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A large abstract graphic on the left side of the page, consisting of a green triangle at the bottom left, a black shape that curves upwards and to the right, and a grey shape above the black one, all separated by white lines.

# The Port of Los Angeles Port Police GIS Strategy Project

Final Report  
Version 1.0



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# 1 Executive Summary

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Geographic Information Systems (GIS) are tools for mapping and analysis of physical features and locations. For the Port Police, GIS will provide an accurate map of the current state of the Port of Los Angeles property and its environs. It is a critical component of Computer Aided Dispatch, Record Management Systems, Crime Analysis, and Threat Detection. Officers on site and investigators will have access to information on parcels, structures, and tanks by simply clicking on the object on the map.

NorthSouth GIS LLC (NSG) has conducted a GIS Strategy Review of GIS for the Los Angeles Harbor Department (LAHD) Port Police. The purpose of the project was to assess the current status of GIS within the department, the GIS related needs of the Port Police users, and the ability of the Department to satisfy these needs.

## Port Police GIS Needs

Overall, there are four key needs of the Port Police for GIS:

- **Accurate, timely and complete geographic information improves emergency response time:** The primary need for GIS within Port Police is to provide accurate and timely information to officers in the office and in the field. GIS should help answer key questions of: “Where am I?”, “How do I gain access to this facility?”, “Who is the tenant and how do I make contact?”, or “Are there hazardous materials or circumstances at this location that I should be aware of?” GIS reduces the time needed to respond to a call for service.
- **Port Police requires further mapping and analytical systems to help improve Port security and response capacity.** GIS is a core technology that supports Computer Assisted Dispatch, Blue Force Tracking, Integrated Command, Crime and Intelligence Analysis. Future benefits will be derived from a GIS that supports analytical and predictive capabilities to improve tactical planning, threat detection, and emergency response capacity. The analysis of threats to the Port requires a full understanding of its geography and the location of critical infrastructure.
- **Consistent, standardized, and up to date information for the Port Police as both first responders and maritime security are all imperative.** However, the existing GIS personnel within the LAHD have all stated that their data is incomplete, inconsistent across functional areas, use different applications, or are not developed from the perspective of police operations.
- **Other Departmental GIS contain information vital to Port Police – and there is an opportunity to leverage these systems.** Port Police requires access to blueprints of facilities, leasehold data, locations of pipelines or other data maintained by other LAHD divisions. GIS provides an opportunity to integrate the disparate technologies and data within the Department into a common framework without sacrificing prior investments in technologies.

Further, GIS is important to supporting key strategic objectives of the Port of Los Angeles Strategic Plan for Safety and Security, in the areas of Public Safety, Homeland Security and Emergency Preparedness. Many of these needs are urgent, and without a determined process supported by senior management, several other substantial investments in technology will be under-utilized.

## Existing Harbor Department GIS

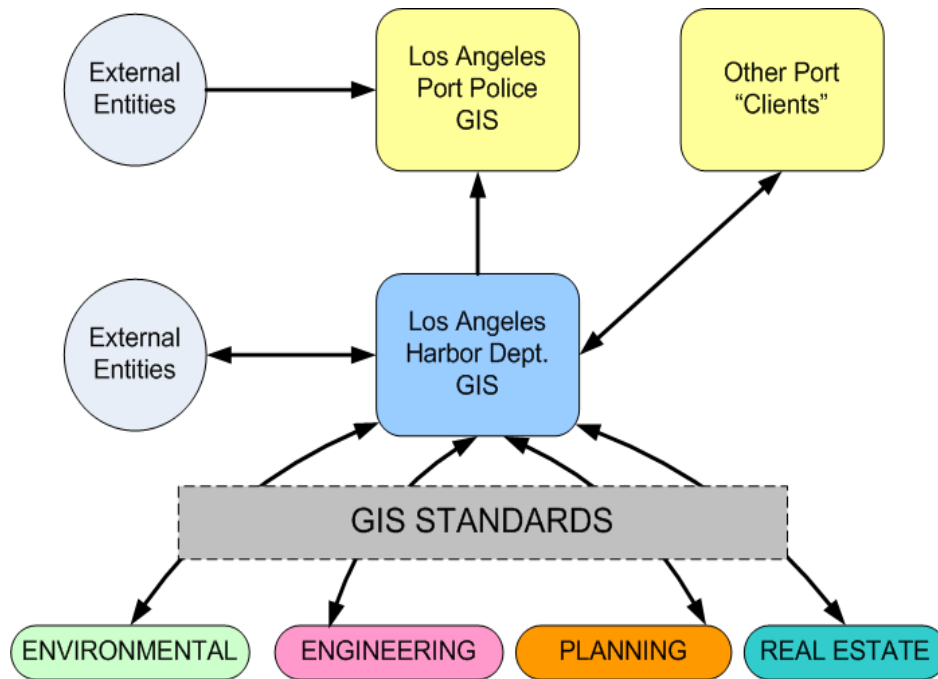
GIS plays a key role in developing comprehensive maritime (domain) awareness and a Common Operating Picture (COP) of the Port. The Harbor Department has a modest number of GIS activities scattered in three divisions – Engineering, Environmental Management and Planning & Research – and possibly in the Real Estate division soon as well. However, the Department lacks a corporate vision or an enterprise-wide mandate for GIS. No data or application standards have been defined with Engineering using Autodesk software, and Planning and Environment using ESRI software. It appears that GIS is the tail end of the work, rather than a tool integrated into the work process.

**Vision for Port Police GIS**

To function properly the Port Police GIS data must be constantly updated as changes are made to the Port and its surroundings. For example, as lease information changes the GIS must be updated to ensure the correct contacts are available. Port Police will need to schedule regular updates with Port divisions and others to maintain effectiveness.

The vision for a LAHD and Port Police GIS is to leverage the investments in current systems, develop standards with the aim towards a department wide GIS repository, and select appropriate GIS “layers” of data from other LAHD divisions that would be needed for Port Police. This vision is depicted in the Exhibit below:

*Exhibit 1 - Vision for Port Police Geographic Information System Framework*



Source: *NorthSouth GIS Analysis of Port Police GIS, December 2007*

As depicted by this exhibit, existing GIS applications and systems could continue but standards would establish common protocols for GIS. This would support both a department wide GIS and the establishment of a Port Police GIS. This exhibit illustrates the importance of collaborating with other Divisions on data standards. Developing data standards will make it possible for the different LAHD divisions to share data while maintaining control of information critical to their function. The diagram also illustrates the different relationship that the Port Police may have with the rest of the Port’s GIS and other (non-Port) sources of data.

Because Port Police operates on a different level of priorities and deadlines than does the rest of the Harbor Department, the needs for the Port Police GIS development are imminent. Therefore, the Port Police GIS must be developed in a short time period in order to provide this technology to pending Dispatch, Blue Force Tracking, and Integrated Command Systems. It is recommended that Port Police establish collaboration with other Harbor Department divisions, and other agencies beyond, to achieve the results it seeks.

**Next Steps**

Implementing the recommendations of this strategy should be carried out in three phases. The first phase requires Port Police to build its own GIS future, leveraging others’ efforts where possible, but not relying on the current GIS infrastructure at the Port. This will require a combination of GIS specialists and consultants, who as a team can implement GIS at Port Police. The hiring constraints imposed on the Port by civil service rules are best handled by relying on GIS subject matter experts to lead the effort while internal positions are filled.

## Phase 1 Implementation

Phase 1 recommended next steps are to:

- **Establish a cross organizational GIS Standards team:** Develop mutually supportive relationships with GIS users throughout the Port. These relationships will become important to the effort to manage need for ongoing data exchanges.
- **Prepare a detailed implementation plan:** Develop a road map to building all the components of GIS at Port Police to include: people, hardware, software, networks, data, analysis, mapping, systems integration, and custom applications development. This is a crucial tool for budgeting and scheduling further GIS progress at Port Police.
- **Assemble a detailed GIS data inventory:** Develop a thorough catalog of available data, identify the method for acquiring and converting the data to a Port Police GIS, and identify gaps in the data. This level of detail actually involves obtaining as much data as possible, and working with the data, but not necessarily converting it to the desired storage format.
- **Identify and acquire mission critical data:** Expedited the identification and acquisition of the data required to support the most urgent systems being built in parallel by Port Police, such as Computer Aided Dispatch (CAD).
- **Establish a GIS team:** Create and fund GIS positions at Port Police and carefully recruit and train personnel, as appropriate, by external resources.

## Phase 2 Implementation

At this stage, data will be obtained from various sources. It is in this period that the first benefits from implementation are likely to begin to be realized. This will be the most suitable time for bringing staff on board, as the data period is the easiest time to train new staff. Some of the data may require legal agreements, and others may require purchasing.

## Phase 3 Implementation

The third phase will bring an additional wave of benefits from GIS, beyond the basic availability of data and what are most likely to be simple functions. This phase will begin to both integrate data in new and creative ways, and to disseminate it to end users who had never had this level of access to geographic data (maps, images) and data related to them. This is a period of intensive investment in server technologies, communications systems, and custom software development.

## **Conclusion**

The Port of Los Angeles has extreme needs due to its size and the challenges and threats posed to it. The needs of the Port Police are particularly demanding because of the broad jurisdiction that this specialized police force has in the Port, its properties beyond the Port, and areas of influence farther away, such as the Alameda Corridor. There are considerable benefits and the potential for great achievements with GIS, supported by a sound implementation strategy. NorthSouth GIS is pleased to present this assessment, which should be viewed as a first step along the road of GIS implementation at Port Police. NorthSouth GIS is positive that it can assist Port Police with the phases outlined above.

## 2 Introduction

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NorthSouth GIS LLC, is pleased to present this GIS Strategic Plan to the Los Angeles Port Police. This report arises out of the Port Police's need to incorporate GIS technology into its daily operations and emergency reaction plans. The completion of this high level GIS Strategic Plan, is the outcome of a project performed by NorthSouth GIS on behalf of the Port Police in October – November 2007, and will be the basis for the development of GIS capabilities at the Port Police.

Prior to this project, it had already been known to the Port Police that GIS is being utilized by divisions at the Port of Los Angeles, and that related data are available in various formats for the port and its surrounding areas. It was not known, however, to what levels the data are complete, accessible, and compatible. The Port Police had identified the need to gain access to GIS data and software applications in order to deal with the significant threats present at the Port of Los Angeles, as well as to deal with the less dramatic but more immediate needs of law enforcement, intelligence work, smuggling interdiction, and other specialized activities unique to a port police. It was not clear to the Port Police, how to leverage existing resources or fill gaps, where needed. It was for these reasons that NorthSouth GIS was engaged, to provide an analysis of resources and gaps, and present these in a GIS Strategic Plan.

The project associated with the preparation of this GIS Strategic Plan took the above facts into account, and has provided the following deliverables:

- Compilation of a brief user needs assessment, based upon discussions with current and potential users of GIS data at the Port Police.
- Determination and confirmation of the options and availability of GIS data applicable to the expanded use of GIS at Port Police.
- Review and documentation of the benefits associated with the expanded and coordinated use of GIS at Port Police.
- Review and documentation of the benefits associated with the establishment of different levels of GIS capabilities, from liaison with other sources of GIS, MOU's for the "outsourcing" of GIS capabilities to other divisions or departments, the contracting of services to outside vendors, the hiring of GIS staff in-house, to the establishment of a full-fledged in-house "Geospatial Intelligence Operations Center".
- Recommendations for the development of a possible staged approach to expanded use of GIS.
- Identification of resources required for implementation including hardware, and software, with a focus on the scale and requirements to handle the anticipated data expectations. In addition the personnel to manage and work with such systems and the relevant skills of such resources.

The completion of this project and the preparation of the recommendations provides the basis for establishing the use of GIS at Port Police. A focus for this assessment is the range of benefits derived from a phased implementation.

Completion of this project has required the following:

- On-site visit at Port Police collating information and meeting with various users and potential users of geographic information at Port Police. Several presentations and meetings were arranged with a variety of individuals across a range of groups within the Harbor Department, over about a period of a month.
- Collation of information, review of the availability, and examination of the data necessary for GIS implementation.
- Documentation and submission of a draft report to Port Police.
- Preparation of a final report and submission to Port Police.
- Preparation and delivery of a formal presentation to Port Police management and other relevant parties.

## 3 Needs Assessment

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The interviews conducted with members of the Los Angeles Port Police and other divisions of the Harbor Department, have resulted in the following brief assessment of the need for GIS at the Port Police. This summary not exhaustive but endeavors to capture key highlights that serve to form the basis for the implementation of GIS at Port Police. The actual priorities and practicalities of development would form an important component of the GIS Implementation Plan which is an important recommendation of this Strategic Plan.

This summary focuses on the benefits and contribution that GIS can make to the operations of Port Police. As previously stated, while the focus of this report has been on the requirements of Port Police, there is an inevitable requirement for integration with the business requirements of the rest of the Harbor Department. This section has been compiled from information provided the staff who were interviewed and whose comments are summarized in Appendix 1, Interview Summaries.

Key operational objectives for GIS at Port Police are to achieve comprehensive maritime (domain) awareness and a Common Operating Picture (COP) of the Port. There are significant advantages in the development of spatial data systems that provide the framework for delivery and integration of disparate systems and databases which are linked by geography.

As the basis for implementation of GIS, key requirements can be broken down into the two key areas;

1. The necessity for spatial and non-spatial datasets
2. The necessity for integration with existing or new systems and technologies

Items one and two are necessary to achieve the objective of the delivery of specific applications that will meet the disparate requirements of different individuals and teams within the Port Police.

### 3.1 Data

Key spatial datasets required for GIS implementation at Port Police are:

#### 3.1.1 Transportation and Place Name Base Map for the Port

The most specific road, railroad, place name, and landmark data should be developed for the Port property itself, paying special attention to unique nature of the Port. Many "roads" are not public right of ways, and many of the right of ways are not static. Many landmarks are not of the type that would show on typical maps, but reflect the long history and evolution of the Port.

#### 3.1.2 Transportation Base Map for Los Angeles Area

The development and availability of road networks should be supported by common place names and key landmarks for the entire geographic extent of the City of Los Angeles and the urban portion of Los Angeles County. This dataset should be structured and attributed to support route analysis and be the same as would be implemented in support of the proposed Computer Aided Dispatch (CAD) system. This dataset may be available from the City of Los Angeles itself, or from a commercial data vendor.

#### 3.1.3 Transportation Base Map for Southern California

The information above should be extended for the requirements of Port Police to include the availability of a general road network, again supported by information such as key locational information for the extent of Southern California.

### 3.1.4 Parcels and Lease Boundaries

The establishment of a parcel database that includes all properties owned or managed by the Harbor Department. This parcel dataset should enable attribution that not only includes legal description and parcel identifiers to support compatibility with the parcel database from the City of Los Angeles, but should also support sufficient detail as is required by the Harbor Department Real Estate division. For this dataset to achieve the objectives of Port Police, the data may need to be modified to accommodate the concept of "Port Parcels", i.e. legally defined areas that represent leases to third parties, rather than parcel ownership. Alternately, parcels and leases may need to be kept separately, but their core use for Port Police is similar: to provide a special view of information that gives a clear and concise "picture" of the Port including port property, and provides sufficient framework for the location of physical structure both above and below ground.

### 3.1.5 Aerial Photography

Port Police would benefit significantly from having access to aerial photography as available to the Harbor Department from the participation of the City in the LAR-IAC project. The scale of this imagery should support both the operational requirements of the Port i.e. large scale 1:200 presentation, as well as more generalized strategic and planning responsibilities. This coverage of aerial photography should be supplemented for display to support strategic planning and for other business requirements should include presentation at a regional scale, covering the whole of the City, and at a more generalized scale the whole of Southern California. In addition to ordinary aerial photography, Port Police may benefit from the "oblique" (or "bird's eye") aerial photography available from Pictometry International through a subscription maintained by the City through ITA. This photography depicts each part of the City, including the Port, from 4 directions, and can provide useful intelligence and visualization in certain scenarios.

### 3.1.6 Utilities

It is especially important that Port Police have access to the location of all utility data including sanitary and storm sewers, water, phone, petroleum, electric and gas pipelines. The spatial representation of some of these datasets is available within the engineering division of the Harbor Department. Although this information has been compiled specifically with a locational emphasis (i.e. to display on CADD maps), it is important that this database is extended to include the attributes of these datasets – for example information about material, date of installation, ownership, current status etc. This database should also include non-linear features, such as valves, switches, etc.

### 3.1.7 Infrastructure

All above ground structures need to be captured as "vector" datasets that allow for integration with non-spatial descriptive databases. Structures should include: buildings, bridges, docks, wharfs, tank farms, oil refineries and production locations, hazardous material sites (which may also be below ground), etc. Non-spatial databases should include information about type of structure, age, material, content (for example of tank), owner (if applicable) etc.

### 3.1.8 Environment and HazMat

Data relating to environmental and hazardous materials should be coordinated by a centralized GIS system. Environmental data is heavily related to property and spatial location. It is information about environmental risk such as the storage of hazardous materials that is most important for both operational and emergency response planning. This requirement includes the location of tank farms and extended information, such as what materials are being stored in such tank locations. This information is dynamic and can change daily so it is most important that procedures are in place to support the accessibility of quality, accurate and timely information.

### 3.1.9 Public Water Facilities

Port Police needs to have access to spatial database that represents all docks, wharfs, berths, slips and moorings. This layer should be integrated, for display purposes, with the Port Parcel dataset. This dataset is most likely to be used to support the management and response to situations involving the areas of recreational use such as in marinas, within the jurisdiction of the Port and which will require development of a database that includes moorings (leases),

asset data such as the locational information on life rings, buoys, and various facility stores, as well as integration with the Port Police incident reporting for thefts, narcotics incidents etc.

### **3.1.10 Public Land facilities**

Port Police needs to have access to a similar spatial database that represents all public facilities on land, specifically areas around the Lane Victory, cruise terminal, Ports O' Call Village, and 22<sup>nd</sup> Street Landing, etc. This layer should also be integrated with the Port Parcel dataset. This dataset will most likely benefit from richer information than in other leased areas, especially since some of these areas are sub-leased and therefore under the control of the lease-holder differently than terminals, for example.

### **3.1.11 Business Data**

There is an advantage for the Port Police to have access to an economic business location database that summarizes owner, lease information, nature of business and key contact details. This information is distinct from the database that would be developed by the Real Estate division as this would primarily relate to non-Harbor Department information. It maybe that this information is available from the City of Los Angeles and is an example of the type of "integration" possibility that implementation of a GIS can encourage for organizational business benefit.

All data collected should also have "metadata" collected for it – data that describes where the information came from, how current it is, who is responsible for updating it, restrictions on distribution, etc.

All data should be collected with a clear idea of how it is to be maintained and kept up to date, in order to maintain data validity and integrity.

## **3.2 Systems Integration**

Specific non-spatial databases will need to be established. Some of this information could be easily managed within the GIS, however some data is best managed external to the GIS and managed by more sophisticated data management tools and technologies. Examples would include:

### **3.2.1 Other GIS and CADD Systems**

There are many examples of potential system integration within the implementation of GIS at Port Police. GIS can integrate with spatial data systems that are already implemented within the Harbor Department. These include the AutoCAD based CADD and GIS developments within the Engineering division and the ESRI based GIS developments within the Planning and Environmental divisions. While these systems have evolved to support specific divisional business requirements, coordination and encouragement to share information between these divisions and the implementation at Port Police will be fundamental for a successful GIS implementation at Port Police.

### **3.2.2 Lease Management System**

A Real estate lease management system is planned, which will contain information of key importance to Port Police, including who is leasing what property, the nature of the business, the term of the lease and specific contact details. This information can be linked to the "Port Parcel" dataset and such integration should be modeled in the design of the proposed new systems at the Real Estate division. The real estate system could be developed as an asset management system to record and maintain additional information about the property that would be useful to Port Police. This includes floor plans and access points that would assist officers in response to operational situations, and for planning purposes to support such activities as counter terrorism strategic planning. The benefits from having a single, stable and authoritative land mapping base can not be over emphasized

### **3.2.3 CAD**

Integration should be planned with the proposed Computer Aided Dispatch (CAD) system, where the key requirements of this system include the utilization of a common base data framework for the CAD and the GIS system at Port Police. Information within the CAD should be available for summary and export to the GIS to provide the basis for a database that records and enables incidents to be displayed and mapped as a component of a crime analysis system for Port Police. Data that should be able to be extracted and reported includes; location, date, time, officer, RD and event.

### **3.2.4 MDTs**

The implementation of in-car Mobile Data Terminals (MDT's) should include the capability to upload and visually display geographic data. This should be a component of the CAD system but should also include the capability to display the results of analysis such as a response scenario of an oil tanker emergency, and the display of an evacuation plan if necessary for implementation in response to such a scenario.

### **3.2.5 Inspections**

Extended integration opportunities exist for the establishment of a database that includes the location of inspections, be they ship inspection by berth or inspections of other port facilities. Such a database and the inclusion of the time and nature of inspection would assist with management and resource planning in support of operational and strategic responsibilities.

Certain information will also be managed by other technologies, but a link to GIS would be potentially beneficial, including:

### **3.2.6 Video Surveillance**

Integration with video surveillance systems, where video will be integrated and available for view from a GIS application that allows for selected query for display by time and location. This information should be available both internal to the Port Police but also as maybe required for external deployment to MDT's. Surveillance information is important not just for the Port, particularly bridges and main highways, but also for the Alameda corridor.

### **3.2.7 Scanned Documents**

Integration with imagery such as documents or scanned plans, which are best managed by technologies such as document management systems. These systems may not only be the repository of building floor plans, but also the repository of ship plans which may have been sourced from Lloyd's or the Jane's register of ships.

### **3.2.8 Vessel Tracking**

Of special significance to Port Police is a requirement for integration with Marine Exchange. This should include live access to the Vessel Tracking System (VTS), which is already in the works. However, since VTS is not directly integrated with GIS, Port Police may consider the processing of the vessel tracks in a way that can be used in GIS in real time, and thus integrated more directly with other data layers. Further, regular downloads of recent vessel activities can enable Port Police to develop a picture of historical vessel activity for both operational, homeland security and counter terrorism planning.

### **3.2.9 US Customs, US Coast Guard**

Port Police's counter terrorism would benefit from access to the US Customs' cargo manifest data related to incoming cargo, which are filed with CBP at least 24 hours prior to cargo loading at port of origin. That information could potentially be tied to the 96 hour Notices of Arrival filed with the Coast Guard, and the Marine Exchange's AIS signal processing, which is part of the VTS mentioned above. This has the potential for tracking specific cargo – not just the dangerous cargo that is reported to the Port directly – all the way to the dock.

### 3.2.10 Weather Data

The Marine Exchange is also the source of weather data which is available via the Marine Exchange web site. It may be practical for the GIS implementation at Port Police to be integrated with this web site to take advantage of the real time data availability for operational and emergency response scenarios.

### 3.2.11 Traffic and Traffic Control

The City of Los Angeles Department of Transportation (LADOT) maintains an Automated Traffic Surveillance and Control (ATSAC), which could potentially be integrated with the Port Police GIS system. This could provide not only real time traffic information on the freeways and bridges, but give access to the conditions of traffic control devices like traffic lights and draw bridges. It is possible that Union Pacific or another source can provide a live link reporting on the live traffic status on the tracks in the Southern California area that would impact traffic in and out of the Port.

System integration extends to not only departments within the Harbor Department but also to external agencies, in particular: The City of Los Angeles (including the Emergency Operations Center), Los Angeles Fire Department (LAFD), Port of Long Beach, US Coast Guard, California Highway Patrol (CHP) and a number of other agencies. Relationships with these organizations are important and should be managed by the proposed GIS coordinator for Port Police.

## 3.3 Software Applications

There are many specific software applications that should be developed in response to particular business requirements at Port Police. The objective of building specific applications for specific teams at the Port Police is to make it easier for them to access information that is specific to their business requirements. Segregation of specific applications may also be for management or internal security reasons.

GIS implementation often relies heavily on a GIS analyst to provide products (typically maps and reports) on behalf of clients, which becomes a bottleneck in operations. The judicious building of a specific software application that provides specific search query and analysis tools, coupled with customized reports and map templates, can deliver powerful capabilities directly to users. This not only removes the human bottleneck, but permits users to make many more requests than would be feasible through a human agent, and in police work this can be a crucial freedom.

The following list serves as an example of custom applications that could be developed and implemented by Port Police. The priority for development should be established as a component of the proposed GIS Implementation Plan for Port Police.

### 3.3.1 Property and Lease Based System

A key application is to provide for the ability to display and identify exactly what property is owned by the Harbor Department and therefore what properties are specifically within the jurisdiction of the Port Police. This application should include the ability to search by lease, owner, nature of business, term of lease etc. Reports and customized map display should include similar information supported by information such as reported inspections, incidents etc. Where this application would differ from the Real Estate division's upcoming lease management system, is that it would join a lot of police-specific information to the base data, and add analytical capabilities.

### 3.3.2 Asset Based System

A comprehensive asset management database that records information related to the critical infrastructure of the Port. This should include the ability to support the search and query by location of address, common name, wharf number, berth number, etc. It should also have the ability to build ad-hoc searches to provide for the ability to display the location of utilities, for example, or the facilities that have been inspected in the month of January.

### **3.3.3 Police Activity System**

It should be possible to develop an application that includes the ability to search and display all reported incidents in the area of jurisdiction or in an extended area. This could depict and report on narcotics activity, theft and nature of theft, incidents of threat, etc. It would be important for such an application to support query and display within a specific time period. Such an application would have applicability for Port Police management, crime analysis, the Cargo Theft Interdiction Team (CTIP), and Homeland Security, as well as to assist day to day operational reporting and resource management.

### **3.3.4 Emergency Response System**

An emergency response system is designed for managing emergencies, such as Tsunami, earthquakes, or HazMat incidents. Response activities may include evacuation, perimeter control, traffic management, HazMat containment and cleanup, and ultimately disaster recovery. Such an application would require the display and reporting of information from outside the typical jurisdiction of the Port, such as demographic information on population, proximity to public facilities, such as schools or health facilities, etc. Such a system may also have the requirement of easily disseminating information, such as to the LA EOC, or LASO, but only after certain data had been secured and stripped away.

## 4 Recommendations

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NSG's recommendations are divided in two: *What* we think Port Police needs to accomplish, and *how* we think Port Police might accomplish that. Based on past consulting experience, we have chosen to present the *How* part ahead of the *What* part. This is based on the experience that decision makers frequently need to know *how* goals will be accomplished more than *what* the details of implementation will be. The readers of this report are free to read the report in a different order.

The section describing *what* we think needs to be done is structured sequentially, covering the Organizational Structure, Systems Infrastructure, Data, and Software to support Port Police's goals. Each is considered a building block for the next element. Without an organization to support the building the systems infrastructure, that infrastructure cannot be built. Likewise, without data, software is not particularly useful.

### 4.1 A Vision

The following vision for GIS at Port Police is recommended.

- The vast majority of Port Police's work involves location-based data, and great value will be derived from the management of the spatial components of police work in a computer system.
- The type of software that is designed to collect, manage, analyze, and present location-based, or location-related information, is called GIS (Geographic Information Systems). Therefore, Port Police should commit to integrate GIS technology into its operations at the earliest possible time.
- Port Police is significantly behind the curve in the use of GIS. Therefore, Port Police should commit to establishing a baseline GIS capability and functionality at an accelerated pace.
- By the same measure that Port Police has committed to replacing manual dispatch with a full fledged Computer Aided Dispatch (CAD), and to creating a cutting edge Incident Command Post, Port Police should commit to provide the resources to implement GIS.
- The benefits derived from GIS implementation at Port Police will correspond to the level of investment. GIS can act in a minor supportive role for other systems that require spatial data, or it can take a central role in linking systems, analyzing data in ways that only GIS can, and presenting information in ways unique to GIS.
- How far Port Police goes with GIS technology depends on the GIS leadership at Port Police.
- Port Police can create a GIS infrastructure that runs in parallel to a broader GIS infrastructure at the Harbor Department. If possible administratively and politically, Port Police would be better served by taking a strong role in encouraging a better implementation of GIS at the Department, and then focusing only on its own special needs. However, if this is not feasible, Port Police needs to identify those areas where collaboration from other Divisions at the Harbor is vital.
- Successful GIS implementation at Port Police will not be possible without senior management commitment to the project, including acceptance of the proposed strategy supported by way of financial investment and commitment to the proposed organizational structure.

## 4.2 Implementation

This section lists the top *action items* required to move towards tangible integration of GIS into Port Police operations. Recommendations are *not* presented in order of priority.

### 4.2.1 Staff with Consultants

#### Recommendation

Contract a consultant to provide short- to mid-term in-house GIS project coordination, as well as the hands-on data acquisition and management required to support the implementation of CAD, Integrated Command, and other systems initiatives at Port Police. Long-term, retain a consultant to provide continuity.

#### Rationale

Wheels turn slowly at the City, both in terms of creating the needed positions and filling them with qualified personnel.

#### Importance

Very High

#### Workaround

Hire highly qualified GIS Coordinator and GIS Analyst at Port Police right away.

### 4.2.2 Create and Fill Internal Positions

#### Recommendation

It is essential that Port Police retain its own GIS staff as soon as practical.

#### Rationale

In-house staff need to be sought, who have a high degree of expertise in GIS, databases, applications development, and systems integration. However, it is quite likely that such staff would require assistance from a consultant for a period, so it should not be assumed to be an either/or situation. Further, Port Police should take its time and work the Civil Service system to ensure that it is getting the right people for the job.

#### Importance

Very High

#### Workaround

None

### 4.2.3 Complete a Data Inventory and Data Acquisition Plan

#### Recommendation

Build on this report and create a detailed and prioritized list of available data, as well as identify gaps in available data and recommends means for filling the gaps. This should then be turned into a data acquisition plan, which may be executed through a combination of in-house efforts, contracts, and collaborative efforts with other agencies.

#### Rationale

The following list contains some of the information needs to be collected about the data required by Port Police: Description, spatial extent, currency, format, source, cost, frequency of update, and required conversion process. This is one of the most essential step to supporting Port Police's other efforts, such as the implementation of a CAD system.

### **Importance**

Very High

### **Workaround**

None

## **4.2.4 Complete an Implementation Plan**

### **Recommendation**

Follow the Data Acquisition Plan with a Systems Implementation Plan. This differs from the previous plan as it addresses all the other components of GIS – hardware, software, networks, people, training, data analysis, systems integration, and software development. Alternately, the two plans could be integrated into a single task.

### **Rationale**

This report sets out the needs for GIS, and suggests the possible ways in which GIS can be incorporated into the Port Police's work. The next step, however, is to put together an Implementation Plan which details how this should be accomplished. The Implementation Plan should include such topics as resources (internal and external) specific hardware and software configurations, specific sequences of data acquisitions and conversions, specific application development and systems integration plans, and specific budgets.

### **Importance**

High

### **Workaround**

None

## **4.2.5 Create a Training Program**

### **Recommendation**

Design a training program specific to the needs of Port Police, at different levels depending on the usage of GIS by various members of the force.

### **Rationale**

Port Police officers possess an impressive set of skills and responsibilities, and see in particular a need for a rich source of information to perform their varied work. GIS has the potential to provide that, but this naturally requires specific training. It is recommended that training be tailored specifically to their needs, rather than generic GIS training.

### **Importance**

Medium

### **Workaround**

While GIS implementation is focused on data, it is possible for most Port Police to “experience” GIS through other systems that consume this data, like CAD. Similarly, if most applications development is Web based, then very limited training may need to be provided.

#### **4.2.6 Commence Data Collection Activities**

##### **Recommendation**

Commence on data collection and database construction activities as soon as possible, to support the core needs of CAD and other systems that are being very rapidly implemented.

##### **Rationale**

Certain data acquisition activities can, and need to be, commenced early on, even before other plans are fully fleshed out. That is because certain data layers may be needed to support other urgent projects, most notably CAD. However, this should not dilute the need for a solid data inventory, data acquisition plan, database design, systems implementation, and staffing.

##### **Importance**

High

##### **Workaround**

None

#### **4.2.7 Commence Systems Integration Activities**

##### **Recommendation**

Start implementing the components of the Implementation Plan that deal with integrating systems together, such as a Port Police information system with a Lease Management system. These activities generally require network, inter-application communication and other integrative activities, almost always involving custom software development. This activity is usually very dependent on external resources, as Port Police is not very likely to ever build the niche expertise required for this type of software development.

##### **Rationale**

GIS is mostly equated with maps, specifically digital maps. But the true power of GIS is in its analytical and integrative capabilities. The sooner these are exercised, the more interest and support that GIS will gain at Port Police, and the more momentum it will attain for reaching more results.

##### **Importance**

High

##### **Workaround**

Focus on data elements for longer, turning to applications development and systems integration later.

## 4.3 Organizational Structure

The Harbor Department has a fair amount of organizational inertia that occasionally comes in the way of progress. And yet, phenomenal technological projects have been accomplished at the Harbor. The Port Police must recognize when change can be achieved directly and when an existing condition just has to be “worked around”. The recommendations contained here try to identify these situations.

### 4.3.1 Hire a GIS Coordinator for LAHD

#### Recommendation

Hire a GIS Coordinator for the whole Harbor Department. Place this person as high as possible within the IT Division. Give that person budget capabilities, and strong sway over GIS activities in the entire port. Obtain candidate with significant GIS and management experience.

#### Rationale

Port Police's GIS needs are based on specific law enforcement and counter terrorism requirements. The vast majority of *base* GIS data required to support these needs derives from other divisions in the port. These include lease data, engineering data, vessel movement data, container content data, and so on. The Harbor Department's current GIS activities lack coordination. That there appears to be little in the way of a concerted plan for GIS at the Department, or even within the divisions that actively employ GIS technology. This has resulted in less system function at greater cost. Incompatible technologies lead to misconceptions about capabilities, lack of coordination, and sub-optimal usage of the available resources.

A Department-wide GIS Coordinator, if given sufficient authority by the Executive level, can streamline operations, resources, data acquisition, training and software development. This would be of benefit to the Harbor Department, and would relieve Port Police of much of the additional pressure and expense to gather, convert, and maintain data which, by all accounts, could be centralized by a Department Coordinator.

#### Importance

Medium.

#### Workaround

The divisions utilizing GIS can continue their own GIS projects and data collection. Port Police will spend more time acquiring data, and dealing with data inconsistencies. But with proper GIS staffing the Port Police can overcome the absence of an LAHD GIS Coordinator. The consequence, however, is additional cost and time, both at the beginning and in future years.

### 4.3.2 Hire a GIS Coordinator for Port Police

#### Recommendation

Hire a GIS Coordinator for Port Police. Place this person on the organizational chart within Port Police, under the person responsible for implementing IT projects for Port Police. Give that person budget capabilities, and certain sway over other technical initiatives at Port Police. Obtain candidate with significant GIS, database, systems integration, and software development experience. Give GIS at Port Police equal importance as CAD and ICP.

#### Rationale

The rapid increase of technologies at Port Police has a great bearing on, and reliance on, GIS technologies – not just data, but applications development, systems integration, and data maintenance and data mining. Many of these activities will be unique to Port Police, both in terms of data produced (surveillance, cameras, accidents, etc.) and data

consumed (data feeds from the LA Sheriff's Office, US Customs Service, etc.). There is nothing trivial about the level of work and expertise that will be needed to manage the GIS activities at Port Police. This person will need to be not only a technical expert, but a person who can safely maneuver the administrative and political waters,

### **Importance**

Very High.

### **Workaround**

Port Police can contract this position out, at least initially. The main rationales for this would be: lack of budget for a position; absence of qualified candidates within the City; the entrusting of the initial set up to an expert and the passing on of the system to an in-house person after a certain level of stability has been achieved; and a desire to "try things out" first before committing to a particular path.

#### **4.3.3 Hire a GIS Analyst for Port Police**

### **Recommendation**

Hire a GIS analyst for Port Police. Place this person on the organizational chart under the GIS Coordinator at Port Police, or in the absence of an in-house GIS Coordinator, take direction from a contract GIS Coordinator.

### **Rationale**

Making GIS an integral tool of Port Police operations will require a lot of data manipulation, map creation, and on-site training and support. While a GIS Coordinator will be responsible for planning, coordination, system administration, collaboration with other divisions, departments, and agencies, and for contract management, the GIS Analyst will perform much of the day to day work. Due to the dynamic nature of police work, it is recommended that this individual be experienced in a variety of GIS software, data types, and techniques, and be able to think on their feet.

### **Importance**

Very High.

### **Workaround**

Contract this position out, at least until initial implementation is accomplished, to give Port Police more time to identify a good candidate. Unlike other Departments in the City, Port Police cannot afford to "get stuck" with a GIS Analyst who cannot meet the demanding requirements of Port Police. Therefore, it is best to take the time to recruit the right person.

#### **4.3.4 Make Use of Harbor Department's IT Division for Computer Support**

### **Recommendation**

GIS is a highly specialized area of IT, and Port Police's GIS needs, in particular, will be even more specialized. Therefore, Port Police should develop its own GIS expertise. However, the Department's IT Division should be used for hardware procurement, network and software installations, on-going hardware and basic software support, and potentially for database support as well. Port Police may develop a need for its own Database Administrator, in conjunction with the GIS activities, but in the short term, database support from the IT Division may be very useful. However, a clearly defined roles and responsibilities will be needed to reduce organizational friction. A Service Level Agreement may be desirable once the system requirements have been clearly identified. Ideally, one or two of IT's staff should be dedicated to support Port Police's efforts, on an as-needed basis.

## Rationale

Typical GIS implementations require various desktop software installations, including service packs, patches, and version upgrades. More importantly, they usually require server installations, including web server software, networking, and user management. This level of IT expertise is better handled by IT professionals, leaving the expert use of GIS data and analysis to Port Police personnel. This is particularly important since GIS “travels” over the Department’s general networks and IT infrastructure. Absence of *appropriate, informed* and *timely* IT support can be devastating to Port Police’s efforts.

## Importance

High.

## Workaround

If the IT Division cannot train one or two people to understand and support the GIS needs, or if the staff that is provided is not up to the job, then Port Police will have to find their own resources. However, this would not be an ideal situation, as those resources would have to rely on the IT Division to various extents. Still, it is possible that Port Police can combine the requirements for a GIS Coordinator with an IT specialist, for example, or contract this work out.

### 4.3.5 Collaborate on Data Level

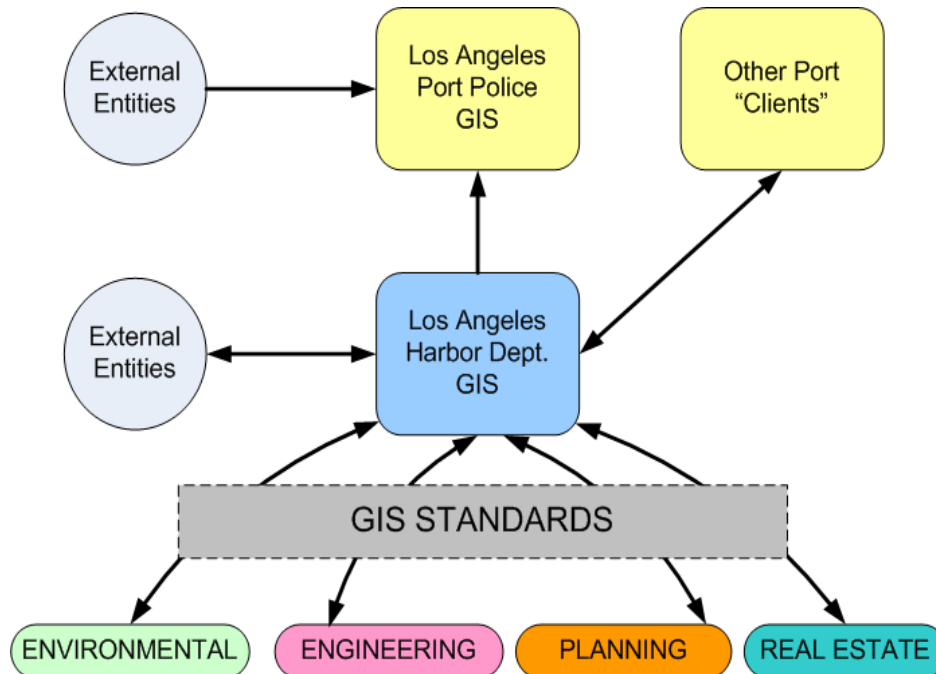
#### Recommendation

Port Police operates on a different level of priorities and deadlines than does the rest of the Harbor Department. Therefore, its implementation window may be a lot smaller than the rest of the Harbor Department.

One important level of collaboration is the collaboration between a Harbor Department GIS Coordinator and a Port Police GIS Coordinator (see previous recommendations). If both positions are created and filled, and collaboration is successful, then the Port Police GIS Coordinator can focus much more on Police GIS data and applications. If there is no Department GIS Coordinator, or collaboration is poor, the Port Police GIS Coordinator will undoubtedly need to spend more time dealing with more mundane base mapping, and results for Port Police may suffer.

#### Rationale

The temptation may rise to go it alone on developing GIS. Going it alone would place much higher demands on Port Police resources, while collaboration with other divisions can speed up results and offset the resource demands on other divisions. Exhibit 1 illustrates the importance of data standards for making it possible for the different divisions at the Harbor Department to share data, whether or not there is a centralized GIS group or GIS Coordinator for the Port

Exhibit 1 - Vision for Port Police Geographic Information System Framework

Source: NorthSouth GIS Analysis of Port Police GIS, December 2007

The diagram illustrates that the Port Police GIS could “ride” on top of the Port GIS, but that using common standards for formats, projections, accuracy, etc. Port Police could “ride” directly on top of the individual divisions. The diagram also illustrates the different relationship that the Port Police may have with the rest of the Port’s GIS, in that the data flow is most likely to be one-way, not two-way like with other divisions. This is also true with other (non-Port) sources of data, where a two-way exchange of data may be the norm – but not necessarily with the Port Police. The other divisions have little need for police data.

### Importance

High

### Workaround

In many cases, it may be possible for Port Police to get around lack of data or collaboration from other divisions, at least temporarily, by using contractors and consultants, but there are limits to this approach when it comes to core data, such as lease boundaries and utilities in the Port. *One compromise workaround is to work with other divisions to establish data standards for the Harbor Department, such that when data is made available from other divisions, it is assured to fit into the Port Police geodatabase structure.*

### 4.3.6 Collaborate on Software Applications Level

#### Recommendation

Collaboration on the level of software application development is an entirely different and potentially more complex matter than collaboration on the data level. However, it is not an impossible goal. It involves setting standards for database design and accessibility, and for applications development inter-operability tools. Examples include setting Windows and .NET as the standards for the development environment, and SOA (Services Oriented Architecture) as the method for communicating between software components.

**Rationale**

Building software applications using a common approach can be very powerful. For example, if the Lease Management system commissioned by Real Estate, is built around Web Services (i.e. SOA), Port Police applications may consume (reuse) data and functions from Real Estate without the need for rewriting, then add its own proprietary (and probably confidential) applications *on top* of Real Estate's system.

**Importance**

Medium

**Workaround**

Since this is an ambitious recommendation, it is easy to see ways to work around it. At one level below software application collaboration, is the live sharing of data, but with completely separate applications written at Port Police. At the lowest level, Port Police can simply download data from other divisions, then create its own separate databases and applications.

**4.3.7 Collaborate on Database Level****Recommendation**

Port Police can potentially benefit from having direct read-only access to other divisions' database, to avoid the need to replicate data, keep it synchronized, etc.

**Rationale**

Dynamic databases, such as lease information databases, will probably be best read directly, rather than having to deal with regular updates. The downside of a direct-read approach is a reliance on other divisions' hardware and database being reliably available. Other divisions' hardware and licenses may also have to take the additional load into account. More importantly, this level of collaboration relies heavily on agreements about the structure of data between Port Police and its data "suppliers".

**Importance**

Medium

**Workaround**

Data can be replicated (automated synchronization) from other sources to Port Police data servers, or least optimally, copied to Port Police and synchronized manually.

**4.4 Infrastructure**

The recommendations presented in this section are relatively generic, as this report does not attempt to make detailed recommendations for hardware and software.

**4.4.1 Hardware**

Only generic recommendations can be made on hardware at this juncture.

#### 4.4.1.1 Desktop PCs with Lots of RAM and Good Graphics

##### Recommendation

End-user workstations need to be fairly “beefy”, especially in the area of RAM – 2GB should be a standard. This is particularly true for users who process data, make ad-hoc maps, and develop software, and is less important for users who primarily rely on a Web browser to access GIS data. CPU speed is important, but not as important as RAM. Monitors should support high resolution, and dual monitors are very useful, especially for users performing data manipulation and analysis. Get graphics cards with on-board RAM (256-512MB minimum), rather than shared graphics memory.

##### Rationale

GIS, drafting, and any software involving graphics and large amount of data are usually large consumers of memory, and often cannot use virtual memory (paging space) for memory. Therefore, large amounts of dedicated RAM are important. For similar reasons, graphics cards with on board memory are important, as are high resolution graphics (e.g. 1600 x 1200). The reason that dual monitors are useful is that GIS work often involves one or two GIS windows, a database window, and other related software, all being active at the same time.

##### Importance

High

##### Workaround

There is little substitute for RAM, but CPU speed is less important. Single, high resolution monitors can be sufficient.

#### 4.4.1.2 Multiple Sets of Powerful Servers

##### Recommendation

Servers should be particularly “beefy”. CPU speed is important on the servers, as well as a large amount of RAM. Application servers require good graphics cards. Storage should anticipate large volumes of data, especially when photos, video, and scanned documents are incorporated into the system (though this can be phased in, as large volumes are not anticipated immediately). GIS server technology is often divided across two servers – a database server and an application server – the application server often also acts as the Web server as well, but not always.

For mission critical applications, dual, triple or even quadruple setups are often installed: A Production set of servers (one or two servers, as described above) for actual deployed applications; a Staging set of servers for testing new applications or application updates prior to “going live”; a Development set of servers, for developing new applications, or upgrading existing applications; and a Redundant set of servers, off-site, to absorb excess load when the system is running normally, or kick over when the main system fails. Without knowing the exact order of implementation, it is nonetheless recommended that any server configuration be implemented with at least a Production set and a Staging set of servers, as well as a Redundant set of servers. If used judiciously, Virtual Machines can be used to create the appearance and function of multiple setups, so if budgets are limited, the Staging and Production servers can exist on the same physical machines, while the redundant servers physically reside off-site, at an alternate site.

##### Rationale

The nature of spatial data is that it is very voluminous, which poses high demands on servers – in terms of storage, processing, throughout, and in the case of web mapping server, even graphics speed. The magnitude of the servers has a lot to do with whether the Port Police plans to implement a lot of custom GIS applications, or merely serve data to other applications, such as the Dispatch system. This also impacts whether multiple configurations are needed – custom applications development, or even the implementation of commercial applications packages, requires multiple

servers as described above, particularly in mission critical environments. Obviously, redundant and geographically-separated replication is recommended to mission critical applications, especially in a vulnerable location like the Port of Los Angeles.

### **Importance**

Very high, depending on the mission criticality of the applications that are selected for implementation.

### **Workaround**

Some level of server multiplicity is possible with Virtual Machine technology, and collaboration with other geographically-separated agencies can also lead to mutual redundancy (one agency placing their off-site redundancy on another agency's server, sharing their server with other applications).

#### **4.4.1.3 Plan for Live Updates of Data to Mobile GIS Users**

### **Recommendation**

There will be great benefit to disseminating GIS data and applications to mobile units, including tablet laptops on cars and boats, and at a later time, to PDAs on motorcycles. It might be possible to send these units out with data that is only occasionally updated, but it is naïve to think that this will satisfy long term needs, as the need for live data updates will increase over a short period of time. Therefore, a solution for disseminating spatial data to mobile units throughout POLA territory must be envisioned. This can be achieved through radio, wireless, or cellular communications, so long as heavy throughput, and high availability are taken into consideration, and the difficult land and marine environments are accounted for.

### **Rationale**

A consistent need expressed in the Needs Assessment was to permit rich data content to be delivered to all field units, including data that is dynamic in nature, such as the results of emergency response modeling, and the location of other Port Police (and non police) units. Some of this may be addressed by the CAD package that is selected, and by data feeds from VTS, or by a separate Blue Force Tracking implementation. It is very possible, however, that the full offerings of GIS may still need a separate conduit for disseminating data to the field. This will be determined by the GIS Implementation Plan.

### **Importance**

It is hard to place a single importance to this. In terms of base data (streets, for example) it is of Very High importance to keep the mobile units updated, but probably of Low importance to do so on a moment's notice. On the other hand, some data may be deemed of Very High importance to disseminate in real time, such as exclusion perimeters established from information derived in the central office – modeling, weather related, tip-offs, etc.

### **Workaround**

The largest GIS data layers are typically the "raster" layers (aerial photos, satellite images, or any other image related layers) – these can be preloaded in the office, when mobile units are brought in for service, or they can be sent out on memory cards or memory sticks. The more dynamic layers are usually the "vector" layers (roads, hydrants, buildings, etc.), and these can be disseminated in a similar fashion at first. It is conceivable to transmit them via public cellular networks, if the coverage is sufficient, but such networks cannot be considered reliable during large emergencies, when the competition for airtime may not enable large data transfers. Wireless transmission may not be practical throughout POLA, but a number of private WiFi Hotspots can be established that would permit mobile units to get wireless uploads when they are in the vicinity of the Hotspots. Finally, it is conceivable that limited data layers (such as real time updates to perimeter boundaries of an evacuation zone) can be transmitted over radio frequencies, as these can be limited to very focused information (in spatial terms, that would restrict transmission to point data, not linear, polygonal or image data).

## 4.4.2 Software

### 4.4.2.1 Standardize on ESRI GIS Software

#### Recommendation

Standardize on GIS software from ESRI. On the surface, it appears that there are various options to ESRI GIS software on the market – Autodesk, MapInfo, and some Open Source packages are examples. However, when it comes to the full range of GIS offerings, from redundant cluster servers, to desktop, to handheld GIS, nothing comes close. Beyond that, the aspect of compatibility with other GIS systems, availability in ESRI-based data formats, and the amount of available experience in ESRI software makes this a strong choice.

#### Rationale

ESRI is the standard in GIS software in governmental and private applications in the US, including at the City of Los Angeles, Los Angeles County, City of Long Beach, JRIC, and most agencies that Port Police will need to collaborate with, consume data from, or provide data to. While some departments within government use Computer-aided Design and Drafting (CADD)-based GIS, such as Autodesk at the City Bureau of Engineering and the Harbor Department's Engineering Division, and MicroStation at Los Angeles County's Public Works Department, even those departments are migrating to ESRI technology for data storage and truly scalable geoprocessing and Web applications. So while engineering design and rudimentary web map publishing is sometimes accomplished with non-ESRI software, the vast majority of GIS database storage and applications on the market today are ESRI-based. Just as importantly, the majority of GIS specialists in the City, or that are being hired by the City today, come with ESRI experience.

Beside the value of standardization with governmental entities, the key reason to standardize on ESRI technology is that it is extremely strong in using the database approach to GIS, is a leader in SOA (Services Oriented Architecture), and offers a range of platforms that covers the range of high end server-based GIS all the way to hand-held and smart phone GIS. Finally, perhaps the most important reason for Port Police to use ESRI software is that the sheer volume of uses for GIS at Port Police will most likely outstrip the capabilities of any CADD-based or Open Source GIS packages.

#### Importance

Medium.

#### Workaround

In the context of the Port, it is possible to avoid a single GIS software suite, but set strong standards for data and software development, and enforce its use by all GIS participants at the Port. This can probably only happen with a strong GIS Coordinator for the Port. However, within the context of the Port Police, such a workaround does not appear likely.

### 4.4.2.2 Standardize on Microsoft Database Technology

#### Recommendation

Standardize on database technology from Microsoft.

#### Rationale

Beyond the most basic uses of GIS, where file based storage can be used for managing GIS data, GIS typically stores data in relational databases, such as SQL Server and Oracle. This permits for greater scalability, more secure multi-user access, and more flexible direct or web-based publication of data. The main reason to choose SQL Server over Oracle is to lower the level of expertise required of support staff, thus increasing the pool of available resources who can be recruited by Port Police.

**Importance**

Medium.

**Workaround**

While it is the recommendation of this report to standardize on Oracle database technology – it should be noted that the Harbor Department has standardized on SQL Server.

**4.4.3 Plan for Emergency Data Exchanges****Recommendation**

At times of large scale emergencies, or even catastrophes, Port Police may need to exchange data with entities that it had no prior experience or intention of doing in the past. Clearly stating data formats and exchange standards is a good start for planning for such an event. However, implementing an ETL (Extract, Transform, Load) software at Port Police, such as one of Safe Software's FME suite, would permit much faster and exact transformations, especially when having to integrate unexpected data formats.

**Rationale**

Implementing an ETL software is an easy way to plan for the unexpected, in terms of GIS data. A simple example is the GIS database of one of the neighboring cities, which is stored in a *modified* coordinate system, not immediately importable into the Port's GIS database, which is based on an *unmodified* coordinate system.

**Importance**

Low

**Workaround**

Use the Port Police's GIS software's native capabilities, to the best extent possible. Standardizing on ESRI software already goes a long way towards this capability, since most outside sources are likely to have at least some of their data in ESRI-compatible format.

**4.4.4 Networking****4.4.4.1 Ensure True 100MBit or Better Wired Network Throughput****Recommendation**

Local networks should be fast – true 100Mbit full-duplexing should be used, i.e. the routers, NICs, and wiring should all be compatible and tested for actual throughput. This should apply within the main Port Police building, to the remote stations and sub-stations (e.g. Wilmington), and to the location of the redundant servers. 1Gbit networks are not mandatory for standard work, but may become necessary over time, as GIS related applications develop at Port Police.

**Rationale**

Whilst many in-office users will probably only view GIS data via a web browser, anyone involved in data management, programming, or ad-hoc analysis will most likely use desktop GIS software, and interact with server-stored GIS data. High throughput is very important for transferring (i.e. even just displaying) GIS data between a server and desktop thick clients. This is even more critical when imagery is involved, such as aerial photography, and an improperly configured 100Mbit network can be as slow as a 10Mbit network, so it is important to run performance tests with real data before declaring a network sufficient.

**Importance**

High

**Workaround**

There are no workarounds that will not limit the true potential of GIS functionality for Port Police.

**4.4.4.2 Ensure Minimum True 2MBit or Wireless Network Throughput****Recommendation**

Although it is hard to anticipate specific wireless speed needs at this time, the minimum practical wireless speed would be true 2MBit, keeping in mind that in an emergency dozens or even hundreds of simultaneous data transmissions may occur.

**Rationale**

Throughput depends on how much data and how many applications are implemented in real time. For example, if ship diagrams are made available in the field for officers performing an ad-hoc ship inspection, then 2MBit is considered a minimum reasonable useful transmission rate. Certainly, if an interactive *server-based* GIS solution is created, with perhaps a browser on the mobile units, then this level of throughput is essential.

**Importance**

High

**Workaround**

Client-based applications can be used, though they are harder to maintain, because they can carry much of their data, including spatial data, with them. In that case, throughout is needed for sending text data, or to push occasional spatial data. Furthermore, this can be a more secure application by reducing the transmission of sensitive data – but it is also an higher risk in the even of the loss of the mobile unit!

**4.4.5 Security**

Port Police should consult with a network and data security expert regarding general data transmission and networking protocols in law enforcement. Specific implementation steps should be devised during the first phase of GIS deployment, particularly with regards to backing up and restoring data, transmitting it securely internally and to remote locations (particularly via wireless, radio or cellular channels), and the enforced stripping of sensitive information on the occasions of exchange of data outside Port Police.

**4.4.5.1 Create the Ability to FTP Data In and Out of Port Police****Recommendation**

GIS data is usually too large to attach to emails, and in times of emergency it will be important to be able to transmit large volumes of data to and from Port Police (to other agencies, for example). This is only practical if an FTP capability is established at Port Police in advance, which is usually contrary to City security and firewall policies.

**Rationale**

The ability to transfer large volumes of data – and GIS data often are large – is especially important as part of emergency preparedness plans. In times of emergencies it is often necessary to collaborate with outside agencies that have not been interacted with before, and to collect and disseminate data quickly. FTP is the only practical method for achieving this on an ad-hoc basis.

**Importance**

Medium

**Workaround**

FTP can be established on separate, either non-networked computer that has its own Internet connectivity (e.g. DSL connection), or a dual NIC computer, whereby data is first copied to the computer, then FTP'd. There are also pseudo-FTP web based services, such as [www.yousendit.com](http://www.yousendit.com), that can be used in lieu of true FTP, but these may have limitations on size, speed, and reliability over direct FTP connection.

**4.4.5.2 Enable Limited Secure VPN Access****Recommendation**

It is likely that software development and configuration support for Port Police's GIS will be performed by consultants off-site. By far the easiest method for secure remote support is via a limited VPN access, at least to a "cordoned" machine, particularly the development servers. Since VPN represents the clearest possibility for a security breach, careful planning of this capability should be done, but not at the expense of doing nothing. In times of emergencies, off-site resources may be extremely important for rapid updates and support, and those occasions would be the wrong time to find out that no external access is possible.

**Rationale**

This recommendation pertains to any software applications implemented at the Port Police, but especially to custom applications. Any complex application, commercial or custom, requires upgrades, bug fixes, and user "hand holding". These are most easily achieved through secure "tunnels" known as Virtual Private Networks (VPNs), which permit as-needed secure access to a network from the outside. These are coupled with remote desktop sessions, whereby the support person logging in through VPN can see and drive a Port Police user's computer remotely.

**Importance**

High

**Workaround**

Use on-demand access, such as WebEx and GoToMyPC technologies, to access, view, and drive Port Police computers. These do not require hardware or special permissions, and can often be installed and managed by the end user.

**4.5 Data**

The following recommendations are not meant to be exhaustive, but act as a minimum list of GIS layers to be obtained for Port Police.

## 4.5.1 Phased Construction of the GIS Database

### Recommendation

There are three broad sources of GIS data at Port Police: the Harbor Department; agencies outside the Harbor Department, including other City departments, the County, the State, etc.; and the Port Police itself. The fastest approach to achieving benefits from a Port Police GIS is to gather and/or build data from the Harbor Department first, then the Port Police, and finally outside sources.

### Rationale

The rationale for this approach is *results*. Access to Harbor Department data is easiest because of proximity and the level of control that Port Police can assert on obtaining the data. Obtaining data from almost anywhere else would require an administrative and perhaps political process to be followed. Furthermore, the vast majority of needs expressed in the Needs Assessment emphasized data within the boundaries of the Port itself, which are *generally* available from Harbor Department sources. The need for data outside the Port is definitely tangible, but can be phased in over time.

The reason that the Port Police itself is identified as the second data source, is again *results*. The Port Police would experience the most dramatic immediate benefits from being able to “feed” its new CAD and Integrated Command needs, but also from the ability to “spin off” other uses for GIS data: crime analysis, HazMat response, exercise planning, etc. As soon as a useful base map is available for the port, Port Police can begin a path of training and use of the software, first on one-off projects, and then on standardized systems. It should be noted that this data will for the most part remain with Port Police, unless data sharing with other police agencies is contemplated.

The rest of the data – Southern California street data, Long Beach parcels, navigation charts, etc. – will be collected and integrated into the system over time, driven by priorities set by Port Police.

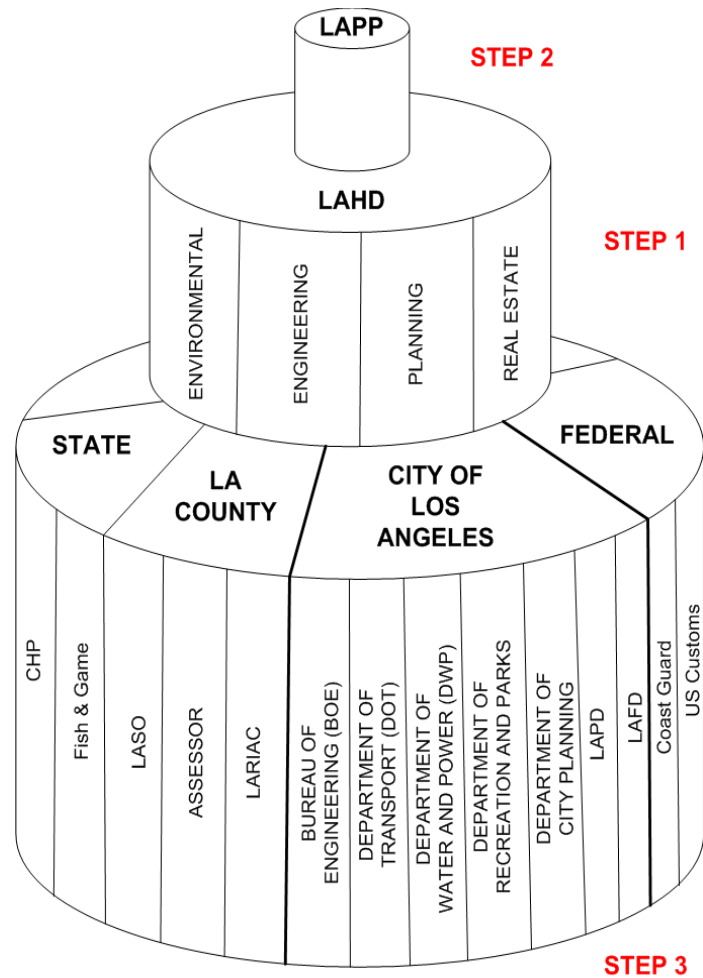
### Importance

Very High

### Workaround

If certain crucial data are not available, such as “Port Parcels” (i.e. lease boundaries), then a combination of “best of what there is” data and external data (probably from the City) will have to do, initially. However, this can only be viewed as a stopgap measure.

Exhibit 2 – Phased Data Acquisition Layers



Source: NorthSouth GIS Analysis of Port Police GIS, December 2007

**4.5.2 Base Layers**

**Recommendation**

Layer	Description and Notes	Source(s)	Extent	Native Format (if known)	Maintenance
LAR-IAC Aerials	4" resolution aerial photos	LAR-IAC (LA County) via LA City participation contract	Entire jurisdiction, including at a minimum POLB, POLA, Alameda Corridor and the former San Pedro Branch	TIFF, JPEG2000, MrSID (recommend JPEG2000)	LAR-IAC is updated every two years – Consider intermediate updates annually
Parcels (including owner information under limited distribution)	Parcels (including owner information under limited distribution)	LA County and possible Orange County	5-10 mile radius around POLA	ESRI (LA County)	3 months
Zoning	For planning	LA City, Long Beach, Rolling	5-10 mile radius around POLA	ESRI (LA City, Long Beach)	3 months

Layer	Description and Notes	Source(s)	Extent	Native Format (if known)	Maintenance
		Hills, Lomita, Carson			
Parks	For shelters, evacuation, staging	LA City, Long Beach, Rolling Hills, Lomita, Carson	20-30 mile radius around POLA	ESRI (LA City, Long Beach)	3 months
Points of Interest	For navigation, geocoding	LA City, Long Beach, Rolling Hills, Lomita, Carson	20-30 mile radius around POLA		3 months
Roads	Navigation, geocoding, mapping	Thomas Brothers, Navteq, or TeleAtlas (possibly through LA City)	20-30 mile radius around POLA		Annually
Coastlines		NOAA? Coast Guard?	5-10 mile radius around POLA		Annually
Railroads	Navigation, mapping	Thomas Brothers, Navteq, or TeleAtlas (possibly through LA City); Union Pacific?	20-30 mile radius around POLA		Annually
Demographics	Demographics by census tract, for planning and emergency response	US Census (via LA City?)	5-10 mile radius around POLA		As available
Traffic control	Traffic lights, draw bridges, railroad crossing barriers	LA City, other adjoining cities, LADOT, CHP	5-10 mile radius around POLA		3 months for infrastructure, real time for conditions if available
Currents	Direction and speed of currents	National Weather Service, Marine Exchange, NOAA	20-30 mile radius around POLA		Real time
Weather		National Weather Service, Marine Exchange, NOAA	Regional		Real time
Vessel location and movement	VTS data; small vessel movement if available too	Marine Exchange	Regional and 20-30 mile radius around POLA		Real time
Ship diagrams	To aid in inspections	Lloyds? Janes?			

## Rationale

These are data layers that for the most part need to be collected, rather than created. Their source is mostly outside the Harbor Department – either at other City Departments, other Cities or Counties, the State of California, Federal agencies, quasi-government agencies (like Marine Exchange), or commercial vendors (like Navteq). Formats, currency, cost, accuracy, and other factors, will vary greatly. Some items may require little effort, and other may take a long time to obtain and integrate.

**Importance**

Medium

**Workaround**

None

**4.5.3 Port Specific Layers****Recommendation**

Layer	Description and Notes	Source(s)	Extent	Native Format (if known)	Maintenance
Port parcels	Actually lease boundaries	POLA Engineering	POLA	AutoCAD	Unknown at this time
Lease data	Tied to port parcels and LA County parcels	POLA Real Estate	All POLA leases (incl. Wilmington)		Unknown at this time
Streets		POLA Engineering	POLA, POLB		3 months
Railroads		POLA Engineering	POLA, POLB		3 months
Structures		POLA Engineering	POLA (and off-site properties)		3 months
Pipelines		POLA Engineering	POLA		3 months
Utilities		POLA Engineering	POLA (and off-site properties)		3 months
Berths, docks, slips		POLA Engineering	POLA, POLB		3 months
Navigation charts		POLA Engineering, Coast Guard	POLA, POLB, and certain radius outside port		Annual
Existing land use		POLA Planning	POLA		Annual
Planned land use		POLA Planning	POLA		Annual
Bridges		POLA Engineering	POLA, POLB		3 months
Evacuation routes		POLA Planning, POLA Homeland Security	POLA, POLB and 5-10 mile radius around POLB		Unknown at this time
Points of interest	For mapping, geocoding	Various	POLA		3 months

**Rationale**

Most of these layers are of the greatest immediate interest to Port Police, as they pertain to the Port itself. Many are either created by Harbor Department divisions, or have already been obtained from outside sources and can be easily integrated with the Port Police's efforts. These are data layers that if the Harbor Department maintained a centralized GIS repository suitable for the Port Police's needs, the Port Police could potentially access without additional effort.

**Importance**

Very High

**Workaround**

None

**4.5.4 Port Police Specific Layers**

**Recommendation**

Layer	Description and Notes	Source(s)	Extent	Native Format (if known)	Maintenance
Incidents	Field Interviews content, geocoded to base map	CAD/RMS			
HazMat sites					
Cameras					
Preplans					
Building plans					
Access points					

**Rationale**

These are the proprietary layers that are either generated by Port Police, or are obtained under strict distribution control, such as from the Coast Guard or the FBI. These are data layers that are often derivatives of other data, such as geocoded field interview records. These are the data layers that even if the Harbor Department had a centralized GIS that met the Port Police’s other needs, would be stored at Port Police and “layered” on top of the other data, but would not be reverse-accessible to other divisions.

**Importance**

High

**Workaround**

None

**4.5.5 Geocoding Layers**

**Recommendation**

Layer	Description and Notes	Source(s)	Extent	Native Format (if known)	Maintenance
Lease polygons, parcels	Leases inside the port, parcels outside	LA City, LA County, POLA Engineering, POLA Real Estate			
Roads, berths, slips					
Landmarks	Including historical name aliases				
Reference grid in the open water	Permit geocoding to locations in the water				

**Rationale**

These are layers used for geocoding. Traditionally this means roads and addresses. However, in the context of Port Police, this could mean a layer of locally-significant landmarks, or even the locations of *previously* geocoded items, a practice used by NSG at another law enforcement agency.

**Importance**

Very High

**Workaround**

None

**4.6 Software Applications**

Beyond the collection, management, and presentation of data, the purpose of GIS is to use software to analyze spatial data, and to “spatially enable” other systems. In the Port Police context, software applications based on GIS data can be “GIS centric”, i.e. built on top of GIS software, or “GIS adjacent”, i.e. software that works alongside GIS. There is a role for both.

**4.6.1 Dual Pronged Attack, Simultaneous Design & Build****Recommendation**

The broad needs for GIS at Port Police would be best served by neither a simplistic “hunt and gather” approach to building a GIS database, nor by an over-engineered and “slow and steady” approach. Instead, a comprehensive design should be created at the same time that the most urgent and most obvious elements of data and applications are executed. This can best be achieved by a combination of a highly experienced manager and a skilled technical person, or a combination of consultants and staff.

**Rationale**

Organizational “patience” and “stamina” depend on the knowledge that systems are being built “properly”, but also on the need to see results in the near term. Therefore, early wins are important for sustained interest and support, but not at the expense of a poorly designed system. Therefore, a broad design should be achieved quickly, core data collected, and attention turned to early wins based on systems integration and software application development.

**Importance**

High

**Workaround**

None is deemed advisable

## 4.6.2 Support COTS First, Provide Access Second, Custom Applications Last

### Recommendation

Begin by getting GIS to support COTS (Commercial Off The Shelf) software and other non-GIS software that are being implemented at Port Police, such as CAD/RMS and Integrated Command console. Most staff will not necessarily know that they are using GIS at that point. Continue by providing access to GIS data, probably via web browsers and mobile data terminals. At that point staff will become more aware of GIS and its benefits, but will only be looking at maps and getting information about items on the maps. Finally, focus on custom applications, ones that bring custom analysis, visualization and “fusion” together, particularly in crime investigation, counter terrorism, and fusion of marine and land data.

### Rationale

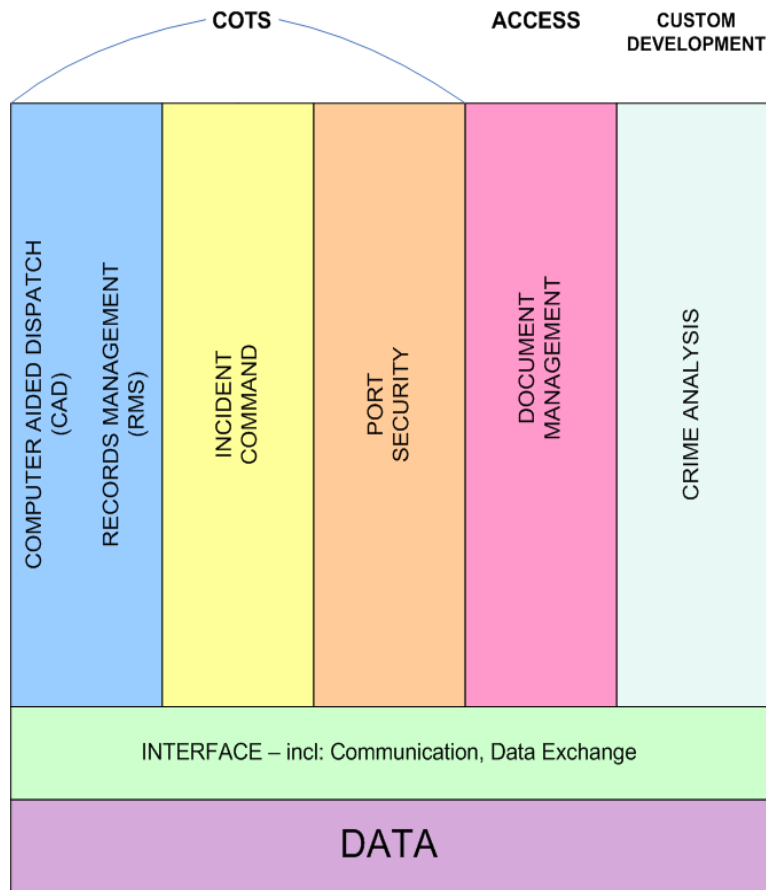
CAD/RMS and Integrated Command are examples of systems already being funded, which rely on GIS data. It would be a missed opportunity to let the vendors provide their own data, in a manner that would not benefit the broader GIS effort. Conversely, this could be an opportunity to push GIS development forward (and get funding), and also to be in the driver’s seat for the data that will be provided to those systems.

The next step is to start providing rich data content to Port Police staff, beyond the capabilities provided by COTS software, such as the CAD system that may have built-in tools for disseminating some GIS data. Much can be accomplished by fusing data from the Port, and the many other data sources discussed in this report, and delivering them across the force. A further step in this stage is adding various query capabilities, such as looking at FI information, then searching for specific commodities or lease holders within a certain distance, or clustering FIs by MO, and comparing the results to various infrastructure data layers.

The step beyond is the one where enough experience has been gained by users for specific queries to be automated, and for more elaborate applications to be conceived and developed.

The exhibit below illustrates several things: The underlying basis for all GIS implementation is the data collection and management element; the primary challenge to working with GIS is the exchange of data with other systems – the interface between the data and user, directly or through a secondary software system; and the progression of implementation from supporting other COTS software, to enhanced data dissemination via GIS-specific viewers and query systems; and culminating in custom or commercial focused applications built directly on GIS, such as crime analysis systems.

Exhibit 3 – Phased Software Implementation Plan



Source: NorthSouth GIS Analysis of Port Police GIS, December

**Importance**

Very High

**Workaround**

Data access applications may take precedence over the support of COTS software, depending on priorities and resources.

**4.6.3 Prioritize Applications that Benefit Most from Spatial Analysis and Integration**

**Recommendation**

The following applications should be considered for implementation in the third phase of development, based on further investigation:

- Link HazMat response plans, particularly maintained by terminal operators, to locations
- Link ship drawings to ships at dock or approaching port – may be a live link to an on-line database
- Link to, and ideally some level of control over, traffic management systems maintained by the City or CHP

- Model air and water dispersion plumes, integrate with demographics and reverse-911, and communicate to mobile units, and possibly to outside agencies (EOC, media)
- Support Blue Force Tracking with enhanced GIS data, e.g. find out not only where another unit or officer is, but who leases a location, what is stored there, or link to camera feeds for that location
- Track trucks, rail cars, ships at an ever increasing circle of influence beyond the port, both coming and going, using a variety of tracking tools – AVL, AIS, and ones only available to investigative details
- System for up-to-date content of tanks
- Link to 24 hour and 96 hour notification systems for cargo content, previous port, etc.
- Publish a paper atlas for emergencies – also store a version in PDF on memory cards
- GIS on a chip – can be started independently on any computer in case of a disaster
- Link infrastructure maps to financial systems – an asset management and spatially-enabled executive reporting system

### **Rationale**

GIS is a technology capable of managing and displaying geographic information, but also of analyzing this information and integrating it with other systems and types of information. Whilst GIS is most critical in the initial phase for supplying up-to-date data to *other* systems, such as CAD/RMS and Integrated Command Console, over time GIS will find utility in supplying capabilities that other systems are incapable of supplying. One of GIS's particular strengths is in bringing together data that would be difficult or impossible to integrate, by using the spatial element of the data. It will be at this stage that GIS will gain particular visibility at Port Police – until then it may be limited to a supporting role.

### **Importance**

High

### **Workaround**

The option to create custom GIS applications, or commercial applications that build *directly* on GIS (such as a crime analysis system), will be made by Port Police's over time based on the foundation implemented in previous phases.

## 5 Appendix 1 - Interview Summaries

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*This information is a summary and an interpretation of comments made by way of interview and frank and open discussions involving the noted individuals for the purposes of supporting the objectives of this project. This should not be taken as representing a definitive opinion of various individuals as some comments may have been taken out of context or misinterpreted.*

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 Capt. Ralph Tracy, Port Police, rtracy@portla.org  
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 Officer Dan Rodriguez, Port Police, drodriguez@portla.org  
 Officer Nathan Ewert, Port Police, newert@portla.org  
 Officer, Dave Yoacham, Port Police,  
 Bob Teremura, Port Police

### Harbor Department Staff

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### Non-Harbor Department Staff

Richard McKenna

Mike Pilgrim

**Other people not contacted but relevant to this project include;**

Randy Price, BOE

Mike Bagheri, DOT, ATSAC GIS

Tina Dickinson, POLB

Lou Repolli, LAFD, Asst Chief

Bob Kramer, LAFD, Battalion Chief, Counter Terrorism

<b>Participant</b>	<b>Lonnie Tang, Director of Information Technology</b>
Date	10/09/2007
Infrastructure	<p>Network configuration information provided and received from Jane Broadwell  850 – 1000 users at the Department  Groupwise implemented and now accepted  Novell being migrated to Microsoft Exchange early 2008  Documentum implemented as Enterprise CRM (not completed)  eRoom for web based collaboration  Board meetings use streaming video indexed to agenda items and presentations/documents  Business continuity via SAN fiber to downtown LA, Business Recovery plan in place.  Identity management at corporate level  Internet available for 5 – 6 years  Intranet currently being rolled out  Environment Management System @ construction and maintenance group (next 3 years)</p>
Comments	<p>Aggregation of information – data can use GIS as one medium  Potential utilization includes monitoring of everything that moves incl. boats, vehicles, trucks  (by terminal) – people relate to images vs. text  Major cultural change over the next 18 months move to crime reports in Documentum  Engineering and Environmental have relied on consultants – do they have as-built  schematics? Are they current?  Identity management requires different levels of access  Different levels of technology, network, in-office, mobile etc  Scheduled move to 300 Water Street, copper and fiber redundancy incl. microwave, Wifi could  – but doesn't - work  Video monitoring server and archive room to be constructed at LAHAB</p>

<b>Participant</b>	<b>Dave Malin, Emergency Preparedness Coordinator</b>
Date	10/10/2007
Comments	<p>Priorities – rewrite Emergency Management Plan, Business Continuity Plan and Port Recovery Plan</p> <p>Emergency Preparedness Plans include training for Department of Operations providing the interface between, Harbor Department and the Emergency Operations Center (EOC)</p> <p>Utilization of WebEOC at the LA City.- include limited mapping, MapTac provides ability to import a jpg image and display for addition of “pin mapping” no ability to include attributes (managed directly into WebEOC). ITA being pressured to provide x,y and map interface to ESRI</p> <p>NCMS – ICS is a national model for Management Policy, Operations, Logistics, Planning, Finance and Admin,</p> <p>EOC is coordinated by Emergency Preparedness Department</p> <p>JRIC interface managed by Paul Lipscomb – Captain Graychik manages incident scenarios</p> <p>LAPD and Port Police have joint jurisdiction over the port – Port Police have full powers</p> <p>Emergency Command Vehicles using proprietary software – implemented by LAPD, LAFD and Long Beach – system from “Future Concepts” – said they will “use LAPD GIS”</p> <p>Important to share information – necessity for “accurate” GIS including demographics of surrounding area. Barriers to coordination are political rather than technical.</p> <p>Tsunami Emergency Response plan - map prepared by Engineering incl. evacuation routes</p> <p>HazMat work at the port is in the most part – investigative work (Sgt Ken Hawkes)</p> <p>Incident command for Port Police is to include management of deployment in response to Emergency Management.</p>
Requirements incl.	<p>Lease agreements – include who is responsible for what area – managed as “Target Files” are necessary for management of what might happen at a particular terminal.</p> <p>Hazardous materials – managed as a hardcopy system, by Environmental EMS.</p> <p>It is desirable to have a database of logistical assets that could be brought to the table, including terminal operators, booms for hazardous spills, special skills e.g. divers, medical skills.</p> <p>Base map – this changes all the time – e.g. streets due to construction</p> <p>Need for traffic data</p> <p>Need for utility data – gas , phone electric – networks of disused pipelines is important.</p> <p>Currently from City of LA BOE and engineering who have “paper plans”</p> <p>Issues with plans include for example berth 161 where construction and maintenance have no plans</p> <p>Census and demographic data – useful as is a phone database such as the 3N reverse 911 system --- useful to have ability to identify and select by polygon and radius potential affected areas.</p> <p>Liaison with LA County and South Bay community (GIS)</p> <p>Coastguard has a Department Operations Center (DOC) on Pier 0 at Terminal Island</p>

<b>Participant</b>	<b>Capt Ralph Tracy, Operations - Patrol</b>
Date	10/10/2007
Comments	<p>Has personal experience with GPS – Garmin and Streets and Maps.          Can see use of GIS for officer in pursuit – out of Port          Need for lat/long for water          Need for waterside and landside images – at least to Catalina and the whole of LA County and for boats charting from Marina del Rey down to San Diego as Port Police has water borne assets that operate in this area.          To train officers it is essential that they know berths, address, and business names – BUT the officers had “better know this” rather than reference a computer system.          A issue is that “they” are constantly moving streets – every 3 months. Current navigation is via instinct.          Current patrol force is 75 – 80 which will increase to 150 next year “will not have them RELY on a machine”.</p>
Potential for GIS	<p>There are HazMat placards on the outside of a warehouse – BUT this does not have actual contents – the officer will call this in to the HazMat team or LAFD.—reference to Chris Manual – a small digital version would be useful          The idea of Blue Force Tracking for officers, vehicles incl. Motorcycles (6-10), boats (9), cars (25). Communications is a problem as wireless can interfere with ships electronics.          Communication has moved to 800mhz for MBT's in cars          Patrol know where there are access points but with regard to buildings would like to know what is stored in them- leasing information would also be good – BUT information has to be current.          For Dispatch – Highway Patrol get all 911 calls          It would be useful to have results of scenarios. Patrol would like the identification of the restricted area to set up a perimeter and why they are being sent there.          Major incident 6 – 8 months ago when a ship experienced an issue with inert gas control system failure. There was significant potential for explosion – a scenario was developed for potential sphere of influence from risk of explosion and the potential for evacuation. The scenario was modeled by engineering (see Sgt Kevin McLosky). Patrol needed to know the results of the analysis and needed it NOW.</p>

<b>Participant</b>	<b>Chief Ron Boyd, Chief of Port Police</b>
Date	10/10/2007
Comments	<p>Police tend to be reluctant to adopt technology – but there is a need to be better, faster and stronger.</p> <p>Need for a clearer action program – have been flat for 3- 4 years</p> <p>Interact with LAFD and Coastguard and LAPD if they require the comfort of another person.</p> <p>Desirable to have an information vault of hazardous materials (HazMat), and the location of critical infrastructure including pipelines.</p> <p>The Joint Terrorist, cargo theft and narcotics operations.</p> <p>Blue Force Tracking is important for San Pedro, Wilmington, Carson, and Long Beach.</p> <p>There is a large landside component of operations incl. corridor 47 that needs to be preserved and secured.</p>
Strategic	<p>The will and determination that the port be autonomous and that it has its own data – we will have alliances where we can e.g. CTIP, JRIC etc.</p> <p>The focus for the GIS project should be on Port Police</p> <p>It is important to define the criteria for success, the purpose of openness to manage public safety and be a world class model for, Australia, Asia, UK etc</p> <p>What are the technologies – both internal and external required for implementation.</p> <p>The project has the commitment at the highest level</p>

<b>Participant</b>	<b>Capt Mike Renteria, Professional Development</b>
Date	10/10/2007
Comments	<p>Responsible for professional development, training and recruitment incl. internal investigation. 30 years experience in Port Police perceives the requirement for a build out model incl. crimes (date/time) event coordination, incident reporting, visual crime analysis – the solution is to give good maritime situation awareness and a Common Operation Picture (COP)</p> <p>For a COP requires input from other agencies incl. Coastguard, Inspections especially vessel Tracking e.g. Maritime Exchange in real time.</p> <p>For inspections – advantageous to have an understanding of layout some available from Lloyds.</p> <p>Port Police is tasked to inspect for hazard and safety incl. ships and marine oil terminal infrastructure (LAFD and Coastguard does similar inspections) – Coastguard delegates to Port Police. Searches can include locations such as rudder compartments.</p> <p>Counter Terrorism is also interested in this.</p> <p>Interest in GIS support for E911 for wireless communication to locate emergency wireless communication- real time weather display, census and evacuation routes.</p> <p><b>Kenny Huerta (CTIP)</b></p> <p>Interest in tracking vehicles, and radio communication with, fire and ambulance.</p> <p>Share of information with coastguard and Capt Graychik.</p> <p>An advantage if there is knowledge of the number of people available for response and to assist.</p> <p>Look for trends to see where there is a high level of incidence e.g. auto theft, drunkenness etc.</p> <p>Establish the location of barges, at any one time, do we have enough tugs?</p> <p>Port Police receive Marine Exchange data – but there is no capability to bring up that data (new viewing stations purchased).</p> <p>Tariff is by docking and weight- customs get the details of the manifest.</p> <p>From an investigative perspective it would be useful to display by visual analysis occurrences within a defined area, or suspects within a 2 – 3 block radius.</p> <p>Integration with scanned documents - currently use Excel – reports and a map would be “great”!</p> <p>Four detectives at Port Police (assigned to narcotics) and ten investigators in the multi agency task force – one being assigned to JRIC.</p> <p>CTIP includes theft from warehouse, trailer, container, -- receive an upload from CHP systems. Overseen by insurance, auto theft, victim and suspect details.</p> <p>Useful if systems sees a pattern, e.g. Same trucking company or driver, there is a vested interest in every threat in the world. Premise type – pattern relevant. Current recoveries are \$1 million per month.</p> <p>Interested in AVL and RFID associated with the container that might have been hijacked out of the port.</p>

<b>Participant</b>	<b>Lt. Mike Kettlekamp, Sgt Mike Cappadano, Sgt Mike Myers, Officer Dave Yoacham</b>
Date	10/11/2007
Comments	<p>Patrol watch commanders. -- and K9 – Dive team  Special dogs – explosives and narcotics – teams have a close relationship with LAFD, Coastguard and Long Beach FD especially for pre-emptive checks.  Necessary to have terminal evacuation (longshoreman) plans in response to bomb alert.</p> <p>Octopus sonar 3D imaging is not compatible with BlueView (3D imaging) on boats.  Question will this integrate into MDT in the field? Esp. command post and dive truck.</p> <p>Critical infrastructure assessment course will not give enough information. Will we be able to push out --- aerial photography.</p> <p>What is the compatibility with LAPD crime statistics? Especially on periphery of the Port responsibility to include aerial photography and streets for at least 2 miles. E.g. . Wilmington and San Pedro. It is important to develop a system that works for Port Police and includes information on key facilities at the command post in the field.  The system needs to be kept up to date – e.g. the contents of tanks can change daily – information is necessary as to who should be contacted held by LAFD, Coastguard etc.  Premise history is important ... information as to the ownership of harbor property is essential.  Port Police often responds to calls at night – a map of the whole harbor should include the breakwater.  To coordinate a dive search is expensive and requires as a minimum location by berth and anchorage.  The Coastguard uses VTS and AIS – recording every vessel over 300 tons.  Boats have GPS and some send out boat length – to only certain access. Boat information on previous calls is important especially in marinas.  While GPS coordinates are recorded on reports this is often on a grid search such as a buoy location.  Who do I call? A contact database would be useful  It takes a couple of years to learn the “nooks and crannies”.  In general we know what it looks like.  It would be useful to have an analysis of how often officers leave the jurisdiction and what did they do there – especially adjacent jurisdictions.  A simple mapping system should be in all patrol cars.  For officer safety we need to know where the officers are at all times (Blue Force Tracking).  Information on truck routes (designated), where signs are posted, citation statistics/violations have occurred – including access to Caltrans cameras.  Currently map reference by watch commander is often to the AAA map  There are approximately 20,000 incidents per annum – but not all the workload is captured.  The new dispatch system will measure and record this information.</p>

<b>Participant</b>	<b>Gegam Gasparian Planning Department</b>
Date	10/11/2007
Comments	<p>GIS is used by Real Estate to create maps incl. aerial photography. Who owns what and why. Base data is Thomas Bros via ITA and BOE (Randy Price), Lease drawings come from PSOMAS and pipeline data comes from the National Pipeline Management Center. City parcel data does not include city department and owner.</p> <p>Most enquiries include a request for an overlay on aerial photography – sourced from the LAR-IAC project. Engineering have AutoCAD data. All requests are project based vs. any corporate structure.</p> <p>Data storage includes LIDAR, and CIR, Pictometry DEM area changes and imagery in Jpg and Jpg 2000 – there is approximately 250Gb of aerial imagery.</p> <p>Systems were set-up by Richard – previous employee. Gegam is a graduate of UCLA and has been with POLA since late 2006.</p> <p>ESRI licenses include 1 floating ArcGIS (ArcInfo level) license plus all extensions. Also 2 single seat ArcGIS- ArcView. All licenses are ver. 9.1 with Service Packs. The server is in Gegam's workspace,</p> <p>Project examples include a request from Capt Graychik – for 200 police officer locations in the county – what is the response time to respond to incidents at 6000 economic business locations. This took a week to complete.</p> <p>Leases are all spatial but are most up to date on paper records. Leases cover 300 parcels (polygons) and – UID produces 1015 records. Most easements are polygons.</p> <p>A script exists that updates the engineering (BOE) parcels with the leases in ArcMap. This includes a timestamp attribute. It appears as if this script and the process is currently broken. There appears to be a mismatch between leases and land use.</p> <p>Real Estate is looking at a product for lease management.</p> <p>Important to talk with David Mathewson – Director of Planning</p>

<b>Participant</b>	<b>Capt Alan Rosario (Command Counter Terrorism and Investigation), Mike Pilgrim (Consultant to Homeland Security), Officer Sonia Estevez (JRIC), Officer Scott Gaines (Joint Terrorism Taskforce), Officer Nathan Ewart (Physical Security),</b>
Date	10/11/2007
Comments	<p>It is most important to achieve "Domain Awareness" – what is going on at the port at any one time. Including Marine Exchange, JRIC, Coastguard.</p> <p>Invaluable information would be details about buildings – leases, POLA ownership, and contact information.</p> <p>Information about vessels in the port, at the same time of day, trends would trigger an alert. Pre-indications say up to 5 days in advance could be a trigger that there has been a breach.</p> <p>With regard to critical infrastructure- this should include a probability index – this might include several different assessments. Time is an important attribute. Hotspots for each day and special event mapping should include connectivity to other agency databases.</p> <p>Surveillance should include the location of all video cameras including the field of view and real time video interaction.</p> <p>Video analytic camera integration should include berth, building, common name and/or GPS location.</p> <p><b>Additional comments from George Cummings - Homeland Security Consultant</b></p> <p>What is the key status of infrastructure – including the Alameda corridor, bridges, main highways. The proximity to other targets e.g. downtown LA and other targets.</p> <p>Possibility of integration with the port of Long Beach, rail, Caltrans including the location of every truck in Southern California.</p> <p>Pictometry imagery was very useful – regularity of imagery was important – "what is around there", "what can be seen from that location". Integration with the command console is important</p> <p>Integration with population data – and the CAS/RMS system is important – especially activity at a given time of day such as video of train movement, status of the bridge activity.</p> <p><b>There is the risk of information overload.</b></p> <p>With an increase in staff e.g. sworn vs. non-sworn police they may not know the streets. They will need to know "what is here" and "how do I get there"? For example access to berth 248 maybe via berth 240. Knowledge transfer is important from a resourceful officer to others.</p>

<b>Participant</b>	<b>Tony Gioiello, Port Engineer, Engineering</b>
Date	10/11/2007
Comments	<p>Introduced Microstation and then AutoCAD to POLA. Has primary responsibility for data – which is however poorly maintained. A lot of the data has been assembled about infrastructure to support design elements or projects. For a while support was provided to Planning who had no access – Engineering went ahead with minimal training and system design but never saw the need for a full GIS implementations such as at BOE. Engineering has good databases for projects, including scanned images all that is needed for engineering is good data mining – it was not necessary for them to have a full GIS for analysis. It was recognized that Port Police would need its own GIS.</p> <p>It was appropriate to look at information gaps and look at information that is best maintained by Engineering – such an analysis may accelerate priorities such as upgrading data from text to include more attribute information.</p> <p>The planimetric (photogrammetric) base data includes a 3D model – photography is 5 years old (4") The BOE Intranet needs to include more information on ownership. The POLA will need to have information on its own infrastructure including property, lease parcels, geotechnical information. Some is on the current MapGuide system.</p> <p>The Bureau of Street Lighting (BOE) includes some other data – but they do not have DWP (Water and Power), Phone company, Fiber location, Cell Towers on their ROW. Information on dredging is held by the POLA surveyors, there is noticeable changes in land use, (plans for a new cruise terminal), Parks, a new rail network and some road changes. More real time traffic flow information would be useful.</p>

<b>Participant</b>	<b>Paul Johansen, Assistant Director Environmental Management</b>
Date	10/11/2007
Comments	<p>Has had ArcGIS (ArcInfo) for over 10 years. 10 seats of ArcGIS – mostly ArcView – version 9.1 plus 3D and Spatial Analyst. ArcGIS is installed on all professional workstations.</p> <p>Had been working on a GIS pilot for several years – however there was no centralized database. Planning had historically taken the lead and there had been discussions about migrating to a Geodatabase environment. The thought had been to maintain a master database that would be accessed by contractors – this would have included a web based front end. It had been recognized that there would be too much training for such a development so the focus shifted to a data centric approach. There had been a review at the time of ArcIMS. The idea would have been to have a mySQL database with data loaded from Access or Excel with a PHP front end.</p> <p>With regard to data – The base map would start with Thomas Bros, and be extended to include NOAA shipping channels, USGS quads engineering (planimetrics). BOE land parcels were not regarded as critical as they were “inaccurate” and did not represent the port’ properties. For example one POLA parcel might include 12 BOE land parcels. Paul had built his own datasets including his own representation of the breakwater.</p> <p>There had been a close working relationship with Stan Young at Planning (prior to his retirement) this had included obtaining data from Engineering. The concept was to have a central database – (Stan had proposed that this be in ArcSDE) If there was an increased demand from staff then there would be more emphasis to make data and systems available – e.g. to contractors/consultants – who would pass their data back to Environmental (the central database).</p> <p>It would be of mutual benefit to have a well maintained central database.</p> <p>Paul had compiled a lot of historical “scans” at least one depicting the history of the port every 10 years. Paul had compiled an Excel spreadsheet of the available data within Environmental.</p> <p>Perceived utilization included CAMEO and as a first responder to HazMat incidents or for LAFD.</p> <p>Primary environmental data included areas of solid and groundwater contamination. Integration with Marine Exchange... the port already sponsors the system as an extension of the Port Pilots system. It is possible to export data via Excel but NOT the track lines which would be useful. Marine Exchange has a proprietary viewer (which POLA) has committed to purchase. Other relevant data would include Vessel number, name and information from Lloyds (vessel stats) that includes an estimate of the emissions per vessel. HazMat was not a good parcel record location - there is a contamination map but this does not include the main terminal. It is desirable to have tenant audits -- but this was not in a good database.</p> <p>The GIS initiative is the opportunity to secure consensus to build things and staff up to meet needs – it was important to resurrect other systems such as the “green card System” within Real Estate.</p> <p>Address matching was perceived to be a problem – Paul and Stan had spent a year working on that. The hardest part was the ongoing management of address and contacts. A lot of locations have a common name. Lease data was historic e.g. APM vs. APL. Lease descriptions have a bearing and distance to define their legal description. It was important to have a snapshot of port parcels by time.</p>

Property entitlements define port parcels. The "green card" system if maintained – Real Estate confirmed it was not – should be the most accurate representation of port property.

With regard to leases -- some are issued as a 30 day revocable permit (a significant number have been issued over the last 10 years). There are also a number of primary and secondary entitlements.

With regard to spatial data – engineering have improved their georeferencing – NAD 77 (historical CAD) has now migrated to NAD 83. However most of the state information is in Albers projection.

IT manages hardware service contracts – but can't manage application development. Environmental maintains its own Software budget – to plan for their own support. There needs to be a deployment of IT experience for Division level control. There is a necessity to inform and share a framework --- built upon an integrated system

<b>Participant</b>	<b>Sergeant Hawkes, Hazardous Material</b>
Date	10/12/2007
Comments	<p>Hazardous material evaluation compiled using Adoshi – (review at Adoshi.com) for plume mapping e.g. biological dispersion such as Anthrax.. This is the same system as used by LAFD. Similar systems are CAMEO and Marplot – LA City is using Cobra.</p> <p>Response to emergencies is currently Reactive vs. Proactive It is necessary to build a database of sewer, and storm water and pipelines. It is believed that at least 50% are abandoned. It is desirable to have building plans to for example know how to seal of a floor if there is an anthrax contamination on the 5<sup>th</sup> floor. The locations of wells, environmental “features” water and oil tanks is essential.</p> <p>Currently the 8- 10 man response team has Notebooks (2) and Laptops (3) There are MDT’s in 3 vehicles.</p> <p>The terminals have their own engineering drawings and security plans are required CCG. Helicopters are deployed from berths 168 and 94 – they undertake pollution flights and monitor sewer discharge.</p> <p>Prosecutions include illegal discharge (e.g. 15 gallons of bulk oil discharged down a stormwater drain or requiring a boom clean up. Port Police is really investigative only as it is LAFD who have to medicate the spill or stop hazards – there are clearly defined differential roles for both organizations.. Port Police has to monitor the potential impact for example a Chlorine spill – influenced by a SW or SE breeze and assess the affected areas. There have been hazardous material incidents in the last 7 or 8 years but there has been no major oil spill in the last 10 – 11 years.. Port Police is made aware of incidents such as the EPA Pacific Ocean monitoring of an Evergreen container ship being charged with an illegal bilge discharge.</p> <p>The county sheriff, LAPD and Port Police include a 1/3 of all hazardous Material technicians for the whole of southern California.</p> <p>The knowledge of tank contents would be useful. Terminals have a list of dangerous cargo and have a new online permit system. There are 4 on the hazmat team. Vessels have to give a 72 hr notice of where they are going and what time – there are some 3000 vessel movements per annum all have to have a RAD inspection. By (1-9) class. The main carriers are NYK, Maersk, APL and Evergreen. An example of dangerous goods might be Transpac and 40 containers of fireworks. That and special shipments e.g. Amphol require special permits. Care is needed for diving, welding, ballasting (spark danger in empty ship)</p> <p>Search by location includes, berth number, or street address e.g. 200 Cannery Street. Ship inspection would benefit from ship plans.</p> <p>The location of responses is critical – it is expected that call will quadruple when the new camera surveillance system “goes in” This is necessary as a preventive measure for counter terrorism.</p>

<b>Participant</b>	<b>Wharfingers and Marine Exchange plus Bent Christiansen - Pilots</b>
Date	10/12/2007
Comments	<p>Have to deal with 600 vessel movements per month. Marine Exchange deals with Automated Vessel Tracking System (VTS) up to 35 miles with Radar tracking up to 35 miles. Pilots use an automated target mapping system AIRNC (transponder development) This AIS system includes where from and where to information and the rates of travel linked by Lloyds number. Port Police has access to raw data.</p> <p>Pilots record every 24 hours by vessel name, and destination, (cargo? – type especially dangerous content) size, dimension, speed and direction. There is a link to the pilots radar via the LAN.</p> <p>The base map is different to the AAA base.</p> <p>An alarm is triggered if vessels are within 200 yards of each other.</p> <p>There is an electronic dispatch system – KLEIN – which includes what berth and time incl. the number of tugs required.</p> <p>Note: The Lloyds number stays with the vessel vs. a name change, change in shipping company or terminal operator. This information is available to the coastguard.</p> <p>Wharfingers have an inventory of all historical data, the vessel cargo and when it left port. They look at vessels in the berth range including a weekly schedule for vessels and tankers. Information about the terminal is stored in the terminal information sheet, including occupant and operator.</p> <p>Pilots have an up to date status board -- this is being automated via a Maritime Information System MARIS. This includes ships in port, arrival and sailing dates as far back as 1992. Visit 3 months in advance will be in the database.</p> <p>The vessel schedule is in Word – includes destination, name, berth, and the Tanker schedule is in Excel.</p> <p>There is a 96 hour notification for arrival of a vessel – requirements include crew, cargo, last 4 - 5 ports</p> <p>Wharfingers also have a fishing vessel database.</p> <p>Pilots make reference to maps and charts, including NOAA navigational charts, they have some cameras mounted for water (channel and harbor) surveillance and 2 vessels which operate from Berth 68</p> <p>Bob Dunbar in the Survey division has depths and soundings more detailed than NOAA. The US Army Corps of Engineers survey the channel to keep it open 24/7</p>

<b>Participant</b>	<b>Mike Graychik, Commanding Officer, Special Operations, Kevin McClosky, Sergeant in charge of boats, Paul Lipscombe Reserve Bureau Chief</b>
Date	10/15/2007
Comments	<p>Kevin – Feed from Maritime Dive Team, incl. support of dignitary protection, advisor on homeland security, contractors for special projects expectation similar to LAFD No CA in cars but in filed is in charge of the call</p> <p>Mike – Hazardous material database – Port Police have this information, some vessels have to move in and out in 4 hours. There is a site survey from LAFD – day and night surge information is compiled for security and available as a PDF file. Port Police has old site surveys but this has not been updated in the last 4 years. LAFD has inspectors in the port – each terminal has a 3D map of the “stack” they can find and individual container in the stack. The people who know the most are the owners e.g. APL. Basic information requirements include site survey, berthing ships etc.</p> <p>Kevin - In the long term would require a large plotter and laser printer output – they want to be able to do this themselves.</p> <p>Mike – Marine Exchange have accurate weather statistics – as they have stations throughout the port. It would be good to have plume examples.- good weather data would be helpful. There needs to be a focus on Port property, supported by other information such as tsunami evacuation zones. There is a databases of filed interview cards which could if spatially enabled show the location of points which have not been visited. There is a need for critical site inspection tracking – not necessarily moment by moment but Blue Force Tracking would be good. This might be difficult for common name locations such as “The Hatch”. There could be an anomaly Tracking System built up with data over a 5 year period. Ideally there is a need to track vessels under 300 tons incorporation of data which shows anomalies e.g. photographer was here (linked to video feed). Traffic cameras and sensors in relation to critical infrastructure especially primary bridges.</p> <p>Emergency preparedness areas and pre-established evacuation routes would be useful along with the identification of people who need special assistance. The gatehouses include location of hazmat but terminals move around all the time?</p> <p>There is a need for close liaison with LAFD there is a Fire Prevention Bureau at the Port in San Pedro and they have a Battalion Chief allocated to Counter Terrorism.</p> <p>It is important to record access points for terminals tagged with metadata – again it is important to differentiate what is port property, private or city ownership and list various inspection reports. Analysis of this should be by type, certain circumstances or data.</p> <p>Kevin – it is necessary sometimes to patrol off port property to protect port property. There is a need to interface with Coastguard, BCP, EPA, US marshals (Prison), State Fish &amp; Game, NOAA (for maps and charts) Marine Exchange, Port Police Pilots and Pilots at Long Beach.</p> <p>The objective is a Marine Domain Awareness System</p> <p>Currently dispatcher’s have CP’s (?) everywhere. There is currently no Internet or satellite phone on the boats.</p> <p>It is desirable to have laptops with maps and location in times of response, and the ability to interface with cities, EOC. BUT care is needed to avoid a situation where the system were on</p>

a laptop in a car which was stolen - -this needs to be deactivated to avoid potential threat of attack.

Note: It was the Coastguard who had the most successful response to Katrina

Kevin – it is necessary to have the ability to print and publish – and print a book.

Mike – There is a need to raise the awareness of the potential use of GIS. There could be a Table top Plan – as a field exercise for preparation – worked up in conjunction with a “go to guy”. This could include drills and spot inspections.

Kevin- for output the Port Police needs its own capability and should not rely on LAHD – systems in dive house, Mobile Command Post, -- all need a color laser. There should be a Mobile Vessel Command Post, also one at water Street.

For special operations and counter terrorism there needs to be availability of crime statistics and critical infrastructure. Including access from remote centers such as JRIC – 3 times in the last 2 years?

Any systems should include an online tutorial. The interface should include “basic and Advanced” options to support different questions (and audiences)

Mike – It would be useful to have a link to Janes or Lloyds

Kevin – There should be the ability to annotate – e.g. a thing that moves. The system should include metadata on the integrity of the source incl. time.

The ideal would be a Maritime Domain Information System for anywhere in the world as a minimum streets and maps for California and waterways for Southern California. Information should also be included for Long Beach including all the waterfront facilities and Hazmat.

LA County, Sheriff's Department, Coastguard and Long Beach all have maritime assets – there also needs to be interoperability with the City.

Kevin – There are in-house contractors and consultants who have data. Triton imaging software is used by surveyors for sonar -- in Construction (Ping Lit?) has plans of pylons. Real Estate has some data.

<b>Participant</b>	<b>Dick McKenna, Marine Exchange (site visit)</b>
Date	10/15/2007
Comments	<p>Background summary was provided including a summary of the alignment between the Port of Los Angeles and Long Beach. Long Beach has implemented a "huge" camera system. Which has been operative since February. He asked if the LA system would be compatible. The Long Beach system has some feed to Marine Exchange and will host a high tech zoom and IR capability.</p> <p>Marine Exchange uses Bathymetric charts (NOAA?) for LA and Long Beach. ME is especially interested in small boat coverage, integration with Long Beach Operations Center and development of a "Business Resumption Plan".</p> <p>The Vessel Tracking System (VTS) is a Norwegian tracking system that has a feed which is shared with the security group at Long Beach (Jacobsen). The current website is very generic. A "second system" allows for zoom, replay etc Target mapping and feeds to Pilot link for ship handing and berthing. A feed Incl. radar and AIS is available to the Coastguard for their Common Operating Picture.</p> <p>Scripps Oceanography and the Harbor safety committee has information on ocean currents. There are 6 wind bands in the Port with winds swirling from the west. Pilots become worried about variation in conditions. The information is hosted for the rest of the industry and is validated for NOAA.</p> <p>There is a useful weather feed display on the Marine Exchange website depicting information from weather buoys. The website also includes information on the operating roles of vessels with links to other Marine Exchange systems. For example a 6 hour weather prediction model target mapping. There is a restricted login and a charge for various reports.</p> <p>The Marine Exchange location has a video capability with a zoom capability for visibility up to 8 -9 miles.</p>

**Participant** Tamura Fatherree, POLA, Engineering Department

**Date** 10/16/2007

**Comments**

There was brief review of the MapGuide system. It is proposed that there be an interface redevelopment as part of the AutoCAD 6.5 to ver. 2008 upgrade. This would be proposed to be completed by USACD who were LACAD a subcontractor to Moffat and Nicol.

Tamura is to provide a summary of the data inventory as and Excel database.

A library of screen shots was compiled by DE.

Currently the application is only partially functional. Components such as the crane database which was in Excel has been migrated to Access and they are looking at migration to SQL Server.

There are links from the lease index by drawing number and authority number and there is an ability to produce some limited reports.

The database includes a drawing index, permit information, soundings and construction data.

The MapGuide system is accessible to the 3<sup>rd</sup> floor of the POLA Administration Building and others also via the POLA intranet and Port Navigator.

Output systems include HP plotters ... 800PS, 5500 and 1055CM and there is also a large format (A0) Oce TDS600 scanner.

<b>Participant</b>	<b>Dan Rodriguez, Officer - on land drive along experience</b>
Date	10/16/2007
Comments	<p>Knowledge of the port is heavily oriented to past experience. For example that Berth 57 deals with cotton/wool. Information on piling numbers is only visible from the waterside. The watch commander has keys to some stores.</p> <p>Permitting is managed through the LAFD for the wharfs coordinated through the Wharfingers. Information on marine fueled docks with regard to such as diesel and gasoline is related to the various ships. There is a truck staging area – for security there is such as under truck photographic surveys.</p> <p>Incidents can include response to the location of unidentified baggage in a particular area of the cruise terminal. It would be useful to know where are officers and alarms. Information on berths would be useful such as the fact that Berth 55 is the fruit warehouse dock, Berths 46-49 is an ex oil tank site and while there are warning signs there could well be vapors in the pipes and its should be known as a contaminated site.</p> <p>It would be useful to know (easily) the location of such as shallow water areas and life rings. The fire department responds to landside incidents. Information in the port requires good familiarity with location including rail tracks, mile markers. If there is an incident at a terminal e.g. Yao Ming then sentry escort to the incident is required.</p> <p>Actual incident (possible DB) Area 58 , Berth 310 at 240 Whalers Wharf.</p> <p>Explanation of relationship between features in the recreational marina.</p> <p>Gangway, slips, berths and fingers. E.g. Berth 31D, Slip 41.</p> <p>Berths can be e.g. 29 A,B,C,D</p>

<b>Participant</b>	<b>Fernando Campos, POLA, Corporate Department</b>
Date	10/16/2007
Comments	<p>Fernando expressed a major concern over data integrity and accuracy and perceived that a lot of potential data was outdated.</p> <p>Consolidation and de-concatenate would be the best approach.</p> <p>Fernando is involved with a management audit – this performance management audit included looking at GIS and how this may benefit the C&amp;M (Construction &amp; Maintenance) functions.</p> <p>An example of poor data was the recording of pipeline information including dimensions and locations in one field in the database.</p> <p>There is an interest in tracking equipment and its location through its life.</p> <p>Fernando is the Executive Assistant to department Executive Director of Finance. He is tasked with looking at budgets/finance, risk management, performance management, audit, contracts and personnel resources and IT reporting.</p> <p>Fernando believes that in finance the use of the current Dun &amp; Bradstreet systems is 10-15 years behind current requirements.</p> <p>With regard to GIS it was important to have a GIS “chief” a manager to act as a guide for a GIS Senior Analyst. It would be important to have an operations manual for the GIS Manager.</p> <p>This was core technology that should be included in Grant Round 8 for the Integrated Command System (\$26million) to therefore justify a project this fiscal year.</p> <p>GIS was essential for interoperability and geographic awareness. Coordination was required with the Director of Asset Management Jane ...xxxxx.</p> <p>There is a need to build a GIS implementation NOW there is a will to move this along and a catalyst maybe the findings Fernando is working on for reporting in the first or second week of November.</p> <p>There is a requirement to develop a Port wide security plan. Including the ability to select a building, review evacuation options and provide for business continuity. It is essential to consolidate what is currently bits and pieces of information especially critical infrastructure.</p> <p>GIS should not be just for engineering and planning but very much for Homeland Security purposes. Use these resources to capture and maintain information. It is important if engineers can benefit from information but do not depend on them.</p> <p>The best expenditure is to retain a consultant to do it the best way forward is to recognize that implementation is not constrained by \$ but by people.</p> <p>Response planning includes incident management integrated with video surveillance system. Discriminating regulatory enforcement with LAPD. From a Homeland Security perspective with such as limited number of bridges there were only a few places to cover.</p>

Marine Exchange have information about the piers on their website. It should be possible to have GIS in port vehicles, C&M etc on vessels in the port and is essential for situational awareness.

**Participant****Tiburon demo**

Date

10/18/2007

## Comments

Tiburon demonstrated their CAD/RMS system. Tiburon is a CompuDyne company. Their systems have been installed with Long Beach Police since 1996. The demo was actually conducted using Long Beach's live training installation.

They have different levels of software. Their high end product is only suitable for the largest clients. Extreme continuous availability is attained through use of the Stratus VOS operating system (<http://www.stratus.com/products/vos/overview.htm>).

Long Beach has 66 terminals, including Police, Fire, Port, Airport. City of Signal Hill piggybacks on the Long Beach's system for their own uses, which rarely impacts Long Beach.

System has a graphical user interface (GUI) but can also be operated entirely by commands and abbreviations. Calls show up as Dispatched, Officer Initiated, Administrative. Available units can also be displayed.

The system has a direct connection to JRIC (not sure what the significance is).

Addresses are automatically geocoded, with a map automatically popping up when a geocode is questioned by the system.

Mobile units can see calls on a map, with full routing capabilities. Units are AVL/GPS equipped, so show up on the map. Touchscreen enabled. Call details can be retrieved from the map. Other layers can be identified as well. Fresh map data, including orthos, are automatically distributed to mobile units (how? Physical connection? Wireless?). Map shows other incidents in the vicinity. If AVL is enabled on vehicles, this system can be used like Blue Force Tracking, since can ask to see the other units on the map.

e911 calls get reverse-geocoded to the nearest address, displayed with both a radius of likelihood, and a confidence level (color?).

Addresses or other map features cannot be corrected in the field.

Dispatchers can search for hazards within radius of a call and by cal type, and send this information to the mobile unit.

In terms of attributes, there is a way to flag certain data in a way that will not make it part of the public record (hence not disclosable), such as combination codes of locked gates.

An important component of Tiburon's RMS is what to do with data after incident. Depending on the call types, there are various workflows for which data must be captured, including auto-routing to supervisors for inspection and approval. RMS was compared to "CopLink" ([www.coplink.com](http://www.coplink.com)). It has variable reporting from the same source, like reports for insurance, the media, police, etc. Utilizes a Dashboard concept to present information.

**Participant**

**Mike Galvin, Director Real Estate**

**Date**

10/18/2007

**Comments**

Mike has been in the role for 4 months. It appears the Green Card system has not been maintained. Mike proposes to develop an RFP for a lease and admin system that will include a GIS database and will be submitted within a month. This will include data conversion and will address GIS requirements. Including a tap into the engineering system. It is believed that there are currently around 300 leases on port property and around another 300 in the Alameda Corridor and in the former San Pedro branch.

Current systems are manual and antiquated. The current land base is not appropriate. They should parcelize each lease as they derive revenue. Addresses are issued by building and safety.

The proposed RFP is being coordinated by Amy Arnold and Luis Garcia (Manager of Applications in IT)

Traditionally there has been the creation of lots of little systems. The 5 year IT plan is to wipe out these isolations.

Molly Campbell in Finance and Admin tracks expenditure and revenue.

Mike learned a lot from Navigate LA and BOE

There is a need to know where crime is going on and the good and bad person. Especially important to track gross violations of the lease such as environmental dumping.

The lease governs someone's right to the property.

The lease management system will allow integration. Capt McDermott in Real Estate and Capt Mike Christenson in Environmental should be interested parties.

It is perceived there is a need for a GIS division within the Harbor Department.

**Participant**

**Waterside ride along experience**

Date

10/10/2007

Comments

Two officers provided a valuable insight into the complexity of port operations from the "waterside". These included the mix of commercial and recreational vessel movements which highlighted the requirement for the ability to establish location by berth and in the case of recreational marinas by slip and berth.

There is a diversity of responsibility including ship inspection, vessel interception, emergency response, counter terrorism, environmental and hazardous material response.

**Participant**

**Amy Arnold, Real Estate Lease Management, Luis Garcia, POLA IT**

**Date**

11/14/2007

**Comments**

The port serves as both a landlord and an Engineering and Design entity, which operate of different (competing) models – one focuses on operating costs, the other on capital investment.

POLA will soon put out an RFP for a system to replace the old Green Cards system. New lease management to be much more than “just” a lease management system. They expect it give them broad access to data, including map-based or map-accessible data. More of a Facilities Management system! Only interested in a web approach, to cut costs. Especially one built on web services and SOA, so can be flexible, to leverage other systems.

Inclined to use Autodesk technology due to familiarity with Engineering’s systems, and due to impression that ESRI is not advanced in the web-based world. However, RFP will not specify the actual vendor or technology, only the technology approach.

**Participant**                      **David Mathewson, Planning Director**

**Date**                                      11/20/2007

**Comments**

Planning implemented GIS first at port, but largely failed because original implementer (Stan) went for the gold, and tried to implement everything at once. May have been focused too much on the technology and too little on the business needs.

Hopeful of change, but concerned about compatibility, with Planning and Environmental using ESRI, and Engineering using Autodesk. Other concerns – who will maintain data (data becoming “stale” as it did with the Green Cards system), and concern about lack of mandate to share data. Especially so because Planning is largely a consumer of data, not a producer of data at the port.

Interest rarely extend beyond the port.

Want easy access to data, like NavigateLA, so won't have to rely on GIS specialists.

## 6 Appendix 2 - Job Descriptions

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The following job descriptions are meant as guidelines for the type of job descriptions that can be used to recruit GIS personnel at Port Police.

### JOB DESCRIPTION

#### GIS COORDINATOR

#### SUMMARY OF THE POSITION:

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The person filling the position of GIS Coordinator is required to manage the GIS Section of the Los Angeles Port Police and to coordinate with other divisions of the Los Angeles Harbor Department. The GIS Coordinator supervises other GIS staff and consultants, defines requirements for GIS projects and tasks, plans and manages the execution of both GIS project and on-going data and system maintenance, and performs technical tasks that require significant GIS experience. Work is performed under the general supervision of the Chief of Port Police or the Chief's designee, who evaluates work on the basis of results achieved.

#### ESSENTIAL FUNCTIONS:

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- Manages the GIS activities at Port Police;
- Coordinates with other divisions of the Harbor Department, as regards GIS, CADD, GPS, and other spatial database and application matters;
- Manages all other GIS staff and GIS consultants and contractors;
- Creates and tracks budgets for GIS and related technology acquisitions, in terms of hardware, software, networking, data, software development, and consulting;
- Manages all data maintenance activities, importation of data from other sources, exchange of data with other agencies as appropriate, and data management activities;
- Manages data acquisition agreements and contracts;
- Recommends and designs security policies for Port Police spatial data;
- Designs on-going enhancements to Port Police geodatabase, including map layers, table structure, relational database structure;
- Manages users, user roles, and permissions for the GIS and related databases;
- Helps to integrate GIS with other database and software applications;
- Acts as database administrator for the GIS database;
- Manages the use of GPS devices as pertains to use with GIS;
- Participates in technical meetings with Port Police personnel and consultants, to learn about other technical initiatives that may impact, or be impacted by, the GIS;
- Remains up to date on the latest GIS and related technologies through continuing education, attendance at conferences, and review of literature and web sites. Uses this knowledge to inform and educate other technical and non-technical staff at Port Police;
- Remains up to date on the application of GIS and related technologies to the solving of police, port operations, and homeland security activities. Uses this knowledge to inform and educate other staff at Port Police;
- Participates in cross-agency task groups, or any other collaboration efforts, as pertains to GIS and related technologies, and as directed by the Chief of Port Police or the Chief's designee;
- Conducts formal and informal training, and arranges of training if outside skills are required;

## REQUIRED SKILLS AND KNOWLEDGE:

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### Knowledge of:

- Excellent computer skills;
- Thorough knowledge of GIS theory and best practices;
- Thorough knowledge of a wide variety of GIS data, standards, metadata, and exchange mechanisms;
- Thorough knowledge of geodatabase and relational database design and use;
- Good knowledge of the SQL language, preferably at a relational database implementation level (i.e. beyond MS Access's implementation of SQL);
- Good and current knowledge of ESRI GIS technology, particularly desktop and server based versions;
- Good understanding of GPS, orthophotography, relational databases, metadata, and other technologies related to GIS;
- Good understanding of software design and custom implementation;

### Ability to:

- Communicate very well by both spoken and written means;
- Communicate complex technical details to a variety of Port Police staff, from dispatchers and field officers to IT staff and Port Police management;
- Act technically, but behave diplomatically and professionally;
- Work effectively under pressure, handle multiple simultaneous projects;
- Work quickly, able to reprioritize to meet current needs and available time and resources;
- Write clear reports, designs, diagrams, workflows;
- Take initiative – this position is a position for a strong technical leader;
- Relate well to police and counter terrorism work;
- Rapidly assimilate new technological advances and the make use of them in a judicious way to advance the aims of Port Police;
- Train and educate;

## ACCEPTABLE EXPERIENCE AND TRAINING:

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Bachelor's degree in geographic information systems, geography, planning, landscape architecture, civil engineering, computer science; and five years of experience working with geographic information systems; and one year of supervisory experience. Other combinations of experience and education that meet the minimum requirements may be substituted.

## JOB DESCRIPTION

### GIS ANALYST

#### SUMMARY OF THE POSITION:

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The person filling the position of GIS Analyst is required to work under the GIS Coordinator in the GIS Section of the Los Angeles Port Police and to work well with all members of the Port Police. The GIS Analyst executes GIS projects and on-going data and system maintenance, as well as produces maps and reports, and manipulates data.

#### ESSENTIAL FUNCTIONS:

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- Manipulates GIS and related data using variety of software;
- Creates new data from existing data through the use of geoprocessing techniques;
- Analyzes a wide variety of geographic data using GIS models and tools;
- Produces maps and reports;
- Provides hands-on training to a wide variety of Port Police personnel;
- Collects data in the field;
- Uses ESRI GIS desktop software;

#### REQUIRED SKILLS AND KNOWLEDGE:

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Knowledge of:

- Excellent computer skills;
- Excellent communication skills;
- Ability to easily take direction from others;
- Initiative for improved methodologies and efficiencies;
- Thorough knowledge of GIS theory and best practices;
- Good knowledge of a wide variety of GIS data, standards, metadata, and exchange mechanisms;
- Knowledge of geodatabase and relational database design and use;
- Good and current knowledge of ESRI GIS technology, particularly desktop and server based versions;

Ability to:

- Pay high level of attention to detail and accuracy;
- Relate well to police and counter terrorism work;
- Rapidly assimilate new technological advances and the make use of them in a judicious way to advance the aims of Port Police;
- Train and educate;

#### ACCEPTABLE EXPERIENCE AND TRAINING:

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Bachelor's degree in geographic information systems, geography, planning, landscape architecture, civil engineering, computer science; and two years of experience working with geographic information systems. Other combinations of experience and education that meet the minimum requirements may be substituted.