County of Los Angeles
CHIEF EXECUTIVE OFFICE
Kenneth Hahn Hall of Administration
500 West Temple Street, Room 713, Los Angeles, California 90012
(213) 974-1101
http://ceo.lacounty.gov

SACHI A. HAMAI
Interim Chief Executive Officer

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September 28, 2015

To: Mayor Michael D. Antonovich
Supervisor Hilda L. Solis
Supervisor Mark Ridley-Thomas
Supervisor Sheila Kuehl
Supervisor Don Knabe

From: Sachi A. Hamai
Interim Chief Executive Officer

COUNTYWIDE DATA CENTER REPLACEMENT STRATEGY

This memorandum is in response to the Board's instruction to the Chief Executive Office (CEO) included as Item 2 in the September 30, 2014, joint Board Motion by Supervisor Mark Ridley-Thomas and Supervisor Don Knabe wherein the Board moved as follows:

1. Instruct the Chief Information Officer (CIO), in consultation with the Director of the Internal Services Department (ISD), to identify and contract with, under an existing Master Agreement, an independent third party agency or firm with a physical presence in the region that specializes in data center design and implementation in order to provide the Board of Supervisors with a written report within 120 days, with a comprehensive and realistic recommendation regarding the County's current requirements for total and raised floor space, power, and utility needs for a data center. If there is not a vendor with this expertise under the existing Master Agreement, the CIO and ISD should return to the Board with recommended vendors. The recommended scope should:

    a. Reflect the replacement of ISD's Downey data center;

    b. Ensure that the same data center is ready to consolidate most of the County's 64 data centers; and

    c. Accommodate future growth and consolidation, factoring in virtualization and anticipated changes in data center and information technologies.

2. Instruct the CEO to contract with a second independent third party agency or firm to assess and analyze the short and long-term financial, logistical, and operational impacts associated with acquiring, leasing, or constructing a data center that meets the needs defined above. The selected agency or firm should be experienced and familiar with California's building code requirements for data center design and construction, possess a deep and practiced understanding of the County's real estate market, and provide a recommendation of the most beneficial and cost effective option. The recommended scope should:

    a. Consider the range of options to satisfy the County's needs including leasing, purchase, or construction of a new facility;

    b. Identify a County site that will best accommodate current needs and future growth if construction is recommended; and

    c. Compare the benefits and drawbacks of constructing a new facility at the Rancho Los Amigos south campus versus another vacant site.

3. Adopt a policy direction to consolidate departmental data centers in a virtualized, centralized model. Instruct the CEO, CIO, ISD's Information Technology Services Division, and departmental CIOs to form a committee and report back in writing to the Board within 90 days with a Countywide consolidation policy, five-year consolidation roadmap, and an operations governance process for the new data center.

Subsequently, on November 12, 2014, the Board authorized the CEO to execute a Work Order with Gartner Consulting (Gartner) under the Strategic Planning MSA to complete Item 1 from the September 2014 motion as follows:

1. Conduct an assessment of the Downey Data Center (DDC), the Local Recovery Center (LRC), and approximately 65 Departmental computing centers to document the computing requirements to support the development of a data center consolidation strategy; and

2. Develop a data center consolidation strategy that takes into consideration the replacement of the DDC, consolidation of most of the County's approximately 65 departmental data centers, and industry best practices to accommodate growth and contemporary computing technologies.

On March 31, 2015, the CIO submitted to the Board a report from Gartner, which contained a comprehensive recommendation of physical space, power, and utility needs for a Countywide data center. As instructed, the report reflected the replacement of ISD's Downey Data Center, ensured that the same data center would be ready to consolidate most of the County's 65 data centers, and accommodated future growth and consolidation, factoring in virtualization and anticipated changes in data center and information technologies (Item 1 of the September 30, 2014 Board motion).

On June 29, 2015, the CEO contracted with Gartner under a Delegated Authority Agreement to complete a Los Angeles County Data Center Strategy study to provide an independent analysis of the short and long-term financial, logistical, and operational impacts associated with acquiring, leasing, or constructing a data center that meets the needs defined in the initial report conducted for the CIO. To address the Board's recommended scope for the study, Gartner's analysis included consideration of leasing, purchase, and construction options for a new facility, and analysis of Rancho Los Amigos south campus as the location for construction of a new facility, due to the site already being County-owned and its accessibility to utility services. The CEO coordinated with the Treasurer and Tax Collector (TTC) to utilize a separate financial advisory firm, KNN Public Finance, contracted under TTC's Master Agreement for Financial Advisory Services, to provide guidance and validation of Gartner's financing assumptions used in their analysis.

Gartner's analysis included market research of all the potential options for meeting the County's current and future data center needs, consideration of key financial, operational and timing information, a thorough market scan of lease "co-location" providers in the Los Angeles Basin, an alternatives analysis, and additional research on the potential options.

Based on its analysis, the Gartner's report recommends that the County lease space in an existing commercially available co-location facility to serve as its primary, consolidated data center. The quantitative analysis of cost and schedule indicates that the long-term costs of data center operations will be approximately 15 percent lower under a Lease scenario, than under the Build options (Bricks & Mortar and Pre-Fabrication), and will allow a transition to the new data center at least three years sooner than under the other options. Gartner's qualitative analysis in the areas of operational excellence, operating, and transition risks also favored the Lease option over the Build scenarios.

The CEO concurs with Gartner's findings and recommends the County initiate the process to identify and relocate to a co-location lease facility in the near term. The complete Los Angeles County Data Center study containing the detailed analysis and findings is attached for your reference.

If you have any questions or require any additional information on this matter, please contact Tom Tindall at (213) 893-2374, or email at ttindall@ceo.lacounty.gov.

SAH:TT:BMB
FC:PB:zu

Attachment

c: Executive Office, Board of Supervisors
County Counsel
Chief Information Office
Internal Services
Treasurer and Tax Collector

Los Angeles County Data Center Strategy

Financial Model and Analysis of Alternatives
September 8, 2015

Prepared for: Los Angeles County

GARTNER CONSULTING

Project Number: 330025627

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Executive Summary

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An alternatives analysis of potential solutions for the County's new primary data center and determined that leasing space in a current co-location facility is the best option

- The Chief Executive Office is currently working on the second part of the Board Motion to consolidate LA County's Data Center, which is to "assess the long-term financial, logistical and operational impacts associated with acquiring, leasing or constructing a data center" that meets the County's future needs.
- Market research of the potential options available to the County identified three that are viable:
  1. A standard, "brick & mortar" construction of a new primary data center,
  2. A pre-fabricated modular construction of a new primary data center, and
  3. Leasing space in a current co-location facility
- Key financial, operational and timing information was gathered on each option by updating the construction costs for the Rancho Los Amigos data center, a thorough market scan of the co-location providers in the LA Basin, and additional research on the potential options.
- An alternatives analysis was conducted considering each option's cost, operational excellence, time to steady state, operational risk and transition risk.
- Based on this analysis Gartner recommends that the County lease space in an existing commercially available co-location facility to serve as its primary, consolidated data center.

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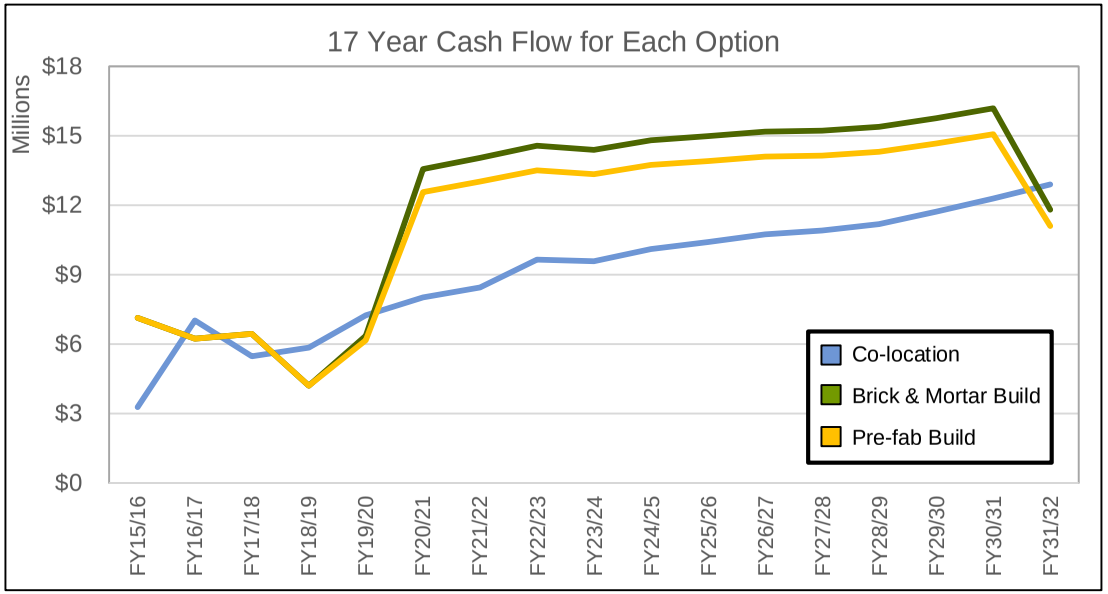
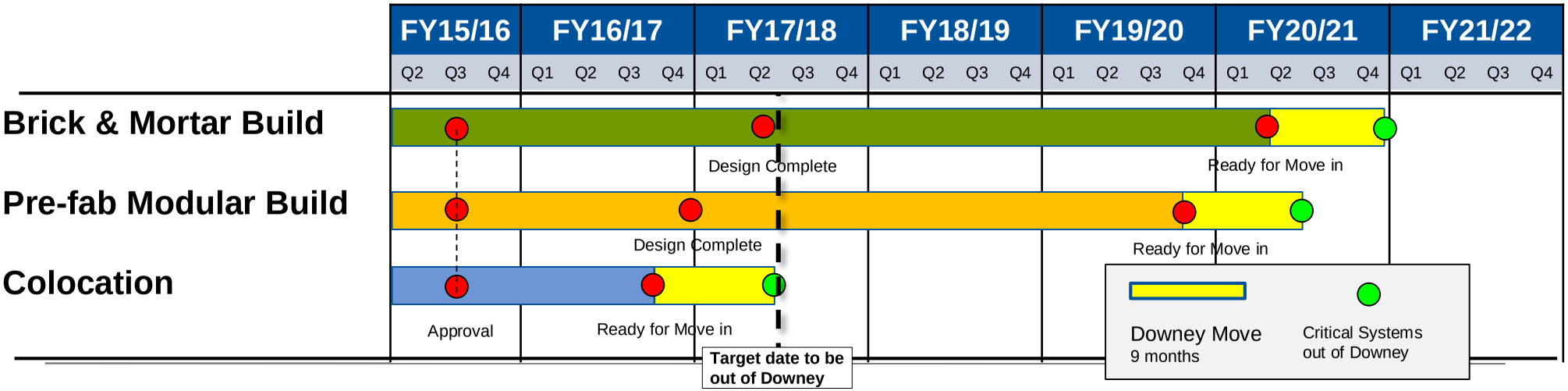
The analysis showed that leasing space in a co-location facility has ~$27M lower cost over a similar timeframe and a 3 year better timeline than the other potential solutions

In the alternatives analysis, cost and time to steady state are the two quantifiable metrics. Leasing space in a co-location facility is significantly more favorable in both of these metrics:

- $155M for co-location v. $182M for brick & mortar and $194M for pre-fab modular construction*
- 3 years faster to steady state for co-location than either build options





*The costs considered only include construction costs, and not outfitting the data center (see slide 7)

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In addition to a lower cost and faster timeline, leasing space in a co-location facility is more favorable in 11 of the 12 qualitative considerations than the other options

Least favorable 🔴 🟠 🟡 🟢 🟢 Most favorable

Category	Weight	Sub-category	Importance	Build (Brick and Mortar)	Build (Pre-fabricated Modular)	*Co-location*
Cost	20%	Total Cost (17 year cost)	H	🟡 $182M	🟠 $194M	🟢 $155M
		Operational Costs (17 year cost)	M	🟢 $105M	🟢 $102M	🟡 $155M
		One-time Cost (Construction Cost)*	M	🔴 $72.9M	🟠 $65.6M	🟢 $0
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 and exit Downey	H	🔴 4-6	🟠 4-5	🟢 1-3
Operating Risks	25%	Strategic Risk	M	🟠	🔴	🟢
		Organization Risk	M	🟡	🟡	🟢
		Solution Risk	L	🟡	🔴	🟢
		Disaster Exposure	H	🟠	🟠	🟡
Transition Risks	15%	Schedule	H	🔴	🔴	🟢
		Operations	L	🟠	🔴	🟢
		Financial	M	🟠	🟠	🟢

*Total cost reflects the costs of repayments to finance the construction cost. For the brick and mortar build scenario, the residual value in FY31/32 of the building is $24M and has been deducted from the cost to allow for a more “apples-to-apples” comparison with other scenarios

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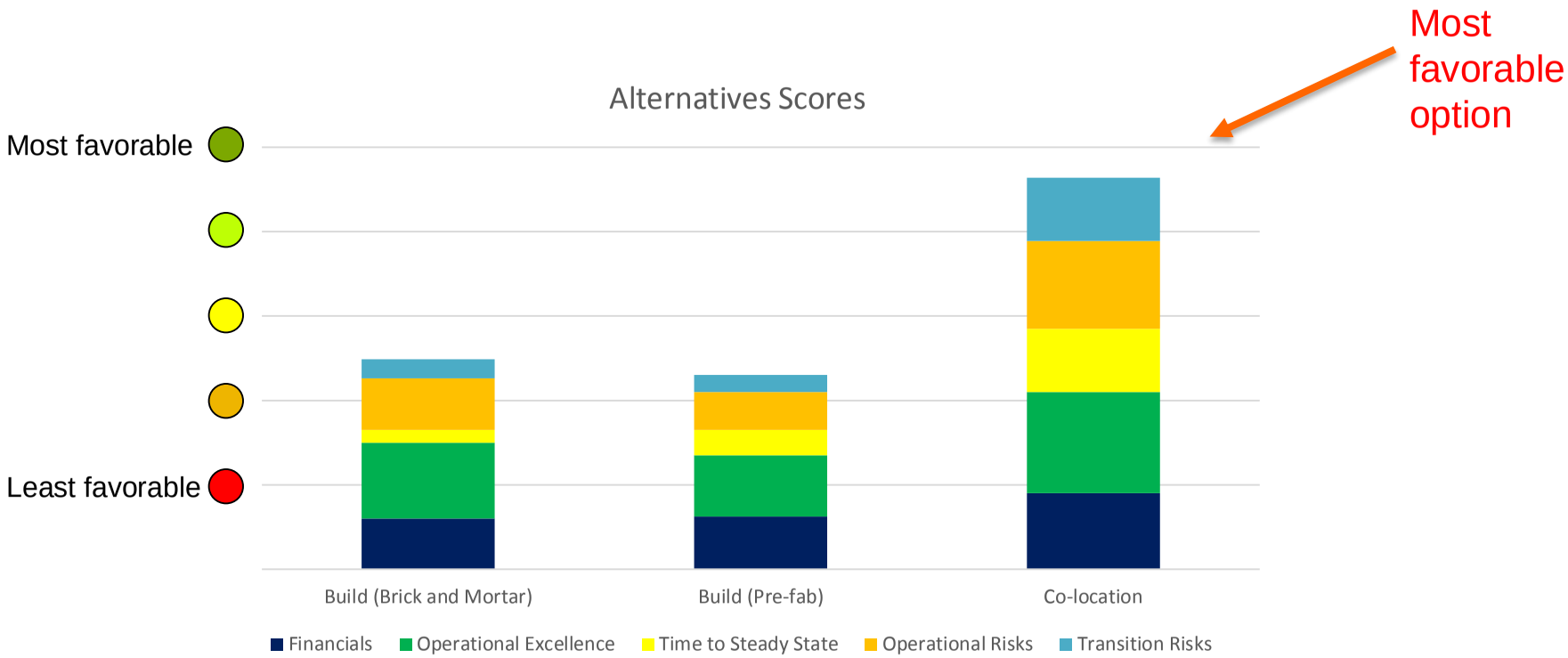
Based on the analysis, leasing in a co-location facility is a significantly more favorable option than for the County to build a data center (either Brick & Mortar or Pre-fab)



Gartner conducted further analysis to determine the sensitivity of each option to departmental participation, capacity needs and co-location pricing. The analysis indicates the co-location option is the best financial option under all scenarios*

*See slides 24-27 (co-location sensitivity); 38-40 (brick & mortar build sensitivity); 45-47 (pre-fab modular build sensitivity) for more detail

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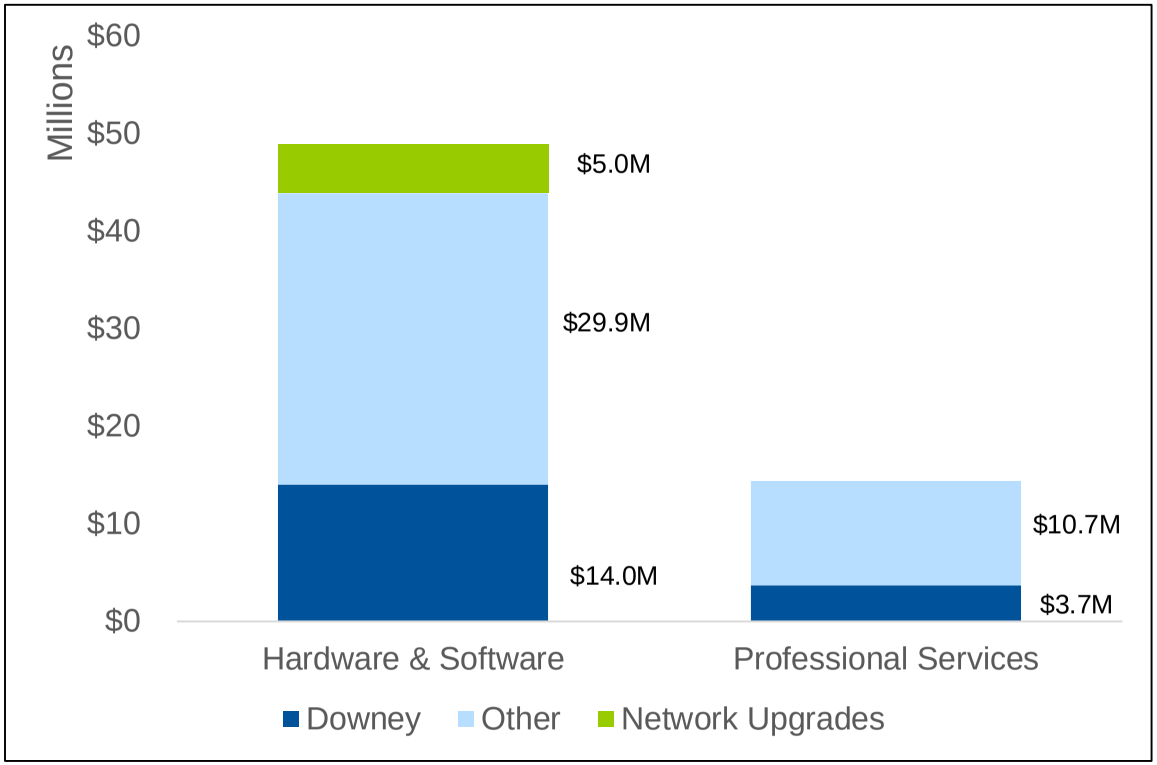
Preliminary estimates for migration costs include approximately $50 million for hardware and software and $15 million for labor and professional services



Notes:

- Estimates developed as part of the consolidation strategy (part I of the Board Motion)
- Costs would be incurred during migration. Downey migration for the various options is represented in slide 4. Migration of the other facilities would occur over the three years following Downey's migration

- The financial models only includes incremental costs. Regardless of the option selected, the County will incur approximately $65M in additional costs for migration and set up of the new data center
- Key Assumptions:
  - All storage is Tier I (most expensive)
  - 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
- Cost do not include:
  - Reconfiguration of WAN
  - Transition cost of operating 2 sites
  - New network hub

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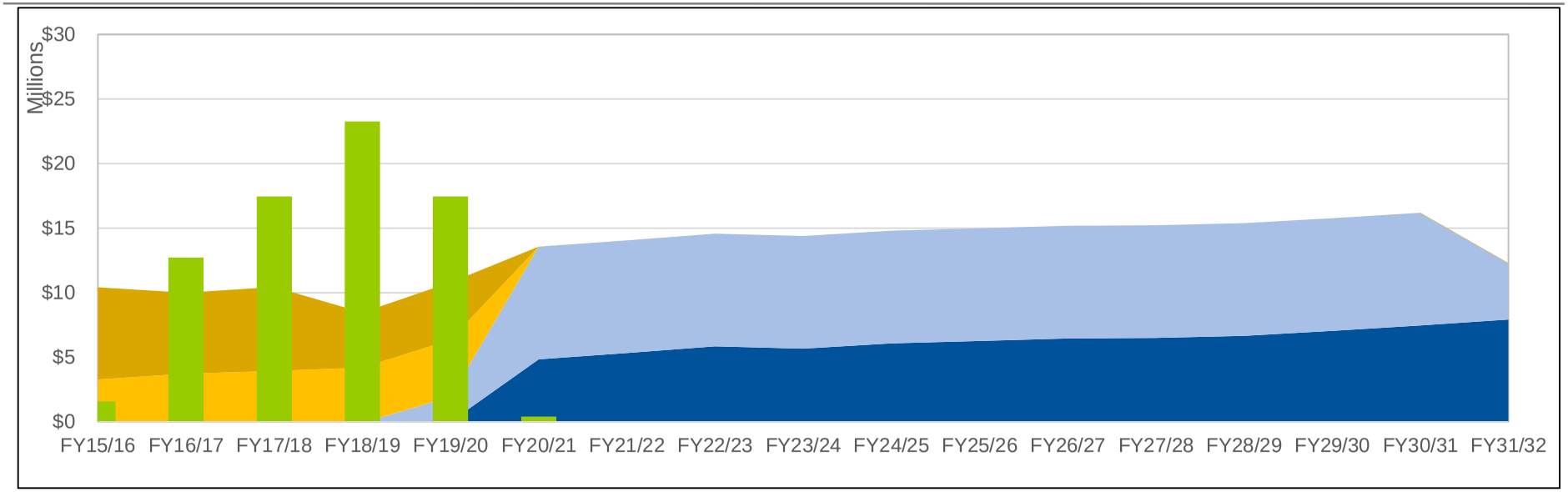
Forecasted Cash Flow for the Brick and Mortar Build Option



One-Time Cost	$1.6M	$12.7M	$17.5M	$23.3M	$17.5M	$0.4M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M
Downey Operating Cost	$3.3M	$3.8M	$4M	$4.3M	$4.4M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M
Downey Life Extension Costs	$3.9M	$2.5M	$2.5M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M
New DC Operating Cost	$0M	$0M	$0M	$0M	$0M	$4.8M	$5.3M	$5.8M	$5.7M	$6.1M	$6.3M	$6.5M	$6.5M	$6.7M	$7M	$7.5M	$7.9M
Debt Service	$0M	$0M	$0M	$0M	$1.9M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$4.4M

Note: Cash flow for the pre-fab modular build would be similar

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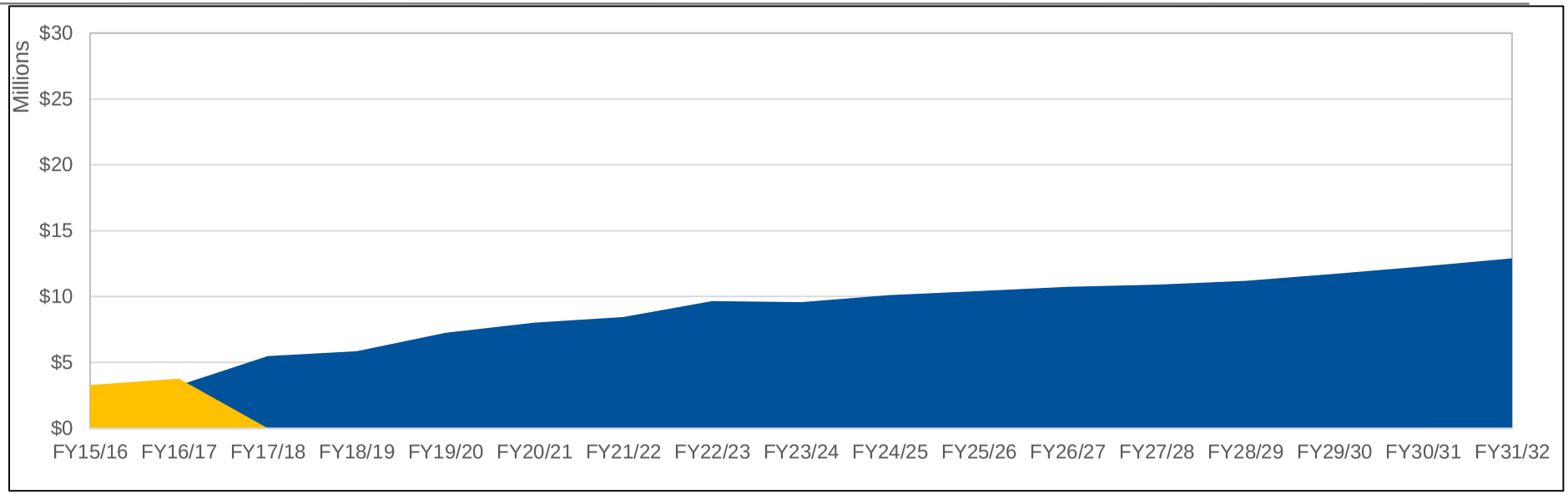
Forecasted Cash Flow for the Co-location Option



One-Time Cost	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M
Downey Operating Cost	$3.3M	$3.8M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M
Downey Life Extension Costs	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M	$0M
New DC Operating Cost	$0M	$3.3M	$5.5M	$5.8M	$7.2M	$8M	$8.4M	$9.7M	$9.6M	$10.1M	$10.4M	$10.7M	$10.9M	$11.2M	$11.7M	$12.3M	$12.9M

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Background

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The CEO was responsible for fulfilling the second part of the Board Motion to consolidate the County's data centers into a new primary data center

2. Instruct the Chief Executive Officer to contract with a second independent third-party agency or firm to assess and analyze the short- and long-term financial, logistical and operational impacts associated with acquiring, leasing or constructing a data center that meets the needs defined above. The selected agency or firm should be experienced and familiar with California's building code requirements for data center design and construction, possess a deep and practiced understanding of the County's real estate market, and provide a recommendation of the most beneficial and cost effective option. The recommended scope should:

   a. Consider the range of options to satisfy the County's needs including leasing, purchase or construction of a new facility;

   b. Identify a County site that will best accommodate current needs, and future growth if construction is recommended; and

   c. Compare the benefits and drawbacks of constructing a new facility at the Rancho Los Amigos south campus versus another vacant site;

The Second Part of the Board Motion to consolidate LA County's Data Center instructs the Chief Executive Officer to "assess the long-term financial, logistical and operational impacts associated with acquiring, leasing or constructing a data center" that meets the County's future needs.

The County CEO has determined that the Build/Lease analysis would benefit from leveraging the knowledge and preliminary analysis work that Gartner conducted as part of their engagement by the CIO's office to address parts 1, 3 and 4 of the Board motion.

To accomplish this, the CEO has decided to engage Gartner to take responsibility for analyzing the short and long-term financial, logistical, and operational impacts associated with acquiring, leasing, or constructing a data center that meets the County's needs.

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Gartner used the approach below for its assistance in conducting the Alternatives Analysis

1. Initiate Project

- Complete project planning
- Mobilize team
- Document and get concurrence on key assumptions in existing Financial Model
- Review Existing Financial Model with KNN
- Review Existing Alternative Analysis scoring criteria with Key LAC Stakeholders
- Document updated Financial Model assumptions and Alternatives Analysis Scoring Criteria

- Final Project Plan
- Updated Financial Model assumptions & Alternative Analysis scoring criteria

2. Gather Additional Data Input

- Develop Service and Contract Profile for Rent and Lease options
- Conduct Market scan to determine most likely pricing and contract terms
- Gather LA specific cost factors (labor, construction, etc.)
- Work with County stakeholders to update Rancho Los Amigos site preparation costs
- Interview County Real Estate and Public Works SME's to determine County Specific Build factors (time, costs)
- Work with KNN to develop and refine key assumptions (residual asset value, etc.)

- LA County specific inputs for financial model for various scenarios
- Residual value approach

3. Validate Financial Model Results & Refine Alternatives

- Identify additional alternatives to model (if any)
- Update Financial Model with new alternatives, updated assumptions and other factors
- Document model results and assumptions
- Validate model and model results with County Core team and KNN
- Refine Model as necessary
- Review and validate financial modeling results with County Stakeholders

- Alternatives to be analyzed
- Updated Financial model inputs, assumptions and results

4. Update Alternative Analysis

- Update Overall Alternatives Scoring and Analysis based on:
  - New alternatives
  - New LA specific input data
  - Financial modeling results
- Document lease vs. buy recommendation
- Validate recommendations with key Stakeholders

- Finalized alternatives analysis and lease vs. buy recommendation

5. Develop Report for the Board

- Finalize and summarize recommendations for the Board report
- Draft Board report and review with KNN and Core stakeholders
- Assist with socialization of Board report with other key Stakeholder (CIO, CEO office, key Board Deputies, etc..)
- Finalize Board report and create executive summary for presentation at Operations Cluster meeting
- Assist with presentation of report at Operations Cluster meeting

- Draft and Final Board Report including attachments
- Socialization Meetings

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During the Data Center Strategy engagement, Gartner identified several possible alternatives which use a combination of the following building blocks

1. **Primary Data Center** – The primary data center will be the largest and the most resilient data center facility used by the County. It will host all mission critical applications, particularly those which can not operate in active-active configuration from two locations. ISD Downey, which is a Tier II data center, is currently considered to be the primary data center, however some of the future state alternatives considered will replace ISD Downey with a new Tier III facility.
2. **Secondary Data Center** – The secondary data center will complement the Primary Data Center by providing a second, resilient location to support active-active application, and provide disaster recovery capabilities that meet Recovery Time Objective (RTO) and Recovery Point Objectives (RPO) for all applications in the event of a major disaster. LRC, which is a Tier II data center, is currently considered the Secondary Data Center, however some of the future state alternatives considered will replace LRC with a new Tier III facility.
3. **Data Bunker –** The Data Bunker is a location where backups of all the critical data is stored. Because compute capacity is not provided at a data bunker, this site will only enable safe keeping of data for restoration of information in some distant future should a catastrophic event happen. **The Data Bunker can not restore services within the required RTO and RPO,** therefore County will have to rely on manual business continuity processes until such time that services can be restored. The LA County data bunker is being implemented in 2015 at the State of California data center in Rancho Cordova.

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Gartner initially identified four different options that the County can consider for acquiring a new primary data center: Build, Co-lo, Lease To Suit

	Description	LA Basin		60+ miles Disaster Strike Zone Separation	300+ miles Disaster Strike Zone Separation
(Option A) Build New Data Center	• Maintain LRC • Build new Tier III primary facility in LA Basin for Active-active operation • Establish data bunker in Sacramento	Build New Tier III Primary DC	LRC Tier II Secondary DC		Sacramento Data Bunker
(Option B) Buy Data Center	• Maintain LRC • Buy a Tier III primary facility in LA Basin for Active-active operation • Establish data bunker in Sacramento	Buy Tier III Primary DC	LRC Tier II Secondary DC		Sacramento Data Bunker
(Option C) Use Co-location for Primary Data Center	• Maintain LRC • Lease capacity in a Tier III primary facility in LA Basin • Active-active operation • Establish data bunker in Sacramento	Lease Tier III Primary DC	LRC Tier II Secondary DC		Sacramento Data Bunker
(Option D) Lease to Suit New Data Center	• Maintain LRC • Lease to suit (dedicated new build for county by commercial DC builder) new Tier III primary facility in LA Basin • Active-active operation • Establish data bunker in Sacramento	Lease to Suit Tier III Primary DC	LRC Tier II Secondary DC		Sacramento Data Bunker

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Based on market research, two of the four options are not currently viable for the County

- County Real Estate Division, with assistance from Gartner, conducted a market scan of the available data centers for purchase in the LA region. About 1,000 brokers and investors were scanned. Those that responded, including a major national firm, proposed conversion of existing office complexes to data centers that did not meet the County requirements. Additionally, Gartner received feedback from some of the co-location providers that they received the buy inquiry, but did not have any facilities for sale.
- Gartner spoke with Digital Reality Trust regarding the lease-to-suit option (build a custom facility that the County could lease back). The provider indicated that they typically require construction of at least a 10 Mega Watt (MW) data center, which is approximately five times the County DC power requirements at the peak (the County is currently forecasted to need 2.1MW in 10 years).

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During the analysis the build option was split into two separate options: Brick & Mortar Build and Pre-Fab Modular Build, creating three options for further analysis

	Description	LA Basin	60+ miles Disaster Strike Zone Separation	300+ miles Disaster Strike Zone Separation
(Option 3) Co-location	• Maintain LRC • Lease capacity in a Tier III primary facility in LA Basin • Active-active operation • Establish data bunker in Sacramento	Lease Tier III Primary DC LRC Tier II Secondary DC		Sacramento Data Bunker
(Option 1) Brick & Mortar Build	• Maintain LRC • Build new Tier III primary facility in LA Basin that is large enough to house the County's IT needs over the next 10-15 years • Active-active operation • Establish data bunker in Sacramento	Build Tier III Brick & Mortar Primary DC LRC Tier II Secondary DC		Sacramento Data Bunker
(Option 2) Pre-Fab Modular Build	• Maintain LRC • Modularly build a new Tier III primary facility, allowing for Pre-fabricated modular computer space to be added as needed • Active-active operation • Establish data bunker in Sacramento	Build Tier III Pre-fab Modular Primary DC LRC Tier II Secondary DC		Sacramento Data Bunker

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Option 1: Co-location

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A market scan of the major co-location providers in the LA area helped shape the co-location option

- On June 24, 2015 Gartner sent out a market scan to the following co-location providers:
  - Equinix
  - Digital Realty
  - CenturyLink
  - T5 Data Centers
  - Colocation America
  - Internap
  - Latysis
  - CoreSite
  - Level 3 Communications
- The following specifications were included:
  - Capacity requirements (initial – final): 800 kW – 2.1 MW of Reserved IT Power and 8,000 – 14,000 sq. ft. of reserved space accommodating approximately 150 - 300 racks over the next 10 years
  - All space must be in the same physical location with use of contiguous space preferred
  - Data center be a Tier III data center
- Six (6) companies responded to the market scan, with one (Co-location America) not qualifying primarily due to focus on retail co-location market and rack densities of 2KW. Responses from the following five companies were considered viable:
  - Equinix
  - Digital Realty
  - CenturyLink
  - T5 Data Centers
  - CoreSite

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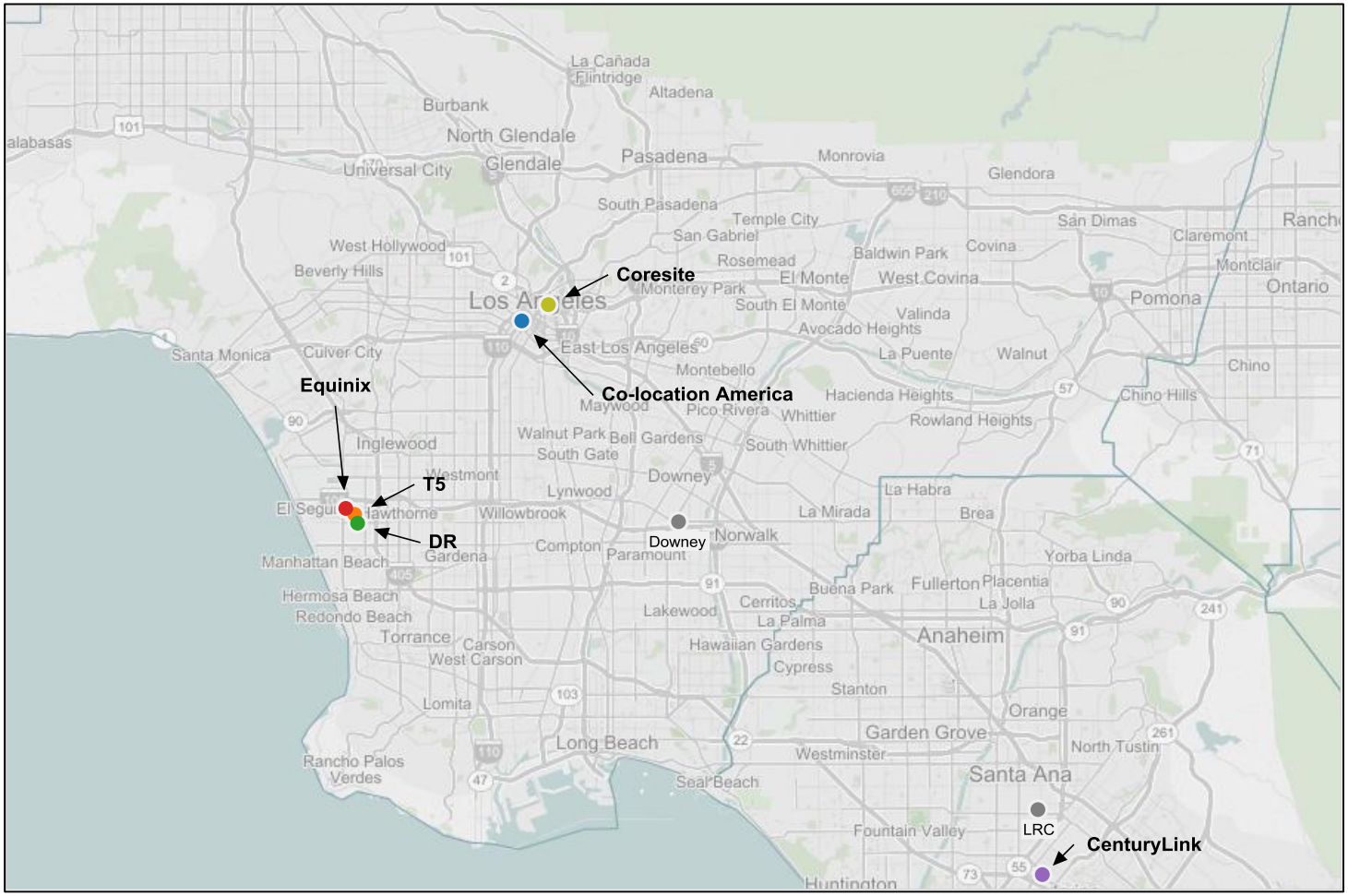
Co-location providers responded by providing information about their data centers located in the areas shown



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Core characteristics of the proposed co-location facilities helped validate that adequate qualified co-location suppliers are available in the LA market

Criteria	CenturyLink	CoreSite	Digital Reality	Equinix	T5
Facility Name and Address	OC2 - 17836 Gillette Ave, Irvine	LA2- 900 North Alameda, Los Ángeles	LAX12 - 2260 E. El Segundo Blvd., El Segundo	LA3 - 1920 E Maple Ave, El Segundo	T5 - 444 North Nash St., El Segundo
Tier Level	Tier III (certified)	Tier III	Tier III	Tier III	Tier III
Space and Power Capacity (contiguous)	20K Sq. Ft.; 5MW	10K Sq. Ft. – ample space and power	39.9K Sq. Ft.; 3.7 MW (2017 projected)		12.3K Sq. Ft.; 1.25 MW (optional add)
Maximum Average Rack Density	8kW	8kW	35kW		Ample power and cooling to support high rack density
Existing Telco Carriers	AT&T, Verizon, Time Warner, CenturyLink, XO, Zayo, Cox	Most Providers – Sprint, AT&T, Time Warner, Verizon	AT&T, Time Warner, Verizon, CenturyLink, Sprint		AT&T, Time Warner, Level 3, CenturyLink, WilCon, So Cal Edison, Synesys, XO, Zayo
PUE	1.55	1.5	1.6	1.42	1.3
Cost for Reserved Power ($/KW) – 5 year contract term	$142	$138	$175	$310	$133
Management and Operations ($/KW)	$0.00	$0.00	$0.00	$0.00	$35.00
Annual Escalation Rate	3%	3%	3%	5%	3%
Utility Rate	$0.114	$0.12	$0.106	Incl. in Base Rate	$0.088
Permanent Office Space ($/SF)	$5.00	$5.00	$6.50	$5.00	$5.00
Permanent Storage ($/SF)	$5.00	$5.00	N/A	$5.00	$3.33
NOC Space Cost ($/SF)	$5.00	N/A	N/A	#N/A	N/A
Smart Hands ($/hour)	$130-$225	$150-$225	$125	$200	$150

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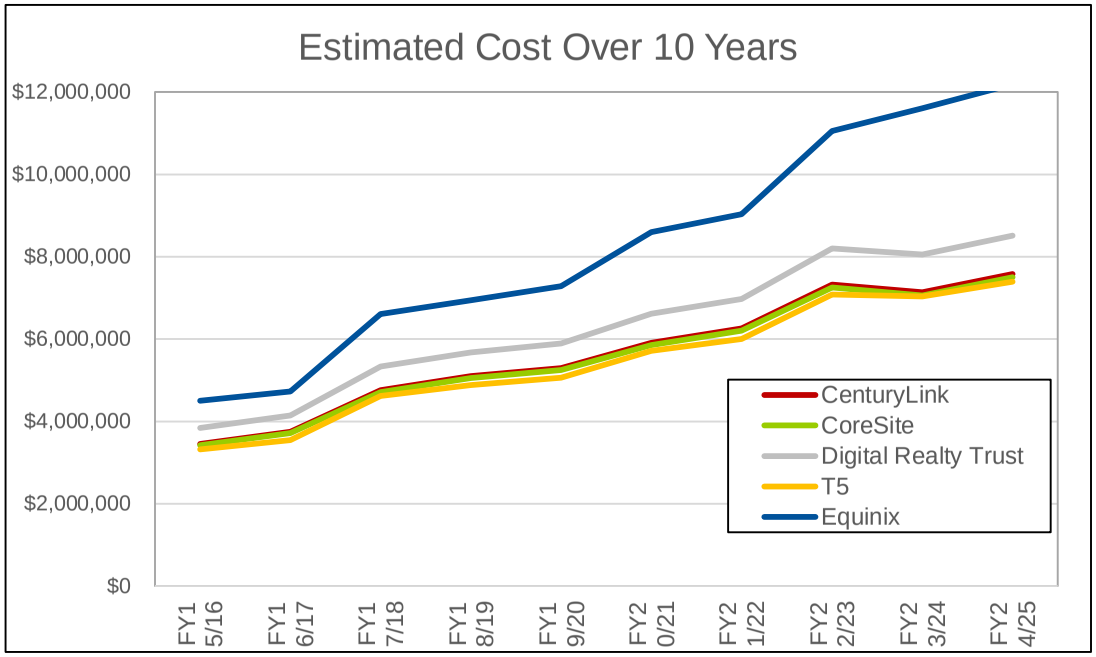
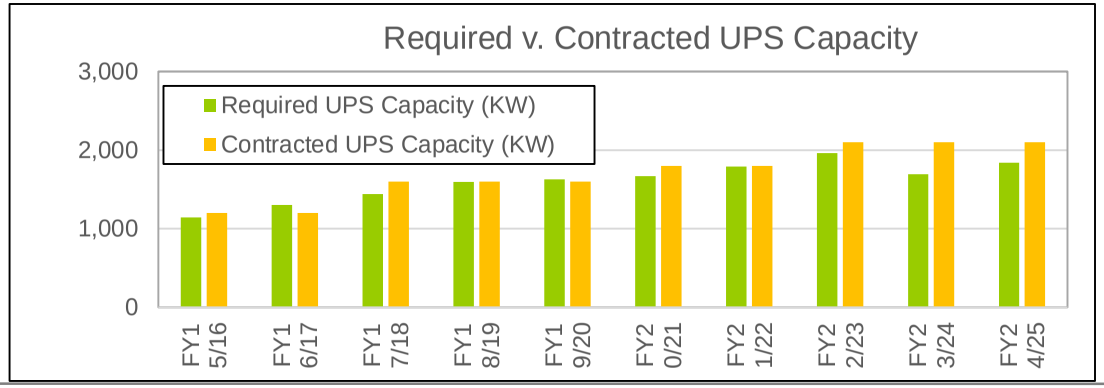
The local market scan also helped identify the 10 year operating cost of the co-location facilities inclusive of space, power, utility, maintenance, and facilities operations

Company	10 Year NPV * **
CenturyLink	$45.9M
CoreSite	$45.5M
Digital Reality	$51.3M
Equinix	$66.5M
T5	$44.3M

* 3.5% NPV discount rate

** Costs based on 5 year contract term





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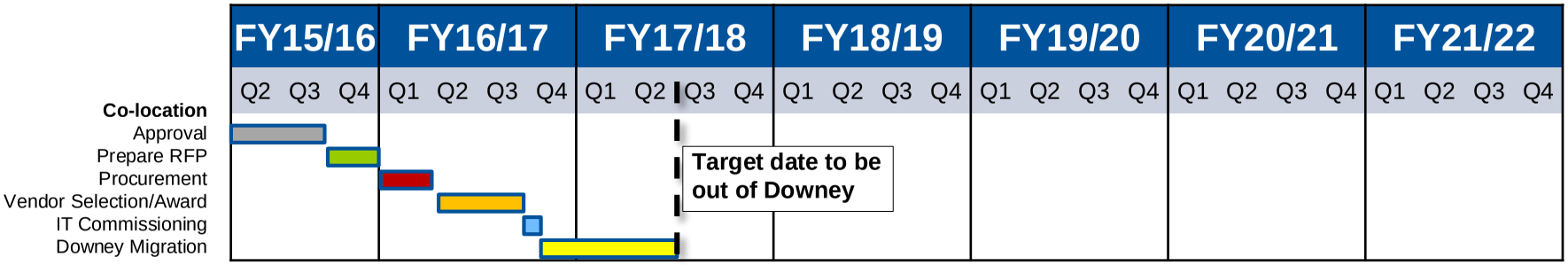
Using the identified operating costs, Gartner developed a complete co-location financial model using the following assumptions

- Procurement of co-location services will follow the below timeline. Vendor selection will be completed by March 2017 and Downey will be completely migrated by December 2017



- All departments will consolidate into the new, primary facility, beginning with Downey
- Migration into a new facility (co-location or constructed) will take 3 years after Downey migrates
- An annual escalator of 3% has been used for lease costs
- Costs are inclusive of space, electricity consumed, reserve power capacity, facilities operations, spaces, 7x24 security and monitoring, etc.
- The County can contract for 15 years at current market rates, plus an annual escalator
- There will be minimal change from the forecasted capacity baseline over the next 17 years
- Long term discount rate of 3.5% (based on 15 year bond yield) for calculating of net present value (NPV)

Note: A sensitivity analysis was conducted on some of the assumptions

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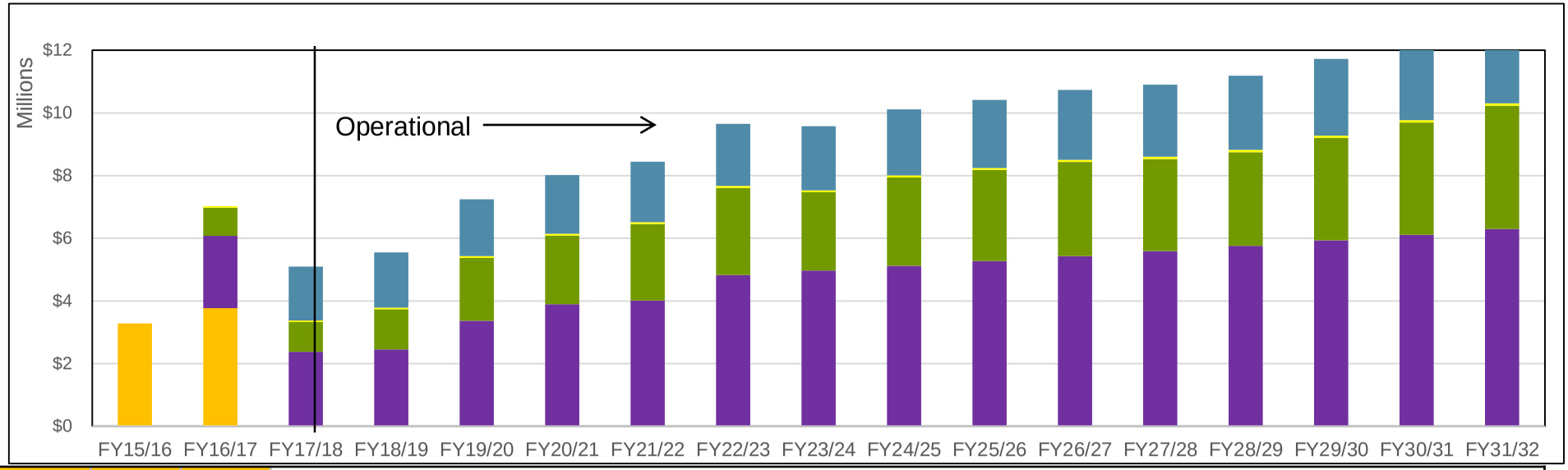
Based on the financial model, the 17 year cost of the co-location option is expected to be $110M



Utility Cost	$1.2M	$1.6M	Orange = Downey Costs						Blue = ISD Operating Costs in Co-location facility								
Downey Lease	$0.1M	$0.1M															
Facility Operation Staff	$1.1M	$1.2M	$1.2M	$1.3M	$1.3M	$1.3M	$1.4M	$1.4M	$1.4M	$1.5M	$1.5M	$1.6M	$1.6M	$1.7M	$1.7M	$1.8M	$1.8M
Service and Supplies	$0.5M	$0.5M	$0.2M	$0.2M	$0.2M	$0.2M	$0.2M	$0.2M	$0.2M	$0.2M	$0.2M	$0.2M	$0.2M	$0.3M	$0.3M	$0.3M	$0.3M
IT Consulting	$0.3M	$0.3M	$0.3M	$0.3M	$0.3M	$0.3M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.5M	$0.5M	$0.5M
Reserved Power	$0M	$2.3M	$2.4M	$2.4M	$3.4M	$3.9M	$4M	$4.8M	$5M	$5.1M	$5.3M	$5.4M	$5.6M	$5.8M	$5.9M	$6.1M	$6.3M
Utility Cost	$0M	$0.9M	$1.3M	$1.6M	$2M	$2.2M	$2.4M	$2.8M	$2.5M	$2.8M	$2.9M	$3M	$2.9M	$3M	$3.3M	$3.6M	$3.9M
Office Space and Storage	$0K	$50.5K	$52K	$53.6K	$55.2K	$56.8K	$58.5K	$60.3K	$62.1K	$64K	$65.9K	$67.9K	$69.9K	$72K	$74.1K	$76.4K	$78.7K
Cash Flow	$3.3M	$7M	$5.5M	$5.9M	$7.2M	$8M	$8.4M	$9.7M	$9.6M	$10.1M	$10.4M	$10.7M	$10.9M	$11.2M	$11.7M	$12.3M	$12.9M
17 Year Cost:	**$155M**																
17 Year NPV:	**$110M**																

Note: Created based on averaging responses from CenturyLink, Coresite, Digital Reality and T5

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To ensure the validity of the financial model, Gartner performed a set of sensitivity analyses to see how changing key assumptions would affect the NPV over time

Factors	Reduce	Baseline	Increase
Departmental Participation	1 LRC, DHS, Sheriff (SCC), Fire, DMH and DPH (lab) do not participate	All Departments Participate (no LRC)	All Departments Participate (no LRC)
Capacity Requirements (changes after the 10 year mark)	2 10% Less 3 25% Less 4 50% Less (than expected)	Capacity Model assumptions remain valid	5 15% More 6 20% More 7 25% More (than expected)
County Contract (changes after the 10 year mark)	8 10% decrease 9 20% decrease 10 30% decrease	Current rates remain valid	11 10% increase 12 20% increase 13 30% increase

**Changes for scenarios 2-13 are only done for FY26-32

1. Scenario 1: Lower Departmental Participation
2. Scenario 2: 10% less capacity requirements
3. Scenario 3: 25% less capacity requirements
4. Scenario 4: 50% less capacity requirements
5. Scenario 5: 15% more capacity requirements
6. Scenario 6: 20% more capacity requirements
7. Scenario 7: 25% more capacity requirements
8. Scenario 8: 10% decrease in contract costs
9. Scenario 9: 20% decrease in contract costs
10. Scenario 10: 30% decrease in contract costs
11. Scenario 11: 10% increase in contract costs
12. Scenario 12: 10% increase in contract costs
13. Scenario 13: 10% increase in contract costs

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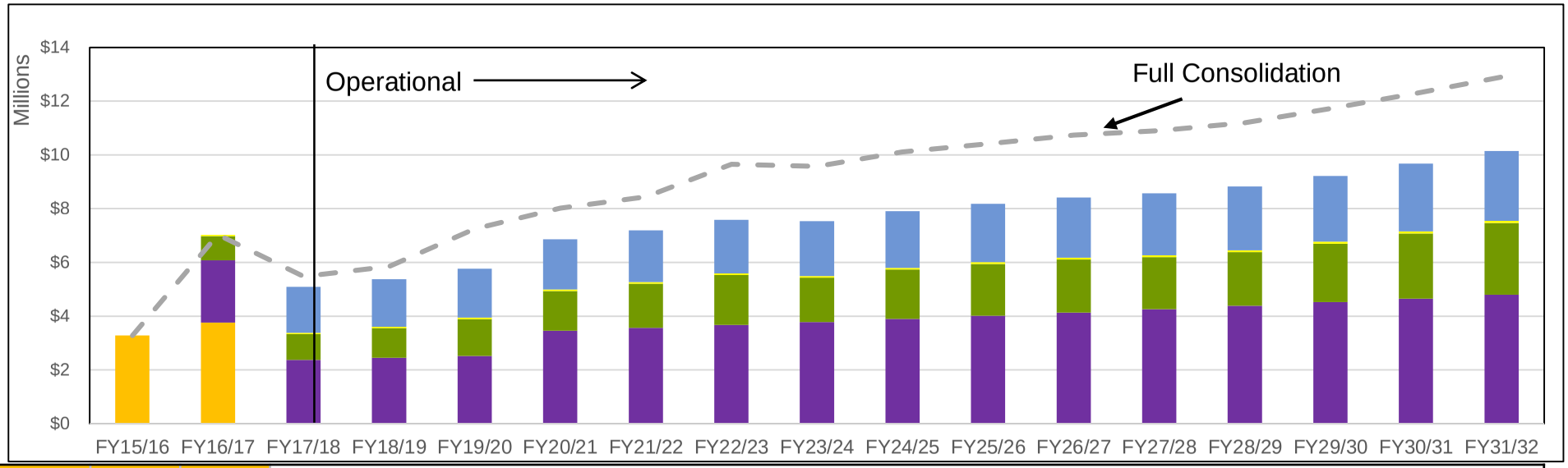
The 17 year NPV of the co-location option under the lower consolidation scenario is expected to be $127M, $28M less than the full consolidation scenario



Utility Cost	$1.2M	$1.6M	Orange = Downey Costs						Blue = ISD Operating Costs in Co-location facility								
Downey Lease	$0.1M	$0.1M															
Facility Operation Staff	$1.1M	$1.2M	$1.2M	$1.3M	$1.3M	$1.3M	$1.4M	$1.4M	$1.4M	$1.5M	$1.5M	$1.6M	$1.6M	$1.7M	$1.7M	$1.8M	$1.8M
Service and Supplies	$0.5M	$0.5M	$0.2M	$0.2M	$0.2M	$0.2M	$0.2M	$0.2M	$0.2M	$0.2M	$0.2M	$0.2M	$0.2M	$0.3M	$0.3M	$0.3M	$0.3M
IT Consulting	$0.3M	$0.3M	$0.3M	$0.3M	$0.3M	$0.3M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.5M	$0.5M	$0.5M
Reserved Power	$0M	$2.3M	$2.4M	$2.4M	$2.5M	$3.5M	$3.6M	$3.7M	$3.8M	$3.9M	$4M	$4.1M	$4.3M	$4.4M	$4.5M	$4.7M	$4.8M
Utility Cost	$0M	$0.9M	$0.9M	$1.1M	$1.4M	$1.5M	$1.6M	$1.9M	$1.6M	$1.8M	$1.9M	$2M	$1.9M	$2M	$2.2M	$2.4M	$2.7M
Office Space and Storage	$0K	$50.5K	$52K	$53.6K	$55.2K	$56.8K	$58.5K	$60.3K	$62.1K	$64K	$65.9K	$67.9K	$69.9K	$72K	$74.1K	$76.4K	$78.7K
Cash Flow	$3.3M	$7M	$5.1M	$5.4M	$5.8M	$6.9M	$7.2M	$7.6M	$7.5M	$7.9M	$8.2M	$8.4M	$8.6M	$8.8M	$9.2M	$9.7M	$10.1M
17 Year Cost:	**$127M**																
17 Year NPV:	**$91M**																

Note: Created based on averaging responses from CenturyLink, Coresite, Digital Reality and T5

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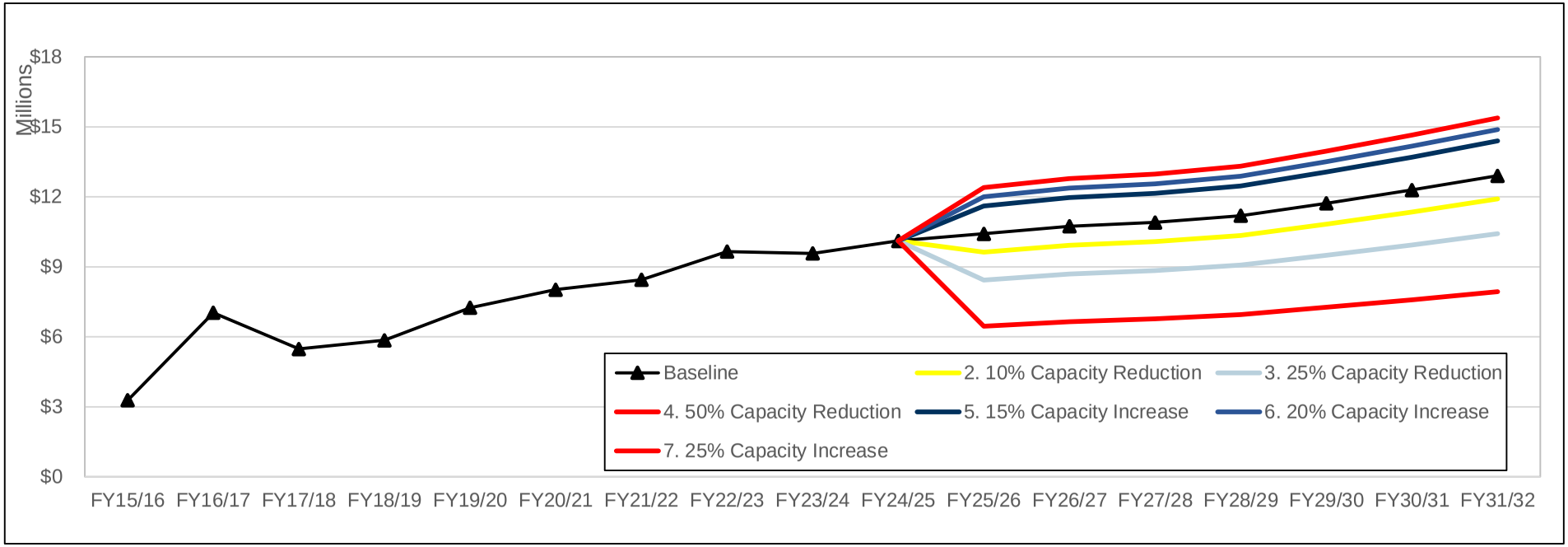
Changes in capacity requirements in FY26-32 result in a -$31M to +$15M variance from the baseline cost



Scenario	17 Year Cost	Variance from Baseline	Scenario	17 Year Cost	Variance from Baseline
Scenario 2: 10% less capacity requirements	$149M	-$6M	Scenario 5: 15% more capacity requirements	$164M	$9M
Scenario 3: 25% less capacity requirements	$140M	-$15M	Scenario 6: 20% more capacity requirements	$167M	$12M
Scenario 4: 50% less capacity requirements	$124M	-$31M	Scenario 7: 25% more capacity requirements	$170M	$15M

Engagement: 330027717
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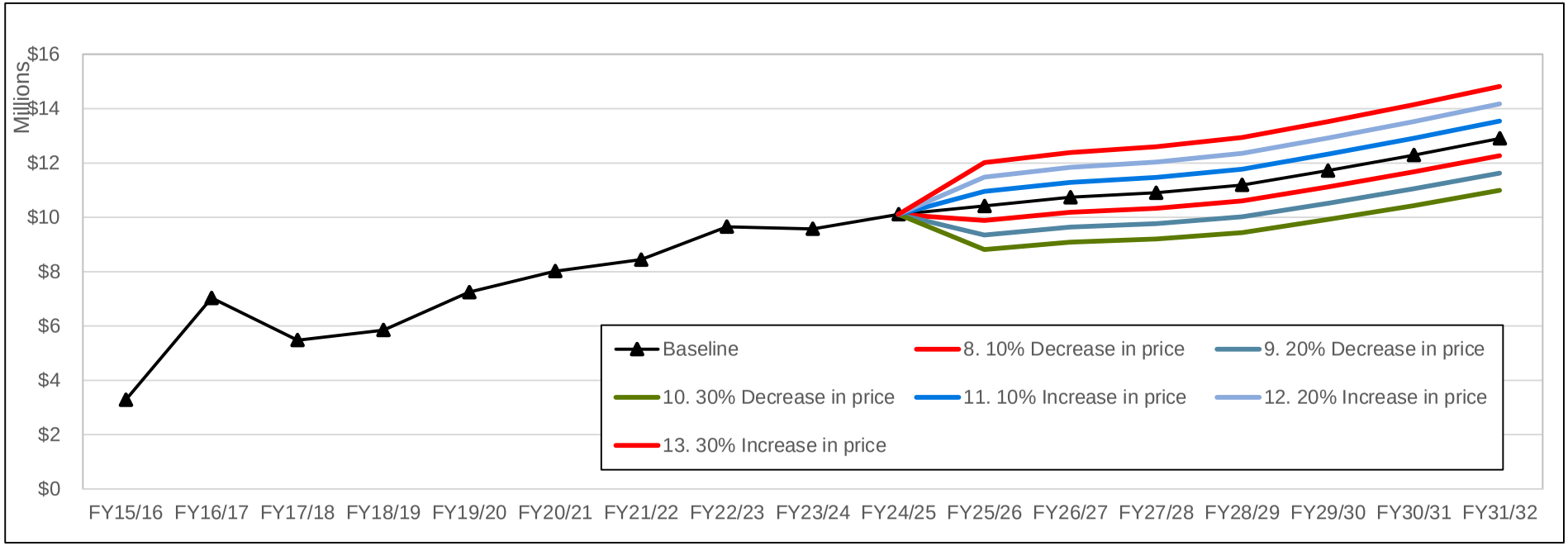
Changes in contract values in FY26-32 result in a -$12M to +$12M variance from the baseline cost



Scenario	17 Year Cost	Variance from Baseline	Scenario	17 Year Cost	Variance from Baseline
Scenario 8: 10% decrease in contract	$151M	-$3M	Scenario 11: 10% increase in contract	$159M	$4M
Scenario 9: 20% decrease in contract	$147M	-$8M	Scenario 12: 20% increase in contract	$163M	$8M
Scenario 10: 30% decrease in contract	$143M	-$12M	Scenario 13: 30% increase in contract	$167M	$12M

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Option 2: Brick & Mortar Build

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In parallel, Gartner worked with DPW to determine the most economically feasible location and estimate the construction cost for a new facility at the county owned land at Rancho

Original proposed development area for the Rancho Data Center (2013)

Most economically favorable build site for the County Data Center.

Provides easier access to utilities.

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The Brick and mortar build option for lot C is based on the following characteristics for a New Tier III data center as compared to the original 2013 Rancho DC Basis of Design

	Rancho (2013 BOD)	New Tier III
Initial UPS Capacity (KW)	2,700	2,100
Ultimate UPS Capacity (KW)	2,700	2,100
Utility Service Redundancy	2N	2N
Utility Service Voltage	15kV	15kV
Maximum Service Capacity	6.75MW	4 MW
UPS Redundancy	N+1	N+1
UPS Distribution Redundancy	2N	2N
Generator System Redundancy	N+1	N+1
Generator Location	Indoor (Power Building)	Outdoor Enclosure
Cooling System	Chilled Water (CW)	Chilled Water (CW)
Chiller System Redundancy	N+1	N+1
Chilled Water Piping Redundancy	No	No
Raised Floor CRAH/CRAC Redundancy	N+2	N+2
Diesel Fuel Oil Storage	2x30,000 Gal	2x30,000 Gal
Cooling Tower Water Storage	Tank	Tank
Electrical System Concurrently Maintainab	Yes	Yes
Mechanical System Concurrently Maintain	Yes	Yes
Project Year	2013	2017
Site Location	LA County	LA County

New Requirements

	Rancho (2013 BOD)	New Tier III
Computer Room (SF)	26,300	14,000
Operations Center	Not broken out	1,000
Staging Room		800
Tape Storage		700
Electrical Rooms		4,000
Battery Rooms		1,700
Mechanical Rooms		4,000
Mechanical Galleries for Air Handlers		2,500
Loading and Receiving		450
Parts and Storage		1,000
Ramps, Corridors, Lobby, Security Office		4,000
Hotel Office Space		1,000
Facilities Shop		400
Conference Room		650
Total Support Areas (SF)	51,192	22,200
Office Area (SF)	Included	5,000
Total Gross Square Footage (SF)	**77,492**	**41,200**

New requirements use 47% less space, 22% less power than the 2013 Rancho Design

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Brick and Mortar Construction Cost Estimates at Rancho (1 of 3)

	Baseline			Estimated Costs Per Gartner
Construction Line Item	2013 Rancho Cost Elements	Cost/GSF	Cost/Kw UPS Load	NEW DC (2.1MW)
A. CONSTRUCTION COSTS				
Foundations	$1,148,175	$19.44	N/A	$800,928
Vertical Structure	$3,785,901	$33.72	N/A	$1,389,264
Floor and Roof Structure	$4,173,307	$53.20	N/A	$2,191,840
Exterior Gladding	$2,765,003	$30.00	N/A	$1,236,000
Roofing and Waterproofing	$2,593,888	$29.46	N/A	$1,213,752
Shell	$14,466,274	$165.82		$6,831,784
Interior Partitions and Doors	$2,011,950	$25.47	N/A	$1,049,364
Interior Finishes - Floors, Walls, Ceiling	$1,211,293	$26.27	N/A	$1,082,324
Interiors	$3,223,243	$51.74	N/A	$2,131,688
Fixed Equipment	$1,577,920	$24.41	N/A	$1,005,692
Stairs and Elevators	N/A	N/A	N/A	N/A
Equipment, Stairs, Elevators	$1,577,920	$24.41	N/A	$1,005,692
Plumbing	$1,610,868	$20.34	N/A	$838,008
HVAC	$11,649,355	N/A	$4,315	$9,060,609
Electrical	$15,876,836	N/A	$5,880	$12,348,650
Fire Protection	$784,232	$12.25	N/A	$504,700
Mechanical and Electrical	$29,921,291	$32.59	$10,195	$22,751,968
Subtotal	**$49,188,728**			**$32,721,132**
Site Development				
Site Development				$2,064,147
Site Utilities				$1,650,434
Site Communications Network Access				$993,022
Site Development Subtotal				**$4,707,603**
Building + Site Development Subtotal	**$49,188,728**			**$37,428,735**
General Conditions and Supervision @ 10.5%	$5,164,816	N/A	N/A	$3,930,017
Bond and Insurances @ 2.2%	$1,195,778	N/A	N/A	$909,893
Overhead and Profit @ 4%	$2,221,973	N/A	N/A	$1,690,746
Subtotal	**$57,771,295**	N/A	N/A	**$43,959,390**
Design Contingency @ 8%	$4,621,704	N/A	N/A	$3,516,751
Subtotal	**$62,392,999**	**N/A**	**N/A**	**$47,476,141**
Cost Escalation to Start (3% per year for 4 years) 2013-2017	$7,487,160	N/A	N/A	$5,697,137
Subtotal	$69,880,159	N/A	N/A	$53,173,278
Total Building Cost	**$69,880,159**			**$53,173,278**

Values in red were supplied by DPW

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Brick and mortar Construction Cost Estimates at Rancho (2 of 3)

Other Design and Construction Costs		
D/B Design Fee	6.00%	$3,190,397
Change Orders (Owner Contingency)	7.50%	$3,987,996
Civic Art	1.00%	$531,733
Proposer Stipends	0.50%	$265,866
Subtotal		**$7,975,992**
Total Building and Site Construction Cost		**$61,149,270**
B. PLANS & SPECIFICATIONS		
Scoping/Programming Architect	1.50%	$917,239
CEQA Environmental	1.00%	$611,493
Deputy Inspection	1.00%	$611,493
Hazardous Materials	0.50%	$305,746
Geotech / Soils Test	1.00%	$611,493
Material Testing	1.00%	$611,493
Cost Estimating	0.20%	$122,299
Topographic Surveys	0.10%	$61,149
Construction Management	4.00%	$2,445,971
Labor Compliance to D.I.R. State Fund	0.05%	$30,575
Subtotal		**$6,328,949**
C. MISCELLANEOUS EXPENDITURES		
Countywide Contract Compliance	$80,000	$80,000
Printing	$25,000	$25,000
Subtotal		**$105,000**
D. JURIDICTIONAL REVIEW / PLAN CHECK / PERMITS		
Regional Planning	0.10%	$61,149
Fire Dept.	0.10%	$61,149
Health Dept.	0.10%	$61,149
AQMD	0.10%	$61,149
State Water Resource Board	0.10%	$61,149
Land Development Support Services	0.10%	$61,149
Building & Safety Plan Check	0.90%	$550,343
Subtotal		**$917,239**

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Brick and mortar Construction Cost Estimates at Rancho (3 of 3)

E. COUNTY SERVICES		
Code Compliance	1.00%	$611,493
Design Review	0.10%	$61,149
Contract Administration	0.50%	$305,746
Project Management	2.00%	$1,222,985
Project Management Support Services	0.50%	$305,746
ISD ITS Communications	2.00%	$1,222,985
Project Technical Support	0.10%	$61,149
Consultant Contract Recovery	0.30%	$183,448
Subtotal		**$3,974,703**
F. THIRD PARTY COMMISSIONING AGENT		
Third Party Commissioning		$400,000
Subtotal		**$400,000**
Total Facility Cost at Occupancy		**$72,875,161**

Values in red were supplied by DPW

- New requirements use 47% less space and 22% less power than the original Rancho Design
- New facility costs 43% less than the original Rancho Design

2013 Rancho DC Estimate: $129.6M

New Rancho DC Cost at Occupancy: $72.9M

2013 Rancho Campus Costs
TOTAL: $208.9M

Data Center
(Power Building + Entry Building + Data Center Building) $129.6M

Other Campus Costs
Annex: $21.2M
Demolition: $7M
Campus Infrastructure: 51.1M

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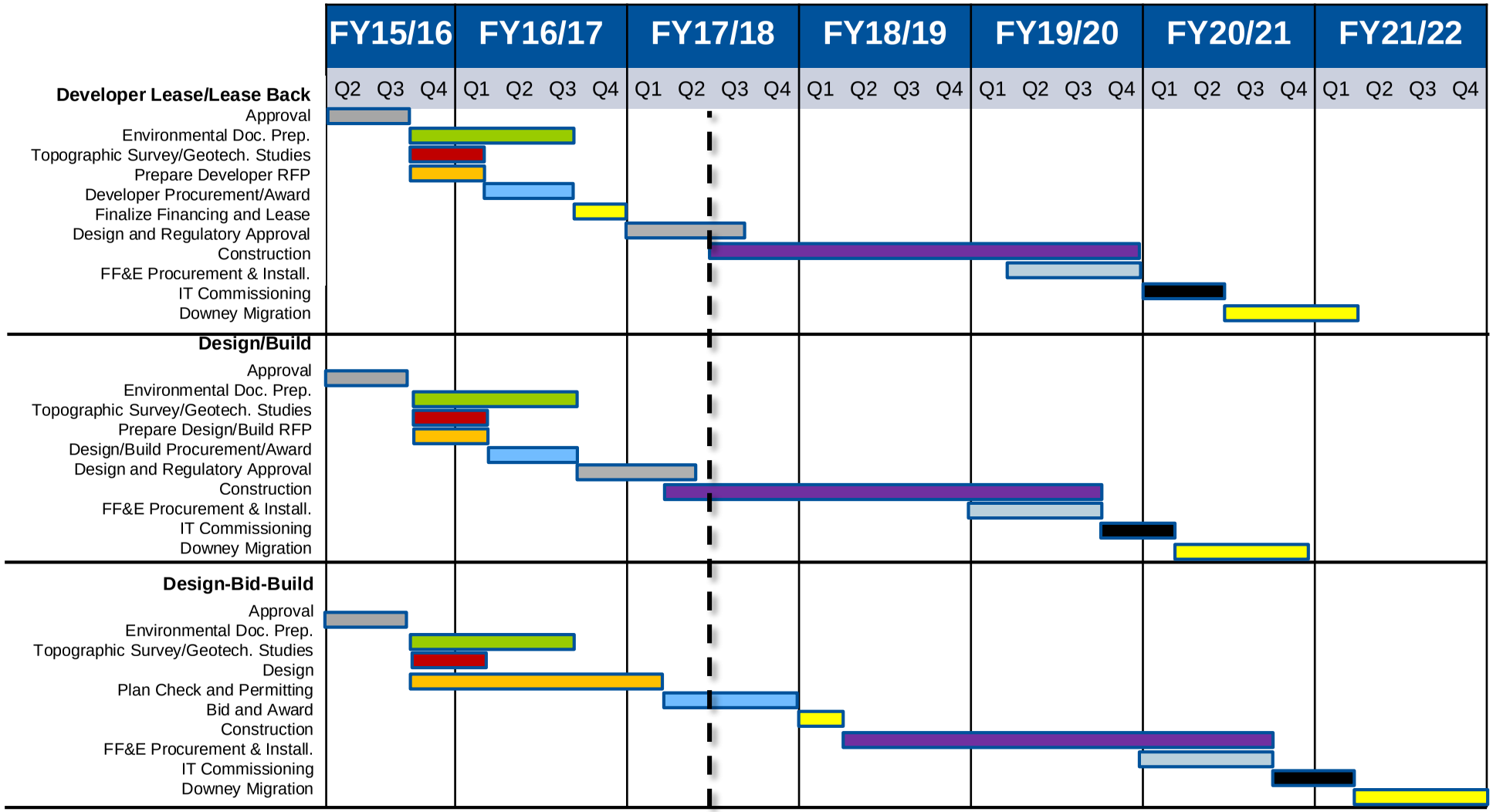
Gartner worked with DPW to establish the time to occupancy for Brick and Mortar construction, which will take 3 to 4 year longer to implementation than co-location



Target date to be out of Downey

Engagement: 330027717
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Gartner

There are a few assumptions that feed the brick and mortar build financial models

- All departments will consolidate into the new, primary facility, beginning with Downey
- Migration into a new facility (co-location or constructed) will take 3 years after Downey migrates
- The County will incur a total of $8.9M over the next 3 years to extending the life of Downey for 5-6 more years
- The entire construction cost bond will be incurred at the time of the design award
- Construction bond assumptions were provided by KNN and are shown on the next slide
- Calculated the residual value of the data center using straight line depreciation based on a mixed asset life of 15 or 30 years and excludes land value and improvements
- Cost of land is assumed to be $0 due to use of existing County land
- There will be minimal change from the forecasted capacity baseline over the next 17 years
- Long term discount rate of 3.5% for calculation of NPV

Note: A sensitivity analysis was conducted on some of the assumptions

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Summary of brick and mortar construction bond assumptions (15 year Term) provided by KNN

Dated Date:	9/16/2016
Principal Amortization:	12 years
First Principal Payment	9/1/2020
Interest Rate Scale:	Scale was created using 8/19/2015 current AAA MMD plus the MMD spreads of the 8/12/2015 Los Angeles County Public Works Financing Authority's Lease revenue Refunding Bonds, 2015 Series B, with an additional .5% added to each of the maturities
Project Fund:	Gross funded. Draws assumed in 3 equal annual payments.
Reserve Fund:	Funded at 1 / 2 of maximum annual debt service. Earnings at 1.5% (8/19/2015 5 year treasury rate)
Capitalized Interest:	Gross funded. Interest is capitalized for 3 years through 9/1/2019.
Call Provision:	First call date is 9/1/2026, 10 years from the dated date.
Debt Service:	Level
Cost of Issuance:	$250,000
Underwriter's Discount:	$5.00 per $1,000 of par

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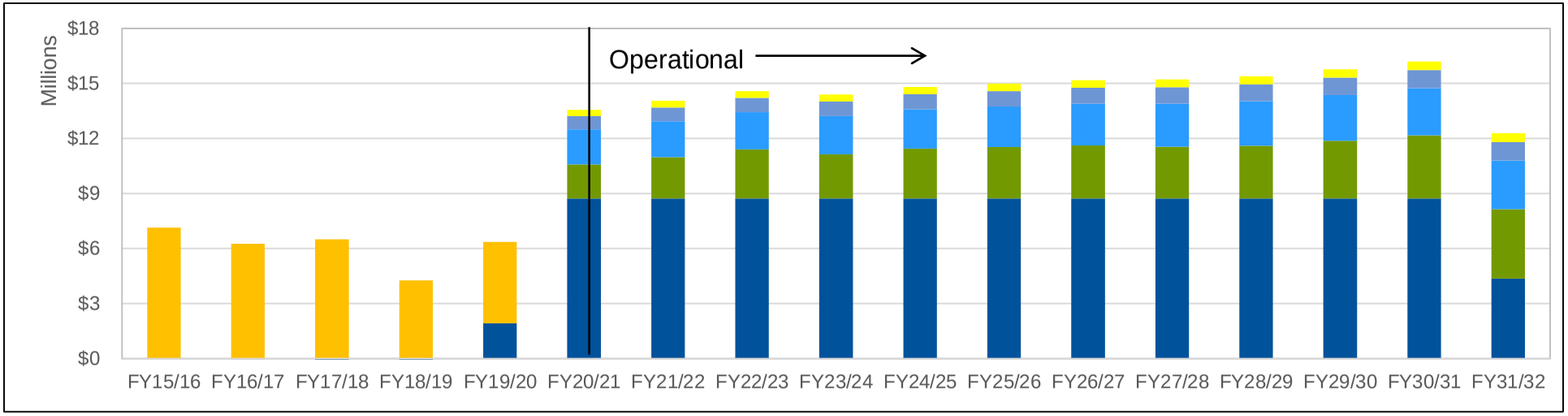
Based on the financial model, the 17 year cost of the brick and mortar build option is expected to be $182M



Bond Incurred*		$90M															
Bond Debt Service	$0M	$0M	-$0.1M	-$0.1M	$1.9M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$4.4M
Utility Cost	$1.2M	$1.6M	$1.8M	$2M	$2.1M	$1.9M	$2.3M	$2.7M	$2.4M	$2.7M	$2.8M	$2.9M	$2.8M	$2.9M	$3.1M	$3.5M	$3.8M
Facility Operation Staff	$1.1M	$1.2M	$1.2M	$1.3M	$1.3M	$1.9M	$2M	$2M	$2.1M	$2.1M	$2.2M	$2.3M	$2.3M	$2.4M	$2.5M	$2.6M	$2.6M
Service and Supplies	$0.5M	$0.5M	$0.6M	$0.6M	$0.6M	$0.7M	$0.8M	$0.8M	$0.8M	$0.8M	$0.8M	$0.9M	$0.9M	$0.9M	$1M	$1M	$1M
IT Consulting	$0.1M	$0.1M	$0.1M	$0.1M	$0.1M	$0.3M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.5M	$0.5M	$0.5M
Downey Lease	$0.3M	$0.3M	$0.3M	$0.3M	$0.3M	Orange = Downey Costs											
Downey Life Extension Costs	$3.9M	$2.5M	$2.5M	$0M	$0M												
Cash Flow	$7.1M	$6.2M	$6.4M	$4.2M	$6.4M	$13.6M	$14.1M	$14.6M	$14.4M	$14.8M	$15M	$15.2M	$15.2M	$15.4M	$15.8M	$16.2M	$11.8M

15 Year Cost:	**$206M**
Residual Value:	**$24M**
Total:	**$182M**

15 Year NPV:	**$147M**
Residual Value NPV:	**$13M**
Total:	**$133M**

*Bond amount is to show when it would be incurred and is not included in NPV calculation

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To ensure the validity of the financial model, Gartner performed a set of sensitivity analyses to see how changing key assumptions would affect the NPV over time

Factors	Reduce	Baseline	Increase
Departmental Participation	1 LRC, DHS, Sheriff (SCC), Fire, DMH and DPH (lab) do not participate	All Departments Participate (no LRC)	All Departments Participate (no LRC)
Capacity Requirements (changes after the 10 year mark)	2 10% Less 3 25% Less 4 50% Less (than expected)	Capacity Model assumptions remain valid	5 15% More 6 20% More 7 25% More (than expected)

**Changes for scenarios 2-7 are only done for FY26-32

1. Scenario 1: Lower Departmental Participation
2. Scenario 2: 10% less capacity requirements
3. Scenario 3: 25% less capacity requirements
4. Scenario 4: 50% less capacity requirements
5. Scenario 5: 15% more capacity requirements
6. Scenario 6: 20% more capacity requirements
7. Scenario 7: 25% more capacity requirements

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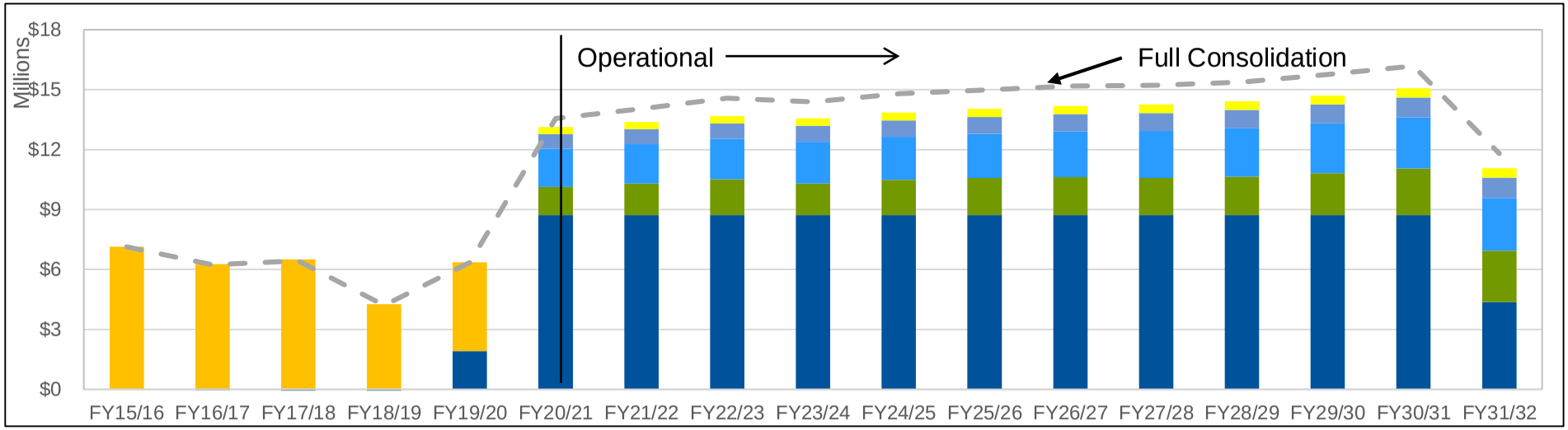
The 17 year cost of the brick and mortar build option under the lower consolidation scenario is expected to be $172M, $10M less than the full consolidation scenario



Bond Incurred*		$90M															
Bond Debt Service	$0M	$0M	-$0.1M	-$0.1M	$1.9M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$4.4M
Utility Cost	$1.2M	$1.6M	$1.8M	$2M	$2.1M	$1.9M	$2.3M	$2.7M	$2.4M	$2.7M	$2.8M	$2.9M	$2.8M	$2.9M	$3.1M	$3.5M	$3.8M
Facility Operation Staff	$1.1M	$1.2M	$1.2M	$1.3M	$1.3M	$1.9M	$2M	$2M	$2.1M	$2.1M	$2.2M	$2.3M	$2.3M	$2.4M	$2.5M	$2.6M	$2.6M
Service and Supplies	$0.5M	$0.5M	$0.6M	$0.6M	$0.6M	$0.7M	$0.8M	$0.8M	$0.8M	$0.8M	$0.8M	$0.9M	$0.9M	$0.9M	$1M	$1M	$1M
IT Consulting	$0.1M	$0.1M	$0.1M	$0.1M	$0.1M	$0.3M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.5M	$0.5M	$0.5M
Downey Lease	$0.3M	$0.3M	$0.3M	$0.3M	$0.3M												
Downey Life Extension Costs	$3.9M	$2.5M	$2.5M	$0M	$0M	Orange = Downey Costs											
Cash Flow	$7.1M	$6.2M	$6.4M	$4.2M	$6.4M	$13.6M	$14.1M	$14.6M	$14.4M	$14.8M	$15M	$15.2M	$15.2M	$15.4M	$15.8M	$16.2M	$11.8M

15 Year Cost:	**$196M**
Residual Value:	**$24M**
Total:	**$172M**

15 Year NPV:	**$146M**
Residual Value NPV:	**$13M**
Total:	**$133M**

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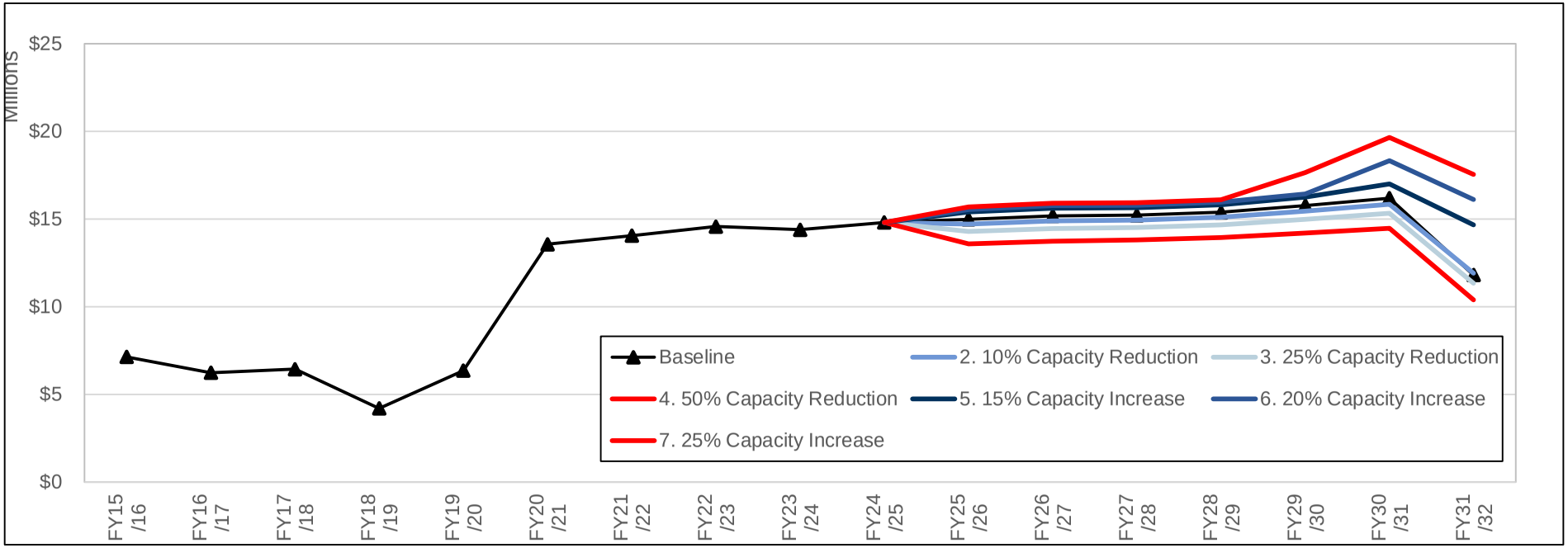
Changes in capacity requirements in FY26-32 result in a -$10M to +$14M variance from the baseline NPV



Scenario	15 Year NPV	Variance from Baseline	Scenario	15 Year NPV	Variance from Baseline
Scenario 2: 10% less capacity requirements	$191M	-$1M	Scenario 5: 15% more capacity requirements	$188M*	$6M
Scenario 3: 25% less capacity requirements	$187M	-$5M	Scenario 6: 20% more capacity requirements	$192M*	$10M
Scenario 4: 50% less capacity requirements	$172M	-$10M	Scenario 7: 25% more capacity requirements	$196M*	$14M

*Capacity exceeds 2.1MW – analysis includes $8,000 per kW for upgrades to accommodate extra capacity

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Option 3: Modular Build

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In addition to brick and mortar construction, Gartner also investigated use of prefabricated modular data centers

- Benefits:
  - Faster time to deployment – Modular solutions could reduce the construction time up to six months.
  - Energy efficiency – Modular solution are a bit more energy efficient. However, their efficiency is often greatly exaggerated by the vendors by not considering the complete power distribution and cooling system configuration of the DC. The advertised numbers are based on most basic Tier I configuration for the module itself.
  - Modular solutions have been effective in highly homogeneous high density computing environments for High Performance Computing (HPC) for scientific and engineering applications. They also work well in military or applications where field deployment is required such as oil and gas industry.

- Risks:
  - Do not have any meaningful use case in government or as mission critical primary enterprise data centers
  - Not ideal for low density or heterogeneous computing
  - Lack design flexibility
  - Less flexibility in IT space configuration
  - Cost of deployment not much different or just slightly less than brick and mortar deployment if high resiliency, Tier III, security, seismic design, and regulatory compliance are key concerns
  - Solutions from IT providers tend to be much more expensive per KW than when purchased directly from original manufacturers or compared to brick and mortar construction
  - Will not have the longevity and reliability of a brick and mortar solutions
  - Will not have the residual value or reusability of a brick and mortar building
  - Local fire AHJ may not be familiar with the solution and cause delays in permit approvals

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There are a few assumptions that feed the pre-fabricated modular build financial models

- Pre fabricated modular data center could have a lower overall PUE (Power Usage Effectiveness) of 1.3 vs. a PUE of 1.4 for brick and mortar construction
- Modular construction one time savings are estimated to be 10% of brick and mortar cost
- Modular pre-fabricated construction could shorten the construction schedule by as much as 6 months
- All departments will consolidate into the new, primary facility, beginning with Downey
- Migration into a new facility (co-location or constructed) will take 3 years after Downey migrates
- The County will incur a total of $8.9M over the next 3 years to extending the life of Downey for 5-6 more years
- The entire construction cost bond will be incurred at the time of the design award
- Residual value of modular pre-fabricated construction will be zero after 15 years.
- Cost of land is assumed to be $0 due to use of existing County land
- Long term discount rate of 3.5%
- There will be minimal change from the forecasted capacity baseline over the next 15 years

Note: A sensitivity analysis was conducted on some of the assumptions

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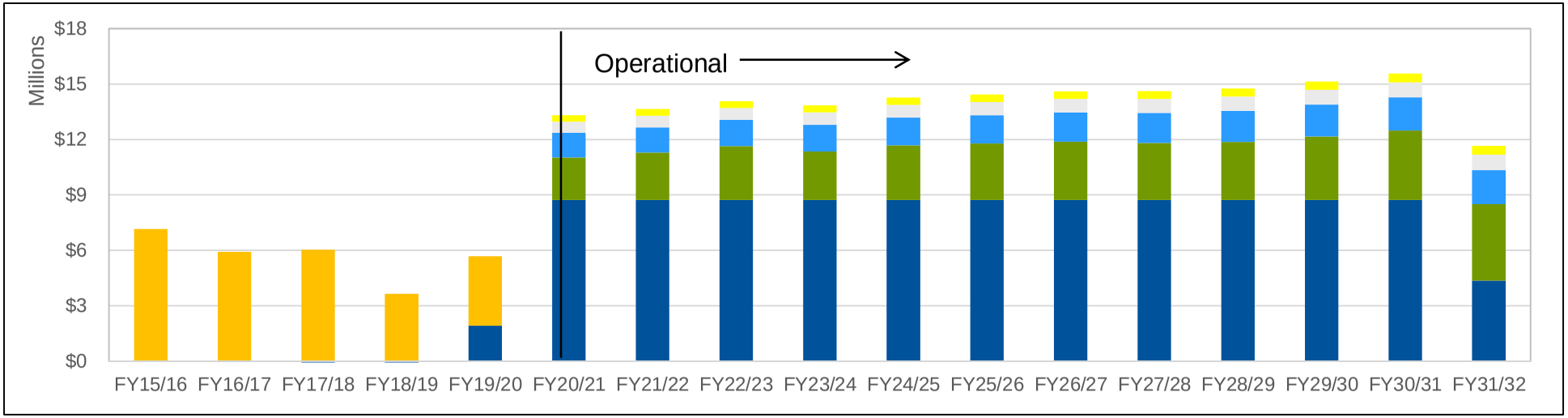
Based on the financial model, the 17 year cost of the modular option is expected to be $194M



Bond Incurred*		$80M															
Bond Debt Service	$0M	$0M	$-0.1M	$-0.1M	$1.7M	$7.9M	$7.9M	$7.9M	$7.9M	$7.9M	$7.9M	$7.9M	$7.9M	$7.9M	$7.9M	$7.9M	$3.9M
Utility Cost	$1.2M	$1.6M	$1.8M	$2M	$2.1M	$1.7M	$2.1M	$2.5M	$2.2M	$2.5M	$2.6M	$2.7M	$2.6M	$2.7M	$2.9M	$3.2M	$3.5M
Facility Operation Staff	$1.1M	$1.2M	$1.2M	$1.3M	$1.3M	$1.9M	$2M	$2M	$2.1M	$2.1M	$2.2M	$2.3M	$2.3M	$2.4M	$2.5M	$2.6M	$2.6M
Service and Supplies	$0.5M	$0.5M	$0.6M	$0.6M	$0.6M	$0.7M	$0.8M	$0.8M	$0.8M	$0.8M	$0.8M	$0.9M	$0.9M	$0.9M	$1M	$1M	$1M
IT Consulting	$0.1M	$0.1M	$0.1M	$0.1M	$0.1M	$0.3M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.5M	$0.5M	$0.5M
Downey Lease	$0.3M	$0.3M	$0.3M	$0.3M	$0.3M												
Downey Life Extension Costs	$3.9M	$2.5M	$2.5M	$0M	$0M												
Cash Flow	$7.1M	$6.2M	$6.4M	$4.2M	$6.2M	$12.6M	$13M	$13.5M	$13.3M	$13.7M	$13.9M	$14.1M	$14.1M	$14.3M	$14.7M	$15.1M	$11.1M

Orange = Downey Costs

17 Year Cost:	**$194M**
Residual Value:	**$0**
Total:	**$194M**

15 Year NPV:	**$138M**
Residual Value NPV:	**$0**
Total:	**$138M**

*Bond amount is to show when it would be incurred and is not included in NPV calculation

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To ensure the validity of the financial model, Gartner performed a set of sensitivity analyses to see how changing key assumptions would affect the NPV over time

Factors	Reduce	Baseline	Increase
Departmental Participation	1 LRC, DHS, Sheriff (SCC), Fire, DMH and DPH (lab) do not participate	All Departments Participate (no LRC)	All Departments Participate (no LRC)
Capacity Requirements (changes after the 10 year mark)	2 10% Less 3 25% Less 4 50% Less (than expected)	Capacity Model assumptions remain valid	5 15% More 6 20% More 7 25% More (than expected)

**Changes for scenarios 2-7 are only done for FY26-32

1. Scenario 1: Lower Departmental Participation
2. Scenario 2: 10% less capacity requirements
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4. Scenario 4: 50% less capacity requirements
5. Scenario 5: 15% more capacity requirements
6. Scenario 6: 20% more capacity requirements
7. Scenario 7: 25% more capacity requirements

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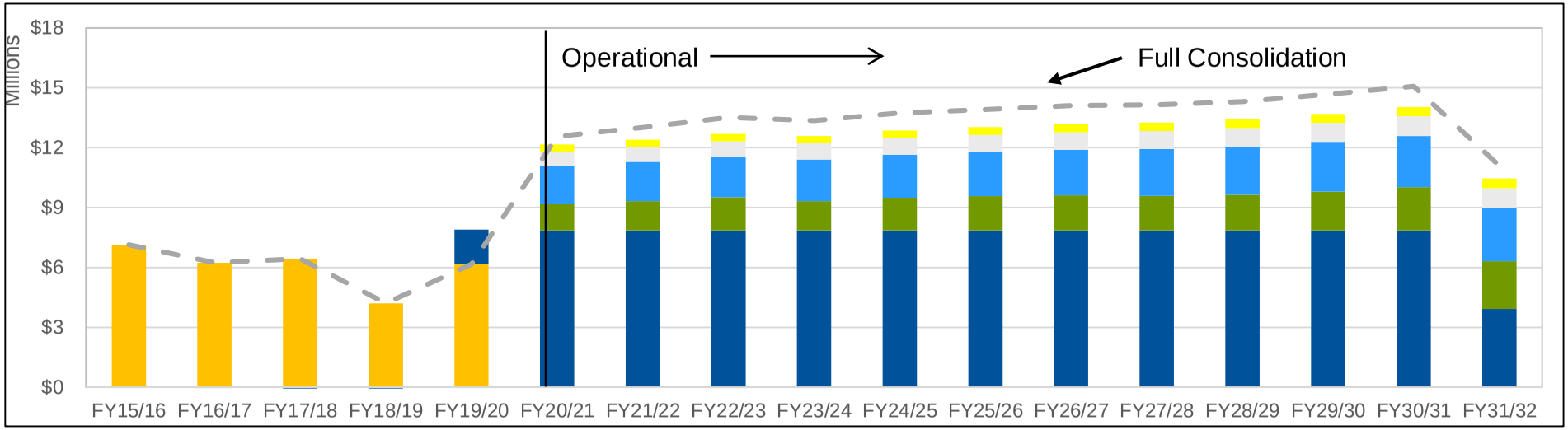
The 15 year NPV of the build option under the lower consolidation scenario is expected to be $131M, $7M less than the full consolidation scenario



Bond Incurred*		$90M															
Bond Debt Service	$0M	$0M	-$0.1M	-$0.1M	$1.9M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$8.7M	$4.4M
Utility Cost	$1.2M	$1.6M	$1.8M	$2M	$2.1M	$1.4M	$1.6M	$1.8M	$1.6M	$1.8M	$1.9M	$1.9M	$1.9M	$1.9M	$2.1M	$2.3M	$2.6M
Facility Operation Staff	$1.1M	$1.2M	$1.2M	$1.3M	$1.3M	$1.9M	$2M	$2M	$2.1M	$2.1M	$2.2M	$2.3M	$2.3M	$2.4M	$2.5M	$2.6M	$2.6M
Service and Supplies	$0.5M	$0.5M	$0.6M	$0.6M	$0.6M	$0.7M	$0.8M	$0.8M	$0.8M	$0.8M	$0.8M	$0.9M	$0.9M	$0.9M	$1M	$1M	$1M
IT Consulting	$0.1M	$0.1M	$0.1M	$0.1M	$0.1M	$0.3M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.4M	$0.5M	$0.5M	$0.5M
Downey Lease	$0.3M	$0.3M	$0.3M	$0.3M	$0.3M												
Downey Life Extension Costs	$3.9M	$2.5M	$2.5M	$0M	$0M												
Cash Flow	$7.1M	$6.2M	$6.4M	$4.2M	$6.4M	$12.4M	$12.7M	$12.9M	$12.8M	$13.1M	$13.2M	$13.4M	$13.4M	$13.5M	$13.8M	$14.1M	$10.1M

Orange = Downey Costs

15 Year Cost:	**$184M**
Residual Value:	**$0M**
Total:	**$184M**

15 Year NPV:	**$131M**
Residual Value NPV:	**$0**
Total:	**$131M**

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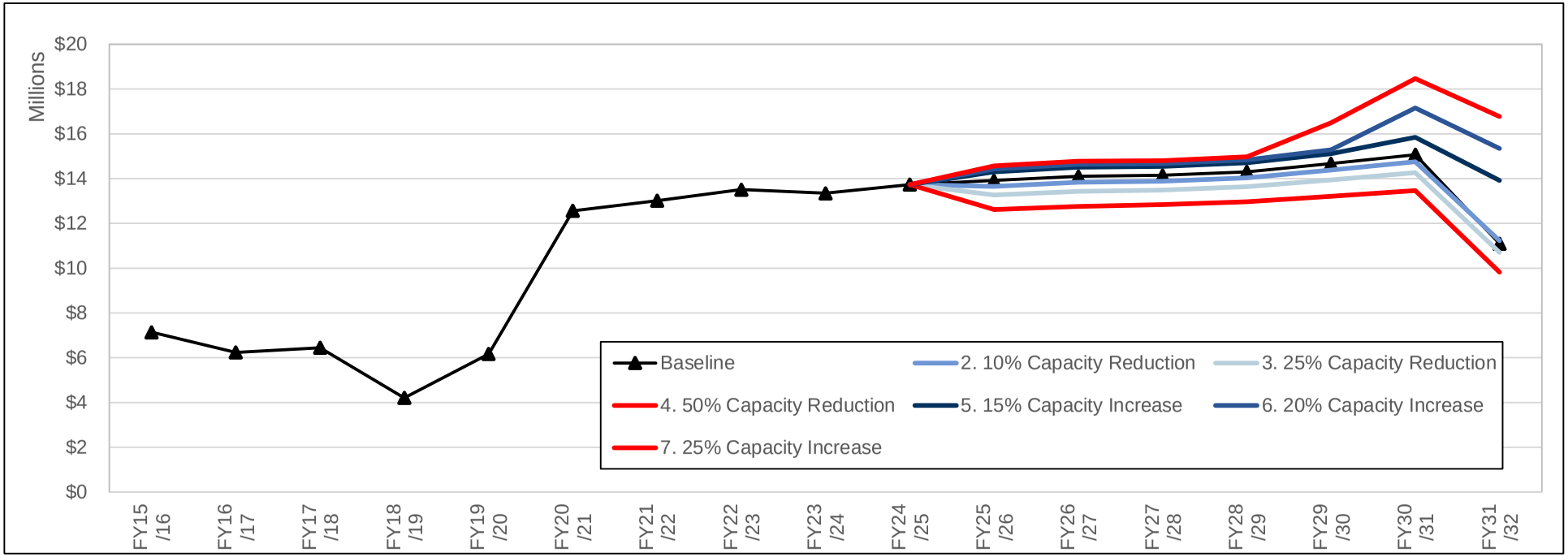
Changes in capacity requirements in FY26-32 result in a -$12M to +$11M variance from the baseline NPV



Scenario	15 Year NPV	Variance from Baseline	Scenario	15 Year NPV	Variance from Baseline
Scenario 2: 10% less capacity requirements	$192M	-$4M	Scenario 5: 15% more capacity requirements	$199M*	$3M
Scenario 3: 25% less capacity requirements	$189M	-$7M	Scenario 6: 20% more capacity requirements	$203M*	$7M
Scenario 4: 50% less capacity requirements	$184M	-$12M	Scenario 7: 25% more capacity requirements	$207M*	$11M

*Capacity exceeds 2.1MW – analysis includes $8,000 per kW for upgrades to accommodate extra capacity

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Alternatives Analysis

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Gartner used the below requirements to inform the development of alternatives approaches for achieving the future state vision

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

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

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

Alternatives for Achieving the Future State Vision

See appendix A for further detail

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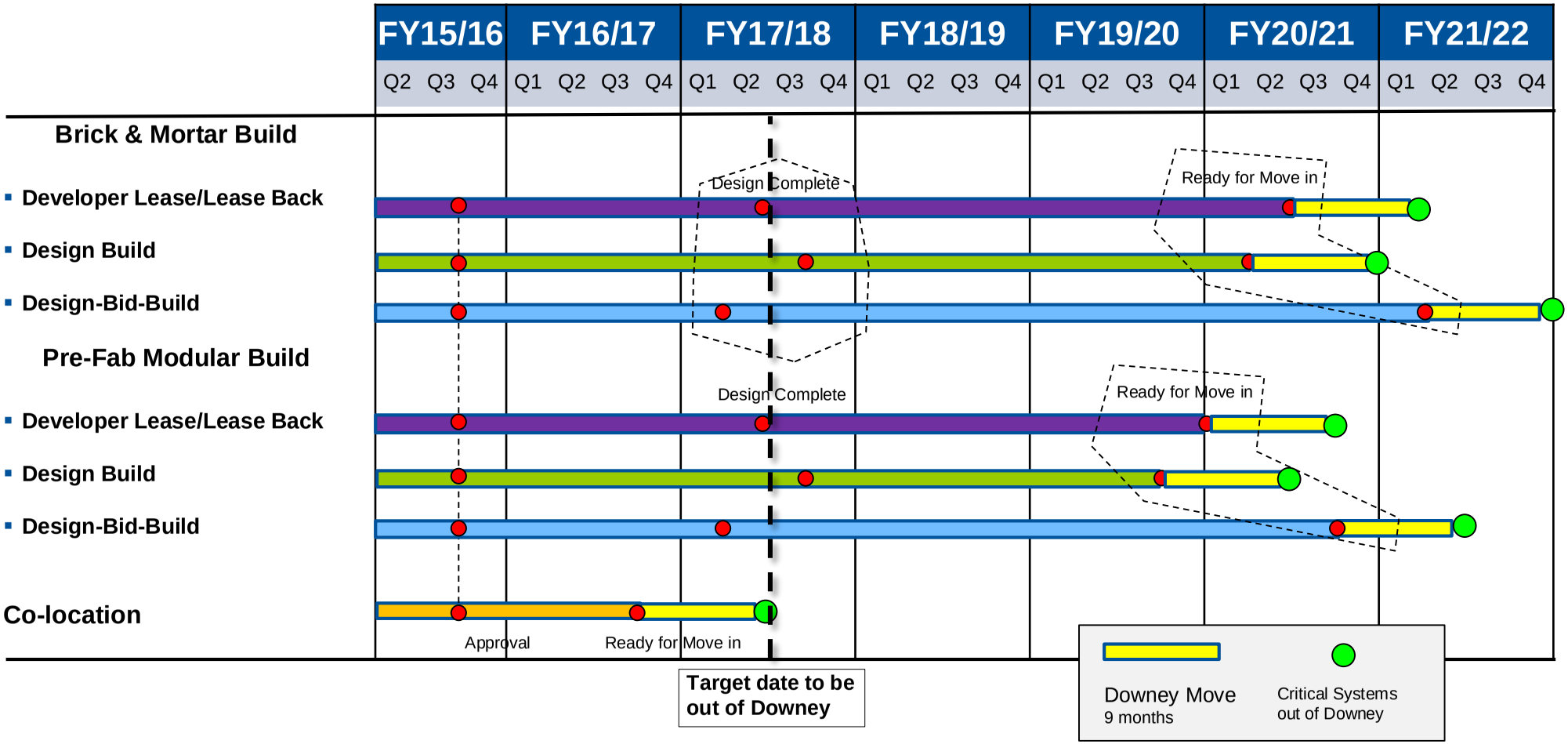
Gartner worked with DPW to establish the time to occupancy for construction, which will take 3 to 4 year longer to implementation than co-location



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From County's requirements and industry best practices the following evaluation criteria was created

Category	Weight	Sub-category	Considerations	Importance
Cost	20%	Total Cost	Total cost (lowest 10 year NPV)	H
		On-going Operational Costs	Yearly operational costs in steady state	M
		One-time Cost	One-time costs including build and transition	M
Operational Excellence	25%	Performance and Availability	Uptime, availability of data and services, performance of key services, continuous availability	H
		Control of Operations	Span of control (degree of management control), ability to change services based on need, ability to enforce standards/policies/governance processes	L
		Future State Capabilities	Ability to use new technologies, tools, & processes, ability to customize IT Services, ability to implement best practices for operations and service delivery, access to diverse carriers, lower network latency, ability to change carriers	M
		Management Ease	Overall ease of operational management, access to trained staff for operating mission critical data centers, access to established policies and procedures, access to pre-deployed tools	L
		Agility	Flexibility, scalability and elasticity of capacity, speed to change	M
Time to Steady State	15%	Speed and schedule to implement strategy	Minimize transition time and effort to future steady state	H
Operating Risks	25%	Strategic	Risk that a change in the County's business strategy renders the Data Center Strategy obsolete	M
		Organization	Risk that a change in the County's or the service provider's organizations or personnel impacts the ability to deliver using the selected Strategy	M
		Solution	Risk that the solution selected does not live up to expectations or reaches obsolescence prematurely	L
		Disaster Exposure	Risk of exposure to natural and man made disasters	H
Transition Risks	15%	Schedule	Risk that the organization cannot implement the project on time or that the project timeline cannot be estimated correctly	H
		Operations	Risk of failure due to the magnitude of the complexity involved because of the project's scale, the degree of change required	L
		Financial	Funding risk and risk of cost over run or that project cost cannot be estimated correctly	M

KEY:
High – H
Medium – M
Low - L

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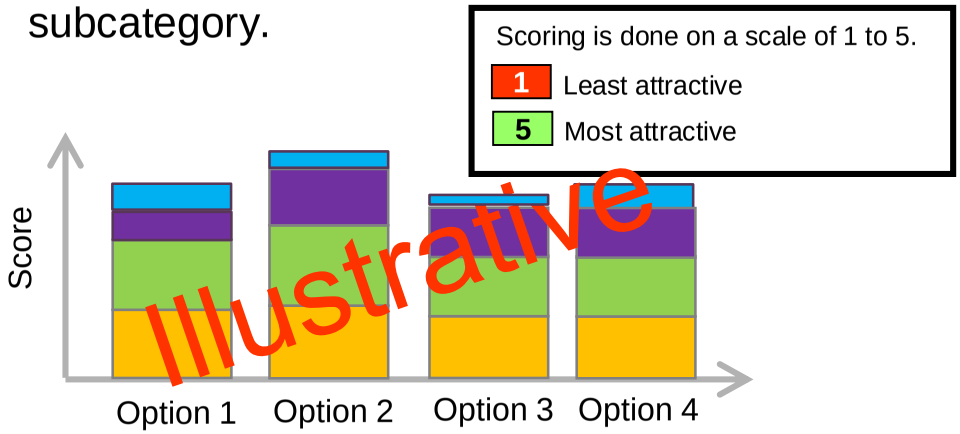
Options are then scored using the developed criteria on a scale of 1 to 5

Category	Weight	Sub-category	Importance
Cost	20%	Total Cost	H
		On-going Operational Costs	M
		One-time Cost	M
Operational Excellence	25%	Performance and Availability (Quality)	H
		County 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
Operating Risks	25%	Strategic	M
		Organization	M
		Solution	L
		Disaster Exposure	H
Transition Risks	15%	Schedule	H
		Operations	L
		Financial	M

- Options, have been evaluated against weighted criteria based on Gartner's understanding of LA County's environment, interviews with LA County IT POCs, and Gartner analyst, consultant, and research opinions.
- Scoring is done on a relative basis with 1 being the least attractive and 5 being the most attractive.
- Raw scores will be calculated based on the weights assigned to each category and subcategory.



KEY:
High – H
Medium – M
Low - L

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Gartner evaluated both options against the evaluation criteria based on current financial numbers and category weightings

Least favorable 🔴 🟠 🟡 🟢 🟢 Most favorable

Category	Weight	Sub-category	Importance	Build (Brick and Mortar)	Build (Pre-fabricated Modular) *, **,***	*Co-location*
Cost	20%	Total Cost (15 year NPV)	H	🟡 $182M	🟠 $194M*	🟢 $155M
		Operational Costs (15 year NPV)	M	🟢 $105M	🟢 $102M**	🟡 $155M
		One-time Cost (Construction Cost)	M	🔴 $72.9M	🟠 $65.6M***	🟢 $0
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 and exit Downey	H	🔴 4-6	🟠 4-5	🟢 1-3
Operating Risks	25%	Strategic Risk	M	🟠	🔴	🟢
		Organization Risk	M	🟡	🟡	🟢
		Solution Risk	L	🟡	🔴	🟢
		Disaster Exposure	H	🟠	🟠	🟡
Transition Risks	15%	Schedule	H	🔴	🔴	🟢
		Operations	L	🟠	🔴	🟢
		Financial	M	🟠	🟠	🟢

* Modular construction 17 year cost is higher than brick and mortar due to zero residual value after 15 years

** Operational savings result from a lower PUE of 1.3 vs. 1.4 for brick and mortar construction, resulting in better energy efficiency

*** Modular construction one time savings are estimated to be 10% of construction cost

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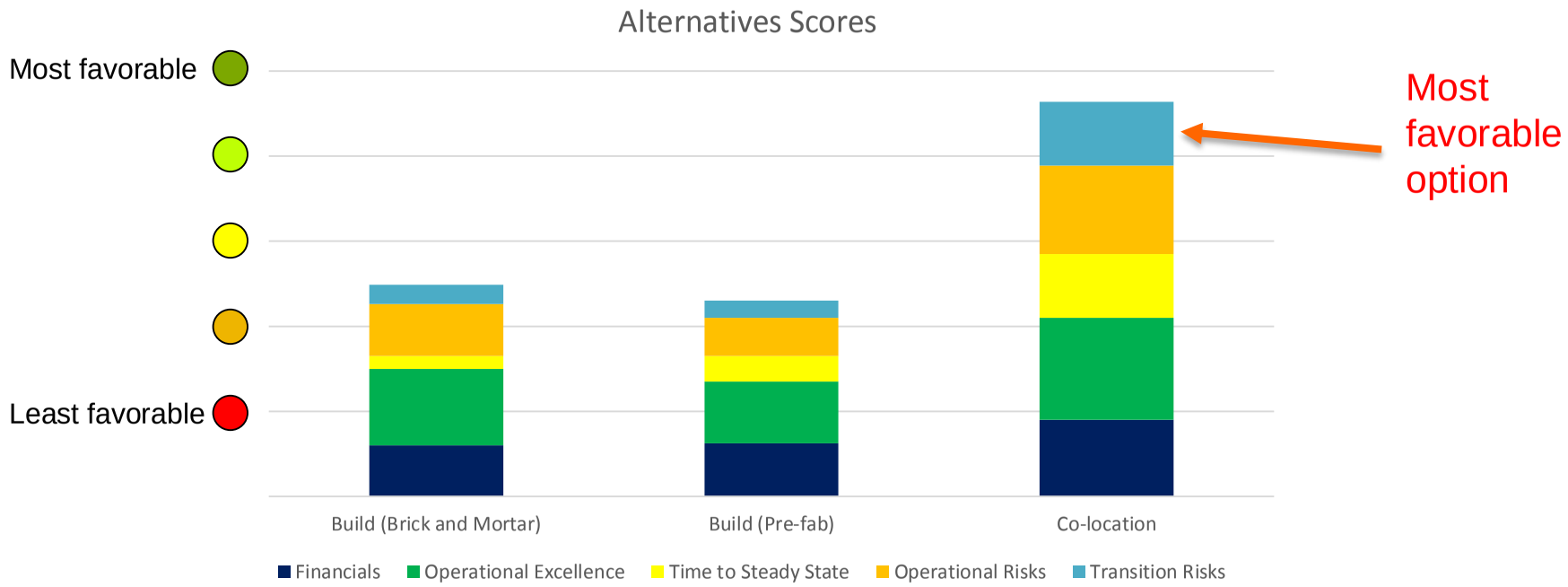
Using the current financial numbers and weightings, the co-location option is the best options



- Options, have been evaluated against weighted criteria based on Gartner's understanding of LA County's environment, interviews with LA County IT POCs, and Gartner analyst, consultant, and research opinions.
- Scoring is done on a relative basis with 1 being the least attractive and 5 being the most attractive (mapped to colors on this graph).
- Raw scores will be calculated based on the weights assigned to each category and subcategory.

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Appendix A

Alternatives Analysis Supporting Material

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We use these requirements to inform the development of alternatives approaches for achieving the future state vision

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

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

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

Alternatives for Achieving the Future State Vision

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Business Alignment and Agility

Data center future state must accommodate increasing role of IT in LA County's business

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 emerging alliances.
- Ability to offer competitive pricing (managing cost)
- Flexibility in changing in business model
- Responsiveness to regulatory changes for some departments

Future State Implications

- Data center solution must accommodate rapid change to functionality and service levels provided.
- Departmental expectations for competitive pricing will have to be met through leveraged staffing, mature processes, leveraged infrastructure (facility, cloud, etc.)
- Differentiated service levels based on application and/or service will be needed to meet unique requirements across the County.
- Over time more LA County systems will require high or continuous availability, and have increasingly demanding service levels that the Data Center solution must be able to meet.
- Distinction between primary and secondary data center will diminish in the future. Active-active services will be running from either site.
- Third-party services that include management of facilities and/or infrastructure stack should be considered, as they would allow LA County IT staff to focus on activities that are more impactful to the core business.
- Solutions that separate DC assets from other real estate assets should be considered as they provide greater flexibility for changing DC services.
- Consolidation of smaller data centers provides an opportunity to leverage assets and staff to improve agility.

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Business Growth and Scalability

Data center future state must accommodate growth in business while remaining elastic

Growth and Scalability

Examples

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

Future State Implications

- Future DC infrastructure must be scalable, modular and/or replicable to support organic and inorganic growth.
- Cloud (IaaS or PaaS) could provide the required elasticity in meeting future demand for some workloads and provide self-service and self provisioning capabilities.
- Data centers should accommodate higher density cabinets and infrastructure (Power and cooling).
- Data Center strategy should support consolidation of future IT environments as departmental participation could change, including systems with non-standard technology or operational requirements.
- Data centers need to be able to support significantly increased storage footprint to address data retention for practical, regulatory, and accessibility reasons.
- Power, space, and cooling requirements could continue to shrink with technology inflection points and proliferation of hybrid and SaaS cloud services.

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Operational Efficiency

Data Center solution must deliver high operational efficiency

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

Future State Implications

- Consolidation of data centers will create new opportunities for improved standardization and optimization.
- A consolidated DC environment will require well trained 7x24x365 mission critical facilities operations staff that are dedicated to the facility. Leased commercial facilities for example provided this capability as part of their offering.
- Proven and well tested facilities operating processes and procedures should be implemented. Again these capabilities are easier to obtain from experienced service providers.
- Consideration should be given to provisioning future capacity in a timely manner. Factors such the following should be given careful consideration.
  - Budget approval cycles
  - Time required for internal approval processes vs. agility of service providers

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Appendix B

Detailed Scoring Matrix

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Gartner evaluated both options against the evaluation criteria based on current financial numbers and category weightings

Least favorable 🔴 🟠 🟡 🟢 🟢 Most favorable

Category	Weight	Sub-category	Importance	Build (Brick and Mortar)	Build (Pre-fabricated Modular) *, **,***	*Co-location*
Cost	20%	Total Cost (15 year NPV)	H	🟡 $182M	🟠 $194M*	🟢 $155M
		Operational Costs (15 year NPV)	M	🟢 $105M	🟢 $102M**	🟡 $155M
		One-time Cost (Construction Cost)	M	🔴 $72.9M	🟠 $65.6M***	🟢 $0
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 and exit Downey	H	🔴 4-6	🟠 4-5	🟢 1-3
Operating Risks	25%	Strategic Risk	M	🟠	🔴	🟢
		Organization Risk	M	🟡	🟡	🟢
		Solution Risk	L	🟡	🔴	🟢
		Disaster Exposure	H	🟠	🟠	🟡
Transition Risks	15%	Schedule	H	🔴	🔴	🟢
		Operations	L	🟠	🔴	🟢
		Financial	M	🟠	🟠	🟢

* Modular construction 17year cost is higher than brick and mortar due to zero residual value after 15 years.

** Operational savings result from a lower PUE of 1.3 vs. 1.4 for brick and mortar construction, resulting in better energy efficiency.

*** Modular construction one time savings are estimated to be 10% of construction cost.

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Scoring of Alternatives (1 of 4)

Category	Sub-category	Opt 1 Build (B&M)	Opt 2 Build (Pre-fab)	Opt 3 Co-lo	Considerations
Cost	Total Cost (15 year NPV)	3	2	5	Pre-fab construction total cost is higher than brick and mortar due to zero residual value after 15 years, resulting in the lowest score. Option 1 has the next highest total 15 year NPV. Co-location has the most favorable score due to its lowest 15 year NPV by nearly $40M.
	On-going Operational Costs (15 year NPV)	4	5	3	Pre-fab construction has the lowest operating cost due to better energy efficiency. It is very closely followed by brick and mortar construction. Co-location has the highest operating cost due to the lease cost of the facility.
	One-time Cost	1	2	5	Co-location does not have any construction cost, therefore it receives the highest possible score. Pre-fab construction one time savings are estimated to be 10% of brick and mortar construction cost.

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Scoring of Alternatives (2 of 4)

Category	Sub-category	Opt 1 Build (B&M)	Opt 2 Build (Pre-fab)	Opt 3 Co-lo	Considerations
Operational Excellence	Performance and Availability	4	3	5	Uptime, availability of data and services and performance of key services will be better in a co-lo facility due to contractual commitments to SLAs as well as well established and tested methods and procedures. Pre-fabricated data centers are scored lower due to their lack of track record as enterprise data centers and Tier III capability.
	Control of Operations	5	4	3	Span of control (degree of management control), ability to change services based on need, ability to enforce standards/policies/governance processes are best in an owned and operated facility. Pre-fabricated facilities are scored lower than brick and mortar due to their limited flexibility in configuring the computer space and limitation on the type of equipment that can be installed (limiting control).
	Future State Capabilities	4	3	5	Co-location will provide the best ability to use new technologies, tools, & processes, ability to customize IT Services, ability to implement best practices for operations and service delivery, access to diverse carriers lower network latency, and ability to change carriers. Brick and mortar construction is scored higher than pre-fabricated because of the rigidity of pre-fabricated modular DCs in accommodating heterogeneous computing environments.
	Management Ease	3	3	5	Co-location removes complexities of facilities operational management, access to trained staff for operating mission critical data centers, access to established policies and procedures, access to pre-deployed tools. It therefore scores the highest.
	Agility	2	2	5	Co-location will provide the best flexibility, scalability and elasticity of capacity, speed to change for the long run. County will be able to readjust the capacity periodically every 3 to five years if capacity exceeds demand. It will also be easier to add or change network carriers, add capacity, and implement managed services in the future in a co-location environment.

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Scoring of Alternatives (3 of 4))

Category	Sub-category	Build (B&M)	Build (Pre-fab)	Co-lo	Considerations
Time to Steady State	Speed and schedule to implement strategy	1	2	5	These scores are driven by the overall implementation schedule. The build option could take 4 to 6 years to complete. Although pre-fabricated construction could reduce the schedule by as much as 6 months, the overall timeline will still remain significantly higher than the 1-3 year timeframe that is need to enter into a co-location agreement. Co-location therefore receives the most favorable score.
Operating Risks	Strategic	2	1	4	Pre-fabricated modular construction carries the highest strategic risk, since the solution does not have a solid track record for an enterprise data center. This solution may also exhibit difficulty in supporting a wide range of heterogeneous equipment and does not perform well when the power densities are low. Pre-fabricated facility can not be repurposed and has little to no residual value should the county move towards a cloud infrastructure in the future. Co-location has the lowest strategic risk since, capacity, location, methods of delivery, and transition to cloud will be simpler and more easily accomplished.
	Organization	3	3	5	Co-location facility has minimum dependencies on the County's organizational roles and responsibilities for continued operation. Risk that a change in the County's or personnel impacts the ability to deliver services is the lowest for this option.
	Solution	3	1	5	Risk that the solution selected does not live up to expectations or reaches obsolescence prematurely is much less for a co-location option. Pre-fabricated solution scores the lowest because the solution may not be a good fit for future technologies. Both build options carry additional risks that the design may fail to accomplish the stated objectives.
	Disaster Exposure	2	2	3	All options will have exposure to local disasters, but co-location options could provide better recoverability capability since many co-location providers operate multiple sites and could provide recovery space in their facilities that are not impacted during the disaster.

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Scoring of Alternatives (4 of 4)

Category	Sub-category	Build (B&M)	Build (Pre-fab)	Co-lo	Considerations
Transition Risks	Schedule	1	1	5	Deign and build of new facilities could take 4-6 years. Finalizing a co-location agreement could take 1-3 years. Co-location is therefore scored highest.
	Operations	2	1	5	Risk of failure due to the magnitude of the complexity involved because of the project's scale and the degree of change required is much more limited for the co-location option. For co-location county does not need to operate a new facility and dos not have to manage complex construction and facilities commissioning processes.
	Financial	2	2	5	Any form of construction has the greatest possibility for cost over runs when compared to co-location where construction is not required and overall cost of staying in and operating the facility is well defined contractually.

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Detailed Primary Data Center Acquisition Evaluation

	Alte+C3: Build		Build (Brick and Mortar)		Build (Pre-fab)		Co-location	
Level 1	Level 2	Weight (L1, L2)	Raw Score (CW)	Weighted Score	Raw Score (CW)	Weighted Score	Raw Score (CW)	Weighted Score
Cost		20%	8	0.55	9	0.55	13	0.90
	Total Cost	50%	3	1.5	2	1	5	2.5
	Operational Cost	25%	4	1	5	1.25	3	0.75
	One-time Cost	25%	1	0.25	2	0.5	5	1.25
		100%						
Operational Excellence		25%	18.00	0.90	15.00	0.73	23.00	1.20
	Performance and Availability	40%	4	1.6	3	1.2	5	2
	Control	10%	5	0.5	4	0.4	3	0.3
	Future State Capabilities	20%	4	0.8	3	0.6	5	1
	Management Ease	10%	3	0.3	3	0.3	5	0.5
	Agility	20%	2	0.4	2	0.4	5	1
		100%						
Time to Steady State (Migration)		15%	1.00	0.15	2.00	0.30	5.00	0.75
	Speed of Implementation	100%	1	1	2	2	5	5
		100%						
Operating Risks		25%	10.00	0.61	7.00	0.45	17.00	1.04
	Strategic	25%	2	0.5	1	0.25	4	1
	Organization	25%	3	0.75	3	0.75	5	1.25
	Technology	20%	3	0.6	1	0.2	5	1
	Disaster Exposure	30%	2	0.6	2	0.6	3	0.9
		100%						
Transition Risks		15%	5.00	0.23	4.00	0.20	15.00	0.75
	Schedule / Planning	50%	1	0.5	1	0.5	5	2.5
	Transition Complexity	15%	2	0.3	1	0.15	5	0.75
	Financial	35%	2	0.7	2	0.7	5	1.75
		100%						
		100%	**42.00**	**2.44**	**37.00**	**2.23**	**73.00**	**4.64**

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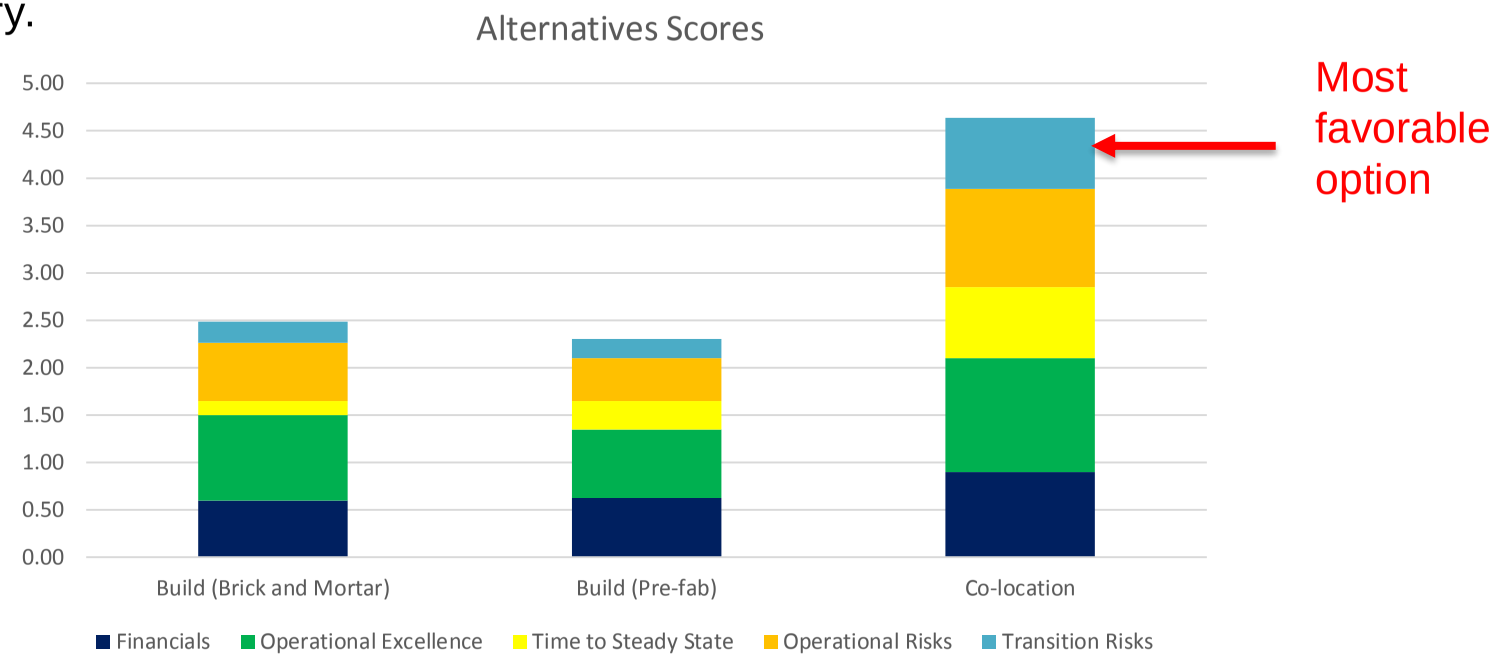
Results for Primary Data Center Acquisition Evaluation

- Options, have been evaluated against weighted criteria based on Gartner's understanding of LA County's environment, interviews with LA County IT POCs, and Gartner analyst, consultant, and research opinions.
- Scoring is done on a relative basis with 1 being the least attractive and 5 being the most attractive.
- Raw scores will be calculated based on the weights assigned to each category and subcategory.



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Appendix C

Consideration of Other Options

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Gartner started with the following five future state alternatives models for further analysis

	Description	LA Basin	60+ miles Disaster Strike Zone Separation	300+ miles Disaster Strike Zone Separation
1 **Status Quo Minimum Change**	• ISD Downey is primary and LRC is secondary • 49 departmental data centers that will shrink by ~15 from intra- departmental consolidations • Active-Active between Downey and LRC • Establish Sacramento Data Bunker for WCS*	Downey Tier II Primary DC LRC Tier II Secondary DC Department DC's		Sacramento Data Bunker
2 **Status Quo Consolidation**	• Consolidate departmental DC's into ISD Downey • Maintain LRC in OC for recovery • Active-Active between ISD Downey and LRC • Establish data bunker in Sacramento for WCS*	Downey Tier II Primary DC LRC Tier II Secondary DC		Sacramento Data Bunker
3 **New Primary outside of LRC Strike Zone**	• Acquire new Tier III primary DC outside disaster strike zone of LRC • Maintain LRC for recovery • Active-Active between Primary and Secondary • Sacramento Data Bunker Not Required	LRC Tier II Secondary DC	New Tier III Primary DC	
4 **New Primary and New Secondary**	• Acquire new Tier III primary facility in LA basin • Relocate LRC to outside the same disaster strike zone • Active-Active between Primary and Secondary • Sacramento Data Bunker optional	New Tier III Primary DC	New Tier III Secondary DC	
5 **New Primary in LA Basin, Keep LRC**	• Acquire new Tier III primary facility in LA basin • Keep LRC at OC • Data centers in same disaster strike zone • Establish data bunker in Sacramento	New Tier III Primary DC LRC Tier II Secondary DC		Sacramento Data Bunker

Note: The Team also considered an option in which the County would consolidate departments into existing DC's other than Downey but determined that it was not viable due to capacity constraints and other factors

*WCS = Worst Case Scenario

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

Category	Weight	Sub-category	Importance	1 Status Quo	2 Status Quo Consolidation	3 New Primary Outside LRC Strike Zone	4 *New Primary and New Secondary*	5 *New Primary in LA Basin Keep LRC*
Cost	20%	Total Cost (NPV)	H					
		On-going Operational Costs	M					
		One-time Cost	M	0.3X	0.3X	$X	$1.2X	$X
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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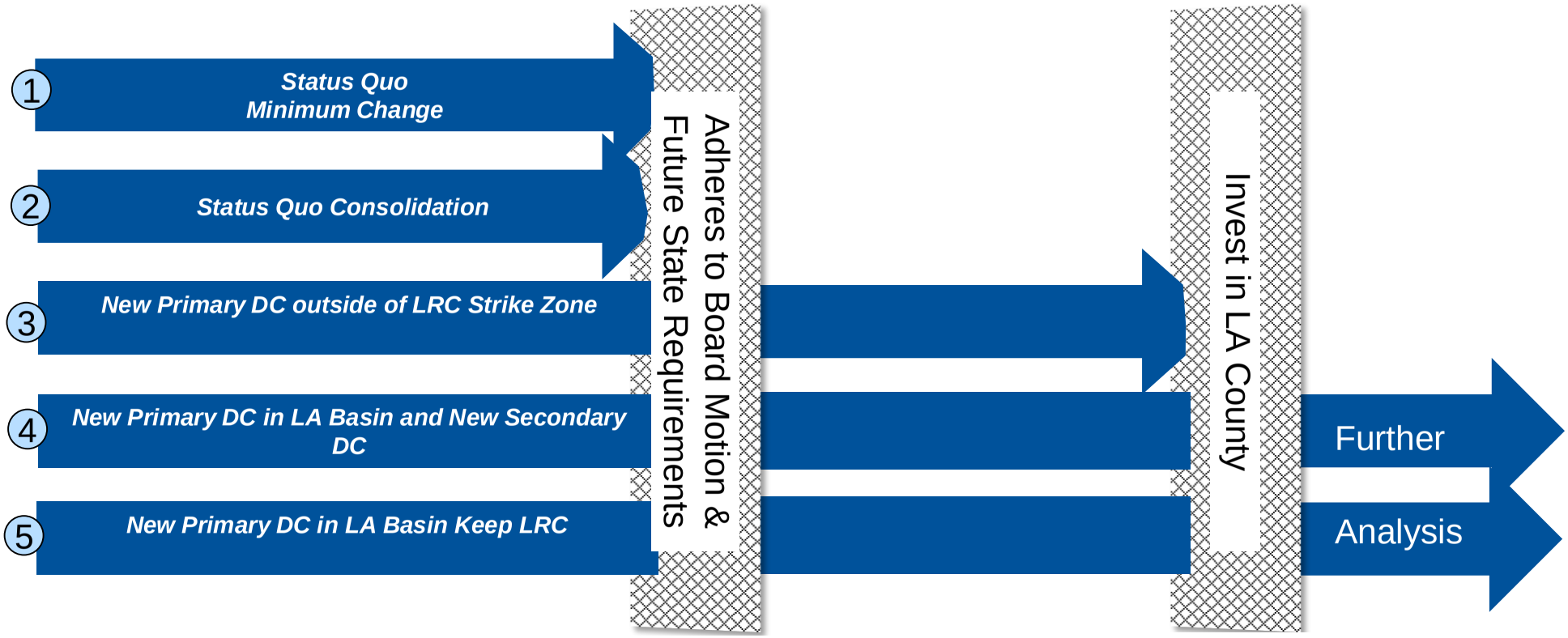
Two initial criteria were also applied to the models, indicating that options 1-3 do not match the Board motion or do not invest in LA County.



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.

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Contacts

Mehrdad Foroozesh
Sr. Director
Gartner Consulting
Telephone: 504-782-5093
mehrdad.foroozesh@gartner.com

Kirk Kirkpatrick
Managing Partner
Gartner Consulting
Telephone: 201-417-7824
Kirk Kirkpatrick@gartner.com

Hannes Scheidegger
Managing Partner Gartner Consulting
Telephone: 530-400-7147
Hannes.Scheidegger@gartner.com

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