

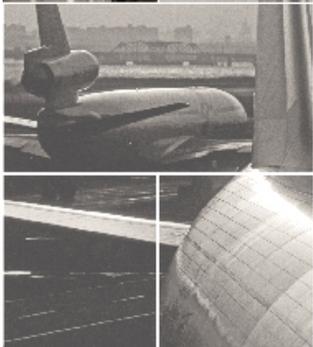


# Geospatial and Information Management

FAA/NASA/Industry  
Airport Planning Workshop  
September 12-13, 2000

PSOMAS Aviation

# Agenda



▶ **What is Geographic Information Systems (GIS)**

▶ **Data**

▶ **Applications**

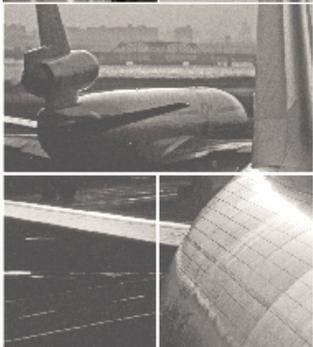
▶ **Case Studies**

▶ **Questions**

## Aviation

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# What is Geographic Information System (GIS)



- ▶ 35,000 years ago Cro-Magnon paintings used GIS principles by noting migration routes (information) with an image



Cro-Magnon Cave Painting

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# What is Geographic Information System (GIS)

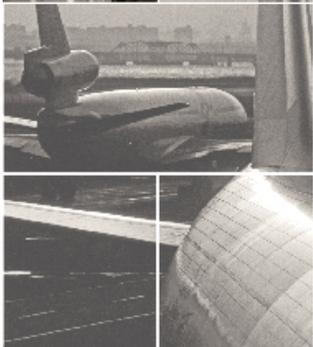
► 1854 John Snow use principles of GIS to track source of Cholera outbreak to a contaminated water pump in London



John Snow (1854 Cholera)



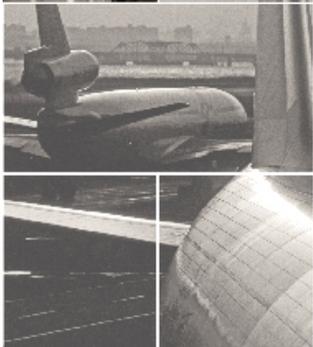
PSOMAS



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# What is Geographic Information System (GIS)

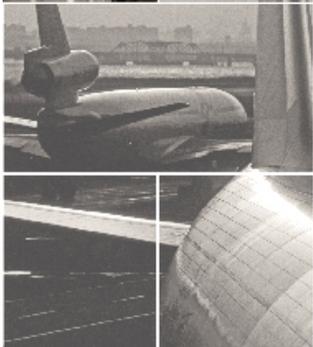


- ▶ Nuclear weapons research spurred computer hardware development and led to general purpose computer mapping by the 1960s

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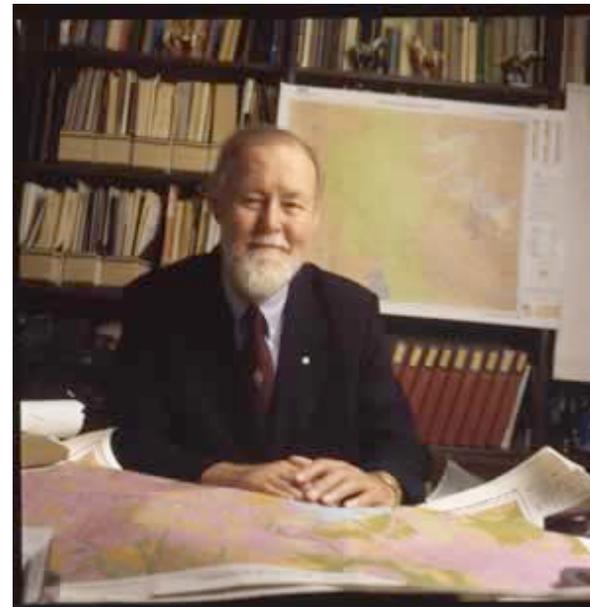
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# What is Geographic Information System (GIS)



## ▶ 1964 Roger Tomlinson developed the first GIS in Ottawa, Ontario

- ♣ Canadian Geographic Information Systems (CGIS)
- ♣ System used to store, analyze, and manipulate data collected for the Canada Land Inventory (CLI)
  - ▶ soils, agriculture, recreation, wildlife, waterfowl, forestry land use
  - ▶ scale of 1:250,000



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# What is Geographic Information System (GIS)



- ▶ Visual method of displaying data that resides within a common space
- ▶ Approximately 80% of all data has a spatial component
- ▶ It is easier to analyze visual data compared to tabular data

**“A picture speaks a thousand words!”**

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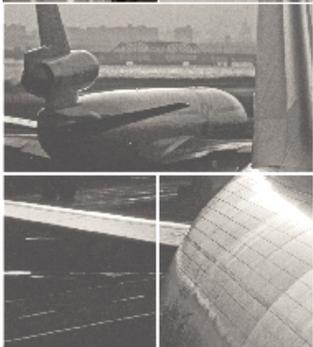
# What is Geographic Information System (GIS)



**A combination of table and spatial data that are merged together to form information which can be analyzed and/or visualized for a better understanding of a defined condition**

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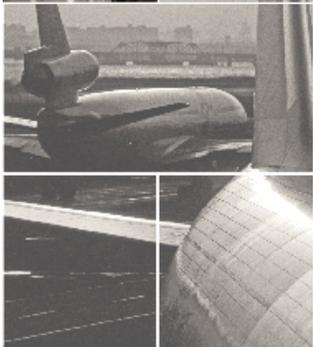
# Data

## Data Types & Database Models

### Aviation

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# Data



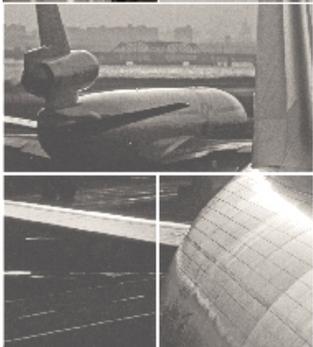
## ► Tabular Data

- ♣ Tables
- ♣ Rows
- ♣ Columns
- ♣ Fields

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# Data



## ► Spatial Data

- ♣ Line
- ♣ Point
- ♣ Polygon

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# Tabular Data

## Parcels

OBJECTID	SITUS_ST	SIT	SITUS_STREET_NAM	SITUS_ST	SITUS_CI	SITUS_	APH
938789	1433	E	WESTCHESTER	DR	CHANDLE	85249	303-79-179
938790	1413	E	WESTCHESTER	DR	CHANDLE	85249	303-79-181
938791	1423	E	WESTCHESTER	DR	CHANDLE	85249	303-79-180
938792	6790	S	CORAL GABLE	DR	CHANDLE	85249	303-73-411
938793	6716	S	TAMARRON	WY	CHANDLE	85249	303-79-197
938794	1802	E	PEACH TREE	DR	CHANDLE	85249	303-73-468
938795	6743	S	JESSE	CT	CHANDLE	85249	303-79-379
938796	6742	S	JESSE	CT	CHANDLE	85249	303-79-376
938797	1863	E	PEACH TREE	DR	CHANDLE	85249	303-73-454
938798	6741	S	SPRINGS	CT	CHANDLE	85249	303-79-375
938799	1792	E	PEACH TREE	DR	CHANDLE	85249	303-73-467
938800	6701	S	CHAMPIONSHIP	DR	CHANDLE	85249	303-73-074
938801	1950	E	KERBY FARMS	RD	CHANDLE	85249	303-73-485
938802	1782	E	PEACH TREE	DR	CHANDLE	85249	303-73-466
938803	6703	S	TOURNAMENT	LN	CHANDLE	85249	303-73-113
938804	1231	E	WESTCHESTER	DR	CHANDLE	85249	303-79-384
938805	1813	E	PEACH TREE	DR	CHANDLE	85249	303-73-459
938806	6821	S	OAKMONT	DR	CHANDLE	85249	303-73-448
938807	6822	S	LAKE FOREST	DR	CHANDLE	85249	303-73-450
938808	6800	S	CORAL GABLE	DR	CHANDLE	85249	303-73-410
938809	6712	S	PEBBLE BEACH	DR	CHANDLE	85249	303-73-028
938810	1762	E	PEACH TREE	DR	CHANDLE	85249	303-73-464

## Rail Line

STARTDATE	COMPDATE	SHAPE*	SHAPE_Length
7/1/2005	11/1/2005	Polyline	1913.12612654322
4/1/2005	8/1/2005	Polyline	30077.3146805268
11/1/2005	5/1/2006	Polyline	4137.19842704965
3/1/2006	11/1/2006	Polyline	3965.90473271362
2/1/2006	8/1/2006	Polyline	3451.24524052218
8/1/2005	2/1/2006	Polyline	5534.94565146589
2/1/2006	8/1/2006	Polyline	7931.7577179175
5/1/2006	9/1/2006	Polyline	2642.04187959807
12/1/2005	3/1/2006	Polyline	561.424709833833
12/1/2005	3/1/2006	Polyline	2632.89200525491
4/1/2005	10/1/2005	Polyline	4582.01240869511
4/1/2005	10/1/2005	Polyline	3790.73975121703
4/1/2005	10/1/2005	Polyline	2627.02151459333
4/1/2005	10/1/2005	Polyline	2779.84716332247
11/1/2005	4/1/2006	Polyline	12072.8171273426
1/1/2006	6/1/2006	Polyline	11995.3614836946
11/1/2005	3/1/2006	Polyline	10702.5246082904
8/1/2005	12/1/2005	Polyline	4025.73846414345
7/1/2005	11/1/2005	Polyline	4199.84459288547
12:00:00 AM	12:00:00 AM	Polyline	23703.2210692641
4/1/2005	8/1/2005	Polyline	4574.88289126417

## Rail Stops

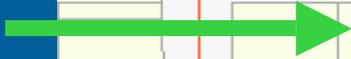
TYPE	OBJECTID*	SHAPE*	LOCATION
Council Approved Station Location	132	Point	Montebello Ave/19th Ave
Council Approved Station Location	133	Point	19th Ave/Camelback Rd
Council Approved Station Location	134	Point	7th Ave/Camelback Rd
Council Approved Station Location	135	Point	Central Ave/Camelback Rd
Council Approved Station Location	136	Point	Campbell Ave/Central Ave
Council Approved Station Location	137	Point	Indian School Rd/Central Ave
Council Approved Station Location	138	Point	Osborn Rd/Central Ave
Council Approved Station Location	139	Point	Thomas Rd/Central Ave
Council Approved Station Location	140	Point	Encanto Blvd/Central Ave
Council Approved Station Location	141	Point	McDowell Rd/Central Ave
Council Approved Station Location	142	Point	Roosevelt St/Central Ave
Council Approved Station Location	143	Point	Van Buren St/Central Ave/1st Ave
Council Approved Station Location	144	Point	Washington St/Central Ave/Jefferson St/1st Ave
Council Approved Station Location	145	Point	Washington St/Central Ave/Jefferson St/1st Ave
Council Approved Station Location	146	Point	3rd St/Washington St/Jefferson St
Council Approved Station Location	147	Point	3rd St/Washington St/Jefferson St
Council Approved Station Location	148	Point	12th St/Washington St/Jefferson St
Council Approved Station Location	149	Point	24th St/Washington St/Jefferson St
Council Approved Station Location	150	Point	36th St/Washington St(GWCC)
Council Approved Station Location	151	Point	44th St/Washington St/Airport
Council Approved Station Location	152	Point	12th St/Washington St/Jefferson St

# Spatial Data

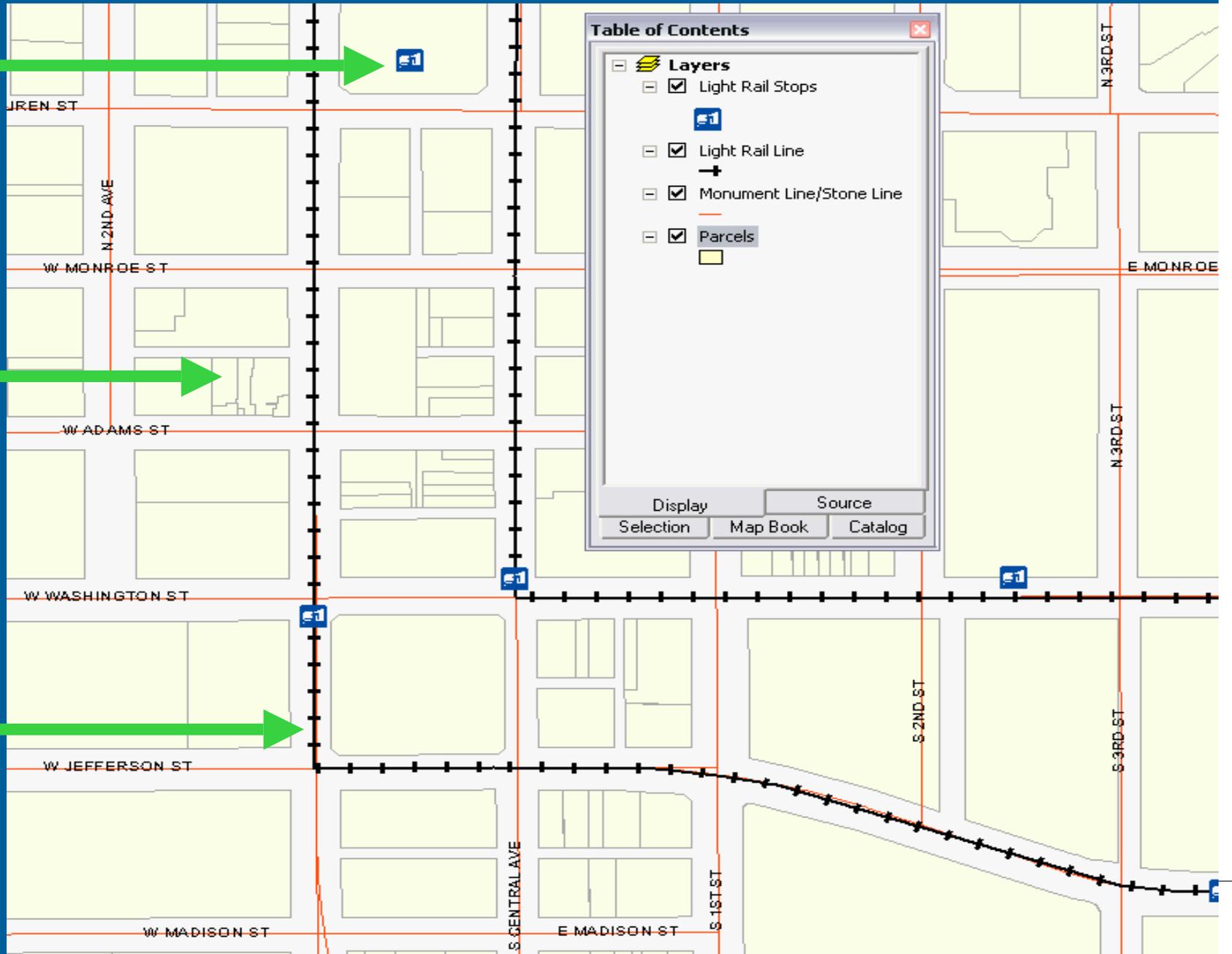
Rail Stop



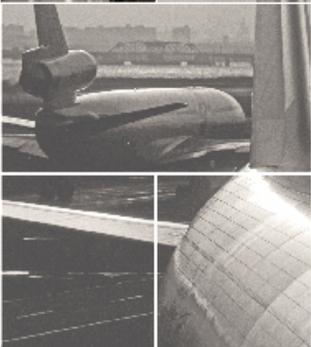
Parcel



Rail Line



# Data



## ▶ Database models

### ♣ Flat model

- ▶ a single, two-dimensional array of data elements

### ♣ Hierarchical model

- ▶ data is organized into a tree-like structure

### ♣ Network model

- ▶ organizes data using two fundamental constructs, called records and sets

### ♣ Relational model

- ▶ contains multiple tables, keys are used to match up rows of data in different tables

### ♣ Dimensional model

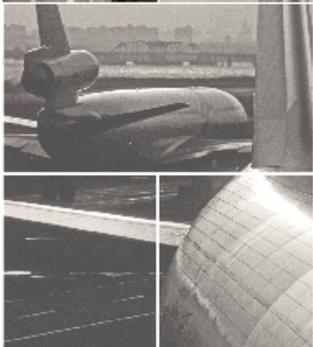
- ▶ database consists of a single large table of facts that are described using dimensions and measures

### ♣ Object database models

- ▶ attempt to bring the database world and the application programming world closer together, ensuring that the database uses the same “type” system as the application program

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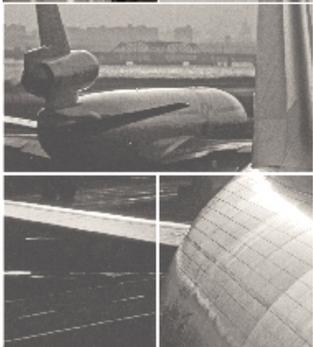
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# Applications

## Presentation Screens & System Architecture

# Applications



## ▶ Desktop

- ♣ Stand-alone application
- ♣ Personal database

## ▶ Enterprise

- ♣ Shared application
- ♣ Shared database

## ▶ Internet / Intranet / Extranet

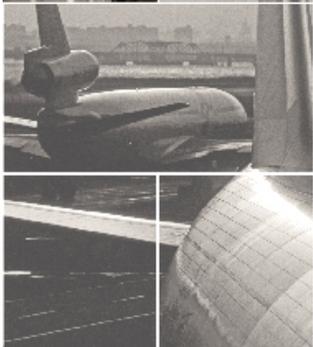
- ♣ Web-based application
- ♣ Assigned database access

## ▶ Mobile

- ♣ Various modes of application access
- ♣ Various modes of database access

### Aviation

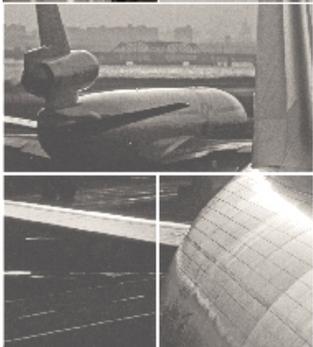
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# Case Studies

## Part 150 Implementation Projects

# Case Studies



## ▶ Part 150 Studies

- ♣ Identify properties that fall within the defined Part 150 Study Area defined as eligible for program participation
- ♣ Capture activities related to the program workflow
- ♣ Provide information relative to FAA Grant reporting
- ♣ Program Management Reports
- ♣ Visual display and analysis

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# Case Studies

City of Inglewood RSIP - Microsoft Internet Explorer

Address: http://216.100.5.136/rsip/viewer.htm

Links: American Express, Blue Cross, BofA Online, E\_TRADE, eBay, Fidelity 401(k), Frazier Mountain, Psonas, SCCCU, Southwest Airlines, Yahoo

Restart MAP Help Contact Us About Disclaimer

## Residential Sound Insulation Program

City of Inglewood

Parcel ID	Address	Resid Ty
<input checked="" type="checkbox"/> <a href="#">4018025046</a>	708 W COVELLE AVE	SINGL FAMIL
<input checked="" type="checkbox"/> <a href="#">4020015021</a>	416 S EUCALYPTUS AVE	SINGL FAMIL
<input checked="" type="checkbox"/> <a href="#">4021030012</a>	717 E LA BREA DR	SINGL FAMIL
<input checked="" type="checkbox"/> <a href="#">4022001014</a>	625 W ELM AVE	SINGL FAMIL
<input checked="" type="checkbox"/> <a href="#">4022001027</a>	649 W ELM AVE	SINGL FAMIL
<input checked="" type="checkbox"/> <a href="#">4022003011</a>	635 W MAGNOLIA AVE	SINGL FAMIL
<input checked="" type="checkbox"/> <a href="#">4022003021</a>	604 W SPRUCE AVE	SINGL FAMIL
<input checked="" type="checkbox"/> <a href="#">4022006009</a>	508 W BUCKTHORN ST	SINGL FAMIL
<input checked="" type="checkbox"/> <a href="#">4022006010</a>	504 W BUCKTHORN ST	SINGL FAMIL
	520 W	

**Locate Properties**  
 Address  
 Owner  
 Parcel Number  
 Phase/Group  
 Cross Street

**Maps**  
 Select Map  
 Show Layers  
 Save Map  
 Print Map

**Tools**  
 Select Features  
 Create Radius  
 Save Data  
 Measure

**Search/Query**  
 Predefined  
 User Defined  
 Active Layers

**Map Navigation**

Current Map: Progress Status

0 FEET 3338

Internet

start | Inbox - Microsoft ... | C:\Public\ax | Microsoft PowerP... | City of Inglewood... | 8:09 PM

# Case Studies

http://cncr-phx.com - Map - Microsoft Internet Explorer

Help Desk | Online User Guide

Community Noise Reduction Program

Legend Layers Search Results Details Draw Extract

Layer Selection

- Parcels  
Label: No Label
- Property Display:
  - Outline Only
  - Property Type
  - Parcel Status
  - Phase
- Neighborhoods
- Quarter Section
- Streets
- Wells
- DNL 1999
- DNL 1992
- Orthophoto (2005)
- Orthophoto (2001)
- Sketches
- Selection

Overview Map

X: 656,669 Y: 886,259

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Done Internet

# Case Studies

http://cnrp-phx.com - Map - Microsoft Internet Explorer

Help Desk | Online User Guide

Community Noise Reduction Program

Legend Layers Search Results Details Draw Extract

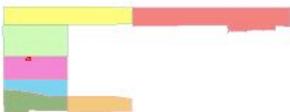
### Parcel Details

AV Number [01040136](#)  
APN [11543055](#)  
Address 1106 E YAVAPAI ST  
PHOENIX, AZ 85034  
Owners Jorge Garcia Castillo  
DNL 1992: 65  
1999: 65  
Property Type SINGLE FAMILY  
Zoning Type R-3  
Status Type Vacated Property  
Hist. Sig. False  
Arch. Sig.  
Photos [Click Here](#)

### Other Layers

Neighborhood Cuatro Milpas

### Overview Map

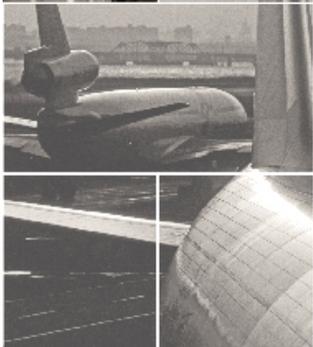


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X: 656,744 Y: 886,255

Done

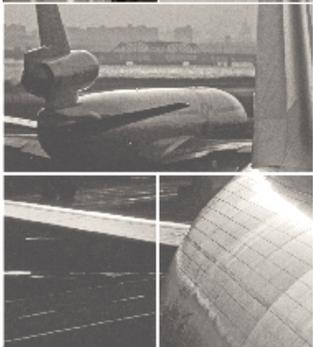
Internet



# Case Studies

## Site Selection

# Case Studies



## ► Site Selection Study

- ♣ Determining the effect of aeronautical requirements on the existing and planned environment
- ♣ Catalogues and overlays planning documents on the proposed airport impact area to quantify future impacts
- ♣ Utilizes GIS to map and analyze environmental issues, i.e., surface water movement

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# Case Studies

Preliminary Draft Deliberative – For Discussion Purposes Only

San Diego County Regional Airport Authority



**LEGEND**

- SDIA-6 Property Line (2642 Acres)
- Major Highway

**Airport Type**

- Terminal
- Airport Related
- Cargo
- Support
- Ground Access
- RWY
- RPZ

north

2,000 0 2,000  
 Feet



Prepared by: PSOMAS

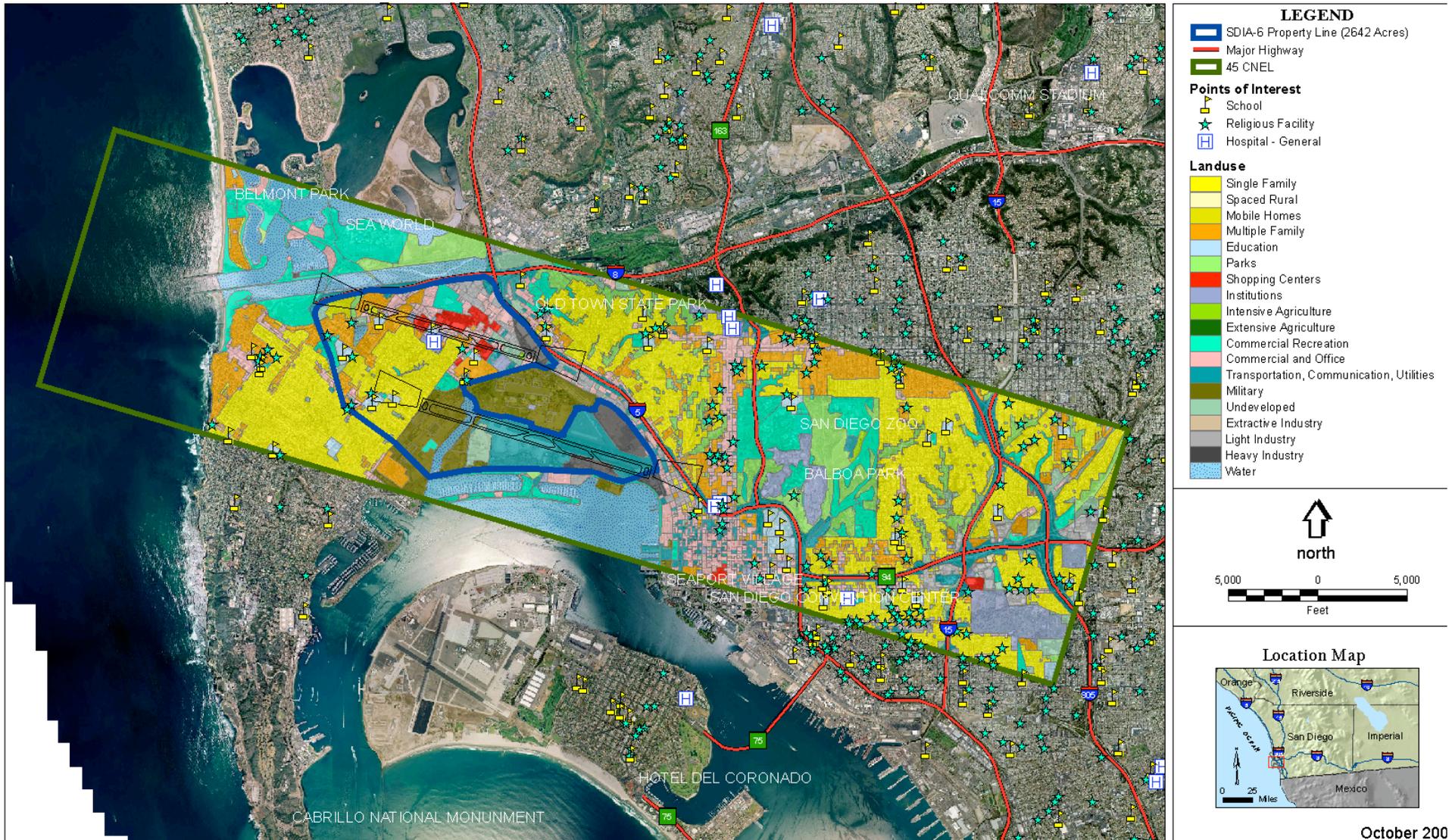
October 200

Exhibit

# Case Studies

Preliminary Draft Deliberative – For Discussion Purposes Only

San Diego County Regional Airport Authority



Prepared by: PSOMAS

October 200

Exhibit

# Case Studies

Draft

San Diego County Regional Airport Authority



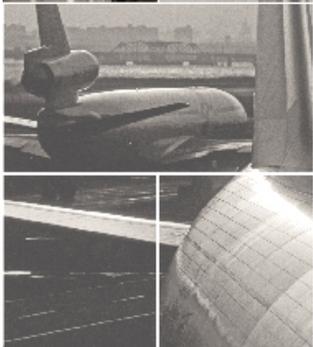
Exhibit 4.10.2-6

## NAS North Island/SDIA Proposed Drainage



Airport Site Selection Program

Draft Alternative Analysis - Military Sites  
March 24, 2006



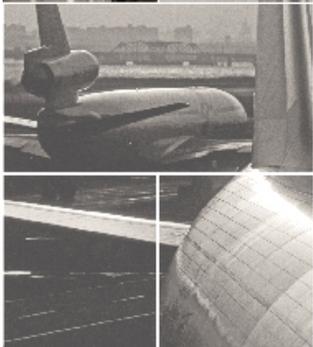
# Case Studies

## Lease Management

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# Case Studies



## ▶ Lease Management

- ♣ Utilizing mobile technology to capture lease space configurations
- ♣ Integrating GIS/Lease Management Systems/Document Management Systems for enterprise solution
- ♣ Utilizing dynamic linking to integrate real time engineering drawing specifications to maintain accurate accountability for financial reporting

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# Case Studies

**Palm Beach International Airport**  
GATEWAY TO  
*the Best of Everything!*

**Legend**   Layers   Search   Results   Details   Draw

**Leases**

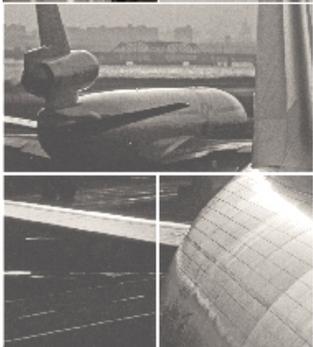
- Level 1
- Level 2
- Level 3
- PBIA Boundary
- PBAIR09
- PBAIR08
- PBAIR07

**Overview Map**

The main map area displays an aerial view of the airport terminal and tarmac. Several colored polygons are overlaid on the terminal building, representing lease areas. A blue outline indicates the PBIA Boundary. The tarmac below shows several aircraft parked at gates.

# Case Studies





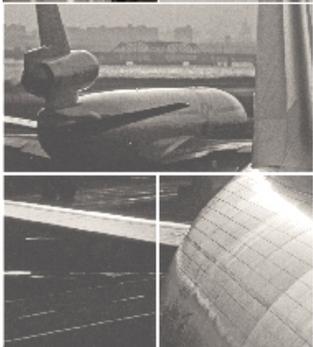
# Future Considerations

## Geospatial Technology

### Aviation

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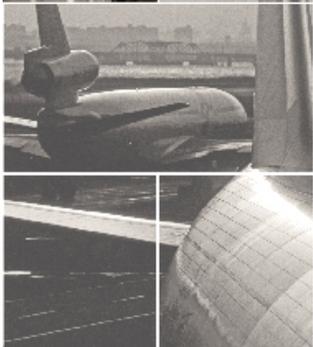
# Future Considerations



- ▶ **Systems Integration**
- ▶ **Wireless Technologies**
- ▶ **GPS**
- ▶ **3-D Imaging and Applications**
- ▶ **Critical Infrastructure Protection**

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# Questions ?

**Gabriel Bey, Project Manager**

[gbey@psomas.com](mailto:gbey@psomas.com)

**602-222-8260**



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