OFFICE OF THE CITY ADMINISTRATIVE OFFICER (CAO)

2014 Selection of the City of LA

Asset Management System

PA Consulting

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EXECUTIVE SUMMARY

The City of Los Angeles performed a review of its asset management function in order to identify areas for improvement and focus. PA Consulting worked with the City Team specifically focusing on the way people, processes and systems are utilized to manage the City's real estate assets. As part of this work, PA reviewed the City's current real estate systems and has provided a short list of leading systems which should be used to support the City's transition to a more desirable future state.

The City currently uses a multitude of single-function asset management solutions which do not appropriately support its asset management functions:

- There are inefficiencies, arising from having to manually update and maintain the single-function solutions (most of which are spreadsheets)
- There is no self-service capability. Stakeholders have to manually request real estate data from the City's General Services Department (GSD) Real Estate Services Division (RES) which results in very long response times and distracts RES management and staff from completing their core functions
- There is no integration between the single-function solutions. Therefore, the processes that should be enabled by these solutions are unnecessarily segmented
- There is no single source of truth for data. Data is scattered across multiple solutions, requiring manual reconciliation, leading to data integrity issues

PA has worked with City Management and staff to recommend leading off-the-shelf Asset Management Systems (AMS) that address these challenges. For its selection process, PA took a holistic approach by considering the business requirements of multiple City departments such as the Office of the City Administrative Officer, RES and GSD's Building Maintenance Division.

PA ultimately shortlisted the following vendors:

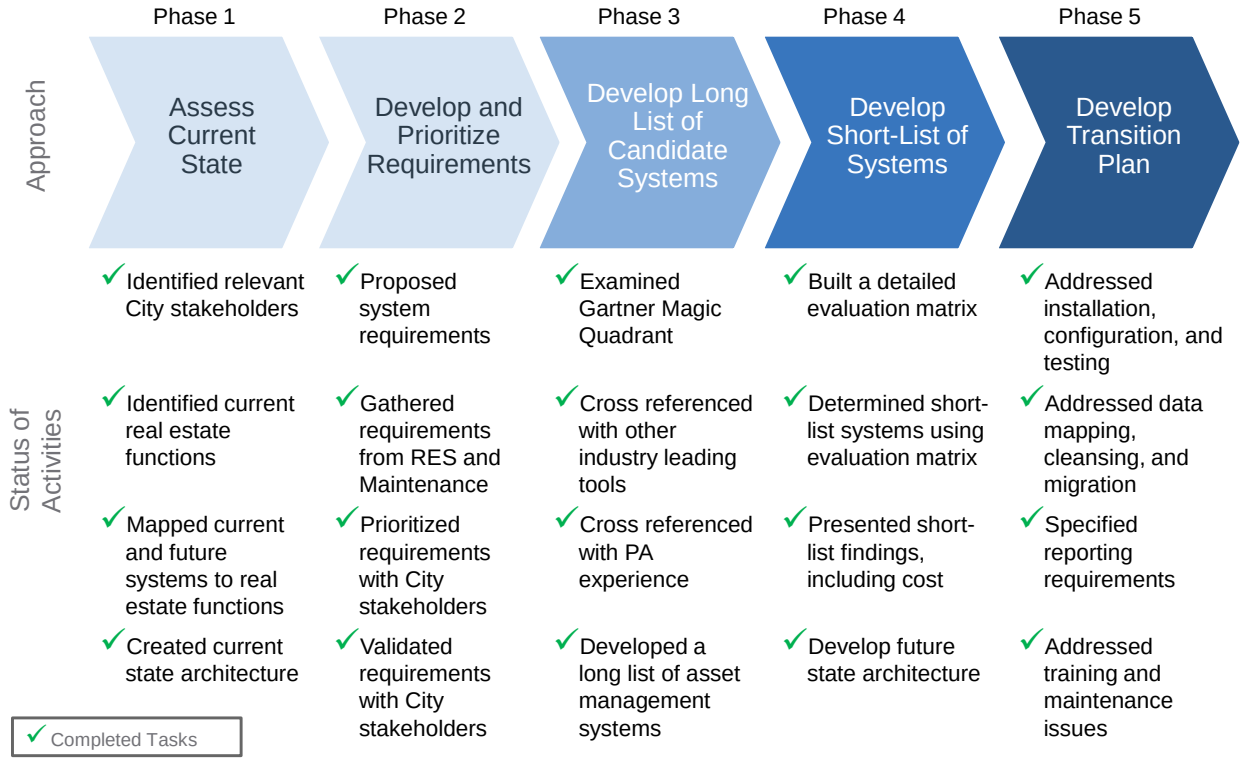
- IBM Tririga
- Archibus
- Manhattan Software
- FM-Systems
- AssetWorks.

Furthermore, PA has provided recommendations with regards to the implementation roadmap (or transition plan) for the City's new system which address key challenges such as data cleansing.

1 OUR APPROACH

PA has followed a five-phased approach in order to recommend market leading real estate systems, and to develop a transition plan (see Figure 1-1 below).

Figure 1-1: PA's Five-Phased Approach



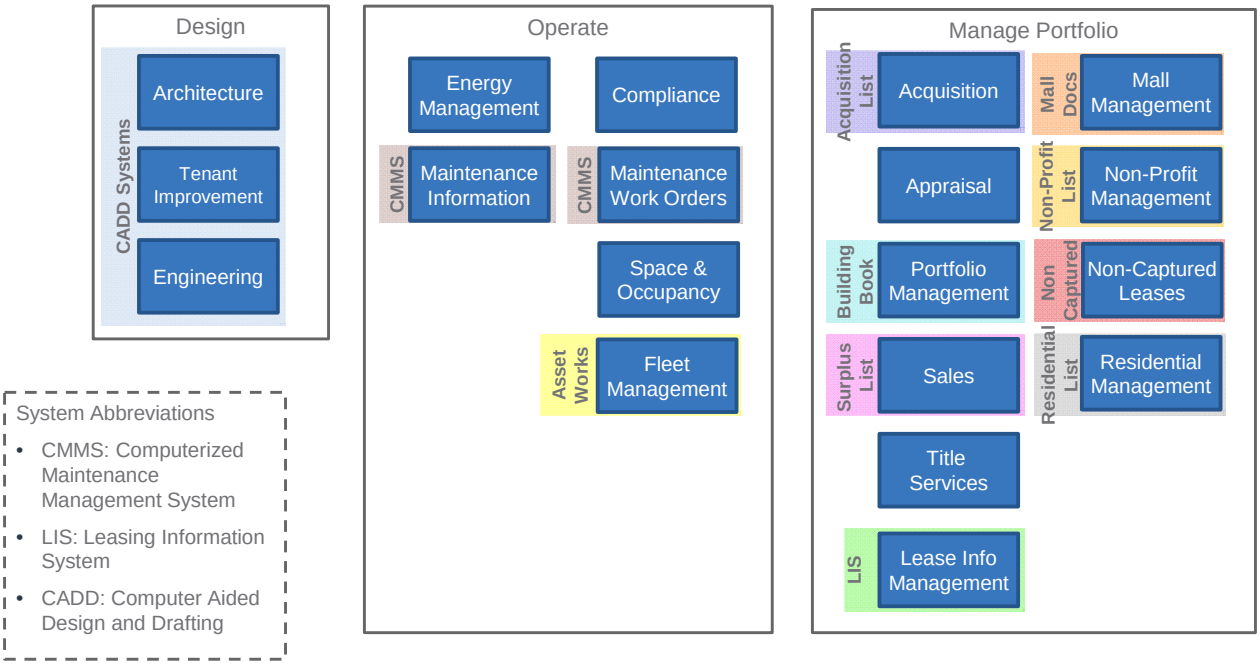
The structure of this report will follow the structure of Figure 1-1.

2 ASSSES CURRENT STATE

2.1 Current State Overview

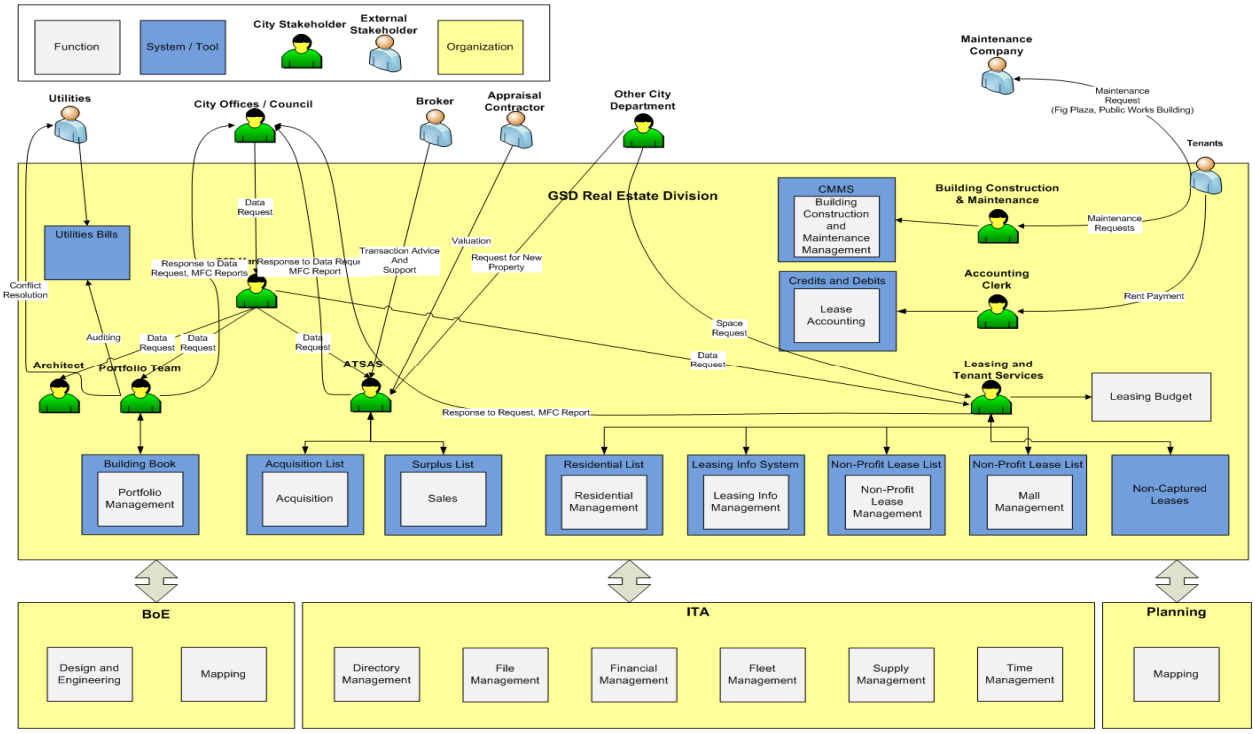
PA developed a high-level functional representation of the City's core real estate functions which formed the basis for mapping current and future real estate systems. The current state, depicted below in Figure 2-1, shows a number of single-function systems (for example, Fleet Management) and several functions that are not currently supported by any system (for example, Energy Management).

Figure 2-1: High-Level Current State Architecture



This current state architecture unnecessarily complicates the management inter-dependent processes and systems. A closer look at the current state architecture (see Figure 2-2 below) reveals a multitude of single-function solutions that lack integration and self-service capabilities.

Figure 2-2: More Detailed Current State Architecture



The City's current state architecture needs to be replaced by a more efficient, integrated and modern solution. The City's current real estate database architecture includes multiple Excel and Access databases which are:

- Not centralized
- Maintained independently by multiple owners within RES
- Not linked to each other
- Not accessible to stakeholders outside RES.

Some core real estate functions are not supported by any solution (for example, Space Optimization and Energy Management). Much of the real estate data:

- Is scattered across multiple databases
- Needs to be reconciled
- Is not comprehensive
- Is not standardized.

PA does not consider the current state to be sustainable during the next three to five years.

2.2 Proposed Future State

Of the City's current systems/tools, only AutoCAD and AssetWorks are viable systems for future asset management related use. Figure 2-3 below differentiates viable from non-viable systems.

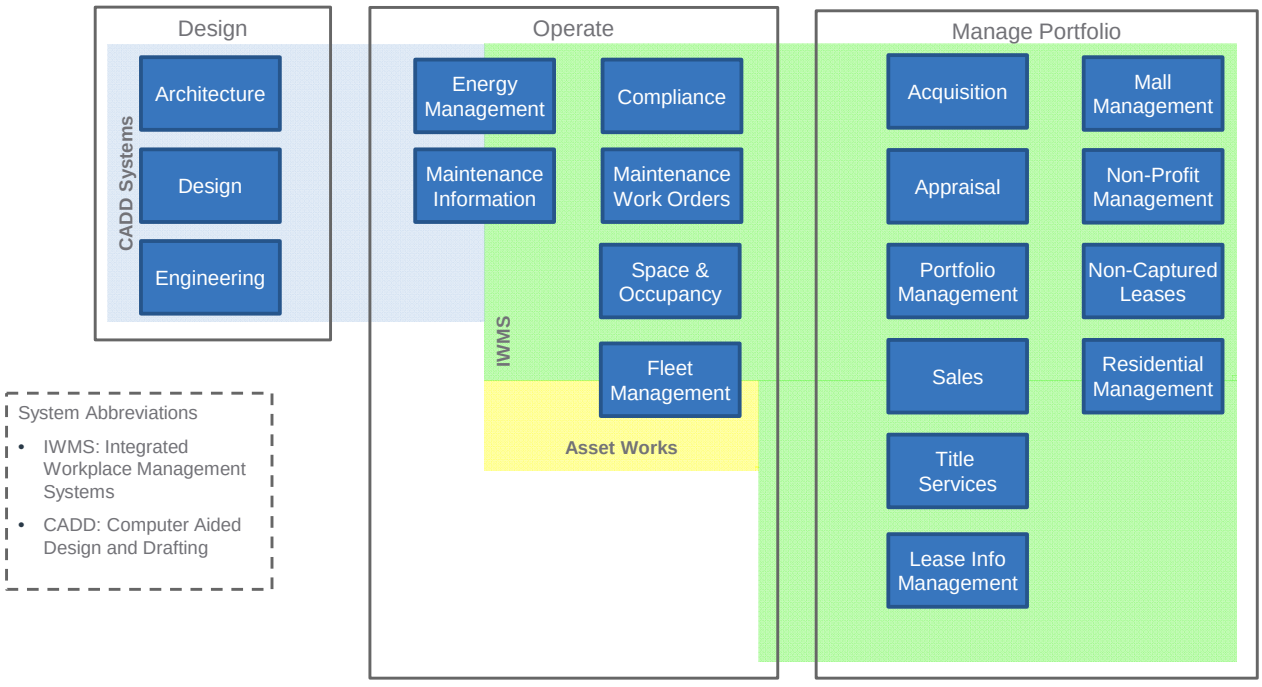
Figure 2-3: Future Viability of Current Systems and Tools

Legend : No future viability for current system : Viable system going forward

Current System	Comments	Future Viability
Acquisition List	Custom MS Excel spreadsheet to track recently acquired real estate assets	
AssetWorks	System currently used for fleet management, but additional software modules have capability in building facilities management (IWMS) space	
AutoCAD	Market leading system for design and engineering, recently upgraded by BoE, with strong capability in maintenance, energy & compliance management	
Building Book	Custom MS Excel spreadsheet used to track real estate assets for portfolio management purposes	
CMMS	Computerized Maintenance Management System – vendor out of business and software no longer supported – needs replacement	
Leasing Info System	Custom MS Access database used to track lease management	
Mall Docs	Custom folder structure to track mall management documents	
Non-Captured Leases	Custom list to track leases that are not recorded elsewhere	
Non-Profit Leases	Custom MS Excel spreadsheet used to track leases provided to non-profit organizations	
Residential List	Custom MS Excel spreadsheet used to track the City's residential leases	
Surplus List	Custom MS Excel spreadsheet used to track the City's properties for sale	

The future state would involve the adoption of an integrated, multi-function Integrated Workplace Management System (IWMS) system that would co-exist with other core City systems, as shown below in Figure 2-4.

Figure 2-4: Future Viability of Current Systems and Tools



The precise boundaries of the new IWMS system modules and existing systems will need to be finalized during the RFP process. The RFP process will provide the City with a greater level of understanding and familiarity with the capabilities of the preferred IWMS system and will enable clearer requirements and decisions about the optimal architecture and interfaces to be acquired.

During the RFP, additional modules providing IWMS functionality will be assessed to determine whether:

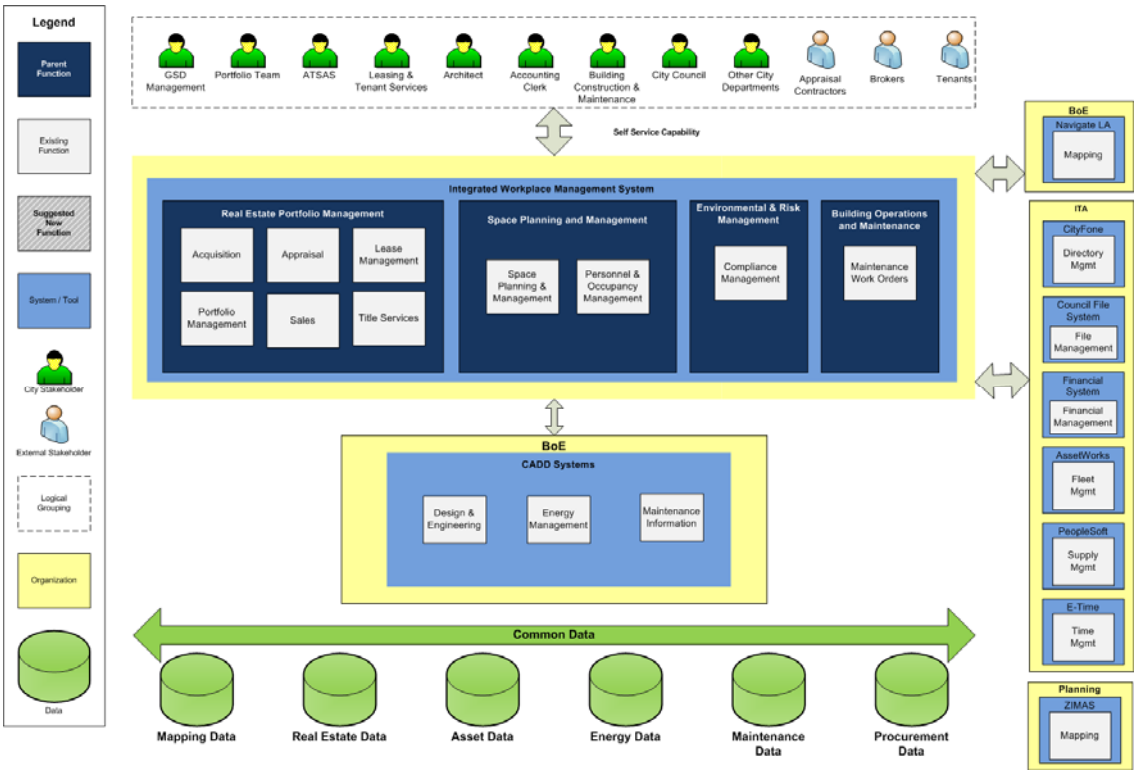
- AssetWorks has the IWMS functionality to meet the requirements provided by the City
- AssetWorks for fleet management should be retained or retired.

The parent company which owns AutoCad, AutoDesk, has a building design product that supports building information modeling, building maintenance, energy-efficient building design and includes an energy analysis module. The RFP process will need to assess in parallel whether:

- Autodesk modules should be used for energy analysis and maintenance – leveraging the underlying information and specifications associated with the building and maintained by the Bureau of Engineering (BOE)
- Energy efficiency and maintenance should be managed within the IWMS modules with an interface into the AutoDesk system to access the underlying data required by IWMS
- Maintenance and work order dispatch should be a separate system with interfaces to both AutoDesk (underlying building date) and IWMS.

The future state architecture provides a self-service, multi-function and integrated system as shown below in Figure 2-5.

Figure 2-5: Proposed Future State Architechture



3 DEVELOP AND PRIORITIZE REQUIREMENTS

3.1 Requirements Development Process

Requirements were collected at three levels and catalogued as follows:

- Business requirements – outlining what key capabilities and services the solution should provide that will lead to the desired outcomes for the City
- Functional requirements – defining the key functions, capabilities and ways of doing things that the system must provide in order to meet the business requirements. These requirements have measurable and testable outcomes
- Technical requirements – standards mandated by the City's architecture, infrastructure and applications group as essential in order to be supportable by the City

An analysis of requirements is considered of key importance because all functional and technical requirements should have a direct relationship back to one or more specific business requirements. Detailed Requirements and Requirements Analysis are captured in an Excel Spreadsheet and are provided in the Appendices.

The high level business requirements were used to select the appropriate vendors to be included in the RFP solicitation. Given that the City stakeholders do not have a comprehensive view of the capabilities and functions that IWMS systems are able to provide, there is a likelihood that any functional requirements defined will change as they gain familiarity with the vendor systems capabilities as part of the RFP process.

3.2 Business Requirements

PA collected a set of Business Requirements in discussion with City stakeholders in order to:

- Describe requirements covering both IT Service and Business Process aspects
- Inform the development of capabilities required to deliver the vision
- Inform early thinking around options for Service delivery, technology drivers and technical architecture
- Inform the development of a Target Operating Model
- Form the basis for a capability gaps analysis of the organization's current capabilities
- Form the basis for the development of detailed requirements for system selection
- Document a set of requirements for business change in a format that is most conducive to change

Detailed Business Requirements are presented in Appendices D.1 – D.5.

3.3 Functional Requirements

The purpose of the Functional Requirements Catalog is to:

- Document functional requirements in terms of measurable and testable outcomes and specific capabilities
- Document sources for each requirement to ensure traceability
- Document the justification for each requirement
- Inform and align with the technical requirements
- Inform and align with the system selection strategy

Detailed Functional Requirements are presented in Appendices E.1 – E.4.

3.4 Technical Requirements

The purpose of the Technical Requirements Catalog is to:

- Document a set of detailed requirements that aides in system selection activities
- Support the development of RFP documentation and execution of RFP process
- Support, where appropriate, the development of contractual agreements with suppliers

Detailed Technical Requirements are presented in Appendices F.1 – F.6.

3.5 Requirements Analysis

A thorough “requirements analysis” will help the City determine the degree to which the documented business requirements for AMS are satisfied by meeting the documented functional and technical requirements. These requirements analyses will likely prove important to the success of the City’s new Asset Management System and Services during the RRP process. The technical and functional requirements that have been documented must be actionable, measurable, traceable, related to identified business requirements, and defined to a level of detail sufficient to ensure implementation success.

- An analysis of General Requirements is presented in Appendix G.1
- An analysis of Real Estate Portfolio Management Requirements is presented in Appendix G.2

4 DEVELOP LONG- AND SHORT-LIST OF CANDIDATE SYSTEMS

The breadth of the City's requirements necessitated a broad review of possible systems in the vendor landscape (see Figure 4-1 below):

- PA looked at six related system categories to come up with the candidate long-list of 15 real estate systems for the City
- Typically Asset Management and Facilities Management systems have been the most aggressive in developing broad capability, expanding beyond their niche to include additional functional modules
- Design and Engineering systems (e.g., AutoCAD), have expanded their functionalities to include equipment maintenance and energy management
- Office and Space Management systems have evolved to include asset management and move management capabilities, but have often remained niche or been integrated into the broader integrated workplace management suites

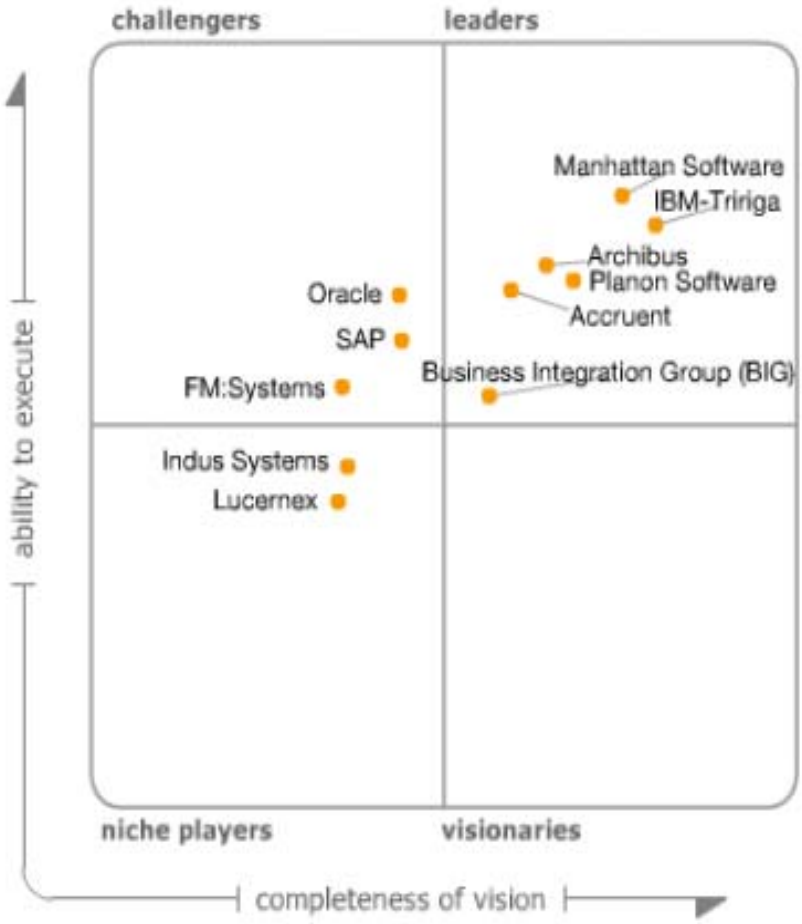
Figure 4-1: Vendor Landscape by System Categories

4.1 Gartner Magic Quadrant

The IWMS category has developed as the "'Enterprise Resource Planning" for Facilities with broad functionality previously provided by multiple vendors. PA used market research and the latest Gartner Magic Quadrant to select the 15 IWMS systems, which took into account:

- Vendors' ability to execute and their completeness of vision
- Feedback from actual users of the vendors' solutions
- The breadth and depth of vendors IWMS functionality
- Vendors' support capabilities
- The quality and consistency of vendors' documentation capabilities
- Vendors' value chain strengths
- Vendors of sufficient size were identified who could support the scale and complexity of the City's needs

Figure 4-2: Integrated Workplace Management Systems (Reflects 11 of the 15 "long-listed" systems)

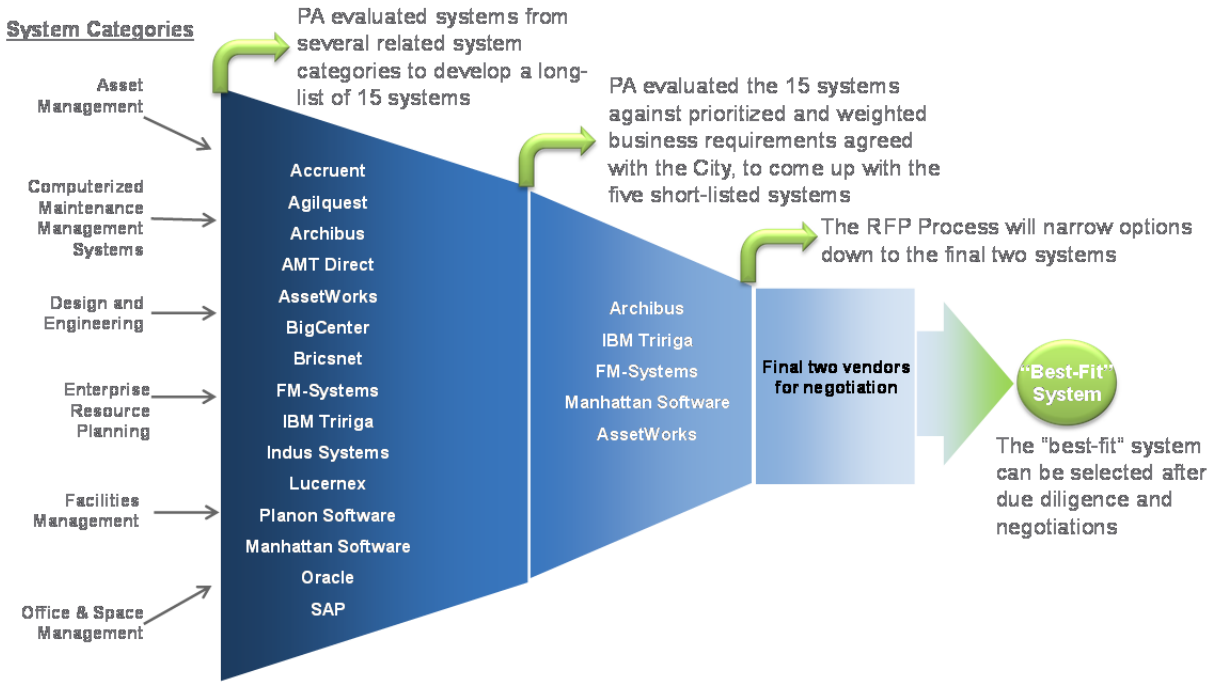


Source: Gartner, 17June 2013 Magic Quadrant for Integrated Workplace Management Systems

4.2 Long- and Short-List of Candidate Systems

PA went beyond the 11 systems characterized by Gartner – 15 "long-listed" systems were evaluated against prioritized and weighted business requirements agreed with the City, to come up with the 5 "short-listed" systems. Down-selection of these 5 IWMS systems was based on compliance with the proposed future state architecture and the City's business requirements and priorities. The high level requirements developed with the City enabled the team to short list vendors to be included within the RFP process.

Figure 4-3: "Best-fit" System Selection Process



4.3 A Closer Look at Five Short-Listed Vendors

A closer look at the five short-listed systems reveals the extent of coverage of the City's high level business requirements (see Figure 4-4 below).

- Three of the five systems PA short-listed (Archibus, Tririga and Manhattan Software) are listed as "leaders" in the latest Gartner Magic Quadrant for IWMS systems
- AssetWorks, which the City currently uses, ranked 5th. It has strong portfolio management, space planning, maintenance management and energy management capabilities. However, its Real Estate Portfolio Management module is not as comprehensive as its competitors
- PA also assessed two other systems currently used by the City: AutoCAD and IBM Maximo
  - AutoCAD's parent company AutoDesk has a Building Design product that supports Building Information Modeling, energy-efficient building design and has an energy analysis module. However, AutoCAD lacks portfolio management and building work order management capabilities
  - Maximo is being used by LADWP and LAWA. It has significant strengths in asset management but needs to be coupled with Tririga to provide real estate management functionalities

Figure 4-4: Recommended Short-Listed Systems for RFP Process

System	General Requirements	Real Estate Portfolio Management	Space Planning Management	Building Operation Maintenance	Environmental Management	Match against high level business requirements *
IBM Tririga	●	●	●	●	●	1
Archibus	◕	●	●	◕	●	2
Manhattan Software	◕	◕	●	●	●	3
FM-Systems	◕	◕	●	●	◕	4
AssetWorks	◕	◕	●	●	◕	5

*** Please note that this is a high level assessment of functionality against high level business requirements for the purpose of identifying vendors to include in the RFP process. It is not a recommendation of a preferred solution, as the RFP process will assess all solutions against a full set of requirements and following demos and vendor presentations.**

5 VENDOR SELECTION – THE RFP PROCESS

5.1 The RFP Process

A well thought through and executed RFP process is essential to optimize the outcome for the City facilities asset management initiative. The City should use the RFP process to "educate and inform" on the full range of capabilities of IWMS solutions. The RFP process should:

- Include a number of leading vendors
- Provide high level business requirements to assess vendor's innovative solution in their response, as opposed to detailed functional requirements that in any case would naturally evolve as the City gains a fuller understanding of the capabilities of the systems under review
- Provide time for vendor solutioning workshops to improve vendor's responses as well as the City's understanding prior to submission of final bid responses. These sessions will also provide further insight into the capabilities of any value added resellers (VARs) put forward by the software vendors
- Provide for sufficient level of due diligence in the down-selection process so that questions around hosting models (on premise, managed services or software as a service) as well as architecture and interface considerations can be effectively addressed
- Maintain parallel negotiations with two vendors to optimize alignment on scope, terms and pricing, before down-selecting favorite solution for completion of contract.

5.2 Benefits of the RFP Process

The City should leverage the RFP process as a learning opportunity that should result in a higher quality agreement and reduced risk during implementation. By following the RFP process, the City should be able to:

- Articulate the detailed business and functional requirements more clearly in the Statement of Work, given a better understanding of the system capabilities
- Create more precise definition, based on due diligence, for integration points, interfaces, and a phased approach to implementation, all of which would include specific milestone deliverables, milestone payments and penalties
- Provide the City with a clearer idea of the level of training required for users of the various system modules and the level of maintenance and support required for the new system and integration points
- Clarify internal resource requirements, and identify additional professional services support requirements to manage the system integration, provide program oversight, and manage any associated change management activities.

6 DEVELOP TRANSITION PLAN

6.1 Data Cleansing

The successful implementation of a new system is contingent on the use of sufficiently accurate and up-to-date real estate data. PA's initial high level review of the accuracy of the facilities data included in RES' real estate databases indicates that there is a concern about the data currently used:

- The square footage data is often inaccurate and/or missing, or does not match the data maintained by other departments (for instance Library, Recreation and Parks, etc.)
- The information included in the LIS database does not seem to be up to date
- The start and expiration dates of the non-profit leases is very often missing
- APN numbers are often missing
- Property duplicates exist across the databases

This situation emphasizes the need for the implementation of a rigorous and efficient data cleansing process. Focusing on key data vs. 'boiling the ocean' will be critical for the successful implementation of the cleansing process.

PA recommends that the City:

1. Focus on key fields that are critical for success, in other words:
    - Drive key operational or financial decisions about the facility
    - Without which the City teams cannot do their jobs properly
    - Are consistently used across departments
    - Are essential for the critical modules of the system which will be implemented first
2. Address secondary fields as a follow-up activity when non-critical modules are implemented
3. Segment the building portfolio to prioritize asset update focus by:
    - Importance of the building (e.g. large user base, subject to immediate sale, subject to grant funding associated with environmental improvements)
    - Level/volume of work associated with those properties
    - Level of information already available from BOE (e.g. around digitized floor plans)
4. Seek to embed data update/validation activities into routine maintenance
5. Develop a dashboard of data improvement to provide transparency on progress

The city should adopt a structured approach to ensure that its real estate data is accurate and up-to-date prior to rolling out the new system. PA recommends the implementation of the following data cleansing process, shown below in Figure 6-1.

Table 6-1: Summarized General System Business Requirements

Tasks	Task Owner	PA's Estimate of the Associated Time and Effort*
• For each real estate database, assess the accuracy and completeness of the data fields (for instance square footage, lease expiration date, etc.)	Real Estate Division	Low – 1 Week
• Identify data fields which should be added to the real estate databases, if any	Real Estate Division & BOE	Low – 2 Weeks
• Identify the properties which are the most valuable to the City and for which it is critical to have accurate and complete data	Real Estate Division	Medium – 1 Month
• Complete a pilot project collecting data for a subset of the most valuable properties to estimate the amount of effort and cost associated with cleansing and populating the fields of the properties identified in steps 1, 2 and 3	Real Estate Division & BOE	Medium – 2 Months
• Collect accurate data for the fields of the properties identified in steps 1, 2 and 3, and populate the databases accordingly	Real Estate Division & BOE	High – 6 Months

* These estimates may need to be revised based on discussions with the RES and BOE

PA also developed a draft template to assess the accuracy and completeness of the current database fields. PA proposes to assess the accuracy and completeness of each database field using the following template, shown below in Figure 6-1, which can be tailored to best match the City's needs.

Figure 6-1: Template for Assessing the Accuracy and Completeness of the Current Database Fields

Field Name	Field Description	Field Rules*	Owner	Critical Field (Y/N)**	Data Status	Comments***
Depart #		2 digit numeric	RES	Y		
Street #		Numeric	BoE	Y		
Street Name		Alphabetic	BoE	Y		
Zip Code		5 digit numeric	BoE	Y		
Thomas Bros		5 digit alpha-numeric	RES	Y		Large number of missing Thomas Bro numbers
Square Ft		Numeric	BoE	Y		Square footage is very often inaccurate or missing
Lease #		Alpha-numeric	RES	Y		Some Lease numbers are missing
APN		10 digit numeric	RES	Y		Large number of missing APN numbers

Legend:
Data is accurate and complete
Data is incomplete for some properties, appears to be inaccurate for some properties and/or may need to be updated
Data is inaccurate and/or incomplete for a significant number of properties
* The "Field Rules" column includes the format to be used for each data field
** A field set to non-critical ("N") reports information that if not 100% right would not be a major issue
*** The comments column includes the justification for the "Data Status" color assigned to each field

6.2 Road Map and Implementation Plan

The high level draft roadmap takes into account a variety of considerations in order to provide a pre-RFP view of the sequencing of initiatives:

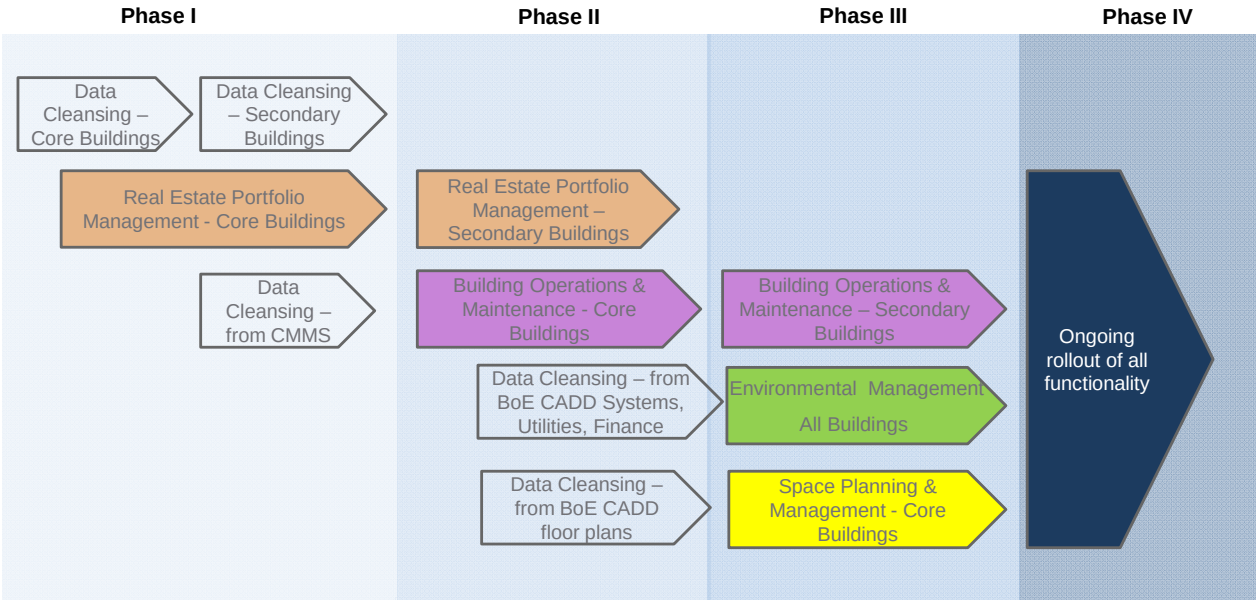
- The areas of greatest need within the City as expressed during the requirements discussions
- The areas most likely to receive senior stakeholder support
- The potential size/benefit of the opportunity
- Striking the right balance between quick-win initiatives to build momentum and 'transformative' initiatives to drive longer lasting operational changes
- The level of operational risk and complexity associated with the implementation
- Timing, dependencies and availability of cleansed data to support the system

The roadmap provides a framework for discussion among City stakeholders about the priority of initiatives, their dependencies to other initiatives taking place at the City and the appropriate business case and budgetary discussions that will take place to support investments in those initiatives.

As such, we fully expect the roadmap to change as this discussion progress both before and during the RFP process, the vendor due diligence, finalization of the agreement and the implementation planning with the selected vendor.

Figure 6-2 below provides a high-level initiative, four-phased roadmap for implementation of the AMS

Figure 6-2: High-level Initiative Roadmap



6.3 Critical Success Factors

The implementation of the new system will require strong governance, alignment and commitment within the City, including:

- **Strong leadership from senior executives** – providing commitment to seeing the changes through and the ability to cut across organization silos
- **Strong stakeholder management** – to ensure key constituents are engaged in the project, participate in discussion around tradeoffs and are working towards their phased implementation
- **Strong vendor commitment** – including professional services to support implementation, with ongoing maintenance & support at the appropriate level
- **Independent Project Management Organization (PMO) oversight for the program** – to effectively drive the change and benefits realization on behalf of the City and provide transparent and objective status on progress
- **Change Management** - end-to-end, cross-functional processes need to be modified in order to manage the full lifecycle of a facility and roll-out the functionality to the City users
- **Data cleansing** - the data used for each facility will need to be validated, updated and added to in order to meet the full functional requirements of the system during implementation
- **Data governance needs to be introduced** in order to preserve the integrity of the cleansed data and ensure clarity on data ownership and update
- **Effective testing against agreed requirements** – including strong City involvement system, functional and user acceptance testing
- **Funding and resources for staffing**

APPENDICES

A STRENGTHS AND WEAKNESSES OF SHORT-LISTED SYSTEMS

A.1 Strengths and weaknesses of two short-listed systems (IBM Tririga and Archibus)

Vendor / System	Strengths	Weaknesses
IBM Tririga	• IBM has strong integration between its portfolio, lease management, and lease accounting modules • IBM has made substantial progress in building a robust SaaS offering • IBM has robust real estate, facility, and energy management capabilities • IBM has brought rigor and structure to Tririga's upgrade process	• It is unclear whether IBM provides robust telecommunications and cable asset management capabilities • Pricing and support quality can be issues. IBM has kicked up Tririga's original pricing • IBM's move management module could be more robust particularly in providing enterprise-grade move management capabilities
Archibus	• The Archibus IWMS system has both breadth and depth. It has breadth in the form of its nine real estate management modules, each of which has the depth of functionality that exceeds the City's needs • Archibus is particularly strong in real estate management, building operations and maintenance, asset management, Building Information Modeling (BIM) 4.0, and environmental sustainability and risk management • Archibus's robust and integrated commercial-off-the-shelf (COTS) structure allows for rapid time-to-value deployments (e.g., tangible results within 90 days of implementation)	• Archibus depends heavily on its extensive federated network of authorized third-party value-added software and service partners. This makes customers largely dependent on the quality and capabilities of Archibus's partners • Some customers indicate that its documentation is overly technical and not targeted to end-users. Archibus has room for improvement in its reporting and printing capabilities, and in its communications with regard to upgrades • It is unclear how robust Archibus's mobile capabilities are e.g., mobile management of building maintenance requests • It is unclear how well Archibus incorporates sensor level data from building equipment

Source: PA research and Gartner, 17June 2013 Magic Quadrant for Integrated Workplace Management Systems

A.2 Strengths and weaknesses of two short-listed systems (Manhattan Software and FM-Systems)

Vendor / System	Strengths	Weaknesses
Manhattan Software	• Manhattan Software provides robust real estate, facilities, and space and maintenance management capabilities • Provides strong user friendly navigation, integration, mobile computing, security, and reporting capabilities • Manhattan has a robust financial management and analytics function that is integrated across its IWMS product suite. This includes general ledger, real estate sub-ledgers, predictive modeling, and pattern analysis capabilities	• It is unclear whether Manhattan Software provides fleet management capabilities • Customers report that Manhattan has room for improvement in its support services especially with regard to the availability and rotation of quality support personnel • Manhattan's documentation needs to improve because it is often unclear or too detailed. Some of this is attributed to the system's flexibility and configurability
FM-Systems	• FM-Systems has received consistently positive customer reviews. Customers indicate that they like FM-System's visible and predictive costs (including fixed-price service contracts) • FM-Systems has developed all of its modules in-house and therefore offers an integrated solution across all IWMS functional areas	• FM-Systems does not offer fleet management capabilities • While FM-System's installed base is still overwhelmingly deployed on-premise, its SaaS offering is growing fast • FM-Systems has room to improve its documentation, e.g., too often new release documentation has not been completely and thoroughly revised

Source: PA research and Gartner, 17June 2013 Magic Quadrant for Integrated Workplace Management Systems

A.3 Strengths and weaknesses of one short-listed system (AssetWorks)

Vendor / System	Strengths	Weaknesses
AssetWorks	• Leading Computerized Maintenance Management System (CMMS) • Well developed Space Planning Management module • Already used by the City	• Does not offer the ability to check utility bills against meters readings • Integration capabilities with external systems (such as AutoCAD, in-house financial systems, etc.) are not as strong as with its main competitors

Source: PA research and Gartner, 17June 2013 Magic Quadrant for Integrated Workplace Management Systems

B INDICATIVE PRICING

B.1 Estimated System Pricing for Budgetary Purposes

The bulk of the asset management system costs relates to the system implementation, training and support. Estimated price ranges for Tririga and Archibus have been provided for budgeting purposes. Estimates focused on:

- License fees for the modules the City is interested in acquiring
- Implementation, training and support costs.

License fees (at list price) for the two systems are as follows:

- Tririga: approximately $250k* (see Figure 6-3 below)
- Archibus: approximately $66k* (see Figure 6-4 below)

In addition, Tririga provided a range of $750k-$1M to cover implementation, support and training expenses. Note that the City will have the opportunity to aggressively negotiate prices during the vendor selection process. Municipalities can usually safely target a 10% to 20% discount on the system list price.

B.2 Estimated System Pricing for IBM Tririga

TRIRIGA

Module	Tririga Product	License Type	License Qty	Price	Total	High Range Total
General Requirements	Tririga Application Builder	Install	1	$42,100	$42,100	
General Requirements	Tririga Connector for Business Apps	Install	1	$14,800	$14,800	
General Requirements	Tririga Connector for Business Apps - NPE	NPE Install	2	$7,420	$14,840	
Real Estate Portfolio Management	Tririga Real Estate Manager	Concurrent	5	$11,900	$59,500	
Integration to AutoCAD	Tririga CAD Integrator / Publisher	Authorized	1	$6,030	$6,030	
Space Planning & Management	Tririga Facilities Manager	Concurrent*	3	$11,600	$34,800	
Environmental Management	Tririga Real Estate Environment Sustainability Manager	Concurrent*	3	$7,390	$22,170	
Building Operations & Maintenance	Tririga Operations Manager	Concurrent*	5	$11,900	$59,500	
	Total Price for Tririga Products		**20**		**$253,740**	
	(1) Discounted Total Price for Tririga Products		**20**		**$250,000**	**$250,000**
	(2) System Implementation/Support/Training				**$750,000**	**$1,250,000**
	(1) + (2) Total (Products + Support)				**$1,000,000**	**$1,500,000**

**Concurrent licenses refer to the number of individuals using the system within a predefined period of time. The maximum number of concurrent users is usually a small portion of the total number of users.*

B.3 Estimated System Pricing for Archibus

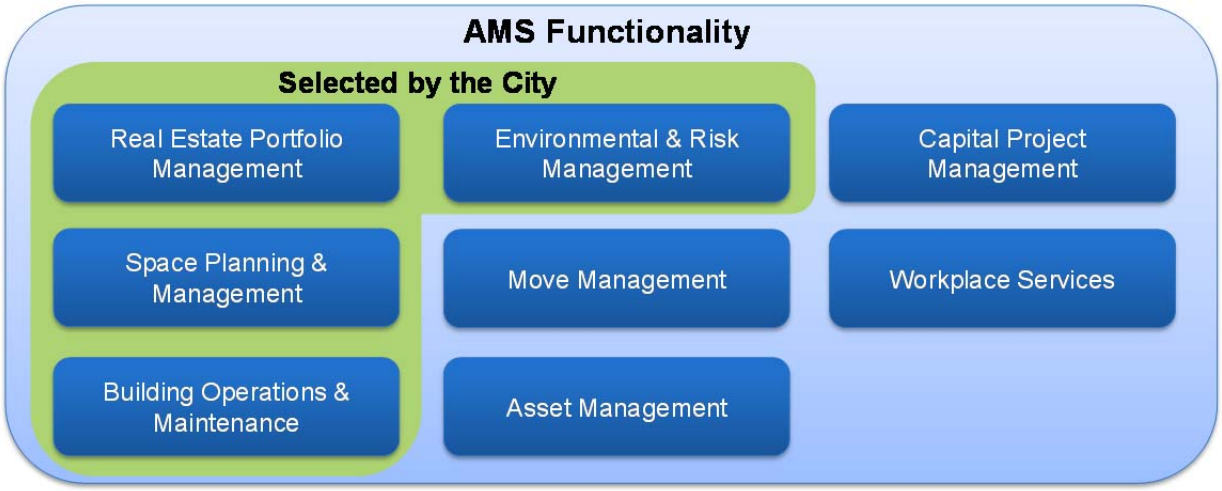
ARCHIBUS

Module	Archibus Product	License Type	License Qty	Price	Annual Software Subscription
General Requirements	Web -Core Program			$7,158	$859
General Requirements	Web ACPs	Concurrent	10*	$3,191	$383
Real Estate Portfolio Management	Lease Management			$7,995	$959
Real Estate Portfolio Management	Cost Administration			$7,995	$959
Space Planning & Management	Space Inventory & Performance			$7,995	$959
Space Planning & Management	Personnel & Occupancy			$7,995	$959
Environmental Management	Environmental Sustainability			$7,995	$959
Building Operations & Maintenance	On Demand Work			$7,995	$959
Building Operations & Maintenance	Preventive Maintenance			$7,995	$959
			(1) TOTAL License Fees	$66,314	$7,955
		Rate	PA's Estimate of the number of hours/days	Cost	
	Implementation Services ($/h)	$205	1920	$393,600	
	Training ($/day)	$2,100	20	$42,000	
			(2) TOTAL Impl./Training Costs	$435,600	
			(1) + (2) TOTAL	$501,914	

**Web ACPS are also available in 25, 50 and 100 (concurrent users) bundles at a discounted rate.*

C EXAMPLE AMS TOOL MODULE / SUB-MODULE

C.1 Typical Asset Management Systems Provide the Following High Level Functionality



- Each of the above modules consist of sub-modules. The following slides detail the composition of these modules and provide some example screenshots
- The business and functional requirements provided by the City were reviewed against typical AMS functionality to identify a complete requirements set

C.2 High Level Description of the AMS Modules Selected by the City

Real Estate Portfolio Management	*The Real Estate Portfolio Management module enables the tracking, analysis, and forecasting of a real estate portfolio's financial performance. Additionally it supports the lease, cost, and invoice administration processes.*
Space Planning & Management	*The Space Planning & Management module enables the planning, measurement, and optimization of facility utilization and occupancy management. Additionally it provides chargeback tools for used space.*
Building Operations & Maintenance	*The Building and Operations module enables the scheduling, dispatch, management, and reporting related to reactive and proactive maintenance work orders.*
Environmental & Risk Management	*The Environmental & Risk Management module supports environmental sustainability, energy management, waste management, emergency preparedness, compliance management, and environmental health and safety management.*
Move Management	*The Move Management module supports the implementation of the move process, from request and approvals, to execution, by internal and external resources.*
Asset Management	*The Asset Management module enables the tracking of physical asset (furniture, equipment, and telecommunications) data, which is used to increase asset utilization and to facilitate asset repair, acquisition, and disposition decisions.*
Capital Project Management	*The Capital Project Management module enables the management of the capital budget cycle (from request and evaluation through approval and funding) as well as the management and modeling of capital (new and repair) projects.*
Workplace Services	*The workplace services module supports shared space reservations (e.g., conference rooms) and fleet management through a centralized, self-service portal.*

C.3 Module #1: Real Estate Portfolio Management

The Real Estate Portfolio Management module enables the tracking, analysis, and forecasting of a real estate portfolio's performance. Additionally it supports the lease, cost, and invoice administration processes.

Sub-Module Descriptions	Corresponding Business Requirements Proposed by PA
Portfolio Management – track and analyze performance of real estate assets and make management decisions to align the real estate portfolio with the organizational mission, vision, and goals	• Provide a planning framework to define facility objectives and performance goals across a portfolio, neighborhood, facility • Evaluate real estate and assets against planned performance targets • Provide update processes for external data such as incremental borrowing rate, index growth rate and fair market value (FMRV) assumptions
Lease Administration – track and manage lease financials and leases	• Provide an integrated process between transaction management, lease management, and lease accounting for new and existing leases and renewals • Provide ability to report on property financials on an individual lease or portfolio basis
Cost Administration – define, allocate, approve, and analyze portfolio lifecycle and occupancy costs	• Provide ability to update cost components (such as maintenance, taxes) of the rent
Cost Chargeback & Invoicing – charge costs back to departments, issue invoices, track receivables and payments	• Validate/audit utility bills against energy usage information collected from building meters
Portfolio Forecasting – evaluate and forecast multiple scenarios for future space needs and associated occupancy costs	• Evaluate financial, operational, and regulatory impacts across multiple lease-build-buy-sell scenarios and help determine optimum real estate transactions

C.4 Module #2: Space Planning & Management

The Space Planning & Management module enables the planning, measurement, and optimization of facility utilization and occupancy management. Additionally it provides chargeback tools for used space.

Sub-Module Descriptions	Corresponding Business Requirements Proposed by PA
Space Inventory & Performance – evaluate, plan, and forecast space usage to maximize efficiency and decrease occupancy costs	• Provide space and utilization measurement and audit tools that identify opportunities for better facility utilization and occupancy management • Provide online and offline surveys to determine future space use • Assess the impact of space forecasts (demand) against facilities (supply) to identify gaps in facilities utilization
Personnel & Occupancy – learn about occupancy needs and use occupancy data to optimize space use	• Optimize space use based on occupancy needs
Space Chargeback – streamline the chargeback process to increase space accountability and reduce occupancy costs	• Provide space use agreements and chargeback tools to increase departmental accountability and space use
Strategic Master Planning – evaluate historical use and forecast future facilities and infrastructure development needs	• Provide stack planning and analysis to determine best-fit allocation of departments within facilities

C.5 Module #3: Building Operations and Maintenance

The Building and Operations module enables the scheduling, dispatch, management, and reporting related to reactive and proactive maintenance work orders.

Sub-Module Descriptions	Corresponding Business Requirement Proposed by PA
On Demand Work – Schedule, dispatch, manage, and report maintenance tasks efficiently using self-service capabilities to reduce operational costs and increase customer satisfaction	• Provide self-service product and service request processes to streamline site and employee services • Provide performance metrics such as maintenance cost ratio and service response rate to improve the efficiency and effectiveness of maintenance staff and service providers
Preventive Maintenance – streamline and automate the preventive maintenance process of critical assets, minimizing downtime and repair expense	• Include/integrate a system that holds building equipment maintenance, warranty, location and service history information
Conditions Assessment – track and effectively manage deferred maintenance liabilities	• TBD

C.6 Module #4: Environmental & Risk Management

The Environmental & Risk Management module supports environmental sustainability, energy management, waste management, emergency preparedness, compliance management, and environmental health and safety management.

Sub-Module Descriptions	Corresponding Business Requirement Proposed by PA
Energy Management – track and manage energy use of the real estate portfolio in order to control utilities related costs and maximize energy savings	• Collect energy-consumption data and building equipment performance metrics to support historical trending, analysis, energy use forecasting and spending against internal and external energy benchmarks • Integrate environmental and energy management with facilities maintenance, capital projects, and space management to streamline energy and environmental impact reduction strategies
Environmental Sustainability Assessment – measure performance indicators in order to assess an organization's carbon footprint in order to support the achievement of environmental sustainability certification goals	• Provide pre-built processes, reports and performance metrics to support city targets e.g., utility (water) usage, energy efficiency certification, energy management systems certification, and energy ratings for buildings
Waste Management – Track and manage waste streams from generation through disposition to minimize health and regulatory risk	• TBD
Emergency Preparedness – Support the management and implementation of emergency plans that will enable business continuity and expedited recovery in the event of a disaster	• TBD
Compliance Management – manage complex health and safety compliance requirements proactively to help mitigate risk, ensure safe work environments, and reduce administrative burdens	• TBD

C.7 Module #5: Move Management

The Move Management module supports the implementation of the move process, from request and approvals, to execution, by internal and external resources.

Sub-Module Descriptions	Corresponding Business Requirement Proposed by PA
Enterprise Move Management – supports the implementation of the move management process, focusing on cost reduction and minimal organizational disruption.	• The move planning process should be linked to the facility planning process (while incorporating floor plans for example) • Increase customer satisfaction by reducing downtime and minimizing move errors • Improve communication, coordination, and collaboration between in-house and external resources with rules-based workflow processes

C.8 Module #6: Asset Management

The Asset Management module enables the tracking of physical asset (furniture, equipment, and telecommunications) data, which is used to increase asset utilization and to facilitate asset repair, acquisition, and disposition decisions.

Sub-Module Descriptions	Corresponding Business Requirements Proposed by PA
Asset Portal – track and manage physical assets to optimize asset utilization, acquisition, and disposition decisions	• Track and manages asset usage to increase organizational accountability and promote redeployment opportunities • Establishes a coherent process for integrating asset planning, acquisition, tracking, disposal and investment recovery
Furniture & Equipment Management – track and manage ownership and usage of furniture and equipment assets	• Analyze the financial impact of furniture and equipment inventories
Telecommunications & Cable Management – track and manages every aspect of your network infrastructure to facilitate planning and improve asset management	• Manage every aspect of your telecommunications and cable infrastructure

D DETAILED BUSINESS REQUIREMENTS AND ANALYSIS

D.1 General System Business Requirements

Table D-1 below summarizes the General System Requirements validated with City Stakeholders.

Table D-1: Summarized General System Business Requirements

Req. ID	Description	Priority
BR.0.1	Provide self-service capabilities to City users (internal or external) on a wide range of common services	Must Have
BR.0.2	There should be sharing of information across relevant City departments with a single source of truth	Must Have
BR.0.3	Provide integration capabilities with selected existing City systems (for instance, GIS integration)	Must Have
BR.0.4	Provide integration capabilities with current and future Computed Aided Design and Drafting systems used by the Bureau of Engineering	Must Have
BR.0.5	Provide a number of pre-designed reports depending on the audience. Additionally provide a self-service ability to create custom reports in a user-friendly manner	Must Have
BR.0.6	Provide an intuitive, web-based user interface with role-based dashboard and user-friendly search capabilities	Must Have
BR.0.7	Be compliant with the City's current IT architecture/infrastructure requirements and provide an open architecture that allows for adaptation and scalability over time as the City's IT infrastructure evolves	Must Have
BR.0.8	The system shall enable the management and standardization of data to ensure data integrity	Must Have
BR.0.9	Provide clear and accessible system documentation and high quality support services	Must Have
BR.0.10	Provide role-based user security, application security, and security logging and auditing capabilities	Must Have

D.2 Real Estate Portfolio Management Business Requirements

Table D-2 below summarizes the Real Estate Portfolio Management Business Requirements collected by PA and validated with City Stakeholders.

Table D-2: Summarized Real Estate Portfolio Management Business Requirements

Req. ID	Description	Priority
BR.1.1	Provide portfolio management, transaction management, lease management, and lease accounting functionality (including data and documents)	Must Have
BR.1.2	Provide a planning framework to define, measure, and report on facility objectives and performance goals across a portfolio, neighborhood, facility	Must Have
BR.1.3	Evaluate financial, operational, and regulatory impacts across multiple lease-build-buy-sell scenarios and help determine optimum real estate transactions	Must Have
BR.1.4	Provide update processes for external data such as incremental borrowing rate, index growth rate and fair market value (FMRV) assumptions	Must Have
BR.1.5	Provide ability to update cost components (such as maintenance, taxes) of the rent	Must Have
BR.1.6	Validate/audit utility bills against energy usage information collected from building meters	Must Have
BR.1.7	Ability to setup automated alerts on pre-defined events/criteria related to transaction and lease management	Must Have
BR.1.8	Create and receive invoices; Reconcile invoices against previous payments and contract terms to identify overcharge	Must Have

D.3 Space Planning and Management Requirements

Table D-3 below summarizes the Space Planning and Management Business Requirements by PA and validated with City Stakeholders.

Table D-3: Summarized Space Planning and Management Business Requirements

Req. ID	Description	Priority
BR.2.1	Provide space and utilization management and measurement tools that identify opportunities for better facility utilization and occupancy management	Must Have
BR.2.2	Provide online and offline surveys to determine future space use	Would Have
BR.2.3	Provide space use agreements and chargeback tools to increase departmental accountability and space use for specific buildings	Could Have
BR.2.4	Assess the impact of space forecasts (demand) against facilities (supply) to identify gaps in supply	Must Have
BR 2.5	Provide floor and stack planning and analysis to determine best-fit allocation of departments within facilities	Must Have

D.4 Building Operations and Maintenance Business Requirements

Table D-4 below summarizes the Building Operations and Maintenance Business Requirements collected by PA and validated with City Stakeholders.

Table D-4: Summarized Building Operations and Maintenance Business Requirements

Req. ID	Description	Priority
BR.3.1	Include/integrate a system that holds building equipment maintenance, warranty, location and service history information	Must Have
BR.3.2	Provide self-service work order / service request capability to relevant users	Must Have
BR.3.3	Provide performance metrics such as maintenance cost ratio and service response rate to improve the efficiency and effectiveness of maintenance staff and service providers	Must Have
BR.3.4	Provide mobility functionality so that staff can retrieve work tickets in the field, close tickets on completion of activity, enter time and material costs, and supervisor does not have to be tied to his/her desk	Must Have
BR.3.5	Auto-generate and auto-route preventative maintenance work tickets based on equipment data in the system	Must Have
BR.3.6	Enable regulatory compliance tracking for assets including: Regulation 4 testing and certification, boiler emissions monitoring, refrigerant monitoring, ladder inspections, etc.	Must Have
BR.3.7	Track and effectively manage deferred maintenance liabilities to mitigate risk by taking corrective actions	Must Have
BR.3.8	Provide budget and payment management including project budgets, forecast management, and payment reconciliation for capital repair programs	Must Have

D.5 Environmental Management Business Requirements

Table D-5 below summarizes the Environmental Management Business Requirements collected by PA and validated with City Stakeholders.

Table D-4: Summarized Environmental Management Business Requirements

Req. ID	Description	Priority
BR.4.1	Provide pre-built processes, data, reports, and performance metrics to support internal and external targets e.g., utility (power and water) usage, energy efficiency certification, Green House Gas Emissions, energy management systems certification, and energy ratings for core buildings	Must Have
BR.4.2	Support historical trending, analysis, energy (power and water) use forecasting and spending against internal and external energy benchmarks	Must Have
BR.4.3	Integrate environmental and energy (power and water) management with facilities maintenance, capital projects, and space management to streamline energy and environmental impact reduction strategies	Could Have
BR.4.4	Energy (power and water) use anomalies to be identified and notifications sent to maintenance staff to investigate equipment malfunction, timers not working, etc. The system should be integrated with the Building Automation System.	Must Have
BR.4.5	Ability to input energy (power and water) retrofit projects, record , verify, measure and track energy savings from these projects (need to be able to log work completed at a particular date and benchmark/measure performance changes from that moment in time)	Must Have

E FUNCTIONAL REQUIREMENTS

E.1 Real Estate Portfolio Management Functional Requirements

Table E-1 below summarizes the Real Estate Portfolio Management Functional Requirements collected by PA and validated with City Stakeholders.

Table E-1: Summarized Real Estate Portfolio Management Functional Requirements

Req. ID	Description	Priority
FR.1.1	Provide direct pre-built integration with lease administration, transaction management, asset management, and strategic planning components within a single solution	Must Have
FR.1.2	Automate workflow-based notices and alerts such as expiring leases, available options, and overdue payments (can include other divisions needs such as Budget requests)	Must Have
FR.1.3	Automate workflow-based creation of payment schedules from approved lease contracts and appraisal contracts while keeping track of the payment deadlines	Must Have
FR.1.4	Provide side-by-side comparison features for comparison of multiple lease-build-buy-sell scenarios	Must Have
FR.1.5	The leasing module shall store the copy of deed and encumbrance records of ownership, including encumbrances on subject property	Must Have
FR.1.6	The leasing module shall store the copy of the lease, appraisal report, class C, etc.	Must Have
FR.1.7	The leasing module shall support automatic and manual rent adjustments	Must Have
FR.1.8	The leasing module shall support a contract attachment feature (including for appraisals)	Must Have
FR.1.9	The leasing module shall include a Google Map link to the property	Must Have
FR.1.10	The leasing module shall include information on non-profit tenants	Must Have
FR.1.11	The system shall support easy report generation by Council District, Map Code, Property Type, Square Footage, User Group, and Lease Type	Must Have
FR.1.12	The system shall store information on the county assessor and rent escalation rates, and be linked to the county assessor	Must Have
FR.1.13	The system shall store the Co-Star for leasing	Must Have
FR.1.14	The system should provide the ability to admin staff to scan all docs and attach to electronic lease, appraisal, surplus file through Blue Link	Must Have
FR.1.15	The system shall store appraisal information if available, including appraisal report.	Must Have
FR.1.16	System shall store Record of Ownership information. System to have Blue Link to County Assessor's Office.	Must Have

Table E-1 continued on the next page

Table E-1 (continued): Summarized Real Estate Portfolio Management Functional Requirements

Req. ID	Description	Priority
FR.1.17	The system shall store encumbrances on subject property. System to have Blue Link to LADBS.	Must Have
FR.1.18	The system shall store a termination tickler that should be linked to Tenant Services and Portfolio Management. Specifically, the system shall support a tickler function for rent expirations and escalations	Must Have
FR.1.19	Provide pre-built forms and data import processes for offline abstraction of real estate and asset leases via internal and third-party abstraction resources	Must Have
FR.1.20	The system shall store copy of title reports, list of City approved Vendors, Title Companies, Appraisal Companies, etc.	Must Have
FR.1.21	The system shall store date of transactions (e.g. acquisition and sales)	Must Have
FR.1.22	Title info, tracking of files by steps involved?	Must Have
FR.1.23	The system shall store and display all relevant information and stakeholders, including the Council District and District Engineer the property belongs to	Must Have
FR.1.24	The system shall contain information on funds used to purchase property	Must Have
FR.1.25	The system shall store and display the list of properties sold and their sale price within a specified fiscal year	Must Have
FR.1.26	The system shall support templates for PSA, Deeds, Acceptance, Letters of Request etc.	Must Have
FR.1.27	The system shall support Own a Piece of LA (OPLA)	Must Have
FR.1.28	The leasing module shall support monthly, quarterly, and annual expense reports	Must Have
FR.1.29	The leasing module shall support monthly and annual invoicing	Must Have
FR.1.30	The leasing module shall support one-time invoices	Must Have
FR.1.31	Automate reconciliation of invoices against previous payments and contract terms to identify overcharges	Must Have
FR.1.32	The system shall provide pre-built metrics such as cost per area, occupancy rate, and on-time delivery	Must Have
FR.1.33	The system shall support the setting and tracking of performance targets against the metrics	Must Have
FR.1.34	The system shall support the following custom modules: Surplus, OPLA, Non-Profit, and Facility Optimization	Must Have

Table E-1 continued on the next page

Table E-1 (continued): Summarized Real Estate Portfolio Management Functional Requirements

Req. ID	Description	Priority
FR.1.35	• The search capability should be able to be queried by the following fields: - Components of the address - APN - Council District - Maintenance District - Thomas Bros - Ownership - Lease Type - Building Book Number's Dept# - Department Jurisdiction	Must Have
FR.1.36	• The system shall capture and display the following data fields as a result of an address search: - Building Book Number (Dept #, Bldg #, Sub-ID) - Current Address (Street #, Fraction, Direction, StreetName, StreetType, Suite/Floor, City, State, Zip) - Last Previous Address (Street #, Fraction, Direction, StreetName, StreetType, Suite/Floor ,City, State, Zip) - Facility Name - Parcel # (APN) - Council District - GPS Coordinates - Thomas Brothers # - Department Jurisdiction - Date of Transfer of Jurisdiction - Ownership (Owned/Leased) - Date Acquired - Date Built - Floor Levels - Floor Plans (Yes/No) - Gross Square Feet - Lease # - Lease Type - Property Manager - Maintenance District - Last Appraisal Date - Appraised Value - Surplus (Declared/undeclared) - Date Sold - Utilities City Pays (W/E/G) - Notes/Comments Section - Photographs of Property - Total # of Employees in Building - # of Employees Per Location *1 - Equipment such as boiler, HVAC & network printer, etc. *2 - Head count VS Occupant load *3 - Facility old name *4 - Modular furniture - brand name & number	Must Have

Table E-1 continued on the next page

Table E-1 (continued): Summarized Real Estate Portfolio Management Functional Requirements

Req. ID	Description	Priority
FR.1.37	The properties should be referenced by address and APN (Assessor's Parcel Number)	Must Have
FR.1.38	The system shall show the value and date of the last appraisal	Must Have
FR.1.39	The system shall store a current photograph of the property	Must Have
FR.1.40	The system shall store the status of the property, i.e., leased, sold, surplus, or OPLA	Must Have
FR.1.41	The system shall store and display the department that has current jurisdiction	Must Have
FR.1.42	The system shall store and display the list of "undeclared" surplus properties	Must Have
FR.1.43	The system shall store and display the list of "declared" surplus properties	Must Have
FR.1.44	Properties should have links to Municipal Facilities Committee (MFC) reports, and minimum, have the listing of Council File numbers if any is associated with the MFC reports. Even better, would also have the documents linked from the Council File Management System.	Must Have
FR.1.45	The system shall include a search feature for properties within designated boundaries and within a designated range of street numbers or Assessor Parcel Numbers.	Must Have
FR.1.46	The system shall record future city properties to include department jurisdictional control and notate corresponding parcel maps with abbreviations similar to DWP, e.g., R&P or Rec & Parks for the Department of Recreation and Parks	Must Have
FR.1.47	Store documents such as purchase orders, contracts, MFC reports, etc.	Must Have
FR 1.48	The system shall store links between all MFC reports (including reports not referenced to Council Files, such as space assignment reports) and associated leases	Must Have
FR.1.49	The Council File # is assigned after approval by MFC and item has been forwarded to the Clerk's Legislative Assistant. Maybe MFC could assign numbers to the reports that are on each meeting's agenda and the City Clerk's site modified to search the MFC reports within the Council File	Must Have
FR.1.50	The system shall include a search feature for properties with irregularly shaped geographic boundaries, such as City Council Districts. Similar to FR 1.45, the list populated should also be list form and able to be displayed and printed out on a map.	Must Have
FR.1.51	System to manage e-mail notification list for Auction	Must Have
FR.1.52	Should include MICLA data to understand a particular facility's borrowing or bonding capacity	Must Have

E.2 Space Planning and Management Functional Requirements

Table E-2 below summarizes the Space Planning and Management Functional Requirements collected by PA and validated with City Stakeholders.

Table E-2: Summarized Space Planning and Management Functional Requirements

Req. ID	Description	Priority
FR.2.1	The system shall store the link between employee location and building floor plans of both city-owned and leased properties	Must Have
FR.2.2	The system shall store stack plans with employee location, building floor plans, vacant space, and # of employees	Must Have
FR.2.3	Enable modeling of trial layouts of assets for analyzing various move options before executing them (link to floor plans)	Must Have
FR.2.4	Users shall be able to query the system to identify vacant spaces	Must Have
FR.2.5	The system shall allow users to execute simple queries such as the size of space, tenant locations, or copy of floor plan	Must Have
FR.2.6	The system shall track costs and enable chargebacks against space use agreements	Could Have
FR.2.7	The system shall store and retrieve floor plans as an attachment in a format(s) selected by the City (PDF, CAD, etc.)	Must Have
FR.2.8	The system shall support the retrieval of end design result on tenant improvements (basically support the retrieval of floor plans related to newly constructed tenant improvements, after they have been inputted into the system) in a format selected by the City (PDF, CAD, etc.)	Must Have
FR.2.9	The system shall support the Construction Forces workflow at location	Must Have
FR.2.10	The system shall generate a report of department locations with square footage	Must Have
FR.2.11	Automate the capture of actual space use to accelerate understanding of core business demands	Must Have
FR.2.12	The system shall automate the capture of future space usage data through online surveys, and make collected data available to the relevant stakeholders	Would Have
FR.2.13	The system shall support the manual entry of future space usage data from offline surveys	Would Have
FR.2.14	The system shall enable the storage and retrieval of space use agreements as attachments	Could Have
FR.2.15	Provide scenario modeling tools to determine the impact of alternative workplace strategies such as hoteling	Must Have
FR.2.16	Deliver side-by-side comparison of scenarios against the status quo, planning goals, and others to identify the most efficient alternative	Must Have

E.3 Building Operations and Maintenance Functional Requirements

Table E-3 below summarizes the Building Operations and Maintenance Functional Requirements collected by PA and validated with City Stakeholders.

Table E-3: Summarized Building Operations and Maintenance Functional Requirements

Req. ID	Description	Priority
FR.3.1	The system shall store invoices and orders for work done on properties	Must Have
FR.3.2	The system shall support the search and listing of properties that require routine maintenance. The system shall be able to set and determine what is routine.	Must Have
FR.3.3	The system shall support the building maintenance workflow at location	Must Have
FR.3.4	Generate corrective work orders and service requests based on equipment data from the system	Must Have
FR.3.5	Route auto-generated work orders to appropriate personnel and service providers as needed for condition-based, corrective and preventive maintenance	Must Have
FR.3.6	Provide data records that capture the root cause and safety-related data for each completed work task	Must Have
FR.3.7	The system shall allow work tickets to be sent to mobile devices so workers can be dispatched remotely and automatically	Must Have
FR.3.8	The system shall allow field workers to close work tickets when the job is complete using their mobile device	Must Have
FR.3.9	The system shall allow time to be entered by workers that automatically uploads to Etime using their mobile device	Must Have
FR.3.10	The system shall allow the supervisor to remotely assign work and not be tied to a desk	Must Have
FR.3.11	The system shall allow material used on a project to be entered and recorded for future reporting, using a mobile device	Must Have
FR.3.12	Should provide budget and management tools for tenant improvement (T&I) programs	Must Have

E.4 Building Environmental Management Functional Requirements

Table E-4 below summarizes the Environmental Management Functional Requirements collected by PA and validated with City Stakeholders.

Table E-4: Summarized Environmental Management Functional Requirements

Req. ID	Description	Priority
FR.4.1	DWP and Gas company billing information to be automatically uploaded from utilities	Could Have
FR.4.2	The system shall display cost and consumption of water and electricity by month for 2 years	Must Have
FR.4.3	The system shall display gas cost and consumption if necessary	Must Have
FR.4.4	Automate the capture of building energy (power and water) data from energy meters and building management systems	Must Have
FR.4.5	Automate data exchange processes with third-party energy (power and water) performance benchmarking services such as ENERGY STAR in order to normalize energy performance data (e.g., Energy Star energy intensity rating for each building, with automatic link to the DOE Energy Star Portfolio Manager)	Must Have
FR.4.6	Normalizes and analyzes energy (power and water) performance by occupant and area, including energy-cost ratio, energy-use intensity and renewable energy ratio	Must Have
FR.4.7	Automates calculation and reporting of scope 1, 2, and 3 greenhouse gas (GHG) emissions based on energy, waste, and direct-to-air emissions using GHG protocol	Must Have
FR.4.8	Should have direct ability to interact with EPA Portfolio Manager in both directions -- uploading and downloading data.	Must Have

F TECHNICAL REQUIREMENTS

F.1 Real Estate Portfolio Management Technical Requirements

Table F-1 below summarizes the Real Estate Portfolio Management Technical Requirements collected by PA and validated with City Stakeholders.

Table F-1: Summarized Portfolio Management Technical Requirements

Req. ID	Description	Priority
TR.1.1	The solution shall be internet/intranet based. The internet site will post information accessible to the public. The intranet site will post information accessible to City employees only	Must Have
TR.1.2	Provide a user-friendly web-based design function to generate, view and export user-defined queries and reports	Must Have
TR.1.3	Create role-based intelligent dashboards composed of multiple views to focus the user attention on just the information required	Must Have
TR.1.4	Offers configurable graphical tools to rapidly configure and reconfigure applications and data structure/elements to a particular data model without changes to the source code	Must Have
TR.1.5	The system's search feature should be "Google-like" i.e. it should accept plain english queries (a combination of queries should also be accepted) and know where to look	Must Have

F.2 System Integration Technical Requirements

Table F-2 below summarizes the System Integration Technical Requirements collected by PA and validated with City Stakeholders.

Table F-2: Summarized System Integration Technical Requirements

Req. ID	Description	Priority
TR.2.1	Integrate the City's GIS system (ZIMAS, developed by ESRI)	Must Have
TR.2.2	The system shall be linked to NavigateLA,Zimas, Lupams, County Assessor's, Google Map	Must Have
TR.2.3	The system shall link to City Clerk sites including Council File Management System and City Contracts Search	Must Have
TR.2.4	The system shall be linked to City email, CityFone, and proprietary databases of departments	Must Have
TR.2.5	Provide integration to the City's CAD solution. The system can extract data from CAD files and vice versa.	Must Have
TR.2.6	The system shall accept all kind of CAD formats available on the market, or able to convert other CAD formats to AUTOCAD	Must Have
TR.2.7	Any new Computer Maintenance Management System (CMMS) must interface with existing E Time keeping and Financial Management Systems programs	Must Have
TR.2.8	Complete building information is unavailable in one place. Any comprehensive report requires investigation into various sources of information, including E Time, FMS, SMS, and various excel spreadsheets and Microsoft Access data bases. A new system should accommodate all building information, including work ticket history, Preventative Maintenance (PM) activities, labor/contractor/material costs, equipment life cycle information, fire life safety violations, Regulation 4 testing, and other regulatory requirements, including boiler monitoring, refrigerant monitoring, etc.	Must Have
TR.2.9	Interfaces with City systems to be carefully designed and integrated, and as simple as feasible. All interfaces to have necessary permissions, security testing and technical support.	Must Have
TR.2.10	Capital projects to be managed and controlled, using lifecycle information and links to FMS, SMS, etc.	Must Have
TR.2.11	The system shall link to BlueLink to Real Quest	Must Have

F.3 Data Management and Sharing Technical Requirements

Table F-3 below summarizes the Data Management and Sharing Technical Requirements collected by PA and validated with City Stakeholders.

Table F-3: Summarized Data Management and Sharing Technical Requirements

Req. ID	Description	Priority
TR.3.1	The system shall support master data management for organizational structures, people, neighborhoods, assets, and financial cost codes	Must Have
TR.3.2	Secure data exchanges with critical enterprise systems	Must Have
TR.3.3	Provides an extensive set of standard data types such as financial rollups, units of measure and color to support a myriad of IWMS processes	Must Have

F.4 Security Technical Requirements

Table F-4 below summarizes the Security Technical Requirements collected by PA and validated with City Stakeholders.

Table F-4: Summarized Security Technical Requirements

Req. ID	Description	Priority
TR.4.1	At minimum there should be three security levels - view only, edit, and administrator access	Must Have
TR.4.2	The system shall automatically record user visits	Must Have
TR.4.3	The system shall allow sign on for new users and provide instructions on how to use the website	Must Have
TR.4.4	Allow system administrators to define security rights at the level of granularity that aligns with data requirements of specific business groups (role-based access)	Must Have
TR.4.5	The system shall contain pre-built but configurable roles that are common to the real estate management industry	Must Have

F.5 System Architecture Technical Requirements

Table F-5 below summarizes the System Architecture Technical Requirements collected by PA and validated with City Stakeholders.

Table F-5: Summarized System Architecture Technical Requirements

Req. ID	Description	Priority
TR.5.1	Offers advanced mobile/offline capabilities to eliminate paperwork, increase productivity, and improve cost controls	Must Have
TR.5.2	Provide full auditing capabilities at the security, field, and action levels	Must Have
TR.5.3	Deliver a single approval management process across all core functions, based on assigned roles and departments	Must Have
TR.5.4	Provide several standard, pre-built workflows built from industry best practices and customer input. Required workflows include tenant relocation, leasing, acquisition, construction, maintenance, project management	Must Have
TR.5.5	Delivers a single workflow engine to establish, implement, and automate business processes	Must Have
TR.5.6	The system shall be able to be integrated into the client's technology environment with ease (system shall support the City's operating system, applications, web and database servers)	Must Have
TR.5.7	The system shall support high availability through the addition of failover and load balancers within the system architecture	Must Have
TR.5.8	The system shall be able to support performance requirements for several hundred users-including several concurrent users	Must Have
TR.5.9	Smart mobile devices should be supported by the system's mobility function	Must Have
TR.5.10	The system shall deliver robust document and records management capabilities to capture, index, check in/out, backup, autosave, and promote collaboration on content such as documents, drawings, contracts, photos, print, warranties, and purchase orders. At minimum upload and download of spreadsheets and drawing files will be supported. Document publishing will also be supported.	Must Have

F.6 Transition Technical Requirements

Table F-6 below summarizes the Transition Technical Requirements collected by PA and validated with City Stakeholders.

Table F-6: Summarized Transition Technical Requirements

Req. ID	Description	Priority
TR.6.1	All information in the existing CMMS to be transferred to the new system	Must Have

G REQUIREMENTS ANALYSIS

G.1 Analysis of General Requirements

An analysis of general requirements is shown below in Table G-1. Requirements analysis should be done in greater depth during the RFP process, as the requirements become more robust.

Table G-1: General Requirements Analysis

Business Requirement	Business Req. #	Business Category	FR or TR #	Description of Functional Requirement (FR) or Technical Requirement (TR)
Provide self-service capabilities to City users (internal or external) on a wide range of common services	BR.0.10	Data Management and Sharing	TR.3.2	Secure data exchanges with critical enterprise systems
		Security	TR.4.1	At minimum there should be three security levels - view only, edit, and administrator access
		Security	TR.4.2	The system shall automatically record user visits
		Security	TR.4.3	The system shall allow sign on for new users and provide instructions on how to use the website
		Security	TR.4.4	Allow system administrators to define security rights at the level of granularity that aligns with data requirements of specific business groups (role-based access)
		Security	TR.4.5	The system shall contain pre-built but configurable roles that are common to the real estate management industry
There should be sharing of information across relevant City departments with a single source of truth	BR.0.2	System Architecture	TR.5.3	Deliver a single approval management process across all core functions, based on assigned roles and departments
		System Architecture	TR.5.5	Delivers a single workflow engine to establish, implement, and automate business processes
		Transition	TR.6.1	All information in the existing CMMS to be transferred to the new system
Provide integration capabilities with selected existing City systems (for instance, GIS integration)	BR.0.3	Real Estate Portfolio Management	FR.1.9	The leasing module shall include a Google Map link to the property
		Environmental Management	FR.4.8	Should have direct ability to interact with EPA Portfolio Manager in both directions -- uploading and downloading data.
		Integration	TR.2.1	Integrate the City's GIS system (ZIMAS, developed by ESRI)
		Integration	TR.2.10	Capital projects to be managed and controlled, using lifecycle information and links to FMS, SMS, etc.

Note 1: Highlighted "cells" represent relationships not called out explicitly in the Detailed Requirements.

Table G-1 continues on the next page

Table G-1 (continued): General Requirements Analysis

Business Requirement	Business Req. #	Business Category	FR or TR #	Description of Functional Requirement (FR) or Technical Requirement (TR)
Provide integration capabilities with selected existing City systems (for instance, GIS integration) - continued	BR.0.3 – continued	Integration	TR.2.11	The system shall link to BlueLink to Real Quest
		Integration	TR.2.2	The system shall be linked to NavigateLA,Zimas, Lupams, County Assessor's, Google Map
		Integration	TR.2.3	The system shall link to City Clerk sites including Council File Management System and City Contracts Search
		Integration	TR.2.4	The system shall be linked to City email, CityFone, and proprietary databases of departments
		Integration	TR.2.7	Any new Computer Maintenance Management System (CMMS) must interface with existing E Time keeping and Financial Management Systems programs
		Integration	TR.2.8	Complete building information (must be) available in one place. Any comprehensive report requires investigation into various sources of information, including E Time, FMS, SMS, and various excel spreadsheets and Microsoft Access data bases. A new system should accommodate all building information, including work ticket history, Preventative Maintenance (PM) activities, labor/contractor/material costs, equipment life cycle information, fire life safety violations, Regulation 4 testing, and other regulatory requirements, including boiler monitoring, refrigerant monitoring, etc.
		Integration	TR.2.9	Interfaces with City systems to be carefully designed and integrated, and as simple as feasible. All interfaces to have necessary permissions, security testing and technical support.
Provide integration capabilities with current and future Computed Aided Design and Drafting systems used by the Bureau of Engineering	BR.0.4	Integration	TR.2.5	Provide integration to the City's CAD solution. The system can extract data from CAD files and vice versa.
		Integration	TR.2.6	The system shall accept all kind of CAD formats available on the market, or be able to convert other CAD formats to AUTOCAD

Table G-1 continues on the next page

Table G-1 (continued): General Requirements Analysis

Business Requirement	Business Req. #	Category	FR or TR #	Description of Functional Requirement (FR) or Technical Requirement (TR)
Provide a number of pre-designed reports depending on the audience. Additionally provide a self-service ability to create custom reports in a user-friendly manner	BR.0.5	Real Estate Portfolio Management	FR.1.11	The system shall support easy report generation by Council District, Map Code, Property Type, Square Footage, User Group, and Lease Type
		User Interface	TR.1.2	Provide a user-friendly web-based design function to generate, view and export user-defined queries and reports
Provide an intuitive, web-based user interface with role-based dashboard and user-friendly search capabilities	BR.0.6	User Interface	TR.1.1	The solution shall be internet/intranet based. The internet site will post information accessible to the public. The intranet site will post information accessible to City employees only
		User Interface	TR.1.3	Create role-based intelligent dashboards composed of multiple views to focus the user attention on just the information required
		User Interface	TR.1.4	Offers configurable graphical tools to rapidly configure and reconfigure applications and data structure/elements to a particular data model without changes to the source code
		User Interface	TR.1.5	The system's search feature should be "Google-like" i.e. it should accept plain English queries (a combination of queries should also be accepted) and know where to look
Be compliant with the City's current IT architecture / infrastructure requirements and provide an open architecture that allows for adaptation and scalability over time as the City's IT infrastructure evolves	BR.0.7	System Architecture	TR.5.1	Offers advanced mobile/offline capabilities to eliminate paperwork, increase productivity, and improve cost controls
		System Architecture	TR.5.10	The system shall deliver robust document and records management capabilities to capture, index, check in/out, backup, autosave, and promote collaboration on content such as documents, drawings, contracts, photos, print, warranties, and purchase orders. At minimum upload and download of spreadsheets and drawing files will be supported. Document publishing will also be supported.
		System Architecture	TR.5.2	Provide full auditing capabilities at the security, field, and action levels

Table G-1 continues on the next page

Table G-1 (continued): General Requirements Analysis

Business Requirement	Business Req. #	Business Category	FR or TR #	Description of Functional Requirement (FR) or Technical Requirement (TR)
Be compliant with the City's current IT architecture / infrastructure requirements and provide an open architecture that allows for adaptation and scalability over time as the City's IT infrastructure evolves (continued)	BR.0.7 - continued	System Architecture	TR.5.3	Deliver a single approval management process across all core functions, based on assigned roles and departments
		System Architecture	TR.5.4	Provide several standard, pre-built workflows built from industry best practices and customer input. Required workflows include tenant relocation, leasing, acquisition, construction, maintenance, project management
		System Architecture	TR.5.5	Delivers a single workflow engine to establish, implement, and automate business processes
		System Architecture	TR.5.6	The system shall be able to be integrated into the client's technology environment with ease (system shall support the City's operating system, applications, web and database servers)
		System Architecture	TR.5.7	The system shall support high availability through the addition of failover and load balancers within the system architecture
		System Architecture	TR.5.8	The system shall be able to support performance requirements for several hundred users-including several concurrent users
		System Architecture	TR.5.9	Smart mobile devices should be supported by the system's mobility function
The system shall enable the management and standardization of data to ensure data integrity	BR.0.8	Data Management and Sharing	TR.3.1	The system shall support master data management for organizational structures, people, neighborhoods, assets, and financial cost codes
		Data Management and Sharing	TR.3.3	Provides an extensive set of standard data types such as financial rollups, units of measure and color to support a myriad of IWMS processes

Table G-1 continues on the next page

Table G-1 (continued): General Requirements Analysis

Business Requirement	Business Req. #	Business Category	FR or TR # (note 1)	Description of Functional Requirement (FR) or Technical Requirement (TR)
Provide clear and accessible system documentation and high quality support services	BR.0.9	Security	TR.4.3	The system shall allow sign on for new users and provide instructions on how to use the website
		Security	TR.5.10	The system shall deliver robust document and records management capabilities to capture, index, check in/out, backup, autosave, and promote collaboration on content such as documents, drawings, contracts, photos, print, warranties, and purchase orders. At minimum upload and download of spreadsheets and drawing files will be supported. Document publishing will also be supported.
Provide role-based user security, application security, and security logging and auditing capabilities	BR.1.0	Security	TR.4.1	At minimum there should be three security levels - view only, edit, and administrator access
		Security	TR.4.2	The system shall automatically record user visits
		Security	TR.4.3	The system shall allow sign on for new users and provide instructions on how to use the website
		Security	TR.4.4	Allow system administrators to define security rights at the level of granularity that aligns with data requirements of specific business groups (role-based access)
		Security	TR.4.5	The system shall contain pre-built but configurable roles that are common to the real estate management industry

Note 1: Highlighted “cells” represent relationships not called out explicitly in the Detailed Requirements.

G.2 Analysis of Real Estate Portfolio Management Requirements

An analysis of Real Estate Portfolio Management Requirements is shown below in Table G-2. Requirements analysis should be done in greater depth during the RFP process, as the requirements become more robust.

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Table G-2: Real Estate Portfolio Management Requirements Analysis

Business Requirement	Business Req. #	Business Category	FR or TR #	Description of Functional Requirement (FR) or Technical Requirement (TR)
Provide portfolio management, transaction management, lease management, and lease accounting functionality (including data and documents)	BR.1.1	Real Estate Portfolio Management	FR.1.1	Provide direct pre-built integration with lease administration, transaction management, asset management, and strategic planning components within a single solution
		Real Estate Portfolio Management	FR.1.10	The leasing module shall include information on non-profit tenants
		Real Estate Portfolio Management	FR.1.12	The system shall store information on the county assessor and rent escalation rates, and be linked to the county assessor
		Real Estate Portfolio Management	FR.1.13	The system shall store the Co-Star for leasing
		Real Estate Portfolio Management	FR.1.14	The system should provide the ability to admin staff to scan all docs and attach to electronic lease, appraisal, surplus file through Blue Link
		Real Estate Portfolio Management	FR.1.15	The system shall store appraisal information if available, including appraisal report.
		Real Estate Portfolio Management	FR.1.16	The system shall store Record of Ownership information. System to have Blue Link to County Assessor's Office.
		Real Estate Portfolio Management	FR.1.17	The system shall store encumbrances on subject property. System to have Blue Link to LADBS.
		Real Estate Portfolio Management	FR.1.20	The system shall store copy of title reports, list of City approved Vendors, Title Companies, Appraisal Companies, etc.
		Real Estate Portfolio Management	FR.1.21	The system shall store date of transactions (acquisition, sales, other?)
		Real Estate Portfolio Management	FR.1.22	Title info, tracking of files by steps involved?

Table G-2 continues on the next page

Table G-2 (continued): Real Estate Portfolio Management Requirements Analysis

Business Requirement	Business Req. #	Business Category	FR or TR #	Description of Functional Requirement (FR) or Technical Requirement (TR)
Provide portfolio management, transaction management, lease management, and lease accounting functionality (including data and documents) (continued)	BR.1.1	Real Estate Portfolio Management	FR.1.23	The system shall store and display all relevant information and stakeholders, including the Council District and District Engineer the property belongs to
		Real Estate Portfolio Management	FR.1.24	The system shall contain information on funds used to purchase property
		Real Estate Portfolio Management	FR.1.25	The system shall store and display the list of properties sold and their sale price within a specified fiscal year
		Real Estate Portfolio Management	FR.1.26	The system shall support templates for PSA, Deeds, Acceptance, Letters of Request etc.
		Real Estate Portfolio Management	FR.1.27	The system shall support Own a Piece of LA (OPLA)
		Real Estate Portfolio Management	FR.1.34	The system shall support the following custom modules: Surplus, OPLA, Non-Profit, and Facility Optimization
		Real Estate Portfolio Management	FR.1.35	The search capability should be able to be queried by the following fields: - Components of the address - APN - Council District - Maintenance District - Thomas Bros - Ownership - Lease Type - Building Book Number's Dept# - Department Jurisdiction

Table G-2 continues on the next page

Table G-2 (continued): Real Estate Portfolio Management Requirements Analysis

Business Requirement	Business Req. #	Business Category	FR or TR #	Description of Functional Requirement (FR) or Technical Requirement (TR)
Provide portfolio management, transaction management, lease management, and lease accounting functionality (including data and documents) (continued)	BR.1.1 (continued)	Real Estate Portfolio Management	FR.1.36	The system shall capture and display the following data fields as a result of an address search: - Building Book Number (Dept #, Bldg #, Sub-ID) - Current Address (Street #, Fraction, Direction, - - StreetName, StreetType,Suite/Floor,City, State, Zip) - Last Previous Address (Street #, Fraction, Direction, StreetName, StreetType,Suite/Floor,City, State, Zip) - Facility Name - Parcel # (APN) - Council District - GPS Coordinates - Thomas Brothers # - Department Jurisdiction - Date of Transfer of Jurisdiction - Ownership (Owned/Leased) - Date Acquired - Date Built - Floor Levels - Floor Plans (Yes/No) - Gross Square Feet - Lease # - Lease Type - Property Manager - Maintenance District - Last Appraisal Date - Appraised Value - Surplus (Declared/undeclared) - Date Sold - Utilities City Pays (W/E/G) - Notes/Comments Section - Photographs of Property - Total # of Employees in Building - # of Employees Per Location *1 - Equipment such as boiler, HVAC & network printer, etc. *2 - Head count VS Occupant load *3 - Facility old name *4 - Modular furniture - brand name & number

Table G-2 continues on the next page

Table G-2 (continued): Real Estate Portfolio Management Requirements Analysis

Business Requirement	Business Req. #	Business Category	FR or TR #	Description of Functional Requirement (FR) or Technical Requirement (TR)
Provide portfolio management, transaction management, lease management, and lease accounting functionality (including data and documents) (continued)	BR.1.1 (continued)	Real Estate Portfolio Management	FR.1.37	The properties should be referenced by address and APN (Assessor's Parcel Number)
		Real Estate Portfolio Management	FR.1.37	The system shall show the value and date of the last appraisal
		Real Estate Portfolio Management	FR.1.38	The system shall store a current photograph of the property
		Real Estate Portfolio Management	FR.1.39	The system shall store the status of the property, i.e., leased, sold, surplus, or OPLA
		Real Estate Portfolio Management	FR.1.40	The system shall store and display the department that has current jurisdiction
		Real Estate Portfolio Management	FR.1.41	The system shall store and display the list of "undeclared" surplus properties
		Real Estate Portfolio Management	FR.1.42	The system shall store and display the list of "declared" surplus properties
		Real Estate Portfolio Management	FR.1.43	The system shall show the value and date of the last appraisal
		Real Estate Portfolio Management	FR.1.44	Properties should have links to Municipal Facilities Committee (MFC) reports, and minimum, have the listing of Council File numbers if any is associated with the MFC reports. Even better, would also have the documents linked from the Council File Management System.
		Real Estate Portfolio Management	FR.1.45	The system shall include a search feature for properties within designated boundaries and within a designated range of street numbers or Assessor Parcel Numbers.

Table G-2 continues on the next page

Table G-2 (continued): Real Estate Portfolio Management Requirements Analysis

Business Requirement	Business Req. #	Business Category	FR or TR #	Description of Functional Requirement (FR) or Technical Requirement (TR)
Provide portfolio management, transaction management, lease management, and lease accounting functionality (including data and documents) (continued)	BR.1.1 (continued)	Real Estate Portfolio Management	FR.1.46	The system shall record future city properties to include department jurisdictional control and notate corresponding parcel maps with abbreviations similar to DWP, e.g., R&P or Rec & Parks for the Department of Recreation and Parks
		Real Estate Portfolio Management	FR.1.47	Store documents such as purchase orders, contracts, MFC reports, etc.
		Real Estate Portfolio Management	FR.1.48	The system shall store links between all MFC reports (including reports not referenced to Council Files, such as space assignment reports) and associated leases
		Real Estate Portfolio Management	FR.1.49	The Council File # is assigned after approval by MFC and item has been forwarded to the Clerk's Legislative Assistant. Maybe MFC could assign numbers to the reports that are on each meeting's agenda and the City Clerk's site modified to search the MFC reports within the Council File
		Real Estate Portfolio Management	FR.1.5	The leasing module shall store the copy of deed and encumbrance records of ownership, including encumbrances on subject property
		Real Estate Portfolio Management	FR.1.51	System to manage e-mail notification list for Auction
		Real Estate Portfolio Management	FR.1.6	The leasing module shall store the copy of the lease, appraisal report, class C, etc.
		Real Estate Portfolio Management	FR.1.7	The leasing module shall support automatic and manual rent adjustments
		Real Estate Portfolio Management	FR.1.8	The leasing module shall support a contract attachment feature (including for appraisals)

Table G-2 continues on the next page

Table G-2 (continued): Real Estate Portfolio Management Requirements Analysis

Requirement	Business Req. #	Business Category	FR or TR # (note 1)	Description of Functional Requirement (FR) or Technical Requirement (TR)
Provide a planning framework to define, measure, and report on facility objectives and performance goals across a portfolio, neighborhood, facility	BR.1.2	Real Estate Portfolio Management	FR.1.32	The system shall provide pre-built metrics such as cost per area, occupancy rate, and on-time delivery
		Real Estate Portfolio Management	FR.1.33	The system shall support the setting and tracking of performance targets against the metrics
Evaluate financial, operational, and regulatory impacts across multiple lease-build-buy-sell scenarios and help determine optimum real estate transactions	BR.1.3	Real Estate Portfolio Management	FR.1.4	Provide side-by-side comparison features for comparison of multiple lease-build-buy-sell scenarios
Provide update processes for external data such as incremental borrowing rate, index growth rate and fair market value (FMRV) assumptions	BR.1.4	Real Estate Portfolio Management	FR.1.19	Provide pre-built forms and data import processes for offline abstraction of real estate and asset leases via internal and third-party abstraction resources
		Real Estate Portfolio Management	FR.1.52	Should include MICLA data to understand a particular facility's borrowing or bonding capacity
Provide ability to update cost components (such as maintenance, taxes) of the rent	BR.1.5	Real Estate Portfolio Management	TR.3.1	The system shall support master data management for organizational structures, people, neighborhoods, assets, and financial cost codes
		Real Estate Portfolio Management	FR.1.32	The system shall provide pre-built metrics such as cost per area, occupancy rate, and on-time delivery
Validate/audit utility bills against energy usage information collected from building meters	BR.1.6	Real Estate Portfolio Management	TR.5.2	Provide full auditing capabilities at the security, field, and action levels

Note 1: Highlighted “cells” represent relationships not called out explicitly in the Detailed Requirements

Table G-2 continues on the next page

Table G-2 (continued): Real Estate Portfolio Management Requirements Analysis

Requirement	Business Req. #	Business Category	FR or TR #	Description of Functional Requirement (FR) or Technical Requirement (TR)
Create and receive invoices; Reconcile invoices against previous payments and contract terms to identify overcharge	BR.1.7	Real Estate Portfolio Management	FR.1.18	The system shall store a termination tickler that should be linked to Tenant Services and Portfolio Management. Specifically, the system shall support a tickler function for rent expirations and escalations
		Real Estate Portfolio Management	FR.1.2	Automate workflow-based notices and alerts such as expiring leases, available options, and overdue payments (can include other divisions needs such as Budget requests)
Provide a planning framework to define, measure, and report on facility objectives and performance goals across a portfolio, neighborhood, facility	BR.1.8	Real Estate Portfolio Management	FR.1.28	The leasing module shall support monthly, quarterly, and annual expense reports
		Real Estate Portfolio Management	FR.1.29	The leasing module shall support monthly and annual invoicing
		Real Estate Portfolio Management	FR.1.3	Automate workflow-based creation of payment schedules from approved lease contracts and appraisal contracts while keeping track of the payment deadlines
		Real Estate Portfolio Management	FR.1.30	The leasing module shall support one-time invoices
		Real Estate Portfolio Management	FR.1.31	Automate reconciliation of invoices against previous payments and contract terms to identify overcharges

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