Report on LA County's Data Center Strategy Governance Model, Strategy and Roadmap

Strategy and Roadmap

Attachment G Data Center Consolidation Strategy and Roadmap

September 30, 2015

Prepared for

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Executive Highlights

- The County currently has 49 data centers utilizing more than 67,000 ft^2 of space and 2.4MW of utilized IT power in facilities that are not adequately secured or reliable to meet its business and technical needs.
- The County's strategy to consolidate its IT assets into a new data center (i.e. moving all data center related services such as physical servers, virtual servers, data storage & back-up) is aligned with Gartner best practices and industry trend. The new data center should meet a number of requirements to provide adequate security and reliability. Gartner forecasts that the County will need a new facility that eventually can support 2.1MW and 14,000 ft^2 of IT workload over the next 10 years. If not all departments participate, capacity requirements will be less.
- The County should consider various ownership options for its new primary facility, including building a new facility, leasing space in a current co-location facility, or leasing to suit. Long term, it should also consider moving its Local Recovery Center (LRC) from Orange County to reduce its disaster risk.
- Over the next five years, the County should focus on selecting a new primary data center and consolidating all its IT assets into the facility. This effort will require a board mandate for consolidation, a new governance model to provide the needed oversight and transparency, and appropriate planning and funding to ensure a smooth consolidation.

Summary of Current State and Future Requirements

The County's current data center environment is not efficient and does not provide the resiliency needed for its critical applications

- The County has already made significant strides to consolidate their systems to ISD; however, 24 departments still have at least one self-managed facility, resulting in a consumption of 2.4MW of IT power and 67,000 ft^2 of space across the County.
- Virtualization efforts have led to significant decreases in data center capacity needs. As a result, the County is currently under-utilizing its space, and the provisioned cooling and energy capacity, with many data centers using less than 50% of the available capacity.
- None of the data centers operated by the County can be considered a dedicated data center facility.
- Only one data center (DHS MLK) has best practice reliability for mission critical applications. Eleven others, including ISD's Downey and LRC, have moderate reliability and the rest have low reliability.
- County departments are focused on maintaining their current facilities and, except for ISD, DHS, DMH, and Sheriff, do not have articulated plans for their data centers.
- All the County's data centers, including its disaster recovery site in Orange County, are subject to seismic risk. Only four data centers are base isolated or have seismically reinforced buildings.

Photos taken during the site visits

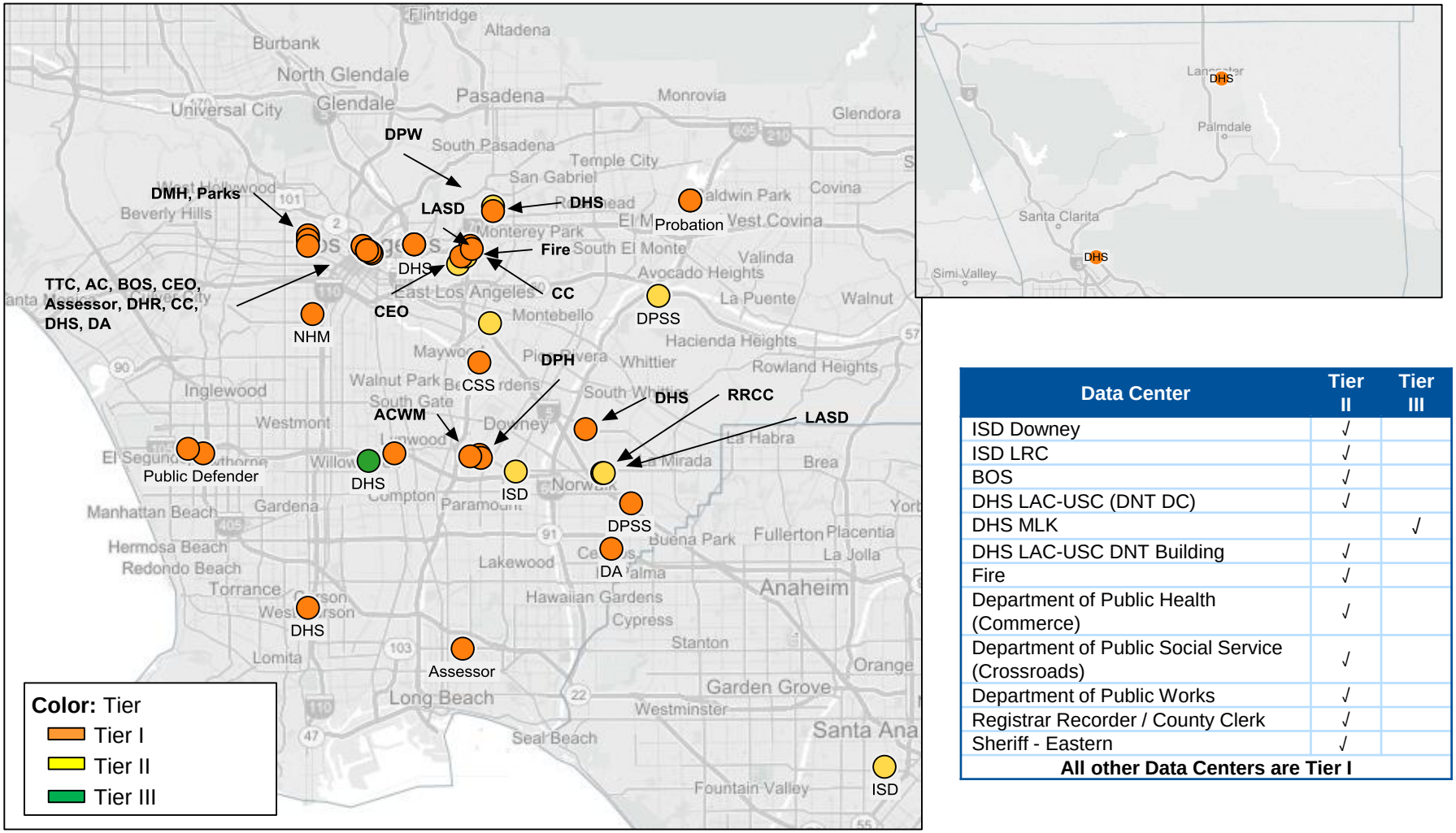
Requires portable AC units

Boxes of storage in Data Center

Aging equipment in aging facilities

Also used as a break room with a refrigerator

Only one (1) of the County's data centers is Tier III (which is best practice for mission critical applications); another 11 are Tier II, including ISD Downey.



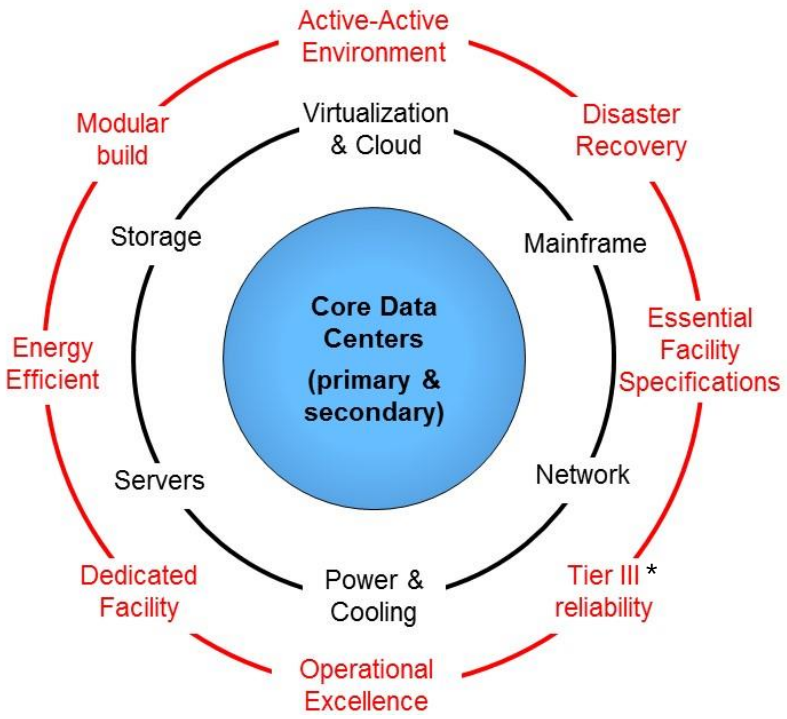
Data Center	Tier II	Tier III
ISD Downey	√	
ISD LRC	√	
BOS	√	
DHS LAC-USC (DNT DC)	√	
DHS MLK		√
DHS LAC-USC DNT Building	√	
Fire	√	
Department of Public Health (Commerce)	√	
Department of Public Social Service (Crossroads)	√	
Department of Public Works	√	
Registrar Recorder / County Clerk	√	
Sheriff - Eastern	√	
All other Data Centers are Tier I		

See appendix for definition of Tiering system

In addition to the current state, Gartner identified seven leading data center practices that influenced the future state vision and requirements for LA County

Leading Practice	Description
1. Consolidate and Establish Multi-site Strategy to Manage Risk and Provide Differentiated Class of Service	• Regional organizations require a minimum of two locations to manage risk. National and global organizations may leverage paired regional or continental data center hubs. • Distinction between Primary and Backup data centers are diminishing as active/active and continuous availability requirements increase.
2. Prioritize Mission Critical Applications	• Define discrete criticality levels for applications and align them to DC service classes. For example, mission-critical applications that do not operate in active/active mode from multiple DCs will need to be hosted in Tier III or higher data centers.
3. Support Realistic RTOs and RPOs	• Select data center architectures that support RTOs and RPOs that are in minutes vs. hours to support digitalization of IT and avoid disruptions to critical services.
4. Avoid the same disaster strike zone	• Location of data centers must avoid the same disaster strike zone. Additional considerations must include power cost, personnel availability, network cost, real estate cost, and climate (which impacts energy efficiency).
5. Leverage Cloud Services Where Appropriate	• When appropriate, use cloud services to leverage assets and improve agility, scalability, elasticity, and self-provisioning. SaaS can enhance maturity of service capability. Hybrid Clouds can extend capacity when needed.
6. Avoid DC Ownership to Improve Flexibility and Reduce Investment Risk	• Leased DC space using experienced service providers enables rapid deployment and replication of the DC environment at a much lower investment risk and initial capital than ownership. Furthermore, existing and proven operational best practices can be leveraged.
7. Utilize DC-only Edifices	• Data centers should be located in dedicated data center facilities in order to improve security, reduce environmental risks, and minimize impact of County land management strategies on IT operations.

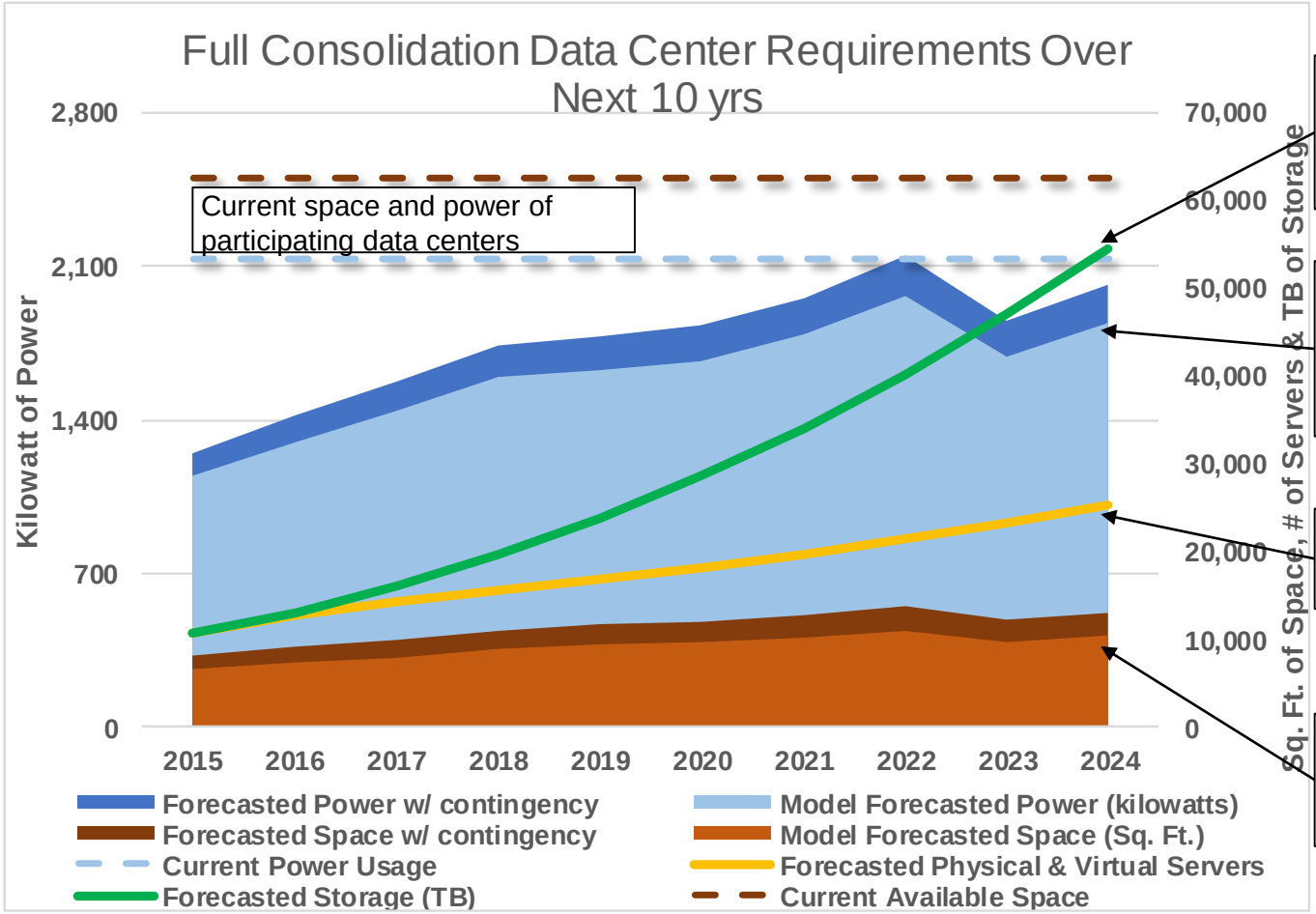
The County's future state vision combines an understanding of the County's current state with market trends and practices



- **Active-Active Environment:** LA County should plan for two consolidated County data centers capable of operating in active-active configuration with a maximum latency of 10ms.
- **Disaster Recovery:** Data centers shall not be within the same earthquake fault zone unless mitigated by a third facility.
- **Essential Facility Specifications:** Building shell shall comply with the International Building Code (IBC) Essential Facility specifications.
- **Tier III Reliability:** To enhance availability and manage risk, consolidated data centers shall comply with TIA-942 Tier III specifications and be able to pass formal certification if so desired by the County.
- **Operational Excellence:** Facilities and IT operational maturity and excellence shall be assessed, monitored, and improved
- **Dedicated Facility:** Building shall only house data center and associated support services such as a Network Operations Center (NOC).
- **Energy Efficient:** Energy efficiency is of great importance. Every effort should be made to design or select a facility for optimum energy efficiency. Total facility Power Usage Effectiveness (PUE) shall not exceed 1.4.
- **Modular Build:** In order to satisfy future demand while managing initial cost, data center power and cooling infrastructure shall be modular with ability to increase capacity without outage to any operating IT infrastructure.

*Industry standard for best practices reliability

Gartner's 10 year capacity model indicates that the County should plan to accommodate 2.1MW of power and 14,000ft^2 of space if all departments consolidate



Storage volume will increase at a close to exponential rate, increasing from 10.6PB to 54.3PB

Power usage will grow faster over time than space leading to a denser configuration (more power usage per ft^2 over the next 10 years)

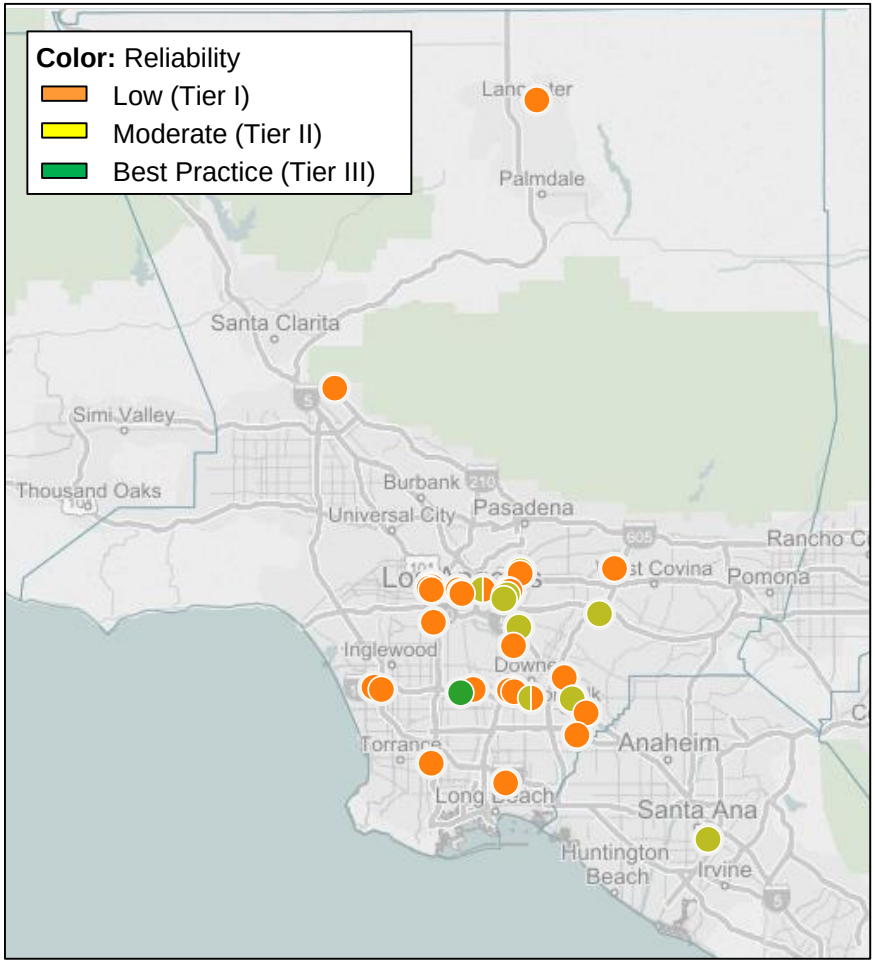
OS Instances & Virtual Desktops will steadily grow over time from 10,700 to 25,300

Space usage will not grow nearly as substantially as other metrics, only increasing 4,000 ft^2 over 10 years

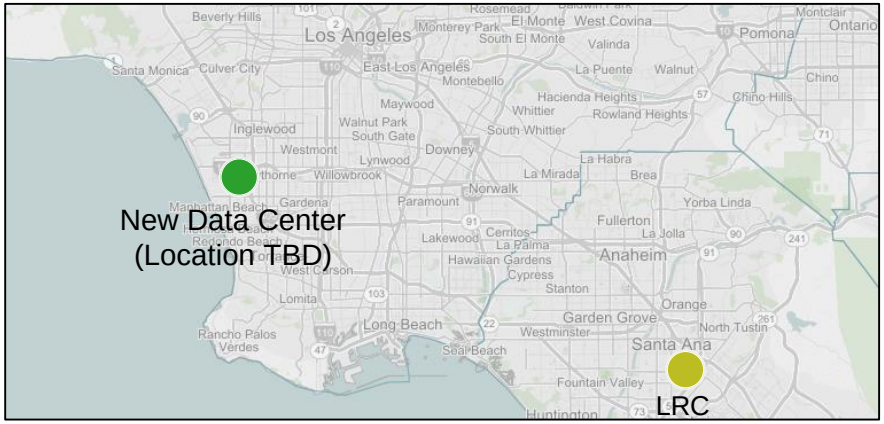
Note: Current Space and Power numbers exclude LRC

Full consolidation would reduce the number of data centers from 49 to 2, but some departments will likely maintain their data centers, at least in the near term

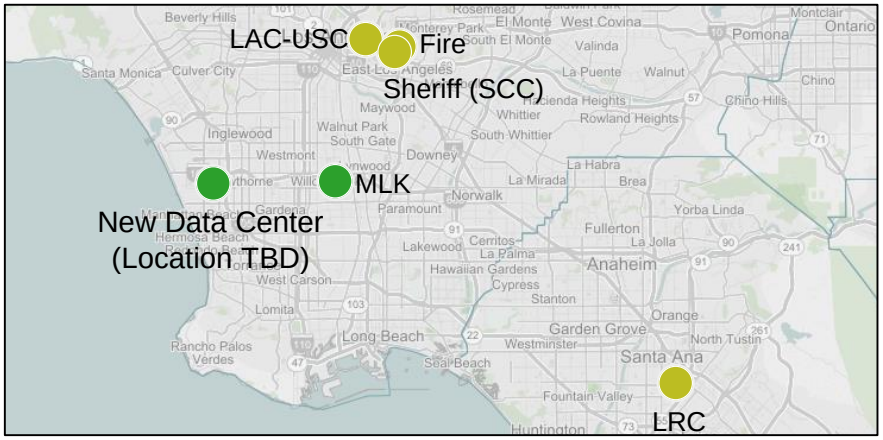
Current State



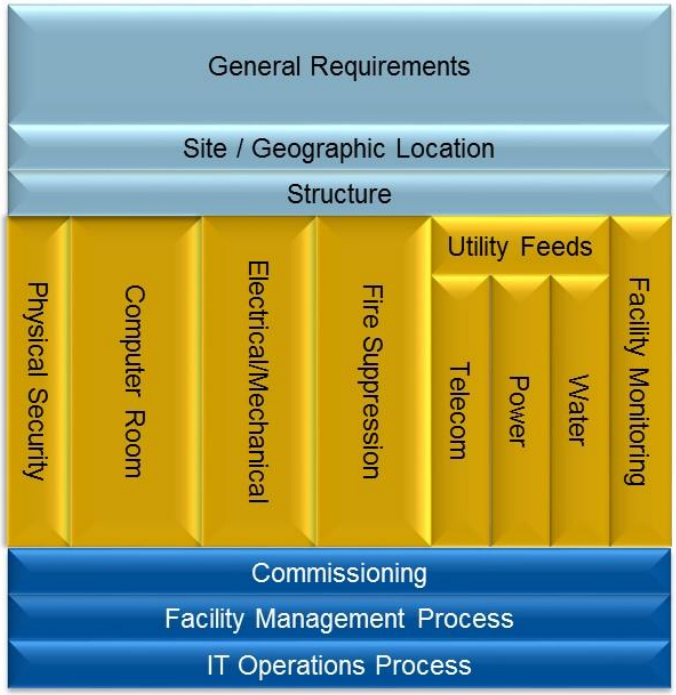
Future: Full Consolidation



Potential Near Term Future State



Gartner provided additional future state requirements according to the following framework



- **General Requirements:** Key requirements which drive the overall data center vision.
- **Site / Geographic Location:** Guidelines and requirements of the geographic location and site (e.g. land) where the data center will be located.
- **Structure:** Guidelines and requirements regarding the construction and layout of the building which will contain the data center.
- **Physical Security:** Requirements for physically securing the data center facility.
- **Computer Room:** Guidelines and requirements for the computer room including both features and capacity.
- **Electrical/Mechanical:** Guidelines and requirements for the heating, cooling and power distribution infrastructure required to support the computer room.
- **Fire Suppression:** Requirements regarding fire detection and suppression systems.
- **Utility:** Requirements regarding utilities (telecom, water, and power) including water storage and telecom/power diversity.
- **Monitoring and Control**: Requirements for monitoring the health and utilization of power and cooling infrastructure, detect hazards, monitor security and other facility related systems, as well as control and automate operation of these systems.
- **Commissioning:** Requirements for a) testing and validating that the facility and its MEP components perform and function as designed, b) documenting and testing all the operating procedures, and c) ensuring that facilities staff are trained in those operating procedures.
- **Facilities and IT Operations Processes**: Requirements for processes, skills and staffing levels required to manage a critical facility and IT Operations.

Alternatives Analysis Summary

The following considerations were weighted in evaluating alternatives for the County's primary and secondary data centers

Growth and Scalability

Examples

- Deployment of new service offerings such as Power Cloud, storage virtualization, desktop virtualization
- Support for long term growth plans and change in departmental participation
- Elasticity – Possible reduction in power and cooling requirements due to future SaaS and Hybrid Cloud opportunities

Business Alignment and Agility

Examples

- Changes to the governance model
- Focusing on core service offerings and what matters
- Responsiveness to competitive market trends, changing political landscape, and reciprocating agreements with other agencies
- Ability to offer competitive pricing (managing cost)
- Flexibility in changing in business model
- Responsiveness to regulatory changes

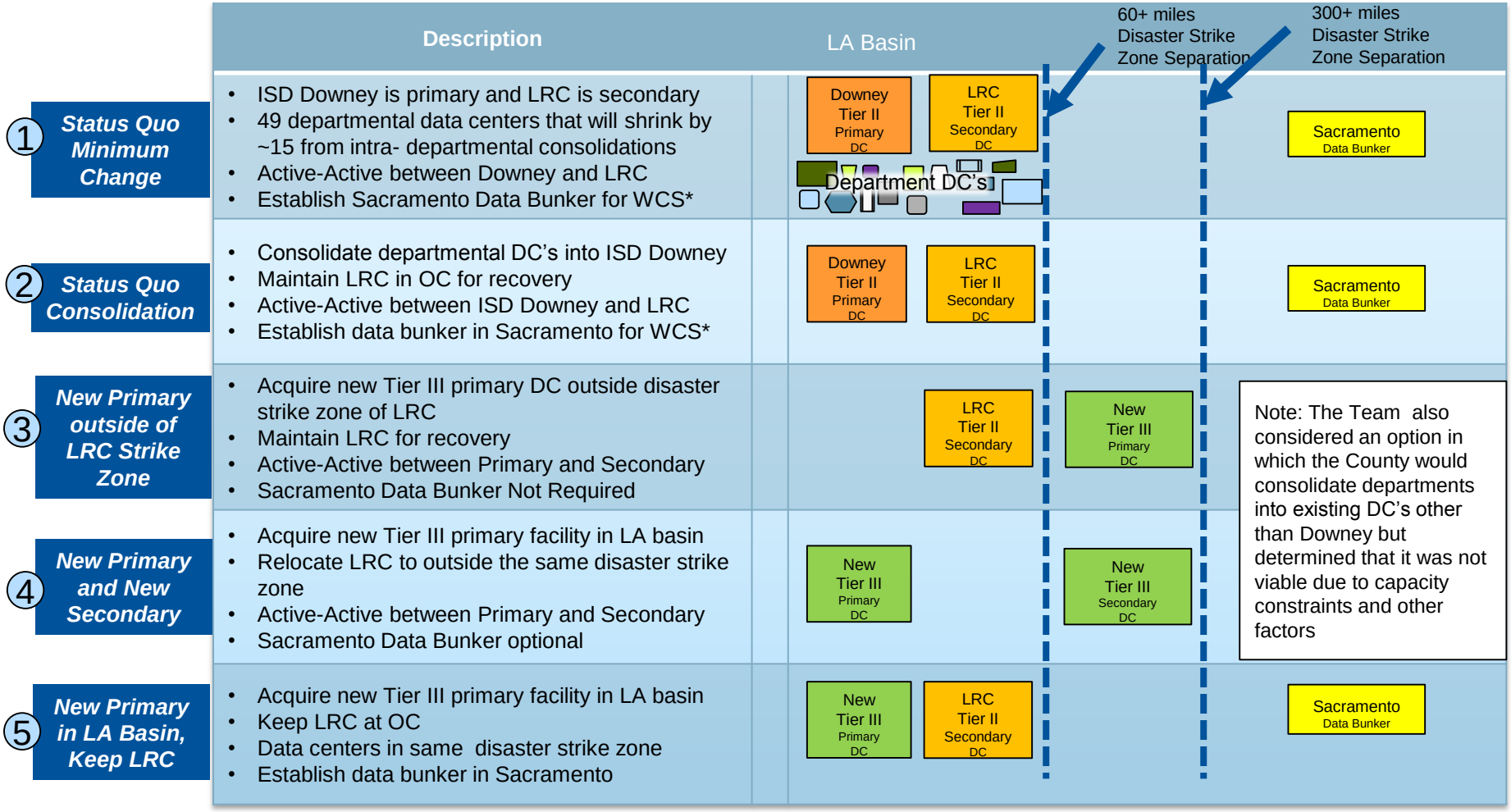
Operational Efficiency (Value and Quality)

Examples

- Established and mature processes and procedures
- Well trained facilities staffing
- Improved facilities staffing 7x24x365
- Improve standardization
- Improve provisioning and time to deployment

- Key Questions:
  - Where should LA County's primary data center be located to minimize business risk? What are the tradeoffs involved in having multiple LA County data centers physically close to one another or far apart?
  - Should LA County continue to leverage LRC? How will the role of the secondary data center evolve in the future?

The County has five (5) possible courses of action that were evaluated based on the board motion and future state requirements



*WCS = Worst Case Scenario

Gartner performed a high level qualitative scan of the 5 identified options against the Evaluation Criteria for Operational Excellence and Operational Risk.

				1	2	3	4	5
Category	**Weight**	**Sub-category**	**Importance**	**Status Quo**	**Status Quo Consolidation**	**New Primary Outside LRC Strike Zone**	***New Primary and New Secondary***	***New Primary in LA Basin Keep LRC***
Cost	20%	Total Cost (NPV)	H	0.3X	0.3X	$X	$1.2X	$X
		On-going Operational Costs	M					
		One-time Cost	M					
Operational Excellence	25%	Performance and Availability	H					
		Control of Operations	L					
		Future State Capabilities	M					
		Management Ease	L					
		Agility	M					
Time to Steady State	15%	Speed and schedule to implement strategy	H	N/A	1-2	2-3	1-6	1-4
Operating Risks	25%	Strategic Risk	M					
		Organization Risk	M					
		Solution Risk	L					
		Disaster Exposure	H					
Transition Risks	15%	Schedule	H	N/A				
		Operations	L	N/A				
		Financial	M	N/A				

Least favorable ● ● ● ● ● Most favorable

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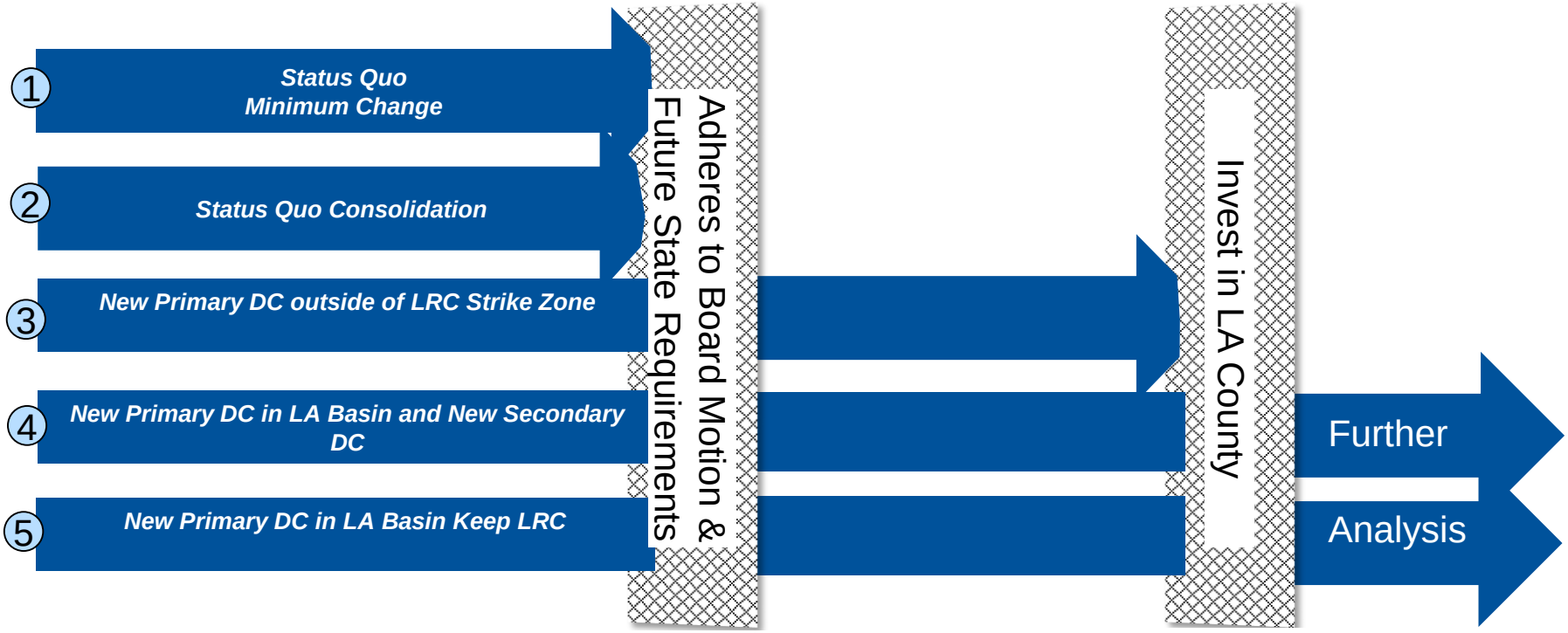
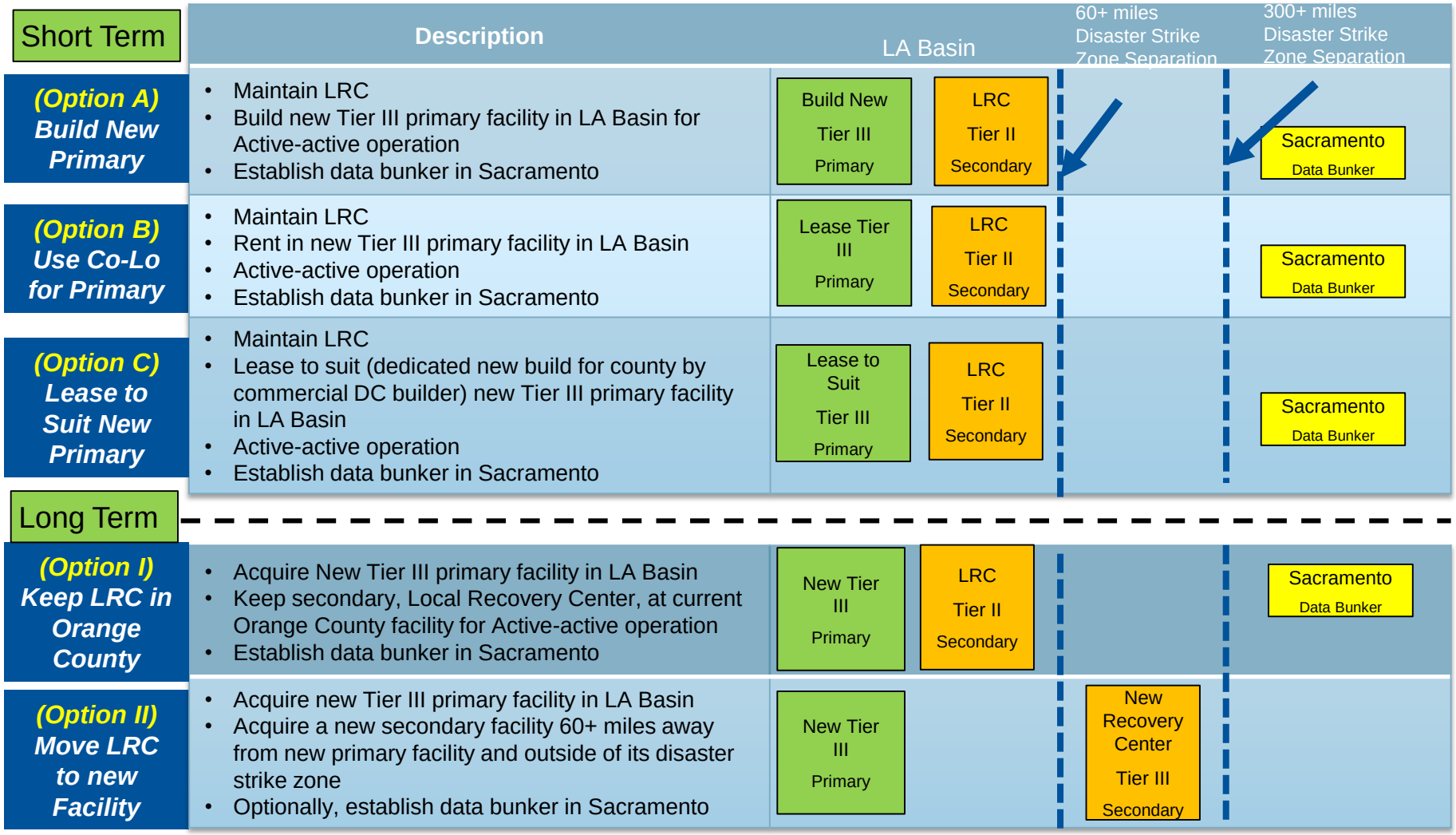
Two initial criteria were also applied to the options, indicating that options 1 – 3 do not meet the requirements in the Board motion or do not invest in LA County.



The Board Motion states the County's strategy to consolidate and replace ISD Downey.

The County's primary data center should be located in an area that is in proximity to County employees for operations and/or oversight and invest in its own economy.

The County has three options for addressing its immediate need to replace Downey. In the long term, it should also consider replacing LRC.



Summary Findings of Alternatives Analysis

1. Where should LA County's primary data center be located to minimize business risk? What are the tradeoffs involved in having multiple LA County data centers physically close to one another or far apart?

   LA County will be best served by maintaining its Primary Data Center in the LA Basin close to its IT staff. This will allow for improved operational excellence and mitigation of operational risks. However, a data bunker in Rancho Cordova should be implemented while the Secondary Data Center remains at LRC in Orange County.

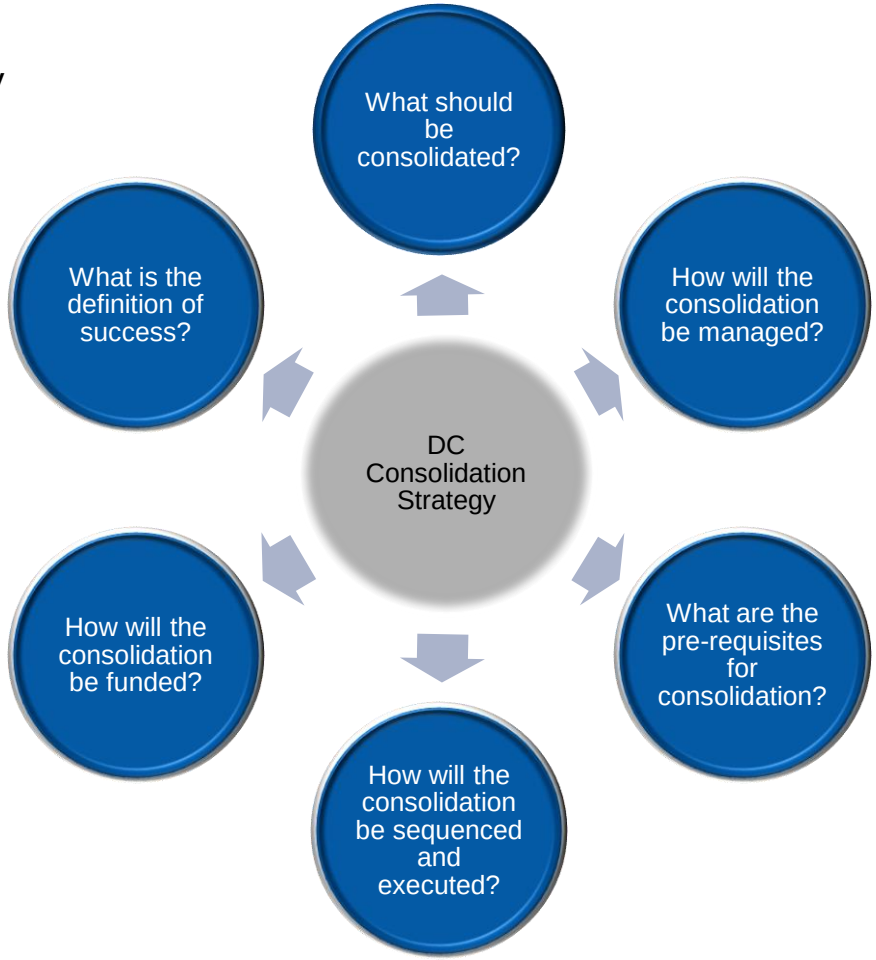
2. Should LA County continue to leverage LRC? How will the role of the secondary data center evolve in the future?

   Continued use of LRC *does carry* operational risks due to its proximity to the Primary Data Center. Although a data bunker in Sacramento can reduce this risk, it will not allow for full restoration of services within the required Recovery Point Objectives and Recovery Time Objectives of applications. For this reason, it is advisable that LA County consider relocating LRC to a leased Tier III data center facility outside of the Primary Data Center's disaster strike zone at some point in the future after the ISD Downey replacement project is underway.

Consolidation Strategy

To inform the Consolidation Strategy and Roadmap, a number of key strategic questions have been addressed with the CIO and ISD

- In forming a Consolidation Strategy, the County needs to consider a number of key questions:
  - What should be consolidated?
  - How will the consolidation be managed?
  - What are the pre-requisites for consolidation?
  - How will the consolidation be sequenced and executed?
  - How will it be funded?
  - What is the definition of success?
- Each of these questions (and associated sub-questions) were discussed in a workshop with the CIO and ISD. Based on the discussions and taking into account industry best practices, Gartner developed a set of recommendations and next steps related to each question. These recommendations have then been summarized in the Consolidation Strategy.



Who should consolidate and how should it happen?
Key Recommendations

- All County departments should fully consolidate into a virtualized, shared environment (such as eCloud, pCloud*, etc.) in the new primary data center, with very few exceptions.
- Exemptions to EDC consolidation should be based on the following criteria:
  - Recent or existing investments in high quality (Tier III) data centers that can support departmental requirements over the next five years.
  - Business needs for key systems to be in data centers located in hardened emergency response or command centers. This would be granted on an application by application basis.
- Exemptions for consolidating into a virtualized, shared environment should be based on the following criteria:
  - Both CIO and ISD agree that the shared infrastructure is unable to meet specific departmental needs (i.e. service levels, regulatory requirements, technical requirements, etc.).
  - A true “apples to apples” cost and risk comparison indicates the shared infrastructure is not the most effective use of County resources.

- **Key Actions Required**
  - CIO make recommendations to the board regarding:
    - Expected departmental participation.
    - Decommissioning of current data centers
    - Use of co-located space vs. consolidated and virtualized shared services.
    - Criteria for exemptions to be granted.
    - Process for approving or denying exemptions.

*Definition in the appendix

How will the consolidation be managed?

Key Recommendations

- The CIO should work with ISD and the CEO to develop a Migration Plan.
- To develop and manage the migration plan, the CIO should establish a Data Center Consolidation Program Management Office (DCC PMO).
  - This office will be responsible for planning and managing the departmental data center migrations.
  - The funding for this office should be included in the migration expenses.
  - The office should have representation from ISD, various departments and be composed of both internal and external resources.
- A separate, ISD program management office (ISD PMO) should be established to do the following:
  - Acquire and build out the new data center.
  - Plan and manage the migration of ISD's Downey data center into the new facility.
- Departments with at least one active data center should be responsible for developing their own migration plans under the oversight of the DCC PMO.

- **Key Actions Required**
  - Establish a data center consolidation program management office (DCC PMO)
  - Establish an ISD program management office
  - Instruct departments to develop a Migration Plan

What are the prerequisites for consolidation?
Key Recommendations

- The County currently has two network hubs, one on Eastern Ave and one at the data center at Downey. The Downey network hub will need to be moved to the new data center or another location as part of the migration.
  - Proximity to the second network hub (currently at Eastern) should be considered when selecting the location for the new facility.
- Moving the Downey data center and consolidating departmental data centers will require changes and upgrades to the Enterprise Network. ISD should conduct a network capacity assessment to determine the needed changes, funding and timeframe.

- **Key Actions Required**
  - Allocate funds for moving network and telecommun-ications hub
  - Develop an Enterprise Network Capacity and Reconfiguration Plan
  - Allocate funds for network upgrades identified by the Plan
  - Complete required upgrades

How will the consolidation be sequenced & executed?

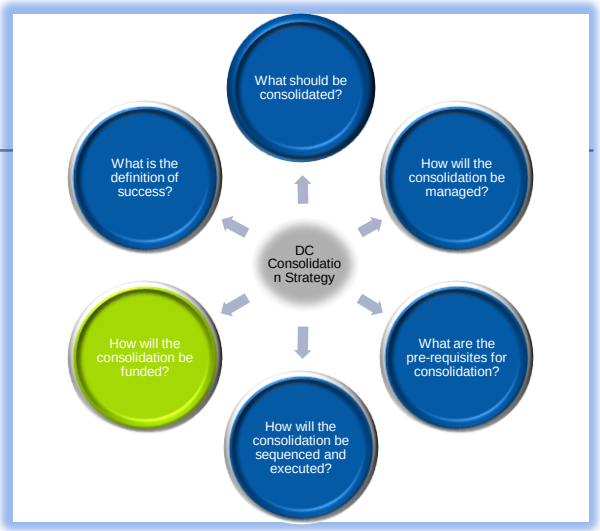
Key Recommendations

- Due to its aging infrastructure and inadequate resiliency, the County's primary data center at Downey should be the first data center to migrate to the new primary data center.
- The DCC PMO should determine a migration sequence for the departmental data centers. In determining the sequence, the following factors should be considered:
  - Size of the data center
  - Quality and age of the data center
  - Timing of current lease agreements
  - Business needs of the departments
  - Opportunities to take advantage of hardware lifecycle investments
- CIO and ISD must develop minimum standards for determining which equipment will be replaced vs. relocated during the migration to the new facility.

- **Key Actions Required**
  - Develop a migration plan for Downey.
  - Determine the parameters to develop a migration sequence of departmental data centers.
  - Require each department to inventory their equipment and develop a migration plan
  - Develop a county-wide migration plan for departmental data centers
  - Develop standards for replacing vs. relocating equipment

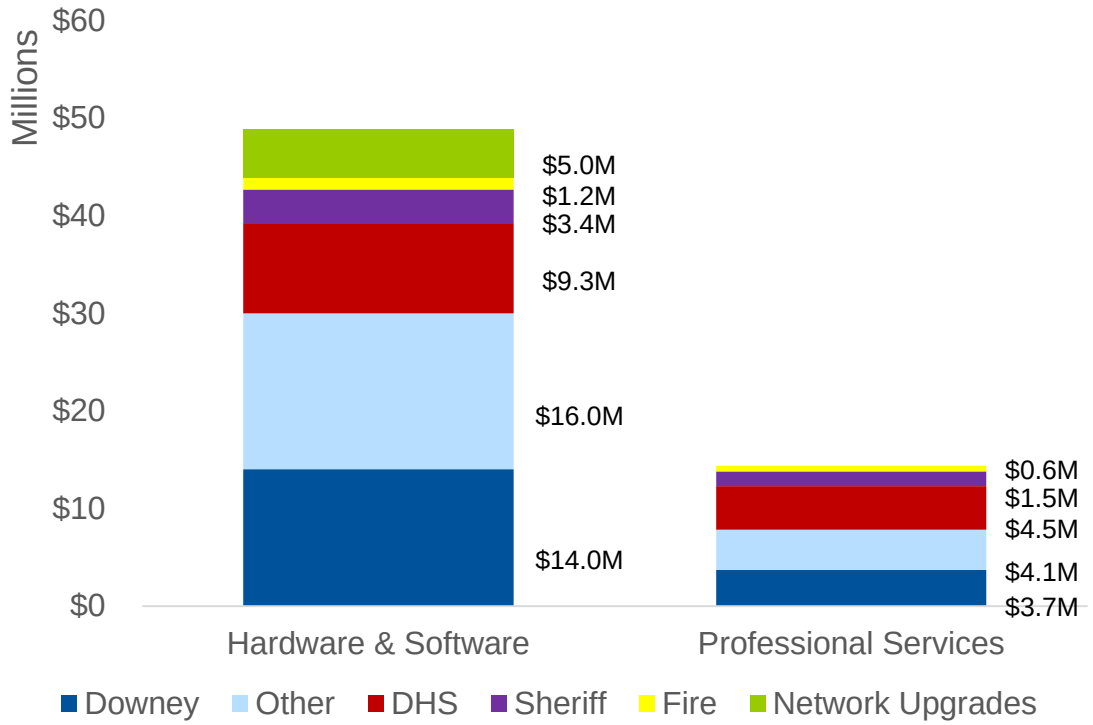
How will the consolidation be funded?
Key Recommendations

- The Data Center migration should use both departmental and centralized funding sources.
- Departments should generally be responsible for consolidating into the new data center.
  - Where possible normal equipment and software lifecycle management expenditures should be accelerated or delayed in order to reduce net incremental migration costs.
- Centralized funding should be provided for infrastructure with enterprise-wide benefits, including:
  - Establishing and operating the DCC PMO.
  - Annual lease cost of the new data center and transition costs of operating two data centers.
  - Reconfiguring the Enterprise Network to support the data center migration.
  - Acquiring the new data center and core IT infrastructure.
  - Migrating Systems in Downey to the new data center.
- Exact funding needs will be determined during the development of the Migration Plan.
  - Gartner best practice estimates for some funding needs are provided on the following slide.



- **Key Actions Required**
  - Determine centralized funding needs
  - Board allocation of centralized funding
  - Instruct departments to develop migration budgets
  - Stop funding improvements to current departmental data centers

Preliminary estimates for migration costs include approximately $50 million for hardware and software and $15 million for labor and professional services



Plus or minus 25% variance

Preliminary rough estimates

- Key Assumptions:
  - All storage is Tier I (most expensive)
  - 30% of storage will be refreshed
  - Budget of $5M for building out the core network at data center
  - 430 critical applications (based on data collection efforts)
    - Each application will be tested for latency prior to migration
  - 40% of servers will be refreshed or used as seed equipment
  - Cost do not include:
    - reconfiguration of WAN
    - Transition cost of operating 2 sites
    - New network hub
  - These costs may be mitigated by utilizing LRC with a stage transition of applications from Downey.

What is the definition of success?
Key Recommendations

- In order to gauge the success of the project once it is complete, the County needs to determine its criteria for success upfront.
- The County's primary criteria for success are:
  - Migrating out of ISD Downey into a Tier III primary facility by December 2017.
  - Consolidating and decommissioning all departmental data centers into centralized, virtualized and shared infrastructure with minimal exceptions, by January 2020.
- The County should consider a number of additional criteria including:
  - Improvements to service delivery and disaster recovery
  - Improvements to security
  - Improvements in ISD service offerings
  - Cost reduction in ISD service offerings
  - Improvements in regular departmental satisfaction surveys
- Baselines for these additional criteria (and potentially other criteria) should be established by the DCC PMO.

- **Key Actions Required**
  - Establish and document success criteria.
  - Determine current state (baseline) of criteria, where applicable.

Summary of Key Aspects of the Consolidation Strategy

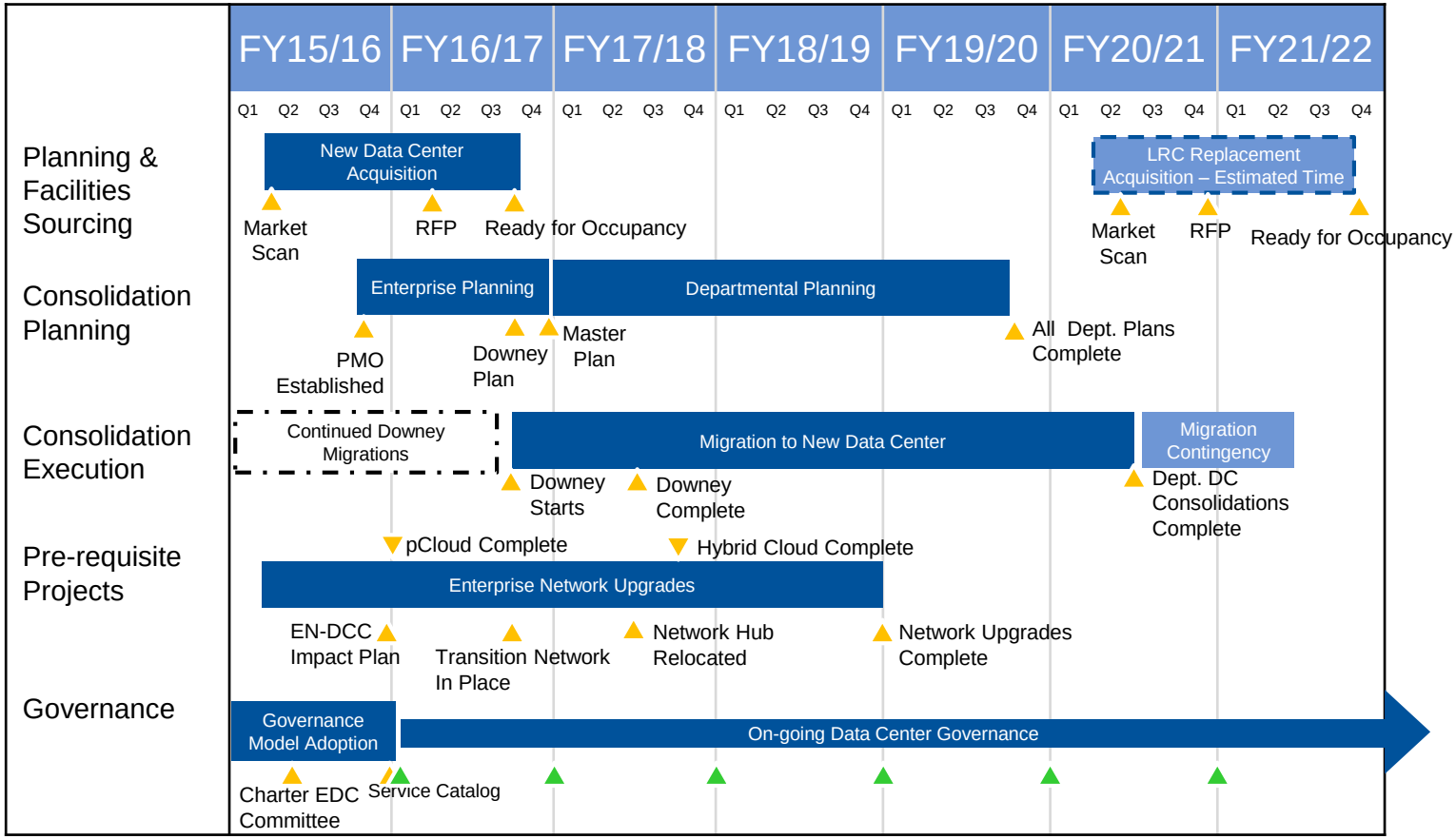
- The County will consolidate and decommission all County departmental data centers into a single, centralized and virtualized shared infrastructure at the new data center and a designated recovery data center.
- The CIO's Office and ISD should establish independent and accountable Project Management Offices (PMOs) to plan, manage, and provide ongoing and independent oversight over the data center consolidation effort.
- The County will fund the central costs of the migration, departments will be responsible for funding their individual migrations.
- ISD needs to make upgrades to the Enterprise Network prior to the start of the data center migration.
- The priority of migration is to retire the ISD Downey data center. Sequencing of departmental migrations will be based on specific parameters and will be determined and monitored by the DCC PMO.
- The primary success criteria of the project is to migrate out of ISD Downey by December 2017, and out of all departmental data centers by January 2020.

Roadmap

The Roadmap was developed based on a few key assumptions

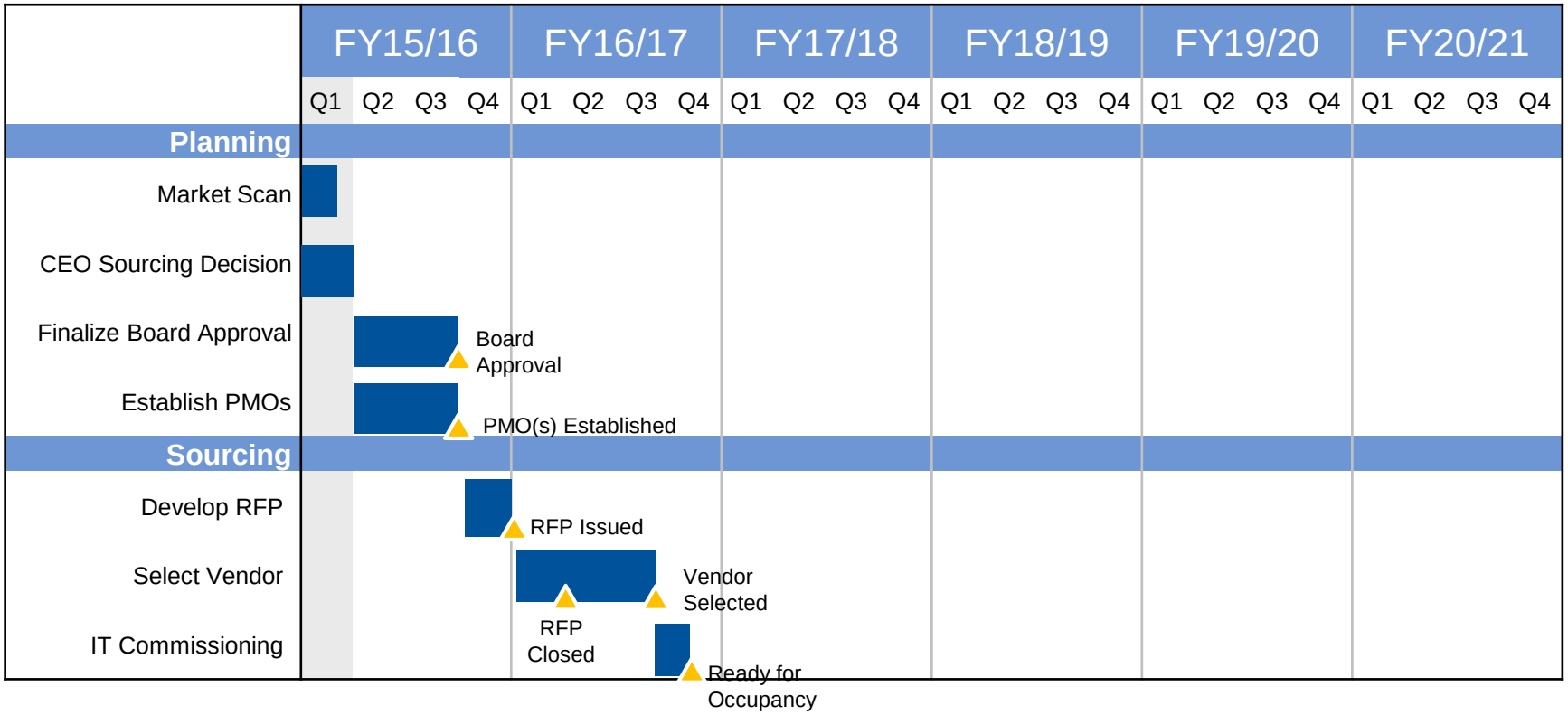
- The County's primary goal is to replace ISD's Downey data center in the next three years.
- The County wants to complete the consolidation of the IT components contained in ~47 department data centers into the new Primary data center within the next 5 years.
- The County will seek to rent space in an existing commercial data center co-location facility for its new primary data center.
- The new governance model will be adopted and the Enterprise Data Center Steering Committee by October 2015.
- DCC strategic and funding decisions will be complete by December 2015.
- The County will be able to end its contract with Orange County for LRC once the consolidation is complete and select a new recovery center.

The Gartner team developed a five-year roadmap outlining the various tasks and timelines to implement the data center consolidation strategy and governance model



Detailed timelines are provided for each work stream for the next five years

DCC Planning and Facility Sourcing



Planning Overview

Description

- Planning for replacing the Downey data center and accommodating the consolidation most of the County's 47 existing departmental data centers.

Key Activities

- The current CIO project provides strategic planning for the future capacity, business and technical requirements for the data center.
- Using the future requirements provided in the CIO project, the CEO project will make the build vs. rent vs. lease decision.
- A subsequent project will develop budgetary estimates for DC acquisition and subsequent migration program.
- The CEO and CIO's offices will gain Board Approval of the plan and budget estimates, including required centralized funding.
- This will establish and fund both and ISD and Enterprise Project Management Offices (PMO) offices to oversee the consolidation program.

Resources

- CEO is responsible for finalizing the build, lease, lease to suit decision (per Board motion).
- ISD and CIO will provide advisory roles as needed in finalizing the decision and selecting the vendor.
- The Office of the CIO should establish the DCC PMO.
- Key participating departments, including ISD should allocate project management resources to the PMO.

Timeline

- The CEO has recommended to the Board that the County select the co-location option for sourcing their new primary data center.
- Over the next six months the Board must accept this recommendation and the PMOs should be established

Dependencies

- Completion of Current CIO Project effort.

Facility Sourcing – New Primary Data Center Overview

Description

- Sourcing of a new primary data center to accommodate the County's current and future needs based on the analysis done by Gartner and further analysis by the CEO.

Key Activities

- Issue an RFI to scan the market for possible options that would accommodate the County's future requirements.
- Issue an RFP for a new facility based on market scan and future state requirements.
- Select vendor. (If decision is to build or lease to suit, will need time to select location, design the data center and build it.)
- Finalize contracts for build or leasing of co-location space.
- Formally place order for required initial space, power and related services/equipment.

Resources

- CEO is responsible for selecting a site and vendor to accommodate the County's needs (per Board motion).
- ISD and CIO should provide advisory roles as needed in selecting the site and vendor.

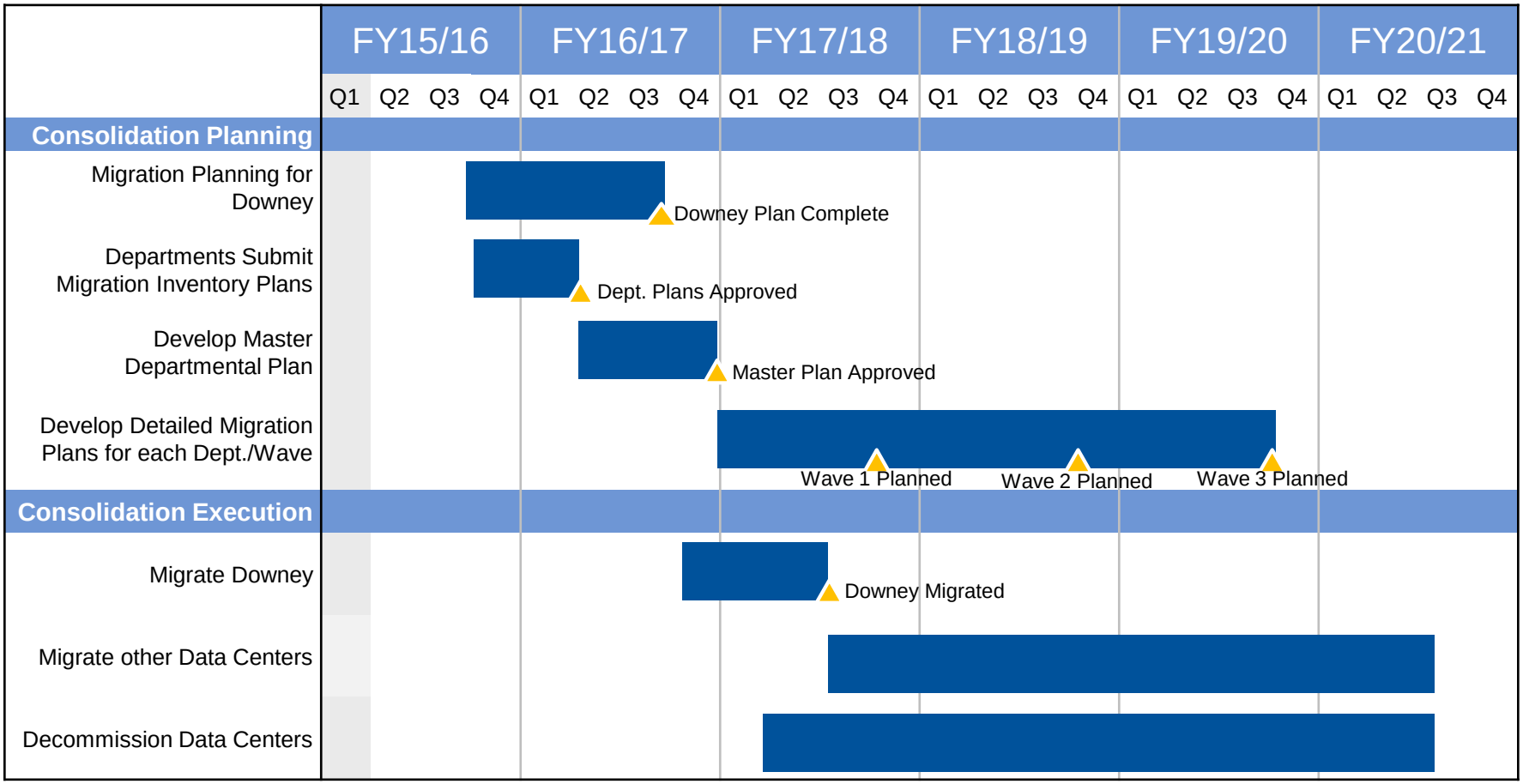
Timeline

- Assuming the Board accepts the CEO's co-location recommendation, the County will develop an RFP and select a co-location vendor by Mar. 2017

Dependencies

- Completion of Current CIO Project effort.

Consolidation Planning & Execution Timeline



Consolidation Planning Overview

Description

- Activities require to plan the consolidation of data center assets from Downey and 47 existing data centers (exclude LRC) to the new Primary County Data Center.
- This also includes managing, monitoring, and reporting on the overall data center consolidation program, requesting and allocating funding and resources, resolving scheduling priorities and conflicts, sharing knowledge/expertise across departments, and establishing County-wide DCC migration framework/methodology for execution.

Key Activities

- Establish and staff DCC PMO under CIO's office.
- Establish master DCC plan with framework, methodology, and best practice guidelines for departments to follow.
- Collect and validate departmental DCC plans.
- Prioritize order of consolidation, funding, resource requirements and timeline.
- Request the required centralized funding and/or assist departments with planning required budgets.
- Work with the ISD program office on scheduling and timelines for readiness of the new County primary data center.
- Coordinate migration planning from Downey into the new site.
- Update migration plans based on DCC experience.

Resources

- Centralized funding shall be provided to support the DCC PMO, Downey migration, and some departmental migrations.

Timeline

- Enterprise Planning (including Master Plan and Downey Migration Planning) - Jun. 2017
- Consolidation Planning for Departmental Waves – Mar. 2020

Dependencies

- Completion of Current CIO DCC Strategy Project.
- Completion of Facility Sourcing Planning Phase.

Consolidation Execution Overview

Description

- Migration of IT equipment located in Downey or any of ~47 departmental data centers into centralized, virtualized and shared infrastructure at a new primary data center.
- Decommissioning of Downey data center and ~47 departmental data centers.

Key Activities

- Coordinate continued departmental consolidation into Downey to maintain the current consolidation momentum.
- Coordinate the migration of all IT equipment and services from the Downey DC into the new Primary DC with ISD's PMO.
- Coordinate consolidation of IT equipment located in ~47 departmental data centers into the new Primary DC according the sequence determined during the Consolidation Planning phase.
- Ensure that all IT equipment is decommissioned in the County data center.

Resources

- DCC PMO
- ISD PMO
- Departmental resources assigned to migration.
- Centralized funding shall be provided to support the DCC PMO and Downey migration.

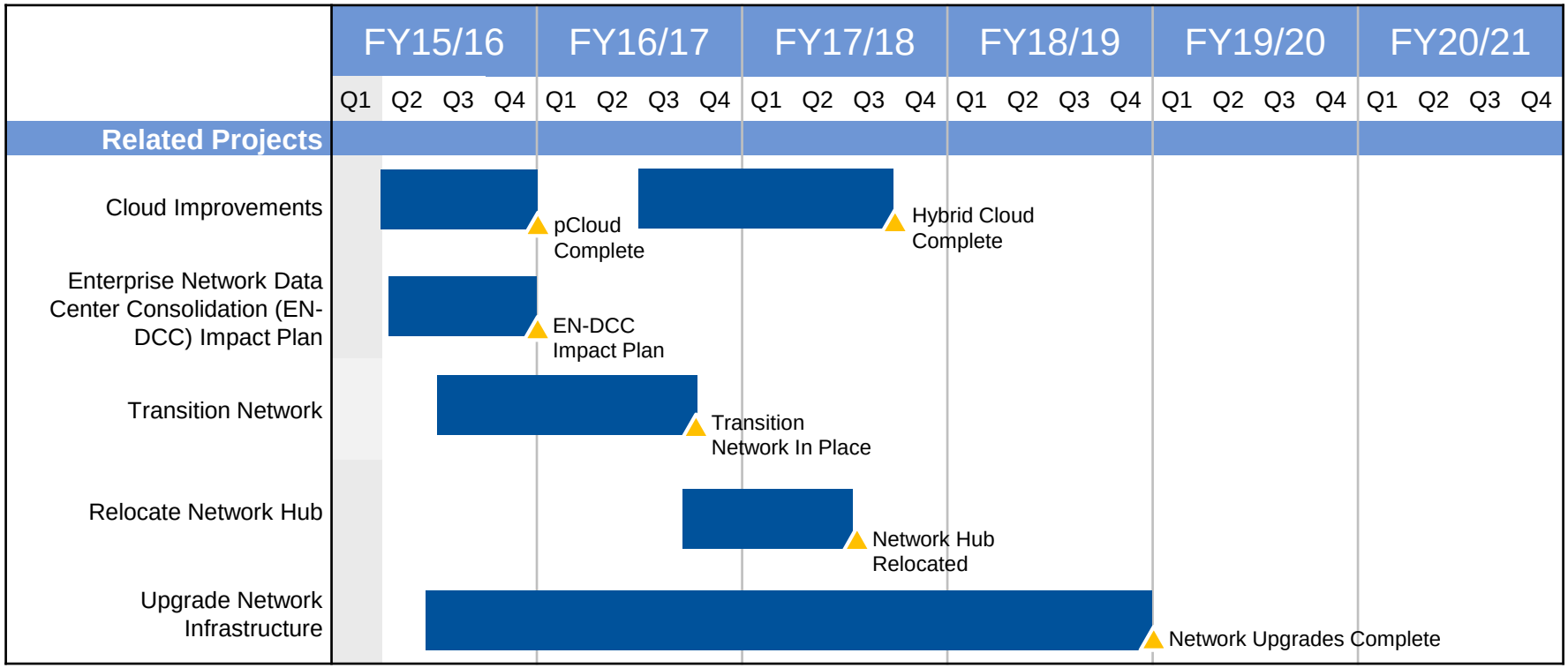
Timeline

- Migration of Downey complete – Dec. 2017
- Migration of departmental data centers complete – Dec. 2020.

Dependencies

- Acquisition of the New Primary Data Center.
- Completion of Consolidation Planning.
- Build Out of IT Infrastructure in the New Primary DC.

Pre-requisite Projects Timeline



Prerequisite Projects Overview

Description

- Ensure that all related projects and the prerequisites for successful completion of the data center consolidation are identified and addressed. Monitor and track all major departmental IT projects that could impact the future state data center requirements.

Key Activities

- Establish guidelines by which all new departmental IT initiatives and their impact on the consolidation project are shared with EDC Steering Committee and DCC PMO.
- Completion and operationalization of the virtualized POWER private cloud (pCloud) and virtualized storage shared infrastructure offerings.
- Assess performance of departmental mission critical applications and the required post consolidation County wide area network improvements to address performance needs.
- Establish high speed reliable transitional connectivity between new Primary DC, EN, Downey and LRC.
- Implement the required network improvements, including relocating existing Downey network hub.

Resources

- ISD technical teams
- DCC PMO office
- ISD and CIO should provide advisory roles as needed

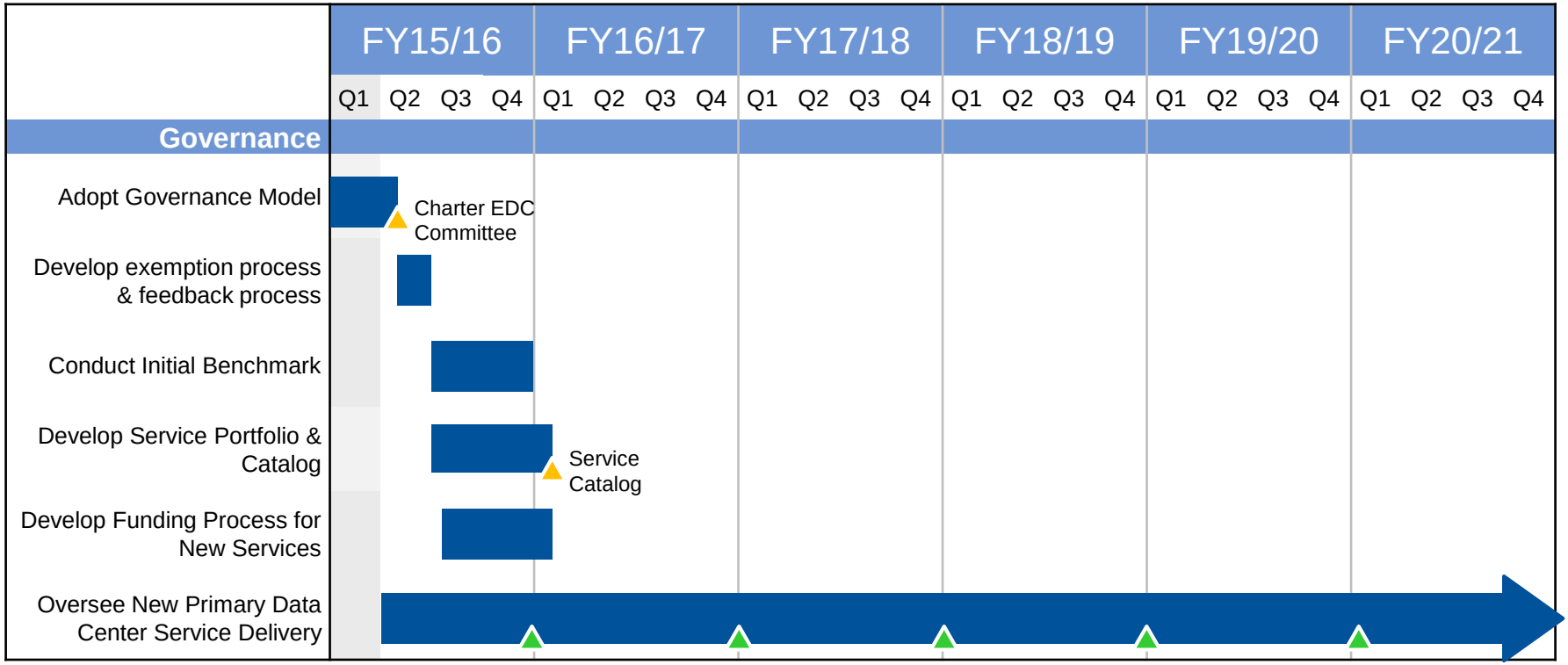
Timeline

- Completion of pCloud and virtualized storage - 1 year.
- Develop Hybrid cloud option to supplement existing eCloud capabilities.
- Determine impact of DCC on EN and design/implement other network improvements – 1-3 years.

Dependencies

- Board direction and availability of funding

Governance Timeline



Governance Overview

Description

- Provide a governance model for that ensures transparency and departmental input into the service offerings and pricing at the new primary data center.

Key Activities

- Adoption of currently proposed governance model and chartering of EDC Steering Committee.
- Develop process for reviewing and approving/rejecting requests for exemption to consolidation.
- Create process for departments to provide feedback on service offerings.
- Conduct first benchmark and create structure for annual benchmark.
- Develop a Service Catalog and Portfolio using the current services as a baseline. Determine a funding method for new services and service levels and reporting metrics for key services.
- Oversee the acquisition of and migration to the new primary data center.

Resources

- The steering committee will have 11 voting members
  - 2 each appointed by ISD (non voting) and the CIO's Office
  - 7 elected by the CIO's on the CIO Leadership Council (2 year staggered terms, 3 CIOs will serve an initial 3-year term)
- Chaired by one of CIO's Office representatives

Timeline

- The new governance model should be adopted by September 2015, with the new EDC Steering Committee formed by November 2015.
- The first annual benchmark should begin in January 2015.
- The first Service Catalog should be complete by June 2016.

Dependencies

- None

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Appendix

Data Centers are Ranked According to Their Reliability

The Uptime Institute is a global international standards organization that created the following tier system to rank data centers according to their reliability

	Description	Common Usage Models
Tier I: Basic	• Single points of failure exist which can result in unscheduled outages. • Single path for power and cooling distribution will require scheduled outages for maintenance • No redundant components, therefore replacement of parts can prolong outage	• Non critical systems • Test and development • Disaster recovery • High Performance and Scientific Computing where downtime can be tolerated • Applications that are distributed among multiple data centers such as internet search engines
Tier II: Some Redundant Components	• Redundant components can reduce time to recovery • Not all single points of failure are eliminated, therefore unexpected outages are still possible • Single path for power and cooling distribution will require scheduled outages for maintenance	• Critical systems that are active/active at more than one DC • Disaster recovery • Engineering and product development • Local manufacturing sites • Satellite data centers
Tier III: Concurrently Maintainable	• Multiple power grids or continuous on-site generation capability • Multiple power and cooling distribution paths, but only one path may be active • Redundant components and distribution paths are configured as concurrently maintainable, thereby eliminating any scheduled outage for maintenance.	• Mission critical applications • E-Commerce sites • Co-location and managed services with contractual SLAs • Primary corporate data centers • Global centers where downtime cannot be scheduled
Tier IV: Fault Tolerant	• Multiple power grids or continuous on-site generation capability • Multiple active power and cooling paths • Redundant components are concurrently maintainable and fully fault tolerant.	• Extensive financial transactions • Large financial institutions • Insurance industry • Some co-location and managed services providers

pCloud Definition

pCloud is a cloud infrastructure built on the IBM P-Series utilizing the AIX operating system and its virtualization capabilities. PCloud similar to eCloud will enable automated provisioning and orchestration of compute, network, and storage capabilities. It will also enable additional capabilities for DR by enable workload transitioning and recoverability between data centers. The initial implementation of pCloud will provide the self-provisioning capabilities to system administrators. In the future this capability will be extended to end users.