

DISCOVER

Best Practices in Airport Lease & Concessions Management at Boston Logan International Airport

Technical Whitepaper by David Tamir

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EXECUTIVE SUMMARY

Through my experience working with dozens of airports over the past 25 years, I have discovered that Boston-Logan International Airport (part of the Massachusetts Port Authority -- MASSPORT) has achieved best practices in lease and concessions management, by leveraging an exceptional system by x-Spatial. The Boston-Logan x-Spatial solution provides the following top 10 advantages:

1. Embedded Geospatial Information System (GIS) with map-driven user interface, allowing airport managers to view, edit, and analyze color-coded leased spaces, and quickly navigate to all pertinent information regarding space and agreement status; also useful for lease agreements on point assets such as advertisement displays, vending machines, etc.
2. Extensive alerting options including ticklers for agreement expirations, due dates, etc.
3. Powerful embedded reporting for customization and distribution of multiple report types.
4. Flexible document linking capability for attaching lease abstracts, lease drawing exhibits, photos, inspections, and other pertinent information to agreements, companies, invoices, spaces, or to the mapped asset location such as billboards, vending machines, etc. (for point asset billing).
5. Practical scenario analysis for contemplated leasehold changes without impacting billings, data, etc.
6. Efficient "Global Rates" database table, simplifying changes to agreements or leaseholds.
7. Agreement & tenant change management via built-in workflow, including approvals and audit trails.
8. Rule-based revenue forecasting for short-term and long-term leases; supporting bond ratings.
9. Google-like fuzzy search; entry of partial information yields results that can be further refined.
10. Context-based filtering, including spatial filtering; for example, highlighting only a specific tenant's lease information on a map.

Moreover, the x-Spatial solution facilitates compliance with the new GASB-87 requirements.

INTRODUCTION

I recently discovered that MASSPORT, including Boston Logan International Airport, has a “hidden gemstone” which they use to manage their leases and concessions with functionality yet to be achieved by other airports. This “gemstone” is a software solution by x-Spatial, refined for over two decades, but not well known.

As a long time consultant, focused on improving various airport business processes by leveraging technology, I felt it is important to let other airports know about the best practices achieved by MASSPORT with x-Spatial’s solution; especially now with the new GASB-87 compliance requirements upon us, and the need for airports to recover from COVID-19 and return to maximizing revenue opportunities.

I would like to thank MASSPORT’s Kevin Gabel and x-Spatial’s Ed Maghboul, for supporting my research and this technical whitepaper.

BACKGROUND

Over two decades ago, airports in North America (NA) started flocking to PROPworks, a well marketed Commercial-Off-The-Shelf (COTS), airport-specific, software solution for lease and concession management. Approximately 100 airports adopted PROPworks and still use it today; supported by Amadeus. However, several alternative solutions have emerged in NA over the past 20 years: x-Spatial’s AviSoft, GCR’s Airport IQ Business & Revenue Manager, ProDIGIQ’s MYKONOS, and Yardi’s Voyager.

MASSPORT, which owns and operates an assortment of real-estate properties along with its seaport and three airports in Massachusetts — Logan International Airport, Hanscom Field, and Worcester Regional Airport, experienced multiple pain-points with their lease and concessions management practices and tools. In 1999, MASSPORT set out to remedy this situation by issuing an RFP for acquisition of a new system, which would improve their practices and combine their three disparate systems into one common lease and concessions management system across all their properties. MASSPORT selected x-Spatial’s AviSoft solution to become their new Common Lease Management System (CLMS) for airport, maritime and other port assets. ^[1] Since initial roll-out at Boston in 2001, MASSPORT has worked closely with x-Spatial to refine the port authority’s lease and concessions business processes and tools through the AviSoft solution. Today, AviSoft is a fine-tuned COTS product with a solid 19-year track record, which has continued to evolve with state-of-the-art proven technology.

AviSoft is a browser-based application for airport lease, concession, and space management. AviSoft can be setup on-premise or on-cloud for managing tenants, their lease/concession agreements, tracking the status of properties/spaces and providing billing information to the airport’s accounting system. MASSPORT’s Boston Logan International Airport (Boston-Logan) also implemented two additional complementary x-Spatial products: an AutoCAD Map add-in called the Leaseline Management Application (LMA), and an airport business statistics application called AvStats. The genesis of x-Spatial’s products date back to 1998 at Los Angeles International Airport (LAX), to automate generation of master lease exhibits.

[1] Keys to Successful Use of a Geographic Information System; Ed Maghboul; AAAE Airport Magazine.Net, February/March 2010

PAST PAIN-POINTS AT BOSTON-LOGAN

Boston-Logan was experiencing various pain-points prior to implementing x-Spatial's solution. Many airports are still experiencing these today, even while using solutions such as PROPworks. Examples of the pain-points, resolved at Boston-Logan, are listed below: ^[1]

- Reporting to regulatory authorities was labor intensive
- Ability was lacking to generate/distribute standard and custom reports, of multiple types
- Difficulty developing revenue forecasts for short-term and long term, needed for bond ratings
- Updating lease rates required manual updates per agreement
- Poor ability to analyze scenarios of contemplated leasehold changes without impacting billings
- Managing lease changes and approvals was inefficient with poor audit trail
- Generating floor plans reflecting tenant leasehold changes was a lengthy process
- Floor plan changes required manual entry of new measurements into the billing system
- Paper drawings pieced together with data from various business systems failed to produce accurate location information
- Information airport property managers accessed was often inaccurate or out of date
- Limited capability to link/attach reference documentation to lease agreements, companies, invoices, or mapped leased spaces/assets (e.g., lease abstracts, lease drawing exhibits, photos, inspections, etc.)
- Poor ad-hoc search capability including filtering of information to find answers
- Typical business questions that were difficult and time consuming to answer:
 - Which tenants are due quarterly invoices next month?
 - Which lease agreements are due to expire in 90 days?
 - How many rooms in this building are leased until the end of the year?
 - Which rooms/spaces are available to be leased?
 - Where is a particular airline renting space from us?
 - Where is the floorplan for this lease-agreement?
 - Where are the lease-agreements for this floor?
 - How many passengers used the airport last quarter?
 - What was the occupation rate for remote gates?
 - Are we handling more trans-Atlantic freight than last year?

[1] Keys to Successful Use of a Geographic Information System; Ed Maghoul; AAAE Airport Magazine.Net, February/March 2010

X-SPATIAL SOLUTION'S TOP 10 ADVANTAGES

Boston-Logan's implementation of the x-Spatial solution, dramatically improved their lease and concessions management business processes, resolving the pain-points described above. [1] The top 10 advantages of the x-Spatial solution, which has transformed Boston-Logan, involve: (1) mapping, (2) alerts, (3) reports, (4) attachments, (5) scenarios, (6) global rates, (7) change management, (8) forecasting, (9) quick search, and (10) filtering.

#1: Mapping



Boston-Logan's x-Spatial solution combines data from different sources to deliver the complete lease and concessions picture, overlaid on the airport's mapped facilities. The solution integrates lease agreements, tenant records, and floorplans.

The solution provides an embedded Geospatial Information System (GIS) with a map-driven user interface, allowing airport managers to view, edit, and analyze color-coded leased spaces, and quickly navigate to all pertinent information regarding space and agreement status; also useful for lease agreements on point assets such as advertisement

displays, vending machines, etc. The GIS interface provides intuitive map-based navigation and queries: one click on a room gives the user not just space quantities, but also tenant and agreement information. GIS thematic coloring highlights information such as rental rates, lease expiration dates, and revenue levels generated per concessionaire.

The solution's mapping functionality includes pre-set map views for quick navigation to various parts of the airport's facilities, zoom and pan functions, map layer controls including predefined layer sets, asset identification, assigning space to leasehold, point dataset functions (e.g., add, delete, move, type, operator), spatial analysis tools including coordinates, measurements (e.g., length, area), buffer, thematic coloring, markup tools (e.g., redlining, symbology, shapes, text, etc.), and print map exhibit functions including options for title, legend,

north arrow, orientation, and paper size.

The solution interfaces with Computer Aided Design and Drafting (CADD) drawings, enabling seamless flow between CADD and GIS; this is efficient because more than 80 percent of space geometry data originates from Autocad drawings. The solution processes floor plan and outdoor property updates into GIS features connected to the System's database, containing the facilities and lease and concessions information. The solution converts updated floor plans or property basemaps, incoming from Autocad, into intelligent GIS space-boundaries; it automatically generates GIS polygons from the CADD linework; it links the GIS spaces to the System's corresponding database facility records (if it's a new facility asset, then it creates a new facility record in the System's database); and it edits space-boundary line geometry (i.e., splitting

[1] Keys to Successful Use of a Geographic Information System; Ed Maghboul; AAAE Airport Magazine.Net, February/March 2010

rooms, joining rooms, modifying rooms) with revised spatial parameters (e.g., area), automatically calculated and reflected in the System's database.

#2: Alerts



Boston-Logan's x-Spatial solution provides extensive alerting options including ticklers for agreement expirations, due dates, etc. The solution provides various alerts functionality for reminding users of needed actions and/or processes to be initiated (e.g., next escalation date for agreement rate schedule, original agreement termination date, option notice due). Boston-Logan's system administrator can create as many different types of alerts as may be required by users and edit these. Setting up an alert type/criterion involves naming the alert type (i.e., category), selecting the relevant due date data field, identifying the number of days prior to the due date for the alert, and specifying the alert message. Workflows, such as billing approval,

requiring completion of certain workflow steps by certain dates, also have corresponding alerts. Alerts are organized by Boston-Logan user groups; alert messages are sent to all users within the group via e-mail. Scheduled alert messages are viewable by all users within a group.

#3: Reports



Boston-Logan's x-Spatial solution provides a powerful embedded reporting module (by Crystal Reports) for customization and distribution of multiple report types. The solution provides typical out-of-the-box reports, which can be readily used and/or customized by Boston-Logan (e.g., true-ups, lease revenue generation comparison across tenants, bill quantity versus measured space quantity, concession insurance tracking, concession lease term tracking, concession listing by terminal, concession listing by concept type, facility-wide concession contact list, Minimum Annual Guarantee

(MAG) tracking, etc.). The solution allows Boston-Logan to develop an unlimited number of its own custom report types. The solution enables "Published Reports", which are snapshots in time at predefined intervals (e.g., monthly, quarterly, annual), while also enabling live reports of the latest available data. Moreover, Boston-Logan's solution reports on aggregated and processed aviation metrics/quantities, self-reported from airlines and other sources, and measured (i.e., from radar), including flights, passengers, baggage, cargo, etc.

#4: Attachments

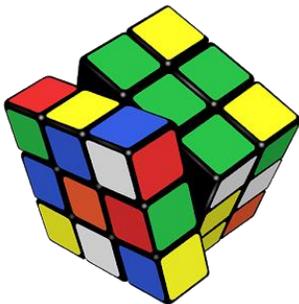


Boston-Logan's x-Spatial solution provides a flexible document attachment capability to agreements, companies, invoices, spaces, or to the mapped asset location such as billboards, vending machines, etc. (for point asset billing). An unlimited number of files and various types can be attached and managed by the x-Spatial

system with metadata and search capability, using keywords or specific document attributes. Document types include but are not limited to: contract materials, certificates, inspections, correspondence, lease exhibits, drawing files, scanned images, digital photos, audio/video files, etc. An unlimited number of attachments

Moreover, an unlimited number of notes can be generated and attached within the system to agreements, companies, invoices, spaces, or to the mapped asset location. The Boston-Logan solution provides embedded notes generation, with rich word processing functionality and metadata describing when and who generated the note.

#5: Scenarios



Boston-Logan's x-Spatial solution provides practical scenario analysis for contemplated leasehold changes without impacting billings, data, etc. What-if-scenarios are enabled to

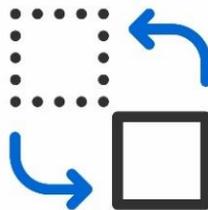
facilitate agreement development, revisions, and amendments with financial reporting/forecasting, without committing to the change and adversely affecting billing.

#6: Global Rates



Boston-Logan's x-Spatial solution provides a "Global Rates" table as part of its database, simplifying changes to agreements and their leaseholds. When a standard rate needs to be changed, applicable across multiple agreements/leaseholds, the change is made in the system's global rates table, rather than in each individual agreement and its leaseholds.

#7: Change Mgm't



Boston-Logan's x-Spatial solution provides agreement and tenant information change management via

built-in revision tracking and workflows, including approvals and audit trails. Revision tracking functionality is provided to document any changes/updates to the agreement's and/or company information, including who made the changes, when, and why. Agreement revisions include an approval workflow, associated documents, notes, etc., which are supported by the system. Agreement revisions may result in issuance of a bill (credit or debit) to the tenant, and may also trigger an amendment to the agreement; managed by the system.

Depending on the type of change requested, the appropriate workflow is automatically initiated with the corresponding change process; such as type of agreement to be revised would initiate the corresponding pre-configured workflow. Different agreement categories require different workflows.

The Boston-Logan solution captures and displays metadata of initiated workflows including, but not limited to, workflow steps (a.k.a., stages) and their corresponding group members, status, completed by, date completed, and comments.

When a workflow step is completed, the system advances the process to the next step. When a workflow step is reached, then the System notifies the group members assigned to the step via e-mail, that a workflow step is awaiting their action (e.g., data entry, data validation, review, approval). Group members are also able to lookup all workflows awaiting their action via the system's inbox, assigned to each group member.

The Boston-Logan solution supports simple and complex workflows. The simplest workflow would involve one initiator and one approver. A complex workflow can have multiple initiators with multiple approvers with multiple approval steps. If a workflow step is going to take some time to work/review, the step's group member has the option to inform stakeholders that the step is "in progress" and provide details/comments if desired. Moreover, if an approval step has been initiated, then the submitter has the capability to "recall" and step the workflow process back in case of a required change/correction. If a workflow step is disapproved, then the system requires an explanation from the disapprover, and then does

not progress to the next step, but rather notifies the process workflow initiator via e-mail. When a final workflow step is approved, then the system closes the workflow.

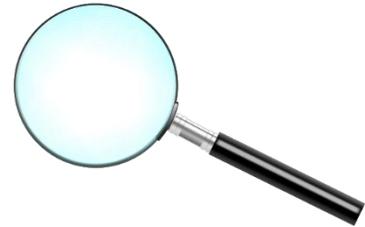
#8: Forecasting



Boston-Logan's x-Spatial solution provides rule-based revenue forecasting for short-term and long-term leases; supporting bond ratings. Revenue forecast income is calculated by the system, by projecting the monthly rent for all existing 'non-cancelable' agreements of any facility over any required period. In order to project the most reliable forecast possible, the system provides robust validation quality control checks of data parameters for: agreements (i.e., missing information), space rates (i.e., not designated as either global or custom rate), space start/end dates (i.e., missing rent commencement or termination dates), space escalation (i.e., missing next escalation factor and/or next escalation date), space

escalation of Consumer Price Index (CPI) type (i.e., missing type such as food & beverage, retail, office, support premise, advertising), space schedule overlap, and space schedule gap. The system will identify such potential errors found and allow the user to correct them. Reports are generated for projected rental income by space, by facility, by agreement, by company, and by charge code.

#9: Quick Search



Boston-Logan's x-Spatial solution provides simple, yet powerful, search functions. The system provides the user the ability to select the type of search desired, to more quickly find the information needed (i.e., by limiting the search to data fields of a particular type). Search types include: company, contacts, agreements, revisions, billing, parcel, sub-parcel, building, floor, and room. "Google-like" fuzzy search capability is also provided; entry of partial information yields results that can be further refined or selected. Search results

associated with a map location, can be quickly shown on the map by clicking the “zoom map” icon, next to the search results item.

Moreover, documentation stored in the system as attachments to facilities, companies, agreements, billing, etc. can be searched by their metadata (e.g., filename, type, revision number, creation date, author name, description, registration date, registration by). You can adjust the search for exact or partial matches and exact date or range (i.e., before, after).

#10: Filtering



In addition to the search functionality described above, Boston-Logan’s x-Spatial solution provides powerful context-based filtering. Whether looking up facility, company, agreement, billing, or other information type in the system, a filter icon allows the user to refine

the listing by any of the attributes associated with the context of the items listed, with Boolean logic (e.g., is, is not, is greater than, is smaller than, contains, begins with, ends with, before, after). For example, a listing of agreements can be filtered by agreement termination date, by contract manager, etc. The system also includes spatial filtering; for example, highlighting only a specific tenant's lease information on a map, or show all spaces available for leasing.

Other Key Advantages



In addition to the top 10 advantages described above, Boston-Logan’s x-Spatial solution provides various other key advantages. The following are some examples.

Multi-record edit function allows for multiple system’s database attributes to be edited at the same time, from the web-enabled user interface by authorized users. For example, if the same data entry change is required across multiple agreements, or facility spaces, etc., the

authorized user does not need to edit each one individually, but rather can select all to be edited, and edit them collectively once.

An agreement with all its details, evolution history, and assigned facility assets can be easily transferred to another company taking over.

Any change to the system’s data is tracked and displayed as to when, why and who changed the system’s data.

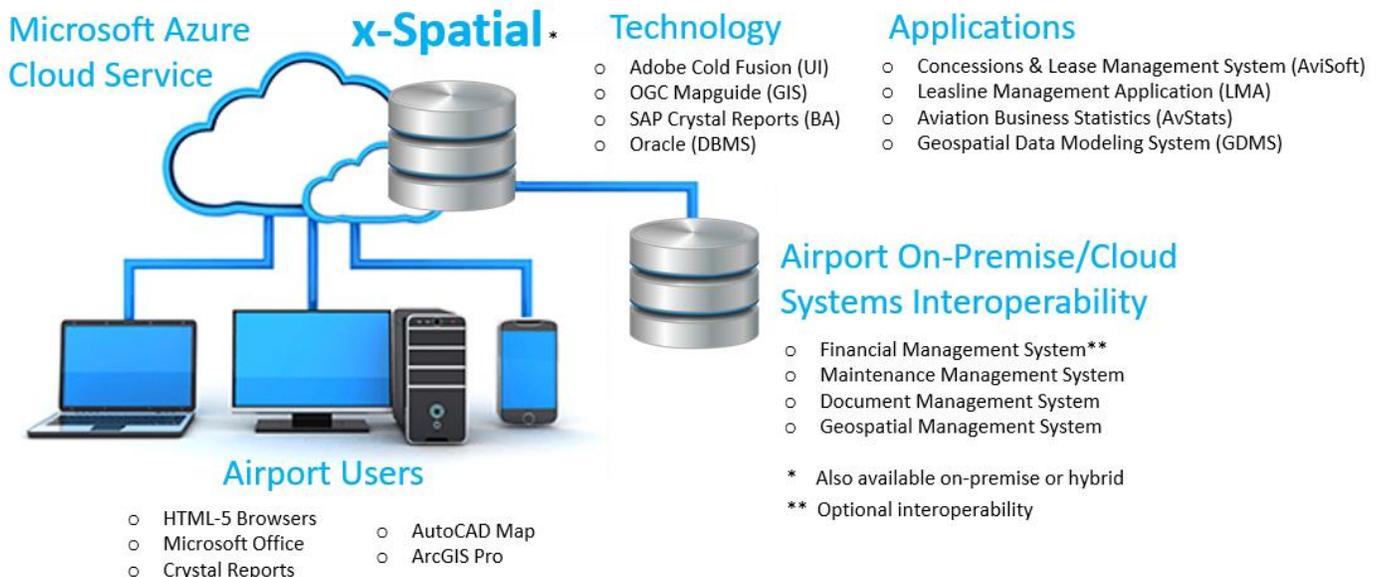
The system is able to interface directly, or via external export/import tables, with the airport’s financial accounting system for billing invoice processing, invoice payment status, etc. Boston-Logan’s x-Spatial solution can either generate and distribute the billing invoices by itself or via the airport’s financial system.

Enabling Technologies

Boston-Logan’s x-Spatial lease and concessions management solution utilizes several state-of-the-art, key enabling technologies: Computer Aided-Design and Drafting (CADD), Geospatial Information Systems (GIS), relational and spatial Database Management System (DBMS), Business Analytics (BA) Reporting Engine, Electronic Document Management System (EDMS), and web-enabled User Interface (UI). The solution provides an AutoCAD Map add-in, called the Leaseline Management Application (LMA), enabling efficient floor plan updates with GIS intelligence to handle incoming Architectural Engineering Construction (AEC) drawings. x-Spatial’s solution includes an embedded GIS with Open Geospatial Consortium (OGC)’s Mapguide Open Source, as the web-enabled GIS mapping platform. While an airport enterprise GIS is not a prerequisite for the x-Spatial solution, integration with an existing airport GIS or implementing x-Spatial’s powerful enterprise GIS are options; x-Spatial’s airport enterprise GIS is industry leading, uniquely integrating Autodesk and ESRI’s CADD-GIS technologies. x-Spatial leverages SAP’s Crystal Reports as its BA engine for authoring reports and dashboards. Moreover, x-Spatial offers an embedded EDMS to manage all types of documentation/files associated with lease-able facilities, companies, agreements, billing, etc. The system’s efficient Oracle DBMS is administered via a user-friendly, web-enabled UI, using Adobe’s ColdFusion Technology. The system is available as an on-premise solution, but also via Microsoft’s Azure cloud service; as a cloud service, no IT infrastructure and corresponding system administration would be necessary on the airport owner side, other than internet connectivity and a web browser.

Open System Architecture

Boston-Logan’s x-Spatial solution is based on an open architecture approach in terms of its DBMS, CADD-GIS, and EDMS data, as well as its web UI platform, facilitating interoperability with other systems and future migration when needed. The system can be integrated if needed with the airport’s financial management system, maintenance management system, document management system, and/or geospatial management system. Interoperability can be supported at the database level, by leveraging external systems’ Application Programming Interfaces (API)s, and/or external intermediary data exchange tables. Spatial interoperability is supported with both Autodesk and ESRI.





REALIZED BENEFITS

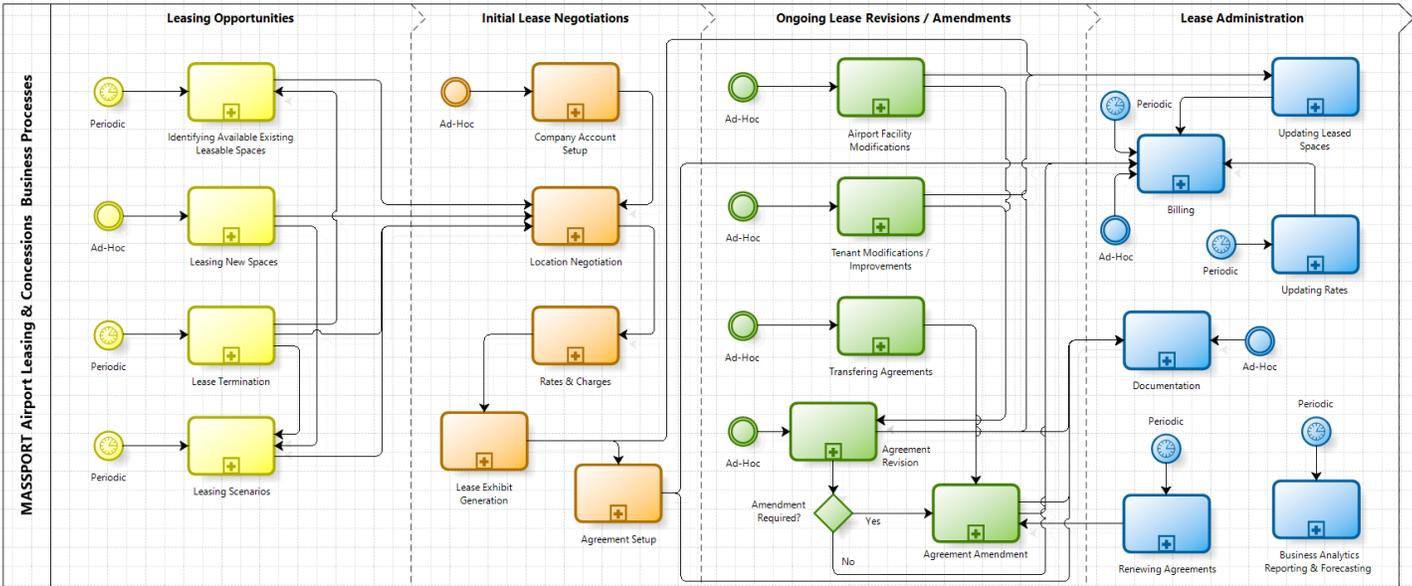
Boston-Logan has realized extensive benefits from the implementation of the x-Spatial lease and concessions management solution.^[1] The system provides continuous alignment of spatial and financial information. If an airline acquires new gates or maintenance space, the system automatically adjusts the billing based on the tenant's negotiated price per square foot. Integrating sitemaps, floorplans and tenant information make it easy to find the answers. When lease managers need to view a lease plan and contract information, they can find the information instantly. "Our GIS enabled application has proved very valuable," explained Greg Zanni, Boston-Logan's manager for airport properties and leasing [retired]. "I use it every day to review vacancies and spaces that tenants occupy throughout the airport. Compared to our old system, it is a tremendous time-saver because we no longer require assistance from a CADD specialist to view electronic lease plans." ^[1]

"Airport terminals are very large and dynamic," said Kevin Gabel, Boston-Logan's Airport Business Office CADD specialist. "Our system delivers real-time maps and business information, helping us to improve productivity and make better decisions. Our lease managers save hundreds of hours each year, and more than 200 employees access dynamic facility maps each day through MGP." [MASSPORT's Geographic Portal (MGP) is part of the CLMS solution deployed by x-Spatial.] Moreover, "...space planning is a breeze. Just set up a proposed contract; code the rooms you want into it; and run accurate reports and drawings right out of the system in minutes," said Gabel. ^[1] Grounds managers also use the system to plan maintenance operations and measure landscaped areas. The system has enabled a single Boston-Logan employee, Gable, to maintain lease plans and geospatial data for more than 10 million square feet of space, covering exterior areas and 39 buildings.

[1] Keys to Successful Use of a Geographic Information System; Ed Maghboul; AAE Airport Magazine.Net, February/March 2010

IMPROVED BUSINESS PROCESSES

Lease and concessions management, at a complex and dynamic environment such as an airport, is an extra demanding and unique discipline, spanning a wide spectrum of business dealings deserving special attention to optimize processes and tools. Leveraging x-Spatial’s tools, Boston-Logan was able to dramatically improve its lease and concessions management processes. These processes can be organized into four major categories, as shown in the Business Process Model (BPM) diagram below: Leasing Opportunities, Initial Lease Negotiations, Ongoing Lease Revisions / Amendments, and Lease Administration.



Leasing Opportunities

Lease and concessions management starts with identifying opportunities to sustain and grow the airport’s revenues. The primary asset which an airport leases is space, whether it’s inside a building such as terminal rooms or advertising space, or outside buildings such as parking areas whether for aircraft or rental cars. There are various types of spaces, across an airport’s multi-faceted property, to track in terms of suitability and availability for leasing. Tracking such spaces and ascertaining corresponding availability is a corner stone need. As airports continue to evolve their properties and facilities, new spaces become available for leasing. These need to be added into the “catalog” of lease-able spaces. Airport lease managers also need to prepare for lease terminations, due to expiring agreements or facility changes; where the leased space or leasehold is removed or replaced. As part of proactively seeking opportunities to maximize leasing, new or amended “what-if” lease scenarios need to be contemplated and studied for financial and functional tradeoffs.

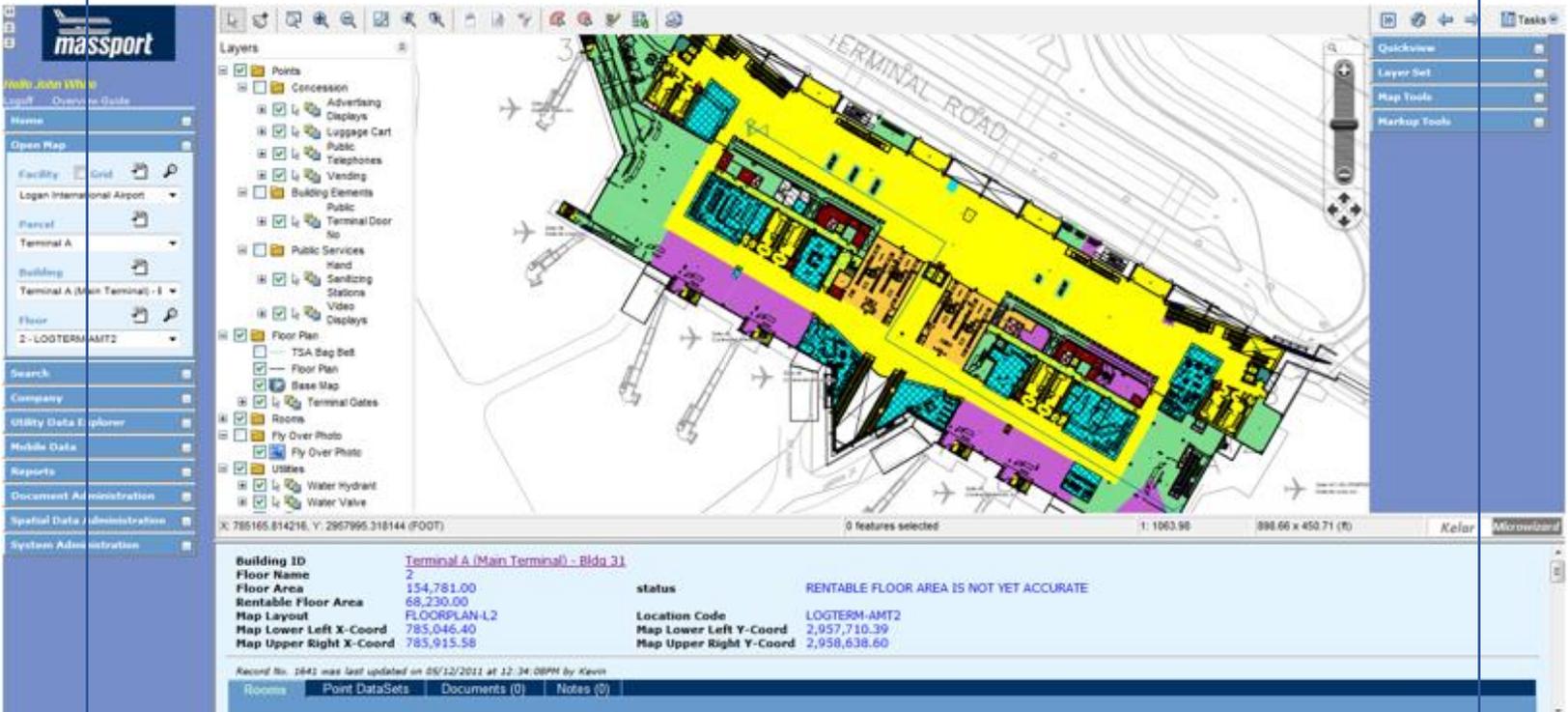
These processes are ongoing on a periodic basis. Boston-Logan’s x-Spatial solution provides the necessary tools to help maximize an airport’s leasing opportunities, especially through x-Spatial’s embedded GIS

functionality, various alerting capabilities, and flexible database architecture to enable multiple scenarios analysis.

Initial Lease Negotiations

After identifying leasing opportunities, potential interested companies need to be engaged to negotiate lease agreement(s) for the available lease-able space/assets. The x-Spatial system is able to store company information for existing, past, as well as potential tenants and concessionaires, which may not have an agreement in place yet with MASSPORT. Boston-Logan is able to spatially examine (i.e., via its built-in mapping interface) the adjacent tenants to the lease-able spaces/assets, for potential interest to expand an existing lease. Boston-Logan is also able to review notes in its x-Spatial database of potential tenants, who may be interested in leasing such available space/asset. Once interested contender(s) for leasing the space/assets are identified, the exact lease location and quantity need to be negotiated along with the corresponding rates and charges. Leasing rates include standard rates and/or custom rates; for example with concessions, the rate may be composed of a fixed rate, plus percentage of revenue, with a Minimum Annual Guarantee (MAG).

Once negotiations are settled, a lease exhibit is generated, serving as a drawing to map the location and quantity agreed upon. Boston-Logan's x-Spatial solution provides this mechanism either via its web-enabled mapping UI or via its AutoCAD extension. Agreement details, corresponding to the company and facility space/asset being leased, are entered into the x-Spatial system via its web-enabled UI, and processed for review and approval and billing. Boston-Logan's x-Spatial system provides various review and approval workflows and billing templates, corresponding to different agreement types. Reminder alerts may be setup for this agreement in the system as well.



Boston-Logan's x-Spatial system is able to support the setup of various types of agreements, beyond basic lease and concessions. These include, but are not limited to: (listed in alphabetical order)

- Access Agreement
- Bill of Sale
- Concession Agreement
- Consent Agreement
- Consent to Assignment
- Consulting Services
- Deed
- Development Agreement
- Dock License
- Easement
- Escrow Agreement
- Ground Lease
- Ground Sublease
- Interim Lease
- Lease
- Letter Agreement
- License Agreement
- License and Concession Agreement
- License and Operating Agreement
- Management Agreement
- Memorandum of Understanding (MOU) Agreement
- Non-Disturbance & Attornment Agreement
- Non-Rentable
- Operating Agreement
- Option Agreement
- Other
- Parking Agreement
- Parking Lease
- Pipeline Removal Agreement
- Professional Services
- Public Premises
- Purchase and Sale Agreement
- Right of Entry
- Service Agreement
- Service Provider Agreement
- Sublease
- Temp Revocable License
- Term Sheet
- Vacant

Ongoing Lease Revisions / Amendments

Lease and concessions agreements often need to be revised and/or amended, on an ongoing basis. Changes may include the need for more or less space, the need to move to another location within the facility, improvements to the space, transferring agreements (i.e., due to mergers and acquisitions, and/or company name changes), billing rate modifications, and various others. Changes may be driven by the airport's facility modifications or tenant required modifications. Managing and tracking agreement changes, with audit trails over time, can be complex and critical.

Boston-Logan leverages the x-Spatial system's built-in change management functionality to document any changes/updates to the agreement's and/or company information, including who made the changes, when, and why. Boston-Logan's agreement revision processes include review and approval workflows, facilitated by the system. Agreement revisions may also result in issuance of a bill (credit or debit) to the tenant, and may also trigger an amendment to the agreement. Depending on the type of change requested, the appropriate workflow is automatically initiated with the corresponding change process. Different agreement categories require different workflows.

Lease administration

Boston-Logan's lease and concessions management include various administrative processes including, but not limited to billing, updating standard rates, updating facility spaces, renewing agreements, business analytics reporting, forecasting, and documentation.

The billing process involves various types of billings such as regular monthly billing, back billing and/or credit, concession billing, accrual billing, one-time billing, etc. The x-Spatial system supports Boston-Logan with appropriate billing templates, monthly automated billing, and interoperability with the financial management system for billing distribution and invoice payment status. Moreover, the system provides an auditable billing review and approval workflow, corresponding to the billing type.

When a standard rate needs to be changed across multiple agreements, per the Consumer Price Index (CPI) and board approval, Boston-Logan makes the change efficiently via the system's "global rates" table, rather than in each individual agreement.

Updating mapped spaces and their attributes, in order to reflect the evolving airport facilities in support of leasing and concessions, is a tedious process facilitated by the x-Spatial system through its interoperability with AutoCAD Map; enabling efficient floor plan updates with GIS intelligence to handle incoming Architectural Engineering Construction (AEC) drawings. Boston-Logan's space updating process includes a component that is absolutely critical to the process – a dedicated CADD-GIS specialist, who sustains and administers the system's facility data on a daily operational basis.

Boston-Logan's various lease and concessions reports are automatically generated and distributed by the x-Spatial system (e.g., true-ups, lease revenue generation comparison across tenants, bill quantity versus measured space quantity, concession insurance tracking, concession lease term tracking, concession listing by terminal, concession listing by concept type, facility-wide concession contact list, Minimum Annual Guarantee (MAG) tracking, etc.). In addition to the automatic "Published Reports", which are snapshots in time at predefined intervals (e.g., monthly, quarterly, annual), Boston-Logan is also able to generate live reports of the latest available data from the system. Moreover, the x-Spatial system reports on aggregated and processed aviation metrics/quantities, self-reported from airlines and other sources, and measured (i.e., from radar), including flights, passengers, baggage, cargo, etc. Further-more, reports supporting bond ratings are generated for projected rental income by space, by facility, by agreement, by company, and by charge code; with rule-based revenue forecasting for short-term and long-term leases.

Boston-Logan's above processes include regimented documentation facilitated by x-Spatial's flexible document attachment capability to agreements, companies, invoices, spaces, or to the mapped asset location such as billboards, vending machines, etc. (for point asset billing). Boston-Logan captures in its system documentation including but are not limited to: contract materials, certificates, inspections, correspondence, lease exhibits, drawing files, scanned images, digital photos, audio/video files, etc. Moreover, Boston-Logan leverages x-Spatial's notes functionality to help document relevant information associated with agreements, companies, invoices, spaces, and mapped point asset locations. These notes include automated system metadata, describing when and who generated the note.

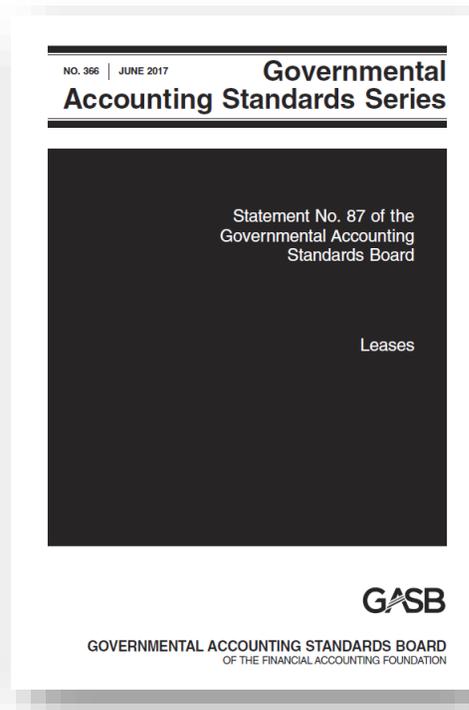


GASB-87 COMPLIANCE

A new Governmental Accounting Standards Board (GASB) requirement for leases, GASB-87, applies to US airports and goes into effect for fiscal years ending on December 31st, 2020, or later. The new standard revises financial reporting for leases. Leases, previously considered operating leases, will now be reported on the balance sheet as a lease receivable or a lease liability, with an offsetting deferred inflow of resources or intangible right to use the asset. The x-Spatial system's extensive database, document management, and reporting capabilities will facilitate airports to comply with GASB-87.

Implementation of x-Spatial's solution will essentially prepare your airport for GASB-87 compliance by identifying all leases to be managed by the system; gathering and loading all the data and associated documentation on all the leases into the system including agreements, revisions, amendments, extension, etc.; populating the system attributes categorizing and describing all the lease terms, conditions and documentation, making them easily searchable and reportable; and configuring report templates and forecasts.

Configuration of the reports in the x-Spatial system for GASB-87 compliance should be performed in concert with the airport's Chief Financial Officer (CFO), accountants, and financial consultants/auditors.



IMPLEMENTING X-SPATIAL'S SOLUTION

Implementing x-Spatial solution is straight forward, from a technology perspective; because it is not a custom solution, but rather Commercial-Off-The-Shelf (COTS). It is configured to tailor-fit to each airport's specifics (e.g., facilities, companies, agreements, user groups, reporting templates, review and approval workflows, etc.). Moreover, implementing x-Spatial's system via its available Microsoft Azure cloud service, is even simpler; because there is no need for on-premise servers, backup, nor system administration. However, implementing a lease and concessions management solution from a data and process perspectives, is a more complex undertaking; as is the case with all business systems requiring data to be collected, processed, loaded, updated and applied with improved organizational processes, which depend on staff.

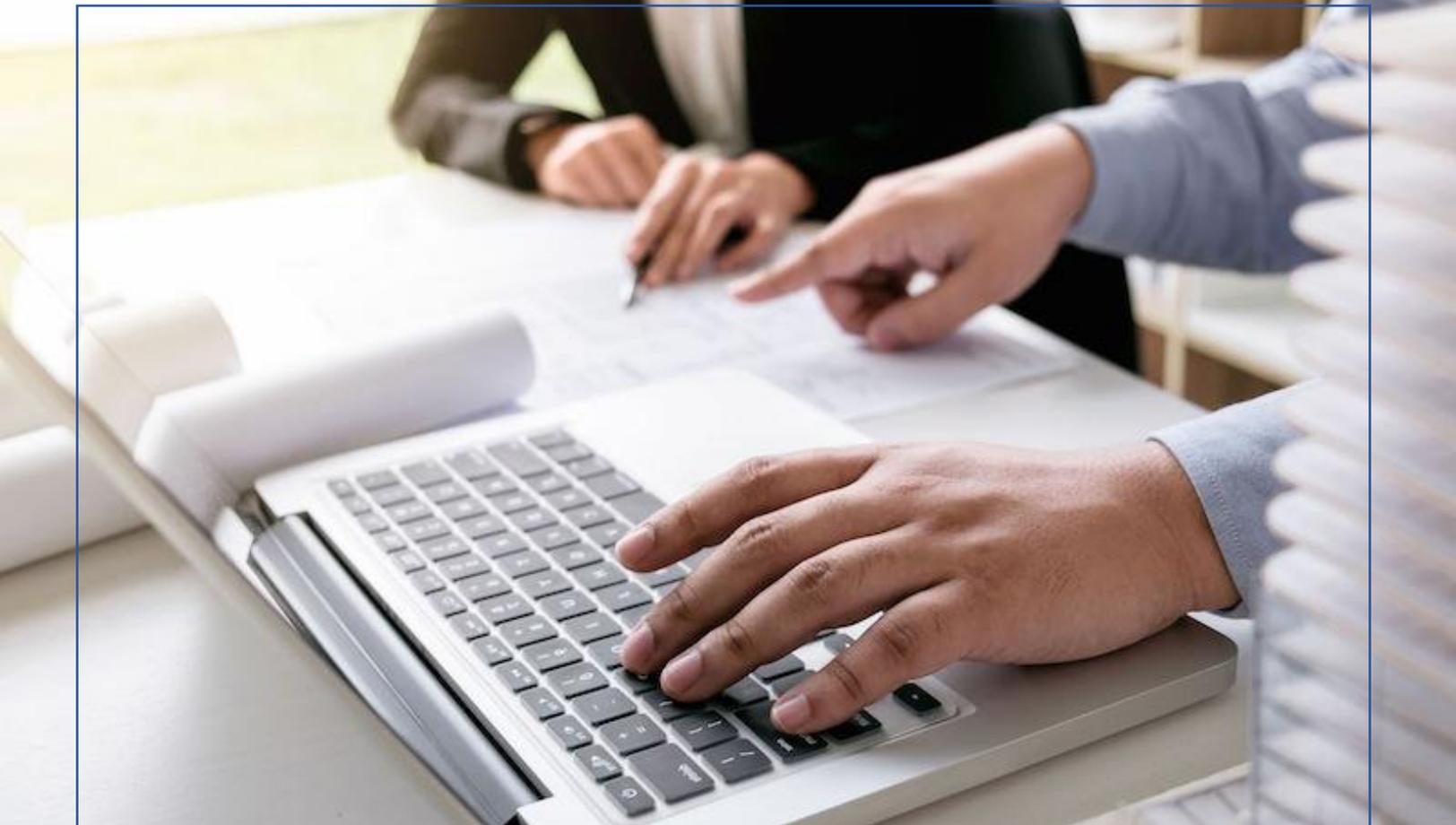
A business system, such as an airport lease and concessions management solution, is like a "three-legged stool." One leg is the TECHNOLOGY, the second is the DATA, and the third is the PROCESS (which includes people). The stool cannot support itself without all three legs in place.



Airport staff are usually saturated with daily work activities, which leave little to no time for them to initially populate the System with data and develop improved processes. This means system implementation will require professional services to supplement airport staff during implementation, to setup the system's data and processes, in addition to the system's technology configuration. Therefore, procurement of a new/replacement lease and concessions management system must include the corresponding implementation labor, as described under the following procurement specification section.

Moreover, as mentioned previously, an absolutely critical component of the PROCESS "leg" is a dedicated CADD-GIS specialist, who will sustain and administer the system's facility data on a daily operational basis. Some airports may attempt to address this need via centralized CADD-GIS airport function. However, from personal experience at many airports, this does not work well for lease and concessions management; because such centralized resources tend to be spread across a myriad of airport business requirements, supporting on a prioritized basis. Lease and concessions management, at a significantly sized airport, requires a fully dedicated CADD-GIS/data administrator for the system, reporting to the airport's organizational division that manages leases and concessions, and working closely with its staff as integrated team member.

Implementation timeframe depends primarily on the airport's readily available, quality, lease and concessions data; especially the corresponding facilities floor plan data. If an airport has outdated floor plans that require a major update, then x-Spatial can provide an indoor laser scanning (LiDAR) service, which can efficiently and cost effectively map and process the data for a large airport's terminal facility within a month's time (i.e., including planning, mobilization, coordination, scanning, and post processing). Given the required tailor configuration of the system, data, and process improvement (including training), the x-Spatial solution can be implemented and activated within 4-6 months.



PROCUREMENT SPECIFICATION

This specification is based on the above best practices learned from Boston-Logan. The specification is provided in an outline format to facilitate use in procurement documentation and/or spreadsheet. The specification is provided at a medium level of detail, to not custom tailor it to the AviSoft software product used by Boston-Logan, and to facilitate fair evaluation of alternative software products. The general functions, necessary to achieve Boston-Logan’s efficient business processes, are specified herein.

The following is a recommended specification for airports to procure the implementation of a Lease and Concessions Management System; hereinafter referred to as the “System”. The System is composed of three foundation elements: Process, Data, and Technology. The following specification is organized across these three elements.

The scope of required Process and Data tasks will be determined with the selected vendor, as part of project planning; hence, only proposed billable rates are requested for such work. For the Technology element, software licensing fees are to be provided, including any software customization fees, to deliver the specified required functionality.

1.0 Process Improvement and Organizational Change Management Services

The successful implementation of the System depends on establishing an improved business process to use and update the System's data. Sustaining the improved business process requires organizational change management. Vendor is to provide information on their airport experience relevant to the following process services, and provide labor hour rates for the following positions that are qualified to perform this work: senior project manager, senior system architect, senior process specialist, process analyst, and documentation specialist. The following services may be required and will be negotiated with the selected vendor as needed.

1.1 Project Management

Vendor may be requested to provide project management services for this implementation including, development of project Work Breakdown Structure (WBS), schedule control, cost control, and document control.

1.1.1 Work Breakdown Structure (WBS)

The required WBS needs to be organized into a decimal breakdown structure to accommodate project phasing, major tasks, and sub-tasks down to an appropriate level of detail to communicate the work steps required, to track scheduled work, and to cost estimate/budget the project. The WBS should address project phases/high-level tasks such as assess existing conditions and data, plan project accordingly, mobilize, ascertain specific airport business process requirements, configure software accordingly, review configurations, adjust, process and load data, test, address issues as needed, document, train, and support system sustainability as needed.

1.1.2 Schedule Control

To achieve schedule control, a Gantt chart (i.e., waterfall schedule) is required, corresponding to the WBS, showing estimated task start and end dates, durations, task dependencies, and estimated dates of deliverables. Required airport stakeholder tasks, including review times are to be identified on the schedule.

1.1.3 Cost Control

The project shall be controlled to not exceed the costs approved by the contract/task order(s). Any required changes in scope involving cost changes, shall be approved in advance by the airport, prior to commencing any such work.

1.1.4 Document Control

Documentation control involves managing the development, review, and delivery of the documents listed below. Documents are to be produced and delivered in native Microsoft Office file formats, for future edits as may be required, as well as in searchable Adobe Acrobat PDF format. Draft documents are to be provided to the airport for review and feedback, prior to

finalizing the deliverables. Document revision control and history information is to be provided as part of each document's front-matter and header/footer.

1.1.4.1 Processes & Procedures

1.1.4.2 System User Manual

1.1.4.3 System Configuration

1.1.4.4 Interoperability Interface Control Document (ICD)s

1.1.4.5 Lease Measurement Standards

1.1.4.6 Training Materials

1.2 Develop and Manage Risk Mitigation Plan to Achieving Change

Vendor may be requested to develop a detailed risk mitigation plan, identifying the various types of risks, which may threaten the successful implementation of the System and its organizational acceptance and sustainment, including necessary data updates. This plan is to include recommended mitigation approach corresponding to each identified risk. Vendor may be requested to assist with mitigation tasks.

1.3 Setup and Facilitate Process Improvement Team (PIT)

A PIT team may be setup and composed of airport stakeholder representatives for the processes to be improved. The vendor may be requested to facilitate PIT team meetings, including preparation of meeting agendas, meeting minutes, and action items tracking necessary to bring about sustainable process improvement leveraging the new System.

1.4 Develop Business Process Model (BPM) Diagrams & Procedures with Roles & Responsibilities

Vendor may be requested to work with the airport stakeholders to re-engineer the airport's lease and concessions business processes leveraging the new System; including updating procedures, and roles and responsibilities. The overall lease and concessions business processes may be organized into four parts: leasing opportunities, initial lease negotiations, ongoing lease amendments, and lease administration.

1.4.1 Leasing Opportunities

Leasing opportunities processes, for sustaining and increasing revenues where possible, should include at least the following:

1.4.1.1 Identifying Available Existing Lease-able Spaces

1.4.1.2 Leasing New Spaces

1.4.1.3 Lease Terminations (e.g., expiring agreement, space/leasehold removed or replaced)

1.4.1.4 Leasing Scenarios

1.4.2 Initial Lease Negotiations

Lease negotiations processes, to establish an initial lease or concessions agreement, should include at least the following:

1.4.2.1 Tenant Account Setup

1.4.2.2 Location Negotiation

1.4.2.3 Standard Rates

1.4.2.4 Custom Rates (including percentage of revenue and minimum annual guarantee)

1.4.2.5 Lease Exhibit Generation

1.4.2.6 Agreement Setup; supporting various types, such as the examples listed below:

- Access Agreement
- Bill of Sale
- Concession Agreement
- Consent Agreement
- Consent to Assignment
- Consulting Services
- Deed
- Development Agreement
- Dock License
- Easement
- Escrow Agreement
- Ground Lease
- Ground Sublease
- Interim Lease
- Lease
- Letter Agreement
- License Agreement
- License and Concession Agreement
- License and Operating Agreement
- Management Agreement
- Memorandum of Understanding (MOU) Agreement
- Non-Disturbance & Attornment Agreement
- Non-Rentable
- Operating Agreement
- Option Agreement
- Other
- Parking Agreement
- Parking Lease
- Pipeline Removal Agreement
- Professional Services
- Public Premises
- Purchase and Sale Agreement

- Right of Entry
- Service Agreement
- Service Provider Agreement
- Sublease
- Temp Revocable License
- Term Sheet
- Vacant

1.4.3 Ongoing Lease Revisions and Amendments

Ongoing lease revisions and amendments processes, to address constantly evolving needs, should include at least the following:

1.4.3.1 Airport Facility Modifications

1.4.3.2 Tenant Modifications / Improvements

1.4.3.3 Transferring Agreements (i.e., for mergers & acquisitions, company name change)

1.4.4 Lease Administration

Ongoing lease administration processes should include at least the following:

1.4.4.1 Updating Global / Standard Rates (non-negotiable)

1.4.4.2 Updating Leased Spaces

1.4.4.3 Billing; including various types such as regular monthly billings, back billing / credit, concession "billing", accrual billing, one-time billings; invoice distribution; and invoice payment status

1.4.4.4 Renewing Agreements (i.e., per options, amendments)

1.4.4.5 Business Analytics Reporting & Forecasting; such as true-ups, comparing revenue generation across tenants, negotiated quantity vs measured quantity, revenue forecasting, etc.

1.4.4.6 Documentation Management

1.4.4.7 Quality Control & Quality Assurance (QC/QA)

1.5 Support Development of Tailored Reports & Dashboards (if needed)

The proposed software solution is expected to provide a variety of report templates out-of-the-box. However, the airport may have unique reporting requirements specific to its business environment. Even though the proposed software is to enable the airport to tailor the reports for its specific needs and create its own special reports and dashboards, the vendor may be required to support this activity, if needed.

1.6 Develop Documentation

As described above, under Section 1.1.4 Documentation Control, vendor may be requested to produce some, if not all, of the documentation listed below; to facilitate use, refinement, sustainment, and recovery of the system. The system user manual is expected to already be available off-the-shelf, but will need to be tailored to this specific airport's configuration of the System.

1.6.1 Processes & Procedures; see processes described above under Section 1.4

1.6.2 System User Manual; should also be accessible from within the software

1.6.3 System Configuration; describing the as-configured settings specific to this airport

1.6.4 Interoperability Interface Control Document (ICD)s; to sustain potential interoperability with enterprise systems such as financial management, GIS, and document management

1.6.5 Lease Measurement Standards; for proper delineation of lease lines

1.6.6 Training Materials; Microsoft Power Point format for easy re-use, reference, and updates

1.7 Training

The vendor may be requested to provide thorough training courses for all relevant airport stakeholder personnel, tailored to the various user types, including system/data administration training. Training should include business processes and procedures relevant to the user types. The vendor may be requested to provide training materials and system user manual for use by the trainees during and after completion of the training. Training materials are to be provided in Microsoft Power Point format for easy re-use, reference, and updates. Training should also be video recorded for future reference. The timing of training should be such that when it is offered, those being trained can immediately apply their training on the operational system. Hence, training is to be scheduled in support of system functions that are already setup and running. System administration training may be offered as soon as the system is operational in the test environment, but user training would be offered after the production system is operational.

1.7.1 Users

There are three basic user types: executives, basic users, and advanced users. Each user type should have a training course tailored to their respective needs.

1.7.1.1 Executives need to be trained on basic functionality and executive summary reports and dashboards, and on the overall business processes and roles and responsibilities, established to leverage and sustain the new system.

1.7.1.2 Basic users need to be trained on the common needed functionality by non-lease/concessions managers; for example, operations and/or maintenance looking up which tenant occupies a particular room, contact information, and maintenance responsibilities.

1.7.1.3 Advanced users to be trained would be the lease and concessions management/staff, who will be using the system on a daily basis to do their job duties, including updating the data in the system.

1.7.2 System administration training shall include review of all system configuration settings, further tailoring system options, adding/removing users, troubleshooting scenarios, backup/restore (if on-premise), etc.

1.8 Metrics & Continuous Improvement

The vendor may be requested to report on the system's use metrics, including metadata on update frequency, and facilitate continuous organizational improvement, leveraging the system. System refinements to be realized over the operational phase, may be required.

2.0 Data Services

Collecting and processing into the new System lease and concessions data, and then supporting data updates, is a significant challenge not to be underestimated. Airport staff are usually saturated with daily work activities, which leave little to no time for them to initially populate the System with data. Hence, vendor is to provide information on their airport experience relevant to the following data services, and provide labor hour rates for the following positions that are qualified to perform this work: senior project manager, senior system architect, data Quality Assurance (QA) manager, data Quality Control (QC) supervisor, senior data specialist, and data specialist. The following services may be required and will be negotiated with the selected vendor as needed.

2.1 Existing Lease & Concessions Management Data

Vendor may be requested to leverage the airport's existing lease and concessions data for initial population of the System and evaluate missing and outdated data.

2.1.1 Assess Existing Data

Vendor may be requested to assess existing airport lease and concessions datasets which may be available through hardcopy files and/or digital spreadsheets, databases, lease agreements and exhibits, Computer Aided Design and Drafting (CADD) files, Geospatial Information System (GIS) files, etc. Vendor is to work with airport stakeholders to prepare an inventory of such existing datasets, and rate the dataset's quality in terms of age, completeness, accuracy, etc. This inventory is to include metadata about the source, location, quality etc of each identified dataset.

2.1.2 Gather Existing Useful Data

Based on the assessment above, vendor may be requested to gather copies of all data deemed useful in terms of quality for use in the new System.

2.1.3 Process Collected Data into New System

Vendor may be requested to process the collected data into the new System with metadata; to enable traceability back to the source of the information as identified in 2.1.1 above. This may involve various digitization, conversion, consolidation, cleanup and import techniques.

2.1.4 Identify Missing and Outdated Data

Vendor may be requested to identify missing and outdated data requiring further work to research, measure, collect, and process into the System. Vendor may be requested to provide alternative options and recommended approach to completing the missing and/or outdated data. Vendor may be requested to estimate/propose the cost for such follow-on work.

2.2 Support Data Completion and Updates As-Needed

Vendor may be requested to support data completion and data update tasks. These may include, but not limited to, mapping of facility lease-able assets and lease boundaries, outdoors and/or indoors, and room/area level data attribution and assignments to leaseholds.

2.2.1 Mapping

Vendor may be requested to support mapping of facility lease-able assets leveraging CADD and/or GIS. Mapping such assets may involve spatial measurement using the most cost-effective techniques, depending on the type and quantity of assets to be mapped. These techniques may include 3-D laser scanning ("LiDAR"). In order to delineate the lease boundaries (a.k.a., leaselines), the vendor may be requested to support establishing or updating the airport's lease measurement standard, based on Building Owners and Managers Association (BOMA).

2.2.1.1 Outdoor Campus-Wide Lease-able Assets and Lease Boundaries

2.2.1.2 Indoor (e.g. Terminal) Floor Plans / Indoor LiDAR and Lease Boundaries

2.2.2 Room/Area/Point-Assets Level Data Attributes and Assignments to Leaseholds

Implementation of the System involves tracking all rooms/areas/point-assets making up each leasehold, as well as all potentially lease-able rooms/areas/point-assets. Vendor may be requested to attribute and assign each room/area/point-asset to its corresponding leasehold, where applicable. This may include development and implementation of uniform room/space/asset identification standard.

3.0 Technology Solution

Vendor is to propose a technology software solution supporting the business process and data requirements described above. The proposed software needs to be Commercial-Off-the-Shelf (COTS), with successful use at a major airport for at least 5 years. Vendor is to identify, per each required technology capability, whether it is currently AVAILABLE “out-of-the-box” with the proposed COTS solution(s), or it can be provided as a FUTURE enhancement, or NOT-AVAILABLE. Vendor is to provide the licensing fee(s) covering the listed capabilities that are currently available, annual maintenance fee(s), and any other software technology costs associated with delivery of this solution. Hardware costs are not to be included. Process improvement and data processing costs, described above, are not to be included under the technology costs either.

3.1 Software Setup

A turn-key software solution may be provided as either an on-premise model or on-cloud, via Software as a Service (SaaS) model. If the vendor is able to provide either, then the vendor is to provide a tradeoffs comparison of both models in terms of functionality, performance, accessibility, business continuity, costs, etc. If the vendor is only able to provide one or the other, then the vendor is to provide information on the same criteria above for the software setup model offered.

Vendor is to provide a system architecture diagram, detailing software technologies, databases, user interfaces, Application Programming Interfaces (API)s, servers, etc.

3.1.1 On-Premise

3.1.2 On-Cloud

3.2 User Interface (UI)

User interface with the System is primarily required at office desktop, but also via mobile tablet computer. The vendor’s proposed solution is required to support both.

3.2.1 Desktop

Desktop use should involve a web-enabled UI for system/data administration, advanced users and basic users. Moreover, a CADD/GIS extension for use with Autodesk and/or ESRI products is required. The vendor proposed COTS desktop software is to be Windows 10 Professional compatible. The vendor is required to provide software updates to maintain compatibility with Windows 10 Professional updates release (within 90 days from update release).

3.2.1.1 Web-enabled

The vendor's proposed desktop web-enabled UI should be HTML5 compliant without need for additional plug-ins. Ongoing software updates are to be provided by the vendor to maintain compatibility with current web browsers; within 90 days from web browser update release. The web browser UI functions are to support system/data administration, advanced users, and basic users.

3.2.1.2 CADD/GIS Extension

The vendor's proposed Autodesk and/or ESRI extension is required for processing floor plan updates into GIS features connected to the System's database, containing the facilities and lease and concessions information. Ongoing software updates are to be provided by the vendor to maintain compatibility with current CADD/GIS software; within 90 days from CADD/GIS software update release.

3.2.2 Mobile Tablet

The vendor proposed COTS software needs to be accessible for field validation via a mobile tablet computer. Mobile tablets should use same web browser UI described above. A mobile tailored native application (app) is optional, but not required. If a mobile native app is provided, then the vendor is required to provide software updates to maintain compatibility with current mobile iOS and Android (within 90 days from update release).

3.2.2.1 Web-Enabled (i.e., same as 3.2.1.1, but on mobile device)

3.2.2.2 Native App (optional, but not required)

3.3 Software Functionality

The lease and concessions management software requirements are organized into three core functions: Facilities, Companies, and Agreements. Any lease/concession agreement involves facility location(s) being leased by a company/entity. These three core components are to be supplemented by ancillary functionality including workflows, alerts, reports/dashboards, and revenue forecast.

3.3.1 Facilities

Facilities is the first of three core functions required for the System; to manage information about all airport lease-able assets and their location mapping with spatial analysis.

3.3.1.1 Facility Lease-able Assets

Airport facilities, which may contain lease-able areas, rooms, or assets, need to be supported by the System with location hierarchy involving facility (i.e., supporting multiple airports or port facilities), parcels, sub-parcels, buildings, floors, rooms, and point datasets. Each facility asset needs to include appropriate attributes and metadata in support of lease and concessions management, a mechanism for attaching/searching various types of documents/files to each asset with respective metadata, and a mechanism for generating and associating notes with each asset. Among the attributes/metadata, each asset needs to include a unique asset ID, which is linked to the corresponding asset's mapped GIS feature.

3.3.1.2 Facility Mapping

The System is required to integrate and display basemap and floor plan drawings in the form of interactive maps besides tenant and agreement data. The system's map interface is required to make it possible to view spaces within the browser window, and also to query spaces interactively. One-click on a space needs to provide the user not only geometric information (e.g., dimensions, location and so on), but also tenant information such as occupant and agreement

expiration date. Thematic coloring of the spaces are to provide information spatial visualization such as rental rates, lease expiration dates, and revenue generated per concessionaire.

The System is required to provide the following mapping functionality:

- Pre-set map views
- Zoom functions
- Pan
- Layer controls including predefined layer sets
- Identify asset
- Assign space to leasehold
- Point dataset functions (e.g., add, delete, move, type, operator)
- Spatial analysis tools including coordinates, measurements (e.g., length, area), buffer, thematic coloring
- Markup tools including layer control, symbology, lines, shapes, text, etc.
- Print map functions including options for title, legend, north arrow, orientation, and paper size (e.g., letter, legal, ANSI B, ANSI C, ANSI D, ANSI E)

3.3.1.3 Facility Basemap and Floor Plan Updates

The vendor's proposed Autodesk and/or ESRI extension, identified in 3.2.1.2 above, is required for processing floor plan updates into GIS features connected to the System's database, containing the facilities and lease and concessions information. The required functionality of this CADD/GIS extension is as follows:

- Convert updated floor plans, incoming from AutoCAD, into intelligent GIS space-boundary lines
- Automatically generate polygons from basemaps and floor plans
- Link the GIS space-boundary line to the System's corresponding database facility record; if it's a new facility asset, then create a new facility record in the System's database
- Edit space-boundary line geometry (i.e., splitting rooms, joining rooms, modifying rooms) with revised spatial parameters, such as area, automatically calculated and reflected in System's database
- Generate GIS data for web-enabled mapping embedded in the System

3.3.2 Companies

Companies is the second of three core functions required for the System; to manage various information about any company/entity with which the airport may be doing business, especially involving leasing and concessions. Company information needs to be stored for past, present, and potential future airport tenants/concessionaires. The following are more specific functionality required.

3.3.2.1 Basic company information is required to be managed by the System's database including but not limited to a unique company System ID as well as the corresponding company's ID in the airport's financial system, company name, address, type, special certification (e.g., DBE, MBE, WBE, etc.).

3.3.2.2 Revision tracking functionality is required to document any changes/updates to the company information, including who made the changes, when, and why. The revision may involve an approval workflow, associated documents, notes, etc., which need to be managed by the System.

3.3.2.3 Contact information is required to be managed by the System's database for any number of selected company's management/staff, including documents and notes per contact person.

3.3.2.4 Agreements associated with the company need to be accessible through the System's company information function.

3.3.2.5 A predefined list of functions and sub-functions, performed by companies at the airport, need to be made available by the System for use. Maintenance of the list needs to be restricted to the System's administrator.

3.3.2.6 Joint companies need to be supported by the System for agreements involving two or more tenants in a joint venture.

3.3.2.7 Lease locations down to room level and/or point datasets, associated with the company need to be accessible through the System's company information function.

3.3.2.8 Various types of documents/files associated with a company need to be managed by the System with metadata and search capability, using keywords or specific document attributes. An unlimited number of documents need to be supported per company.

3.3.2.9 Notes generation, with word processing functionality, needs to be available through the System's company information function. An unlimited number of notes with metadata need to be supported per company.

3.3.3 Agreements

Agreements is the third of three core functions required for the System; to manage various lease and concessions agreement information, including financials and billing. This function is also required to manage agreement revisions and amendments with approval workflow capabilities.

3.3.3.1 Agreement information is required to be managed by the System's database including but not limited to a unique agreement System ID, type, dates, status, description, points of contact, notes, etc. Agreement financial information to be managed by the System includes but not limited to Minimum Annual Guarantee (MAG) aspects, rate schedule details, various fees (e.g., handling, sub-tenants, parking, utilities, etc.), and billing details.

3.3.3.2 Revision tracking functionality is required to document any changes/updates to the agreement's information, including who made the changes, when, and why. Agreement revisions require an approval workflow, associated documents, notes, etc., which need to be managed by the System. Agreement revisions may result in issuance of a bill (credit or debit) to the tenant, and may also trigger an amendment to the agreement; to be managed by the System.

3.3.3.3 Amendments modifying an agreement need to be managed by the System, including a review and approval workflow with metadata. The System needs to include an amendment reference number, various relevant dates, approval requirements, and notes.

3.3.3.4 Options to an agreement need to be managed by the System. An agreement could have any number of options attached to it. Agreement options may be for any number of facility elements, terms, or rental rates.

3.3.3.5 Deposits records need to be managed by the System. An agreement may have multiple deposit records. Each record defines the type of deposit, its amount, receiving and expiration dates, etc.

3.3.3.6 Sub-leases need to be managed by the System. Any lease agreement between the airport and a tenant (Company) may be sub-leased to a third party, who may in-turn sub-lease it to another party, and so on. The System needs to keep track of all such sub-lease agreements. Each sub-lease agreement may in-turn have its own data elements in the same way as the main agreement. Multiple sub-lease agreement records may be attached to each agreement record or its sub-lease agreement record(s).

3.3.3.7 All areas leased at the same rate are to be aggregated and grouped into a “Space” category (or equivalent term such as leasehold), to help sub-categorize agreement/billing details. The System needs to manage agreement terms and attributes specific to each Space category, such as billing quantity versus measured quantity and various other financial details, including a percent billable factor (i.e., to facilitate charging for a shared space or part-time use). The System is to also manage documents and notes per Space.

3.3.3.8 Reviews (a.k.a., ticklers) functionality needs to be provided by the System. Users need to create ticklers, so they can be reminded in a defined time-period to check on specific facets of agreements. For example, reminder to check the Environmental Audit Report on a particular agreement every year starting on certain date.

3.3.3.9 Billing information needs to be managed by the System:

- Approval workflow and audit history with attached supporting documentation and notes are required. For more requirements on workflow functions see Section 3.3.4.1.
- Various types of billings need to be supported (e.g., regular monthly billing, back billing/credit, concession billing, accrual billing, one-time billing, etc.) with out-of-the-box templates, which can be modified or added to.
- The System needs to provide various relevant information for billing preparation, such as: description, category, facility, location, quantity, rates, billing amounts, comments, etc.
- The System needs to facilitate aggregating and processing various aviation metrics/quantities, self-reported from airlines and other sources or measured (i.e., from radar), in support of billing, such as: flights, passengers, baggage, cargo, etc.
- The System needs to provide ability to duplicate current billing and its details for another month.
- The System needs to either generate the billing invoices and distribute them, or generate a billing information file for consumption by the airport’s financial accounting system for invoice processing.
- The System needs to provide a billing workflow override function for generating the billing information file and sending it to accounting for invoice preparation, prior to final workflow approval; in such cases an override explanation must be provided. If in such case the billing workflow is disapproved, the System needs to support adjustment billing.
- The System needs to be able to list all billings in process; showing workflow status.
- The System needs to capture and show invoice payment status.

3.3.3.10 What-if-scenarios need to be supported by the System to facilitate agreement development, revisions, and amendments. The system needs to provide a mechanism for contemplating change scenarios with financial reporting/forecasting, without committing to the change and adversely affecting billing.

3.3.3.11 Various types of documents/files associated with an agreement need to be managed by the System with metadata and search capability, using keywords or specific document attributes. Document types include but are not limited to: contract materials, certificates, correspondence, lease exhibits, drawing files, scanned images, digital photos, audio/video files, etc. An unlimited number of documents need to be supported per agreement.

3.3.3.12 Notes generation, with word processing functionality, needs to be available through the System's agreement function. An unlimited number of notes with metadata need to be supported per agreement.

3.3.4 Ancillary Functions

In addition to the three core functions described above, the System is required to provide important ancillary functions including workflows, alerts, reports/dashboards, revenue forecasting, global rates, fuzzy search, and context-based filtering.

3.3.4.1 The System needs to provide the ability to setup different types of workflows to support reviews and approvals in different types of processes. For example, review/approval workflows are required for at least revisions to company information or agreements, amendments, and billing.

- The appropriate workflow needs to be automatically initiated based on the required process; such as type of agreement to be revised would initiate the corresponding pre-configured workflow. Different agreement categories require different workflows.
- The System needs to display metadata of initiated workflows including, but not limited to, workflow steps (a.k.a., stages) and their corresponding group members, status, completed by, date completed, and comments.
- When a workflow step is completed, the System needs to advance the process to the next step.
- When a workflow step is reached, then the System needs to notify the group members assigned to the step via e-mail, that a workflow step is awaiting their action (e.g., data entry, data validation, review, approval). Group members should also be able to lookup all workflows awaiting their action via a System in-box, assigned to each group member.
- The System needs to support simple and complex workflows. The simplest workflow would involve one initiator and one approver. A complex workflow can have multiple initiators with multiple approvers with multiple approval steps.
- Approval groups and their corresponding members are to be setup by the vendor during implementation, based on the Airport's specific processes; subsequent adjustments and/or new setups are to be the responsibility of the System's administrator.
- If a workflow step is going to take some time to work/review, the step's group member needs the option to inform stakeholders that the step is "in progress" and provide details/comments if desired.

- If an approval step has been initiated, then the submitter needs the capability to “recall” and step the workflow process back in case of a required change/correction.
 - If a workflow step is disapproved, then the System is to require an explanation from the disapprover, and then not progress to the next step, but rather notify the process workflow initiator via e-mail.
 - When a final workflow step is approved, then the System needs to close the workflow.
 - The System needs to support billing batch approval workflows.
 - A billing approval workflow needs to support due dates by which completion of certain workflow steps must take place, and corresponding e-mail alerts.
- 3.3.4.2 The System is required to provide various alerts functionality for reminding users of needed actions and/or processes to be initiated (e.g., next escalation date for agreement rate schedule, original agreement termination date, option notice due):
- The System’s administrator is to be able to create as many different types of alerts as may be required by System users and edit these. Setting up an alert type/criteria involves naming the alert type (i.e., category), selecting the relevant due date data field, identifying the number of days prior to the due date for the alert, and specifying the alert message.
 - Alerts are to be organized by user groups.
 - The System is to provide ability for users to lookup upcoming alerts/reminders.
 - Scheduled alert messages are to be viewable by all users within a group.
 - Resulting alert messages are to be sent to all users within a group via e-mail.
- 3.3.4.3 The System is to provide automated reporting and dashboarding capabilities:
- The System is provide typical out-of-the-box reports, which can be readily used and/or customized by the airport (e.g., true-ups, lease revenue generation comparison across tenants, bill quantity versus measured space quantity, concession insurance tracking, concession lease term tracking, concession listing by terminal, concession listing by concept type, facility-wide concession contact list, Minimum Annual Guarantee (MAG) tracking, etc.).
 - The system is to allow the airport to develop an unlimited number of its own custom report types.
 - The System is to enable “Published Reports”, which are snapshots in time at predefined intervals (e.g., monthly, quarterly, annual), while also enabling live reports of the latest available data.
 - The System is to enable reporting of its aggregated and processed aviation metrics/quantities, self-reported from airlines and other sources, or measured (i.e., from radar), including flights, passengers, baggage, cargo, etc.
- 3.3.4.4 The System is to provide revenue forecasting for short-term and long-term with adjustable term lengths.
- 3.3.4.5 The System is to provide a global rates table for simplifying changes to agreements and their leaseholds.
- 3.3.4.6 The System is to provide fuzzy search capability supporting entry of partial information in the search field and yielding results that can be further refined or selected.

3.3.4.7 The System is to provide context-based filtering, including spatial filtering; for example, highlighting only a specific tenant's lease information on a map. Context-based filtering is to enable refining a listing by any of the attributes associated with the context of the items listed, with Boolean logic (e.g., is, is not, is greater than, is smaller than, contains, begins with, ends with, before, after). For example, a listing of agreements is to be filtered by agreement termination date, by contract manager, etc.

3.4 Database

The lease and concessions management software requirements include a relational and spatial database capability to support the facilities assets, companies, agreements, and other ancillary functions described above. The System's database needs to support an unlimited number of records, user access control, including restricting sensitive financial information to the appropriate users. Database administration is to be achieved via a web User Interface (UI) for the System's administrator, and not require a Database Administrator (DBA).

3.5 Interoperability

The lease and concessions management software requirements may include interoperability with the airport's GIS, financial accounting system, maintenance management system, and/or document management system. Interoperability may be required at the database level, via an Application Programming Interface (API), and/or external intermediary data exchange tables.

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