not be interpreted or applied to any Contractor in a manner inconsistent with the laws of the United States or California. (Ord. No. 2009-0026 § 1 (part), 2009.)

2.206.070 Enforcement and remedies.

- A. The information furnished by each Contractor certifying that it is in compliance with this chapter shall be under penalty of perjury.
- B. No Contractor shall willfully and knowingly make a false statement certifying compliance with this chapter for the purpose of obtaining or retaining a County Contract.
- C. For Contractor's violation of any provision of this chapter, the County department head responsible for administering the Contract may do one or more of the following:
 1. Recommend to the Board of Supervisors the termination of the Contract; and/or,
 2. Pursuant to Chapter 2.202, seek the debarment of the Contractor; and/or,
 3. Recommend to the Board of Supervisors that an exemption is justified pursuant to Section 2.206.060.A.14 of this chapter or payment deferral as provided pursuant to the California Revenue and Taxation Code. (Ord. No. 2009-0026 § 1 (part), 2009.)

2.206.080 Severability.

If any provision of this chapter is found invalid by a court of competent jurisdiction, the remaining provisions shall remain in full force and effect. (Ord. No. 2009-0026 § 1 (part), 2009.)



COUNTY OF LOS ANGELES

Policy on Doing Business

With Small Business

Forty-two percent of businesses in Los Angeles County have five or fewer employees. Only about 4 percent of businesses in the area exceed 100 employees. According to the Los Angeles Times and local economists, it is not large corporations, but these small companies that are generating new jobs and helping move Los Angeles County out of its worst recession in decades.

WE RECOGNIZE...

The importance of small business to the County:

- In fueling local economic growth.
- Providing new jobs.
- Creating new local tax revenues.
- Offering new entrepreneurial opportunity to those historically under-represented in business.

The County can play a positive role in helping small business grow:

- As a multi-billion dollar purchaser of goods and services.
- As a broker of intergovernmental cooperation among numerous local jurisdictions.
- By greater outreach in providing information and training.
- By simplifying the bid/proposal process.
- By maintaining selection criteria which are fair to all.
- By streamlining the payment process.

WE THEREFORE SHALL:

1. Constantly seek to streamline and simplify our processes for selecting our vendors and for conducting business with them.
2. Maintain a strong outreach program, fully coordinated among our departments and districts, as well as other participating governments to: (a) inform and assist the local business community in competing to provide goods and services; and, (b) provide for ongoing dialogue with and involvement by the business community in implementing this policy.
3. Continually review and revise how we package and advertise solicitations, evaluate, and select prospective vendors, address subcontracting, and conduct business with our vendors, in order to: (a) expand opportunity for small business to compete for our business; and, (b) to further opportunities for all businesses to compete regardless of size.
4. Ensure that staff who manage and carry out the business of purchasing goods and services are welltrained, capable, and highly motivated to carry out the letter and spirit of this policy.

Listing of Contractors Debarred in Los Angeles County

List of Debarred Contractors in Los Angeles County may be obtained by going to the following website:

<https://doingbusiness.lacounty.gov/listing-of-contractors-debarred-in-los-angeles-county/>

County of Los Angeles *Lobbyist Ordinance*



IT'S THE LAW

It may affect you!

Chapter 2.160 of the Los Angeles County Code requires Lobbyists, Lobbying Firms and Lobbyist Employers to register with the Executive Office of the Board of Supervisors. This ordinance imposes extensive reporting requirements on individuals, businesses and other organizations. It places restrictions on the activities of anyone seeking to influence an official action of the County of Los Angeles including actions of the Board of Supervisors or the granting or denial of County contracts, licenses, permits, grants and franchises.

YOU MAY BE CONSIDERED A COUNTY LOBBYIST

If you are compensated to communicate directly (or through agents) with any County official for the purpose of influencing official action, then you may be required to register with the Executive Office of the Board of Supervisors. The requirement to register is the same whether you are an employee of, or on contract with, a firm or organization with business before the County. Additionally, an individual or business entity may be considered a County Lobbying Firm if it receives compensation to influence the County on behalf of any **other** persons or businesses. An individual, business entity or organization that employs or contracts with another individual or firm to represent or make contacts with a County agency on their behalf to influence County action may be considered a County Lobbyist Employer who must also register. If in doubt, it is best to register.

Furthermore, each person or entity who is not otherwise required to register as a County Lobbyist, Lobbying Firm or Lobbyist Employer, but who directly or indirectly expends \$5,000 or more during a calendar quarter to influence official action need not register BUT must report the expenditure to the Executive Office of the Board of Supervisors on a form available from the Executive Office.

REGISTERING IS IMPORTANT

Failure to comply with the ordinance may subject offending Lobbyists, Lobbying Firms, and Lobbyist Employers to **serious penalties including fines up to \$2,000 and denial of contracts, licenses, permits, grants or franchises. Moreover, some violators may be refused permission to address the Board of Supervisors or any County commission.**

HERE'S HOW TO COMPLY WITH THE LAW

Within 10 days of qualifying as a County Lobbyist, Lobbying Firm, or Lobbyist Employer as described in the ordinance, you must register with the Executive Office of the Board of Supervisors.

Registering with the County is easy. To receive a copy of the ordinance and registration forms, or to receive additional information or answers to specific questions, please contact the Executive Office of the Board of Supervisors at the following address or you may call one of the following telephone numbers:

Executive Office of the Board of Supervisors
County of Los Angeles
383 Kenneth Hahn Hall Of Administration
500 West Temple Street
Los Angeles, California 90012

(213) 974-1093 (213) 974-1578

A copy of the ordinance is available for your review at this County facility or on the Internet.

<http://bos.co.la.ca.us/>

Thank you for your cooperation and attention.



Department of the Treasury
Internal Revenue Service

Notice 1015

(Rev. December 2023)

Have You Told Your Employees About the Earned Income Credit (EIC)?

What Is the EIC?

The EIC is a refundable tax credit for certain workers.

Which Employees Must I Notify About the EIC?

You must notify each employee who worked for you at any time during the year and from whose wages you did not withhold income tax. However, you do not have to notify any employee who claimed exemption from withholding on Form W-4, Employee's Withholding Certificate.

Note: You are encouraged to notify all employees whose wages for 2023 are less than \$63,398 that they may be eligible for the EIC.

How and When Must I Notify My Employees?

You must give the employee one of the following.

- The IRS Form W-2, Wage and Tax Statement, which has the required information about the EIC on the back of Copy B.
- A substitute Form W-2 with the same EIC information on the back of the employee's copy that is on Copy B of the IRS Form W-2.
- Notice 797, Possible Federal Tax Refund Due to the Earned Income Credit (EIC).
- Your written statement with the same wording as Notice 797.

If you give an employee a Form W-2 on time, no further notice is necessary if the Form W-2 has the required information about the EIC on the back of the employee's copy. If you give an employee a substitute Form W-2, but it does not have the required information, you

must notify the employee within 1 week of the date the substitute Form W-2 is given. If Form W-2 is required but is not given on time, you must give the employee Notice 797 or your written statement by the date Form W-2 is required to be given. If Form W-2 is not required, you must notify the employee by February 5, 2024.

You must hand the notice directly to the employee or send it by first-class mail to the employee's last known address. You will not meet the notification requirements by posting Notice 797 on an employee bulletin board or sending it through office mail. However, you may want to post the notice to help inform all employees of the EIC. You can download copies of the notice at www.irs.gov/FormsPubs. Or you can go to www.irs.gov/OrderForms to order it.

How Will My Employees Know if They Can Claim the EIC?

The basic requirements are covered in Notice 797. For more detailed information, the employee needs to see Pub. 596, Earned Income Credit (EIC), or the Instructions for Forms 1040 and 1040-SR.

How Do My Employees Claim the EIC?

Eligible employees claim the EIC on their 2023 tax return. Even an employee who has no tax withheld from wages and owes no tax may claim the EIC and ask for a refund, but they must file a tax return to do so. For example, if an employee has no tax withheld in 2023 and owes no tax but is eligible for a credit of \$800, they must file a 2023 tax return to get the \$800 refund.

INFORMATION SECURITY AND PRIVACY REQUIREMENTS EXHIBIT

The County of Los Angeles (“County”) is committed to safeguarding the Integrity of the County systems, Data, Information and protecting the privacy rights of the individuals that it serves. This Information Security and Privacy Requirements Exhibit (“Exhibit”) sets forth the County and the Contractor’s commitment and agreement to fulfill each of their obligations under applicable state or federal laws, rules, or regulations, as well as applicable industry standards concerning privacy, Data protections, Information Security, Confidentiality, Availability, and Integrity of such Information. The Information Security and privacy requirements and procedures in this Exhibit are to be established by the Contractor before the Effective Date of the Agreement and maintained throughout the term of the Agreement.

These requirements and procedures are a minimum standard and are in addition to the requirements of the underlying base agreement between the County and Contractor (the “Agreement”) and any other agreements between the parties. However, it is the Contractor’s sole obligation to: (i) implement appropriate and reasonable measures to secure and protect its systems and all County Information against internal and external Threats and Risks; and (ii) continuously review and revise those measures to address ongoing Threats and Risks. Failure to comply with the minimum requirements and procedures set forth in this Exhibit will constitute a material, non-curable breach of Agreement by the Contractor, entitling the County, in addition to the cumulative of all other remedies available to it at law, in equity, or under the Agreement, to immediately terminate the Agreement. To the extent there are conflicts between this Exhibit and the Agreement, this Exhibit shall prevail unless stated otherwise.

1. DEFINITIONS

Unless otherwise defined in the Agreement, the definitions herein contained are specific to the uses within this exhibit.

- a. **Availability:** the condition of Information being accessible and usable upon demand by an authorized entity (Workforce Member or process).
- b. **Confidentiality:** the condition that Information is not disclosed to system entities (users, processes, devices) unless they have been authorized to access the Information.
- c. **County Information:** all Data and Information belonging to the County.
- d. **Data:** a subset of Information comprised of qualitative or quantitative values.
- e. **Incident:** a suspected, attempted, successful, or imminent Threat of unauthorized electronic and/or physical access, use, disclosure, breach, modification, or destruction of information; interference with Information Technology operations; or significant violation of County policy.
- f. **Information:** any communication or representation of knowledge or understanding such as facts, Data, or opinions in any medium or form, including electronic, textual, numerical, graphic, cartographic, narrative, or audiovisual.

- g. **Information Security Policy:** high level statements of intention and direction of an organization used to create an organization's Information Security Program as formally expressed by its top management.
- h. **Information Security Program:** formalized and implemented Information Security Policies, standards and procedures that are documented describing the program management safeguards and common controls in place or those planned for meeting the County's information security requirements.
- i. **Information Technology:** any equipment or interconnected system or subsystem of equipment that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of Data or Information.
- j. **Integrity:** the condition whereby Data or Information has not been improperly modified or destroyed and authenticity of the Data or Information can be ensured.
- k. **Mobile Device Management (MDM):** software that allows Information Technology administrators to control, secure, and enforce policies on smartphones, tablets, and other endpoints.
- l. **Privacy Policy:** high level statements of intention and direction of an organization used to create an organization's Privacy Program as formally expressed by its top management.
- m. **Privacy Program:** A formal document that provides an overview of an organization's privacy program, including a description of the structure of the privacy program, the resources dedicated to the privacy program, the role of the organization's privacy official and other staff, the strategic goals and objectives of the Privacy Program, and the program management controls and common controls in place or planned for meeting applicable privacy requirements and managing privacy risks.
- n. **Risk:** a measure of the extent to which the County is threatened by a potential circumstance or event, Risk is typically a function of: (i) the adverse impacts that would arise if the circumstance or event occurs; and (ii) the likelihood of occurrence.
- o. **Threat:** any circumstance or event with the potential to adversely impact County operations (including mission, functions, image, or reputation), organizational assets, individuals, or other organizations through an Information System via unauthorized access, destruction, disclosure, modification of Information, and/or denial of service.
- p. **Vulnerability:** a weakness in a system, application, network or process that is subject to exploitation or misuse.
- q. **Workforce Member:** employees, volunteers, and other persons whose conduct, in the performance of work for Los Angeles County, is under the direct control of Los Angeles County, whether or not they are paid by Los Angeles County. This includes, but may not be limited to, full and part time elected or appointed officials, employees, affiliates, associates, students, volunteers, and staff from third party entities who provide service to the County.

2. INFORMATION SECURITY AND PRIVACY PROGRAMS

- a. **Information Security Program.** The Contractor shall maintain a company-wide Information Security Program designed to evaluate Risks to the Confidentiality, Availability, and Integrity of the County Information covered under this Agreement.

Contractor's Information Security Program shall include the creation and maintenance of Information Security Policies, standards, and procedures. Information Security Policies, standards, and procedures will be communicated to all Contractor employees in a relevant, accessible, and understandable form and will be regularly reviewed and evaluated to ensure operational effectiveness, compliance with all applicable laws and regulations, and addresses new and emerging Threats and Risks.

The Contractor shall exercise the same degree of care in safeguarding and protecting County Information that the Contractor exercises with respect to its own Information and Data, but in no event less than a reasonable degree of care. The Contractor will implement, maintain, and use appropriate administrative, technical, and physical security measures to preserve the Confidentiality, Integrity, and Availability of County Information.

The Contractor's Information Security Program shall:

- Protect the Confidentiality, Integrity, and Availability of County Information in the Contractor's possession or control;
 - Protect against any anticipated Threats or hazards to the Confidentiality, Integrity, and Availability of County Information;
 - Protect against unauthorized or unlawful access, use, disclosure, alteration, or destruction of County Information;
 - Protect against accidental loss or destruction of, or damage to, County Information; and
 - Safeguard County Information in compliance with any applicable laws and regulations which apply to the Contractor.
- b. **Privacy Program.** The Contractor shall establish and maintain a company-wide Privacy Program designed to incorporate Privacy Policies and practices in its business operations to provide safeguards for Information, including County Information. The Contractor's Privacy Program shall include the development of, and ongoing reviews and updates to Privacy Policies, guidelines, procedures and appropriate workforce privacy training within its organization. These Privacy Policies, guidelines, procedures, and appropriate training will be provided to all Contractor employees, agents, and volunteers. The Contractor's Privacy Policies, guidelines, and procedures shall be continuously reviewed and updated for effectiveness and compliance with applicable laws and regulations, and to appropriately respond to new and emerging Threats and Risks. The Contractor's Privacy Program shall perform ongoing monitoring and audits of operations to identify and mitigate privacy Threats.

The Contractor shall exercise the same degree of care in safeguarding the privacy of County Information that the Contractor exercises with respect to its own Information, but in no event less than a reasonable degree of care. The Contractor will implement, maintain, and use appropriate privacy practices and protocols to preserve the Confidentiality of County Information.

The Contractor's Privacy Program shall include:

- A Privacy Program framework that identifies and ensures that the Contractor complies with all applicable laws and regulations;
- External Privacy Policies, and internal privacy policies, procedures and controls to support the privacy program;
- Protections against unauthorized or unlawful access, use, disclosure, alteration, or destruction of County Information;
- A training program that covers Privacy Policies, protocols and awareness;
- A response plan to address privacy Incidents and privacy breaches; and
- Ongoing privacy assessments and audits.

3. PROPERTY RIGHTS TO COUNTY INFORMATION

All County Information is deemed property of the County, and the County shall retain exclusive rights and ownership thereto. County Information shall not be used by the Contractor for any purpose other than as required under this Agreement, nor shall such or any part of such be disclosed, sold, assigned, leased, or otherwise disposed of, to third parties by the Contractor, or commercially exploited or otherwise used by, or on behalf of, the Contractor, its officers, directors, employees, or agents. The Contractor may assert no lien on or right to withhold from the County, any County Information it receives from, receives addressed to, or stores on behalf of, the County. Notwithstanding the foregoing, the Contractor may aggregate, compile, and use County Information in order to improve, develop or enhance the System Software and/or other services offered, or to be offered, by the Contractor, provided that (i) no County Information in such aggregated or compiled pool is identifiable as originating from, or can be traced back to the County, and (ii) such Data or Information cannot be associated or matched with the identity of an individual alone, or linkable to a specific individual. The Contractor specifically consents to the County's access to such County Information held, stored, or maintained on any and all devices Contractor owns, leases or possesses.

4. CONTRACTOR'S USE OF COUNTY INFORMATION

The Contractor may use County Information only as necessary to carry out its obligations under this Agreement. The Contractor shall collect, maintain, or use County Information only for the purposes specified in the Agreement and, in all cases, in compliance with all applicable local, state, and federal laws and regulations governing the collection, maintenance, transmission, dissemination, storage, use, and destruction of County Information, including, but not limited to, (i) any state and federal law governing the protection of personal Information, (ii) any state and federal security breach notification laws, and (iii) the rules, regulations and directives of the Federal Trade Commission, as amended from time to time.

5. SHARING COUNTY INFORMATION AND DATA

The Contractor shall not share, release, disclose, disseminate, make available, transfer, or otherwise communicate orally, in writing, or by electronic or other means, County Information to a third party for monetary or other valuable consideration.

6. CONFIDENTIALITY

- a. **Confidentiality of County Information.** The Contractor agrees that all County Information is Confidential and proprietary to the County regardless of whether such Information was disclosed intentionally or unintentionally, or marked as "confidential".
- b. **Disclosure of County Information.** The Contractor may disclose County Information only as necessary to carry out its obligations under this Agreement, or as required by law, and is prohibited from using County Information for any other purpose without the prior express written approval of the County's contract administrator in consultation with the County's Chief Information Security Officer and/or Chief Privacy Officer. If required by a court of competent jurisdiction or an administrative body to disclose County Information, the Contractor shall notify the County's contract administrator immediately and prior to any such disclosure, to provide the County an opportunity to oppose or otherwise respond to such disclosure, unless prohibited by law from doing so.
- c. **Disclosure Restrictions of Non-Public Information.** While performing work under the Agreement, the Contractor may encounter County Non-public Information ("NPI") in the course of performing this Agreement, including, but not limited to, licensed technology, drawings, schematics, manuals, sealed court records, and other materials described and/or identified as "Internal Use", "Confidential" or "Restricted" as defined in [Board of Supervisors Policy 6.104 – Information Classification Policy](#) as NPI. The Contractor shall not disclose or publish any County NPI and material received or used in performance of this Agreement. This obligation is perpetual.
- d. **Individual Requests.** The Contractor shall acknowledge any request or instructions from the County regarding the exercise of any individual's privacy rights provided under applicable federal or state laws. The Contractor shall have in place appropriate policies and procedures to promptly respond to such requests and comply with any request or instructions from the County within seven (7) calendar days. If an individual makes a request directly to the Contractor involving County Information, the Contractor shall notify the County within five (5) calendar days and the County will coordinate an appropriate response, which may include instructing the Contractor to assist in fulfilling the request. Similarly, if the Contractor receives a privacy or security complaint from an individual regarding County Information, the Contractor shall notify the County as described in Section 14 SECURITY AND PRIVACY INCIDENTS, and the County will coordinate an appropriate response.
- e. **Retention of County Information.** The Contractor shall not retain any County Information for any period longer than necessary for the Contractor to fulfill its obligations under the Agreement and applicable law, whichever is longest.

7. CONTRACTOR EMPLOYEES

The Contractor shall perform background and security investigation procedures in the manner prescribed in this section unless the Agreement prescribes procedures for conducting background and security investigations and those procedures are no less stringent than the procedures described in this section.

To the extent permitted by applicable law, the Contractor shall screen and conduct background investigations on all Contractor employees and Subcontractors as appropriate to their role, with access to County Information for potential security Risks. Such background investigations must be obtained through fingerprints submitted to the California Department of Justice to include State, local, and federal-level review and conducted in accordance with the law, may include criminal and financial history to the extent permitted under the law, and will be repeated on a regular basis. The fees associated with the background investigation shall be at the expense of the Contractor, regardless of whether the member of the Contractor's staff passes or fails the background investigation. The Contractor, in compliance with its legal obligations, shall conduct an individualized assessment of their employees, agents, and volunteers regarding the nature and gravity of a criminal offense or conduct; the time that has passed since a criminal offense or conduct and completion of the sentence; and the nature of the access to County Information to ensure that no individual accesses County Information whose past criminal conduct poses a risk or threat to County Information.

The Contractor shall require all employees, agents, and volunteers to abide by the requirements in this Exhibit, as set forth in the Agreement, and sign an appropriate written Confidentiality/non-disclosure agreement with the Contractor.

The Contractor shall supply each of its employees with appropriate, annual training regarding Information Security procedures, Risks, and Threats. The Contractor agrees that training will cover, but may not be limited to the following topics:

- a) **Secure Authentication:** The importance of utilizing secure authentication, including proper management of authentication credentials (login name and password) and multi-factor authentication.
- b) **Social Engineering Attacks:** Identifying different forms of social engineering including, but not limited to, phishing, phone scams, and impersonation calls.
- c) **Handling of County Information:** The proper identification, storage, transfer, archiving, and destruction of County Information.
- d) **Causes of Unintentional Information Exposure:** Provide awareness of causes of unintentional exposure of Information such as lost mobile devices, emailing Information to inappropriate recipients, etc.
- e) **Identifying and Reporting Incidents:** Awareness of the most common indicators of an Incident and how such indicators should be reported within the organization.
- f) **Privacy:** The Contractor's Privacy Policies and procedures as described in Section 2b. Privacy Program.

The Contractor shall have an established set of procedures to ensure the Contractor's employees promptly report actual and/or suspected breaches of security.

8. SUBCONTRACTORS AND THIRD PARTIES

The County acknowledges that in the course of performing its services, the Contractor may desire or require the use of goods, services, and/or assistance of Subcontractors or other third parties or suppliers. The terms of this Exhibit shall also apply to all Subcontractors and

third parties. The Contractor or third party shall be subject to the following terms and conditions: (i) each Subcontractor and third party must agree in writing to comply with and be bound by the applicable terms and conditions of this Exhibit, both for itself and to enable the Contractor to be and remain in compliance with its obligations hereunder, including those provisions relating to Confidentiality, Integrity, Availability, disclosures, security, and such other terms and conditions as may be reasonably necessary to effectuate the Agreement including this Exhibit; and (ii) the Contractor shall be and remain fully liable for the acts and omissions of each Subcontractor and third party, and fully responsible for the due and proper performance of all Contractor obligations under this Agreement.

The Contractor shall obtain advanced approval from the County's Chief Information Security Officer and/or Chief Privacy Officer prior to subcontracting services subject to this Exhibit.

9. STORAGE AND TRANSMISSION OF COUNTY INFORMATION

All County Information shall be rendered unusable, unreadable, or indecipherable to unauthorized individuals. Without limiting the generality of the foregoing, the Contractor will encrypt all workstations, portable devices (such as mobile, wearables, tablets,) and removable media (such as portable or removable hard disks, floppy disks, USB memory drives, CDs, DVDs, magnetic tape, and all other removable storage media) that store County Information in accordance with Federal Information Processing Standard (FIPS) 140-2 or otherwise approved by the County's Chief Information Security Officer.

The Contractor will encrypt County Information transmitted on networks outside of the Contractor's control with Transport Layer Security (TLS) or Internet Protocol Security (IPSec), at a minimum cipher strength of 128 bit or an equivalent secure transmission protocol or method approved by County's Chief Information Security Officer.

In addition, the Contractor shall not store County Information in the cloud or in any other online storage provider without written authorization from the County's Chief Information Security Officer. All mobile devices storing County Information shall be managed by a Mobile Device Management system. Such system must provide provisions to enforce a password/passcode on enrolled mobile devices. All workstations/Personal Computers (including laptops, 2-in-1s, and tablets) will maintain the latest operating system security patches, and the latest virus definitions. Virus scans must be performed at least monthly. Request for less frequent scanning must be approved in writing by the County's Chief Information Security Officer.

10. RETURN OR DESTRUCTION OF COUNTY INFORMATION

The Contractor shall return or destroy County Information in the manner prescribed in this section unless the Agreement prescribes procedures for returning or destroying County Information and those procedures are no less stringent than the procedures described in this section.

- a. **Return or Destruction.** Upon County's written request, or upon expiration or termination of this Agreement for any reason, Contractor shall (i) promptly return or destroy, at the County's option, all originals and copies of all documents and materials it has received

containing County Information; or (ii) if return or destruction is not permissible under applicable law, continue to protect such Information in accordance with the terms of this Agreement; and (iii) deliver or destroy, at the County's option, all originals and copies of all summaries, records, descriptions, modifications, negatives, drawings, adoptions and other documents or materials, whether in writing or in machine-readable form, prepared by the Contractor, prepared under its direction, or at its request, from the documents and materials referred to in Subsection (i) of this Section. For all documents or materials referred to in Subsections (i) and (ii) of this Section that the County requests be returned to the County, the Contractor shall provide a written attestation on company letterhead certifying that all documents and materials have been delivered to the County. For documents or materials referred to in Subsections (i) and (ii) of this Section that the County requests be destroyed, the Contractor shall provide an attestation on company letterhead and certified documentation from a media destruction firm consistent with subdivision b of this Section. Upon termination or expiration of the Agreement or at any time upon the County's request, the Contractor shall return all hardware, if any, provided by the County to the Contractor. The hardware should be physically sealed and returned via a bonded courier, or as otherwise directed by the County.

- b. **Method of Destruction.** The Contractor shall destroy all originals and copies by (i) cross-cut shredding paper, film, or other hard copy media so that the Information cannot be read or otherwise reconstructed; and (ii) purging or destroying electronic media containing County Information consistent with NIST Special Publication 800-88, "Guidelines for Media Sanitization" such that the County Information cannot be retrieved. The Contractor will provide an attestation on company letterhead and certified documentation from a media destruction firm, detailing the destruction method used and the County Information involved, the date of destruction, and the company or individual who performed the destruction. Such statement will be sent to the designated County contract manager within ten (10) days of termination or expiration of the Agreement or at any time upon the County's request. On termination or expiration of this Agreement, the County will return or destroy all Contractor's Information marked as confidential (excluding items licensed to the County hereunder, or that provided to the County by the Contractor hereunder), at the County's option.

11. PHYSICAL AND ENVIRONMENTAL SECURITY

All Contractor facilities that process County Information will be located in secure areas and protected by perimeter security such as barrier access controls (e.g., the use of guards and entry badges) that provide a physically secure environment from unauthorized access, damage, and interference.

All Contractor facilities that process County Information will be maintained with physical and environmental controls (temperature and humidity) that meet or exceed hardware manufacturer's specifications.

12. OPERATIONAL MANAGEMENT, BUSINESS CONTINUITY, AND DISASTER RECOVERY

The Contractor shall: (i) monitor and manage all of its Information processing facilities, including, without limitation, implementing operational procedures, change management, and Incident response procedures consistent with Section 14 SECURITY AND PRIVACY INCIDENTS; and (ii) deploy adequate anti-malware software and adequate back-up systems to ensure essential business Information can be promptly recovered in the event of a disaster or media failure; and (iii) ensure its operating procedures are adequately documented and designed to protect Information and computer media from theft and unauthorized access.

The Contractor must have business continuity and disaster recovery plans. These plans must include a geographically separate back-up data center and a formal framework by which an unplanned event will be managed to minimize the loss of County Information and services. The formal framework includes a defined back-up policy and associated procedures, including documented policies and procedures designed to: (i) perform back-up of data to a remote back-up data center in a scheduled and timely manner; (ii) provide effective controls to safeguard backed-up data; (iii) securely transfer County Information to and from back-up location; (iv) fully restore applications and operating systems; and (v) demonstrate periodic testing of restoration from back-up location. If the Contractor makes backups to removable media (as described in Section 9 STORAGE AND TRANSMISSION OF COUNTY INFORMATION), all such backups shall be encrypted in compliance with the encryption requirements noted above in Section 9 STORAGE AND TRANSMISSION OF COUNTY INFORMATION.

13. ACCESS CONTROL

Subject to and without limiting the requirements under Section 9 STORAGE AND TRANSMISSION OF COUNTY INFORMATION, County Information (i) may only be made available and accessible to those parties explicitly authorized under the Agreement or otherwise expressly approved by the County Project Director or Project Manager in writing; and (ii) if transferred using removable media (as described in Section 9 STORAGE AND TRANSMISSION OF COUNTY INFORMATION) must be sent via a bonded courier and protected using encryption technology designated by the Contractor and approved by the County's Chief Information Security Officer in writing. The foregoing requirements shall apply to back-up media stored by the Contractor at off-site facilities.

The Contractor shall implement formal procedures to control access to County systems, services, and/or Information, including, but not limited to, user account management procedures and the following controls:

- a. Network access to both internal and external networked services shall be controlled, including, but not limited to, the use of industry standard and properly configured firewalls;

- b. Operating systems will be used to enforce access controls to computer resources including, but not limited to, multi-factor authentication, use of virtual private networks (VPN), authorization, and event logging;
- c. The Contractor will conduct regular, no less often than semi-annually, user access reviews to ensure that unnecessary and/or unused access to County Information is removed in a timely manner;
- d. Applications will include access control to limit user access to County Information and application system functions;
- e. All systems will be monitored to detect deviation from access control policies and identify suspicious activity. The Contractor shall record, review and act upon all events in accordance with Incident response policies set forth in Section 14 SECURITY AND PRIVACY INCIDENTS; and
- f. In the event any hardware, storage media, or removable media (as described in Section 9 STORAGE AND TRANSMISSION OF COUNTY INFORMATION) must be disposed of or sent off-site for servicing, the Contractor shall ensure all County Information, has been eradicated from such hardware and/or media using industry best practices as discussed in Section 9 STORAGE AND TRANSMISSION OF COUNTY INFORMATION.

14. SECURITY AND PRIVACY INCIDENTS

In the event of a Security or Privacy Incident, the Contractor shall:

Departmental Information Security Officer:

- a. Promptly notify the County's Chief Information Security Officer, the Departmental Information Security Officer, and the County's Chief Privacy Officer of any Incidents involving County Information, within twenty-four (24) hours of detection of the Incident. All notifications shall be submitted via encrypted email and telephone.

County Chief Information Security Officer and Chief Privacy Officer email
CISO-CPO_Notify@lacounty.gov

Chief Information Security Officer:

James Thurmond
Chief Information Security Officer
555 W. 5th Street, 36th Floor
Los Angeles, CA 90013
(213) 253-5660

Chief Privacy Officer:

Lillian Russell
Chief Privacy Officer
555 W. 5th Street, 36th Floor
Los Angeles, CA 90013
(213) 351-5363

Departmental Information Security Officer:

Paul Lam
Departmental Information Security Officer
900 South Fremont Ave.
Alhambra, CA 91803
(626) 458-5929
pslam@dpw.lacounty.gov

- b. Include the following Information in all notices:
 - i. The date and time of discovery of the Incident,
 - ii. The approximate date and time of the Incident,
 - iii. A description of the type of County Information involved in the reported Incident, and
 - iv. A summary of the relevant facts, including a description of measures being taken to respond to and remediate the Incident, and any planned corrective actions as they are identified.
 - v. The name and contact information for the organizations official representative(s), with relevant business and technical information relating to the incident.
- c. Cooperate with the County to investigate the Incident and seek to identify the specific County Information involved in the Incident upon the County's written request, without charge, unless the Incident was caused by the acts or omissions of the County. As Information about the Incident is collected or otherwise becomes available to the Contractor, and unless prohibited by law, the Contractor shall provide Information regarding the nature and consequences of the Incident that are reasonably requested by the County to allow the County to notify affected individuals, government agencies, and/or credit bureaus.
- d. Immediately initiate the appropriate portions of their Business Continuity and/or Disaster Recovery plans in the event of an Incident causing an interference with Information Technology operations.
- e. Assist and cooperate with forensic investigators, the County, law firms, and and/or law enforcement agencies at the direction of the County to help determine the nature, extent, and source of any Incident, and reasonably assist and cooperate with the County on any additional disclosures that the County is required to make as a result of the Incident.
- f. Allow the County or its third-party designee at the County's election to perform audits and tests of the Contractor's environment that may include, but are not limited to, interviews of relevant employees, review of documentation, or technical inspection of systems, as they relate to the receipt, maintenance, use, retention, and authorized destruction of County Information.

Notwithstanding any other provisions in this Agreement and Exhibit, The Contractor shall be (i) liable for all damages and fines, (ii) responsible for all corrective action, and (iii)

responsible for all notifications arising from an Incident involving County Information caused by the Contractor's weaknesses, negligence, errors, or lack of Information Security or privacy controls or provisions.

15. NON-EXCLUSIVE EQUITABLE REMEDY

The Contractor acknowledges and agrees that due to the unique nature of County Information there can be no adequate remedy at law for any breach of its obligations hereunder, that any such breach may result in irreparable harm to the County, and therefore, that upon any such breach, the County will be entitled to appropriate equitable remedies, and may seek injunctive relief from a court of competent jurisdiction without the necessity of proving actual loss, in addition to whatever remedies are available within law or equity. Any breach of Section 6 CONFIDENTIALITY shall constitute a material breach of this Agreement and be grounds for immediate termination of this Agreement in the exclusive discretion of the County.

16. AUDIT AND INSPECTION

- a. **Self-Audits.** The Contractor shall periodically conduct audits, assessments, testing of the system of controls, and testing of Information Security and privacy procedures, including penetration testing, intrusion detection, and firewall configuration reviews. These periodic audits will be conducted by staff certified to perform the specific audit in question at Contractor's sole cost and expense through either (i) an internal independent audit function, (ii) a nationally recognized, external, independent auditor, or (iii) another independent auditor approved by the County.

The Contractor shall have a process for correcting control deficiencies that have been identified in the periodic audit, including follow up documentation providing evidence of such corrections. The Contractor shall provide the audit results and any corrective action documentation to the County promptly upon its completion at the County's request. With respect to any other report, certification, or audit or test results prepared or received by the Contractor that contains any County Information, the Contractor shall promptly provide the County with copies of the same upon the County's reasonable request, including identification of any failure or exception in the Contractor's Information systems, products, and services, and the corresponding steps taken by the Contractor to mitigate such failure or exception. Any reports and related materials provided to the County pursuant to this Section shall be provided at no additional charge to the County.

- b. **County Requested Audits.** At its own expense, the County, or an independent third-party auditor commissioned by the County, shall have the right to audit the Contractor's infrastructure, security and privacy practices, Data center, services and/or systems storing or processing County Information via an onsite inspection at least once a year. Upon the County's request the Contractor shall complete a questionnaire regarding Contractor's Information Security and/or program. The County shall pay for the County requested audit unless the auditor finds that the Contractor has materially breached this Exhibit, in which case the Contractor shall bear all costs of the audit; and if the audit reveals material non-compliance with this Exhibit, the County may exercise its termination rights underneath the Agreement.

Such audit shall be conducted during the Contractor's normal business hours with reasonable advance notice, in a manner that does not materially disrupt or otherwise unreasonably and adversely affect the Contractor's normal business operations. The County's request for the audit will specify the scope and areas (e.g., Administrative, Physical, and Technical) that are subject to the audit and may include, but are not limited to physical controls inspection, process reviews, policy reviews, evidence of external and internal Vulnerability scans, penetration test results, evidence of code reviews, and evidence of system configuration and audit log reviews. It is understood that the results may be filtered to remove the specific Information of other Contractor customers such as IP address, server names, etc. The Contractor shall cooperate with the County in the development of the scope and methodology for the audit, and the timing and implementation of the audit. This right of access shall extend to any regulators with oversight of the County. The Contractor agrees to comply with all reasonable recommendations that result from such inspections, tests, and audits within reasonable timeframes.

When not prohibited by regulation, the Contractor will provide to the County a summary of: (i) the results of any security audits, security reviews, or other relevant audits, conducted by the Contractor or a third party; and (ii) corrective actions or modifications, if any, the Contractor will implement in response to such audits.

17. RESERVED.**18. PRIVACY AND SECURITY INDEMNIFICATION**

In addition to the indemnification provisions in the Agreement, the Contractor agrees to indemnify, defend, and hold harmless the County, its Special Districts, elected and appointed officers, agents, employees, and volunteers from and against any and all claims, demands liabilities, damages, judgments, awards, losses, costs, expenses or fees including reasonable attorneys' fees, accounting and other expert, consulting or professional fees, and amounts paid in any settlement arising from, connected with, or relating to :

- The Contractor's violation of any federal and state laws in connection with its accessing, collecting, processing, storing, disclosing, or otherwise using County Information;
- The Contractor's failure to perform or comply with any terms and conditions of this Agreement or related agreements with the County; and/or,
- Any Information loss, breach of Confidentiality, or Incident involving any County Information that occurs on the Contractor's systems or networks (including all costs and expenses incurred by the County to remedy the effects of such loss, breach of Confidentiality, or Incident, which may include (i) providing appropriate notice to individuals and governmental authorities, (ii) responding to individuals' and governmental authorities' inquiries, (iii) providing credit monitoring to individuals, and (iv) conducting litigation and settlements with individuals and governmental authorities).

Notwithstanding the preceding sentences, the County shall have the right to participate in any such defense at its sole cost and expense, except that in the event contractor fails to provide County with a full and adequate defense, as determined by County in its sole judgment, County shall be entitled to retain its own counsel, including, without limitation, County Counsel, and to reimbursement from contractor for all such costs and expenses incurred by County in doing so. Contractor shall not have the right to enter into any settlement, agree to any injunction or other equitable relief, or make any admission, in each case, on behalf of County without County's prior written approval.

PROPOSERS' UTILIZATION PARTICIPATION AND COMMUNITY BUSINESS ENTERPRISE PROGRAM INFORMATION FOR LOS ANGELES COUNTY ADVANCED TRAFFIC MANAGEMENT SYSTEM PHASE III

SELECTED FIRMS

	Proposer Name (Prime with subcontractors* listed below) *only subcontractors with Utilization Participation are listed.	Local Small Business Enterprise (LSBE)	Small Business Enterprise (SBE)	Minority	Women-Owned	Disadvantaged Business	Disabled Veteran Business Enterprise	Social Enterprise	Lesbian, Gay, Bisexual, Transgender, Queer, and Questioning-Owned Business Enterprise
1	Kimley-Horn and Associates, Inc.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NON-SELECTED FIRMS

	Proposer Name	Local Small Business Enterprise (LSBE)	Small Business Enterprise (SBE)	Minority	Women-Owned	Disadvantaged Business	Disabled Veteran Business Enterprise	Social Enterprise	Lesbian, Gay, Bisexual, Transgender, Queer, and Questioning-
1	Q-Free America, Inc.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Information provided by proposers in response to the Request for Proposal. On final analysis and consideration of award, vendors were selected without regard to race, creed, gender, or color.

June 30, 2026

ENCLOSURE B

**PROPOSERS' UTILIZATION PARTICIPATION AND COMMUNITY BUSINESS ENTERPRISE PROGRAM INFORMATION FOR
LOS ANGELES COUNTY ADVANCED TRAFFIC MANAGEMENT SYSTEM PHASE III**

FIRM INFORMATION*		Kimley-Horn and Associates, Inc.	Q-Free America, Inc.
BUSINESS STRUCTURE		Corporation	Corporation
CULTURAL/ETHNIC COMPOSITION			
		NUMBER/% OF OWNERSHIP	
OWNERS/PARTNERS	Black/African American	6/1%	0
	Hispanic/Latino	36/4%	0
	Asian or Pacific Islander	42/5%	1/16.67
	Native American	1/1%	0
	Subcontinent Asian	0	0
	White	740/89%	5/83.34
	TOTAL	825	6
	<i>Female (included above)</i>	176/22	1/16.67
COUNTY CERTIFICATION			
	CBE	N/A	N/A
	LSBE	N/A	N/A
OTHER CERTIFYING AGENCY		N/A	N/A

*Information provided by proposers in response to the Request for Proposal. On final analysis and consideration of award, vendors were selected without regard to race, creed, gender, or color.

**Econline Systems, Inc., is a publicly traded company, and a break down of Owners/Partners is not provided.



Peter Loo
CHIEF INFORMATION OFFICER

CIO ANALYSIS

BOARD AGENDA DATE:

6/30/2026

SUBJECT: SUBJECT:

**AWARD OF SERVICE CONTRACT
LOS ANGELES COUNTY ADVANCED TRAFFIC MANAGEMENT SYSTEM PHASE III**

CONTRACT TYPE:

New Contract Sole Source Amendment to Contract #:

SUMMARY:

The Department of Public Works (DPW) is requesting delegated authority to execute a competitively solicited contract with Kimley-Horn and Associates, Inc., for a 6-year term plus four 1-year extension options to provide an on-prem software upgrade to replace the existing KITS (current software) that is no longer supported. The Advanced Traffic Management System (ATMS) enables remote monitoring and control of traffic signals and Intelligent Transportation System (ITS) infrastructure from locations such as traffic management centers, city halls, or maintenance yards. DPW is further requesting authorization to extend the contract expiration date as necessary, utilize pool dollars, and to adjust the annual contract sum for each option year over the term of the contract to allow for a cost-of-living adjustment.

On October 2, 2024, a notice of the Request for Proposals (RFP) was placed on the County's "Doing Business With Los Angeles County" website (Enclosure D), "Do Business With Public Works" website, X (formerly Twitter), and multiple newspaper outlets. On November 21, 2024, three proposals were received. One proposal was disqualified for failure to meet the minimum requirements of the RFP. The remainder of the proposals were evaluated by an evaluation committee consisting of staff from Public Works and the Los Angeles Metro. The evaluation was based on criteria described in the RFP, which included the price, qualifications and experience, performance history/references, proposed work plan, and demonstration of proposed system, utilizing the informed averaging methodology for applicable criteria. Based on this evaluation, it is recommended that the contract be awarded to the highest rated, responsive, and responsible proposer, Kimley-Horn and Associates, Inc.

The Contract scope of services includes requirements for project planning and management, procurement, custom programming modifications, system integrations & testing, training, system warranty, operational maintenance and support services.

Contract Amount: \$2,919,400

CONTRACT FOR ADVANCED TRAFFIC MANAGEMENT SYSTEM PHASE III

FINANCIAL ANALYSIS:

Kimley-Horn and Associates, Inc. Contract costs:

One-Time Costs, Year 1:

Project Plan & Project Management	\$	85,000
Procurement (Licensing).....		125,000
Custom programming Modifications.....	\$	60,000
System Integration & Testing.....	\$	125,000
Training.....	\$	25,000
Omni Firmware Support.....	\$	235,000
Advanced Decision Support.....	\$	65,000
Advanced 2070 Excel.....	\$	75,000
Optional Traction Premium.....	\$	36,000 ¹
DMS Module.....	\$	50,000
CCTV.....	\$	45,000
Subtotal One-Time Costs:	\$	926,000

Ongoing Annual Costs, Years 2-10:

System Maintenance (Year 2).....	\$	140,000
System Maintenance (Year 3)	\$	145,000
System Maintenance (Year 4).....	\$	150,000
System Maintenance (Year 5).....	\$	155,000
System Maintenance (Year 6).....	\$	160,000
System Maintenance (Optional, Year 7)	\$	165,000
System Maintenance (Optional, Year 8)	\$	170,000
System Maintenance (Optional, Year 9)	\$	175,000
System Maintenance (Optional, Year 10)	\$	180,000

Subtotal Ongoing Costs: \$ **1,440,000**

Total – Contract Sum..... \$ **2,366,000**

Optional Costs, Years 2-9

Optional Traction Premium.....	\$	288,000 ¹
Contract Pool Dollars	\$	265,400 ²

Total – Maximum Contract Sum..... \$ **2,919,400**

Notes:

¹Optional Traction Travel Premium calculates trajectory travel time data or crowd-sourced travel time data from Google, Microsoft Azure, & Waze.

² Pool dollars is an additional 10% of the annual contract sum for unforeseen additional work within the scope of the contract to be charged at the firm fixed hourly rate of \$290/hour.

CONTRACT FOR ADVANCED TRAFFIC MANAGEMENT SYSTEM PHASE III

Risks:

1. **Project Management and Governance** – To ensure a successful project, the Office of the Chief Information Officer (OCIO) recommends a strong project governance and dedicated project manager to ensure adherence to schedule and budget, to manage scope changes, and to manage contractor performance. The project executive sponsor is DPW’s Chief Information Officer, John Calas and the Project Managers are Pat Smith & Charles Spears.
2. **Lack of Contractor Performance** – A critical factor in the success of the project is management of Contractor performance. The Contract has provisions to ensure acceptable contractor performance and correction of deficiencies. These include termination or suspension for convenience, default, improper consideration, insolvency, and non-adherence of county lobbyist ordinance; Performance Requirements for system availability and response time include remedies for non-compliance, as well as charges per occurrence for failing to meet Performance Indicators.
3. **Information Security Review** – The information technology security risk was analyzed by DPW’s Information Security Officer and the County Information Security Officer. OCISO determines the project as a low security risk due to no PII being collected, it is not a cloud solution, and the current architecture exists and no changes to that will occur. Only replacement of the current software and prerequisite requirements for new software setup. The proposed contract includes Technology Errors and Omissions Insurance with limits of not less than \$10 million, and Cyber liability insurance with limits of not less than \$2 million, further reducing risk.
4. **Contract Risks** – County Counsel participated in its negotiation and approved the Contract as to form.

PREPARED BY:

Stephanie Todd

6/3/2026

STEPHANIE TODD, DEPUTY CHIEF INFORMATION OFFICER

DATE

APPROVED:

Peter Loo

6/3/2026

PETER LOO, CHIEF INFORMATION OFFICER

DATE



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0 Solicitation Detail

Solicitation Number:	BRC0000494		
Title:	RFP- Los Angeles County Advanced Traffic Management System Phase III (BRC0000494)		
Department:	Public Works		
Bid Type:	Service	Bid Amount:	N/A
Commodity:	ENGINEERING -TRAFFIC AND TRANSPORTATION		

Description:

NOTICE OF REQUEST FOR PROPOSALS FOR LOS ANGELES COUNTY ADVANCED TRAFFIC MANAGEMENT SYSTEM PHA...
NOTICE OF REQUEST FOR PROPOSALS FOR LOS ANGELES COUNTY ADVANCED TRAFFIC MANAGEMENT SYSTEM
PHASE III (BRC0000494)

PLEASE TAKE NOTICE that Public Works requests proposals for the Los Angeles County Advanced Traffic Management System Phase III (BRC0000494) contract. This contract has been designed to have a potential maximum contract term of 10 years, consisting of an initial 6-year term and potential additional four 1-year option renewals. The Request for Proposals (RFP) with contract specifications, forms, and instructions for preparing and submitting proposals may be accessed at <http://pw.lacounty.gov/brcd/servicecontracts> or may be requested from Mr. Jairo Flores at (626) 458-4069 or jflores@pw.lacounty.gov

The deadline to submit proposals is Wednesday, October 30, 2024, at 5:30 p.m. Please direct your questions to Mr. Flores. See page 2 for all deadlines relating to this solicitation. Be advised, any changes to the due dates listed herein will only be made by Public Works, in writing, in the form of a Notice to the solicitation.

An optional proposers' conference will be held on Wednesday, October 16, 2024, at 10 a.m. via Microsoft Teams Meeting Online Events. To participate, the proposers will need to sign-in using the electronic sign-in sheet through the website listed below. ATTENDANCE BY THE PROPOSER OR AN AUTHORIZED REPRESENTATIVE AT THE CONFERENCE IS ENCOURAGED, BUT IT IS NOT MANDATORY. Attendees should be prepared to ask questions at that time about the specifications, proposal requirements, and contract terms. After the conference, proposers must submit questions in writing and request information for this solicitation within three business days from the date of the conference. A link to sign-in and join the meeting can be found at the following website: <http://pw.lacounty.gov/general/contracts/opportunities>.

PLEASE CHECK THE WEBSITE FREQUENTLY FOR ANY CHANGES TO THIS SOLICITATION. ALL ADDENDA AND INFORMATIONAL UPDATES WILL BE POSTED AT <http://pw.lacounty.gov/brcd/servicecontracts>.

"Do Business with Public Works" Website Registration

All interested proposers for this RFP are strongly encouraged to register at <http://pw.lacounty.gov/general/contracts/opportunities>. Only those firms registered for this RFP through the website will receive automatic notification when any update to this RFP is made. The County does not have an obligation to notify any proposers other than through the Public Works website's automatic notification system.

IMPORTANT NOTICE

Submission of proposals will only be accepted electronically using BidExpress or electronic proposals via Universal Serial Bus (USB) or compact disk to:

Los Angeles County Public Works Cashier's Office
900 South Fremont Avenue, Mezzanine Level
Alhambra, CA 91803
Attention: Mr. Jairo Flores
Los Angeles County Advanced Traffic Management System Phase 111
RFP NUMBER: BRC0000494

Proposals received after the closing date and time specified in this Notice will be rejected by Public Works as nonresponsive. Submission of hard copy proposals will not be accepted.

PROPOSALS MUST BE SUBMITTED ELECTRONICALLY USING THE FOLLOWING METHOD:

Electronic Submission of Proposals

In lieu of submitting electronic proposals to the Cashier's Office, you may submit proposals electronically on www.bidexpress.com, a secure online bidding service website.

To submit your proposals electronically, register with BidExpress prior to the due date above. A new registration page must be signed, notarized, and received by BidExpress customer support for processing before the due date. An Infotech/BidExpress Guide is included as Attachment 6 for reference. There is a nominal service fee to use BidExpress.

All updated instructions for Infotech/BidExpress can be found at the following link: <https://infotechinc.zendesk.com/hc/en-us/categories/360003900254-Bid-Express-at-www-bidexpress-com>

Please note, each file upload in BidExpress is limited to 10 MB per file up to 50 files for a total of 500 MB. Proposers shall plan ahead and allow sufficient time to account for the registration and file size limitations before the proposal submission deadline to complete the uploading of proposal files. If a proposer submits a proposal through BidExpress, the proposer should not send hard copies, compact disk, or any other materials to the County via mail.

Doing Business with Preference Program Enterprise

The County provides many benefits for firms that are certified through the County's Local Small Business Enterprise (LSBE), Disabled Veteran Business Enterprise (DVBE), and Social Enterprise (SE), collectively called Preference Program Enterprise (PPE). Eligible firms, prime contractors, and subcontractors are strongly encouraged to participate and receive benefits available only to PPE, such as price preference during solicitation process, when applicable, and the PPE Prompt Payment Program. Prompt payment is defined as 15 calendar days after the receipt of an undisputed invoice for goods or services. Information on this program and how to obtain certification are available on the County of Los Angeles Department of Economic Opportunity website:

<https://www.ajcc.lacounty.gov/businesses/office-of-small-business>

Individuals requiring reasonable accessibility accommodations may request written materials in alternate formats, physical accessibility accommodations, sign language interpreters, or other reasonable accommodations by contacting our departmental Americans with Disabilities Act coordinator at (626) 458-7337, from 7:30 a.m. to 5 p.m., Monday through Thursday (excluding holidays). Persons who are hearing impaired may make contact by first dialing the California Relay Service at 7-1-1. Requests should be made at least 1 week in advance to ensure availability. When making a reasonable accommodation request, please reference BRC-1.

More

Open Day:	10/2/2024	Close Date:	10/30/2024 5:30:00 PM
Contact Name:	Jairo Flores	Contact Phone:	(626) 458-4069
Contact Email:	jflores@pw.lacounty.gov		
Last Changed On:	10/2/2024 10:22:52 AM		
Attachment File(0):	0 Click here to download attachment files.		

Update (/LACoBids/Admin/UpdateBid/MDAzMDI2MTAyMjQ3)

