



# **Oracle Platform GIS & Location-Based Services**

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Solution Architect  
Ohio Valley**

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# Overview

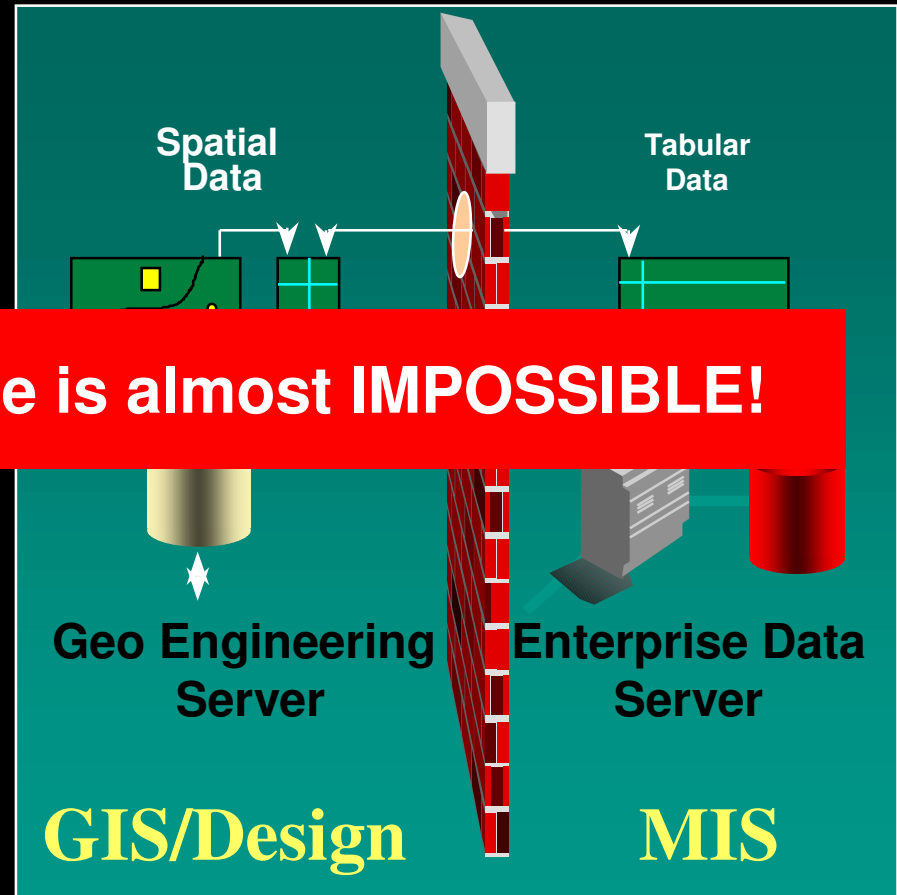
- Geospatial Technology Trends
- Oracle's Spatial Technologies
  - Oracle10g
    - Locator
    - Spatial
  - Oracle Application Server 10g
    - MapViewer
    - Location Based Services
- SDO Partner Support
- Q&A

# Challenge of Incorporating Location Based Information

- Specialty GIS/RS servers
  - Data isolation
  - High systems admin

**Real Business Intelligence is almost IMPOSSIBLE!**

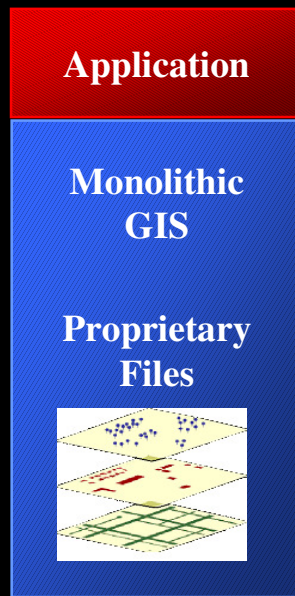
- High training costs
  - Complex support problems
- Information not aligned with Business Processes



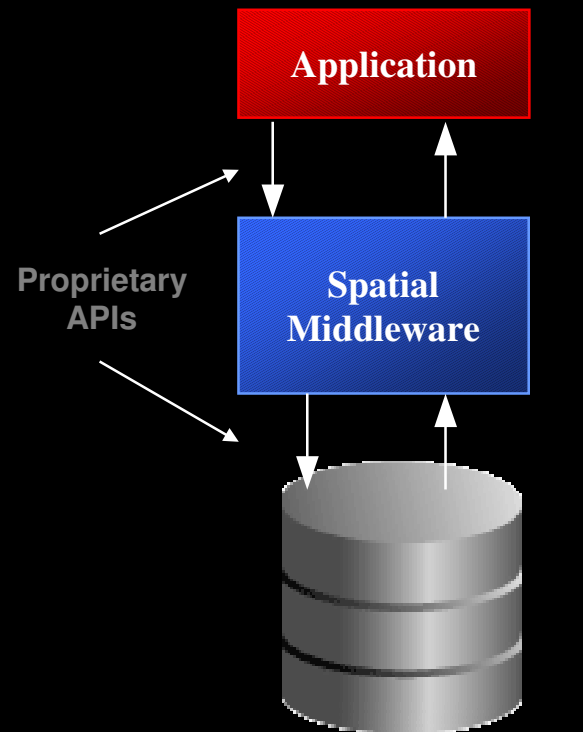
# Spatial Technology Evolution

Past

Today

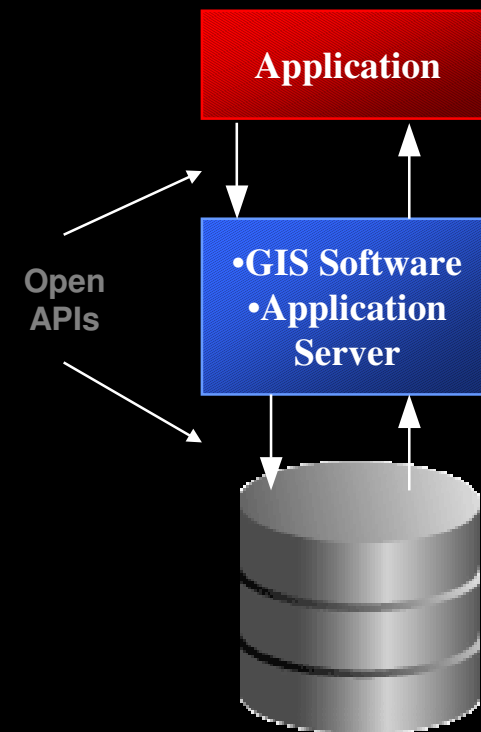


**Standalone**



Traditional Database

**Proprietary  
Middleware**

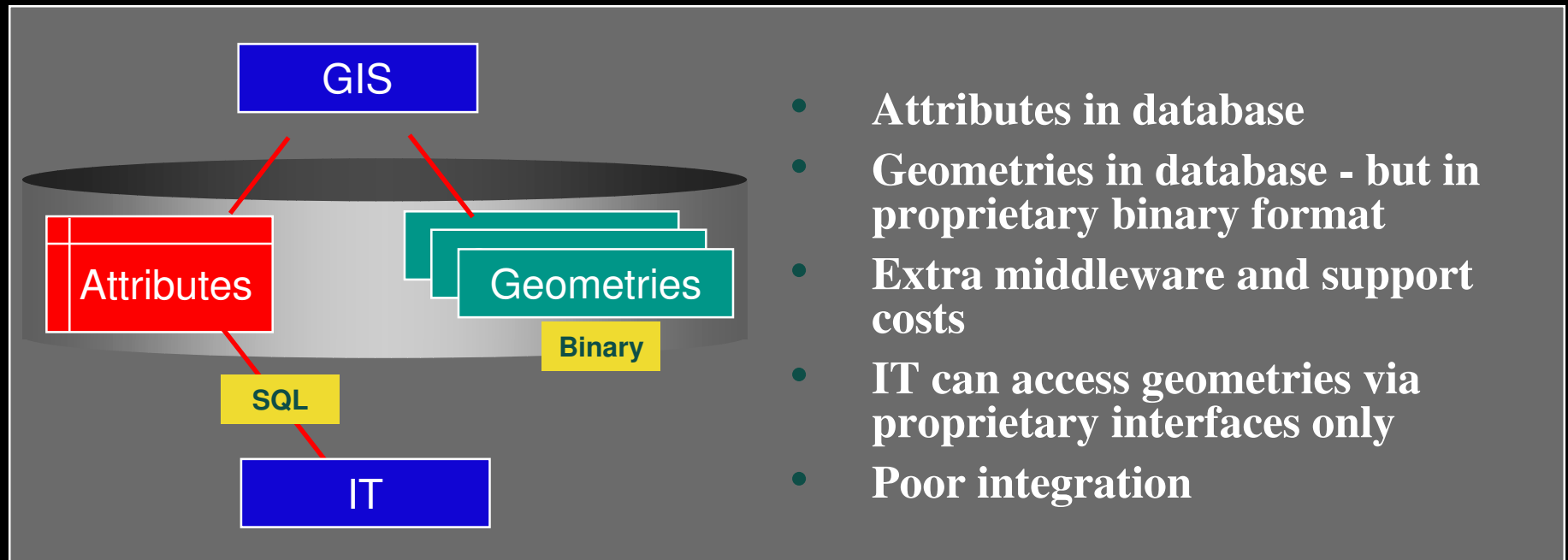


Spatially Enabled Enterprise

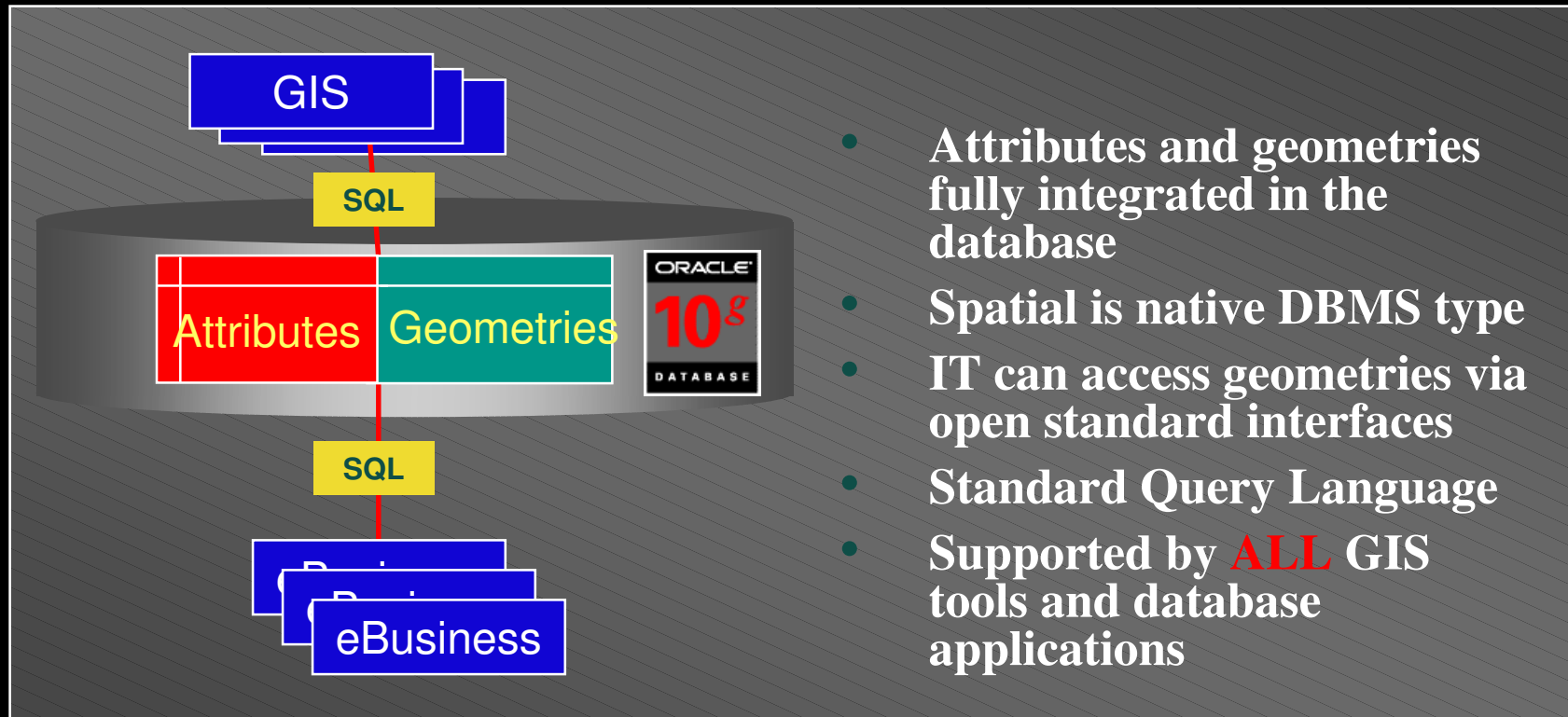
**Internet  
Platform**

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# Early Spatial (Hybrid) Systems

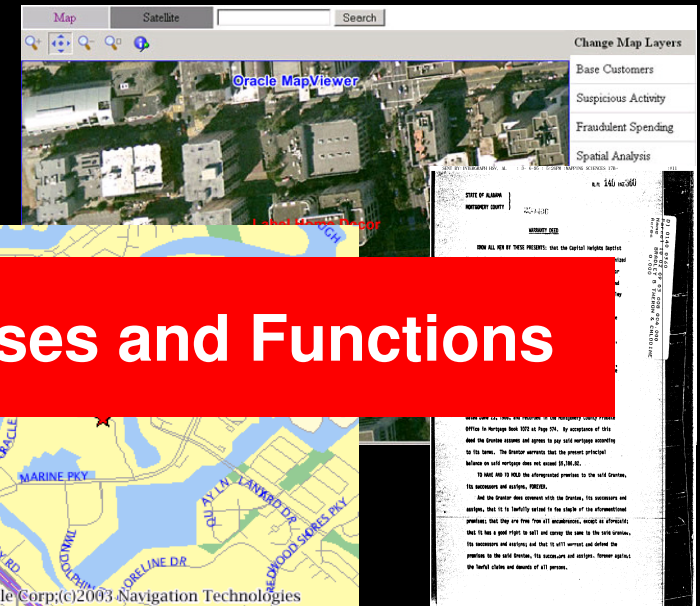


# Today's Open Spatial Databases



# Integrating All Information

- Relate associated information to spatial locations
  - Land records and topologies
  - Road Networks

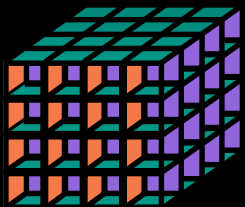


## Support Unified Business Processes and Functions

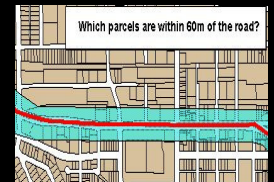
- Integrate satellite imagery
  - Image map data
  - Legal Documents
- Integrate the business rules and processes
- **Location analysis without a GIS!!!**

# Value Propositions:

- Integrated enterprise data management for LARGE datasets and VLDBs
- Consolidated management of spatial operations
- Greater security and interoperability
- **Enhanced decision support and business intelligence**
- Reduced training requirements
- Spatially enabled applications



***Spatial is a differentiator***



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# Location-based, GIS data in the Oracle Database

# Relational and GIS Data in a Hybrid setup

## NO Data Integration

“Show me sales analysis on homes sold by John Doe within five zip codes where the zip codes are less than five miles from the office and...”

*Road*

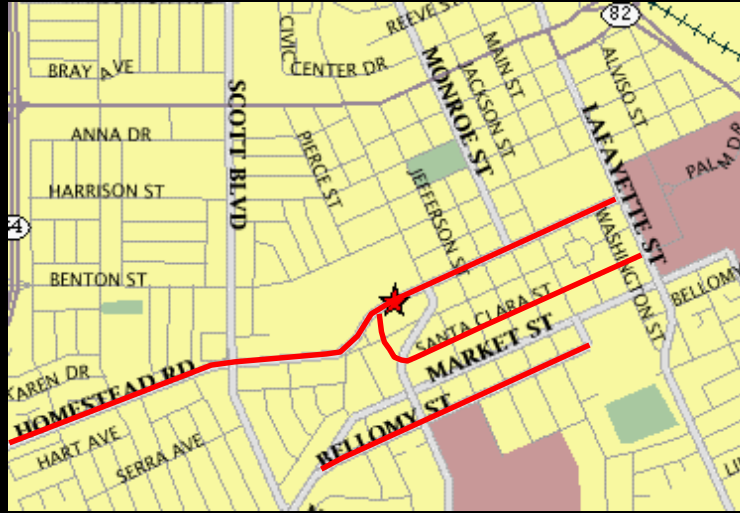
ROAD_ID	NAME	SURFACE	LANES
1	Homestead	Asphalt	4
2	Bellomy	Asphalt	2
3	Santa Clara	Asphalt	2

*GIS*



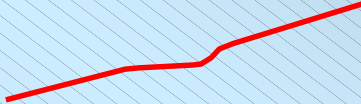
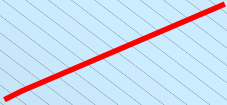
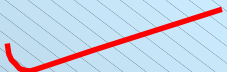
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# Spatial Data in Oracle Tables



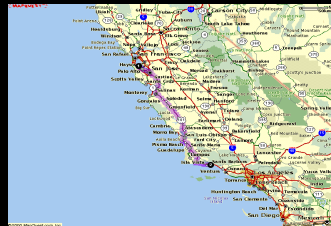
*Road*

Data type:  
**SDO\_GEOMETRY**  
**SDO\_GEORASTER**

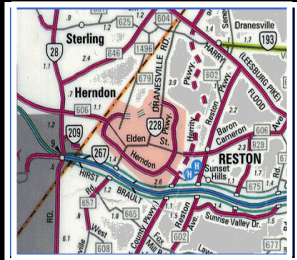
ROAD_ID	NAME	SURFACE	LANES	LOCATION
1	Homestead	Asphalt	4	
2	Bellomy	Asphalt	2	
3	Santa Clara	Asphalt	2	

# What is a Spatial Database?

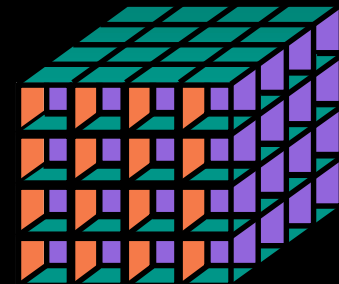
## Spatial Analysis



## Spatial Data Types



## Spatial Indexing



All Location/Spatial Data  
Stored in the Database

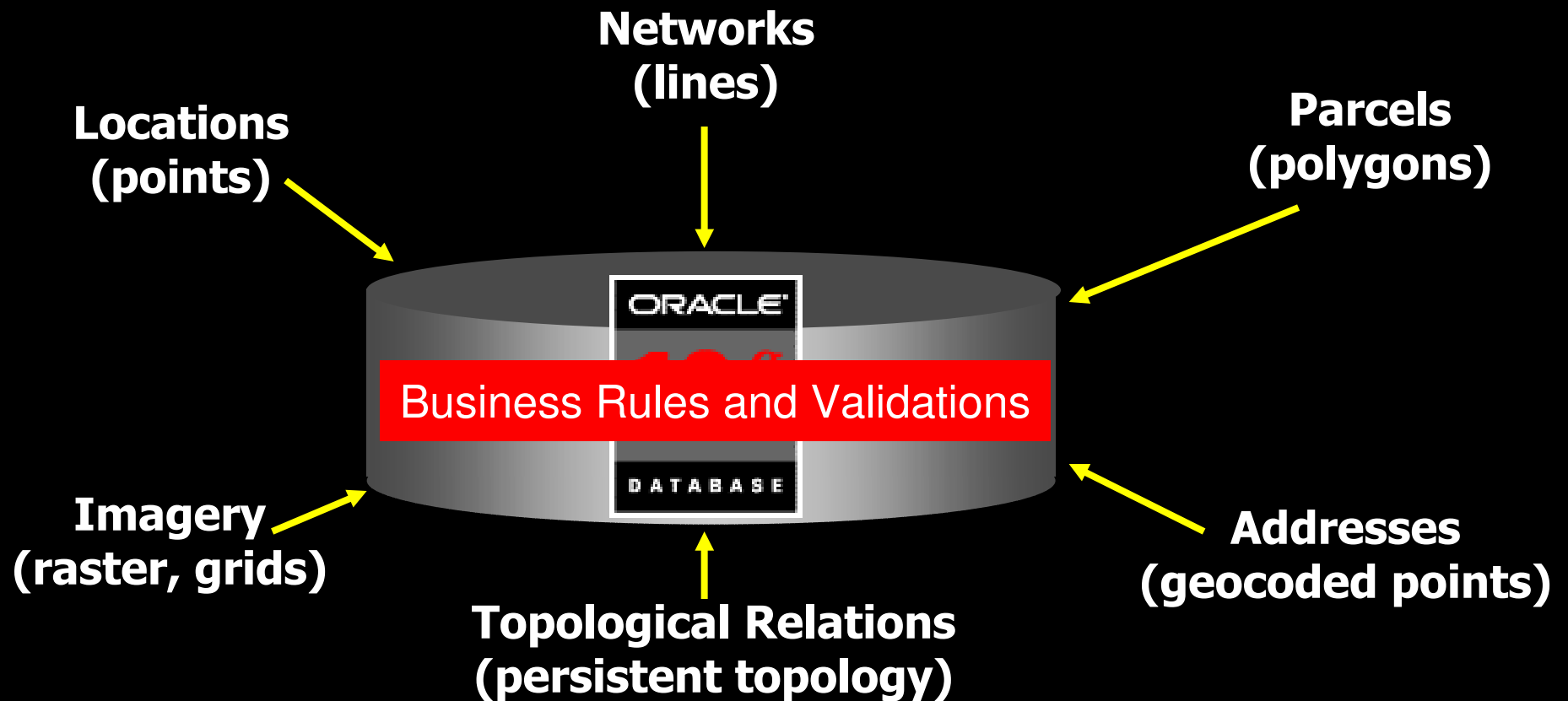


Fast Access to  
Spatial Data

## Spatial Access Through SQL

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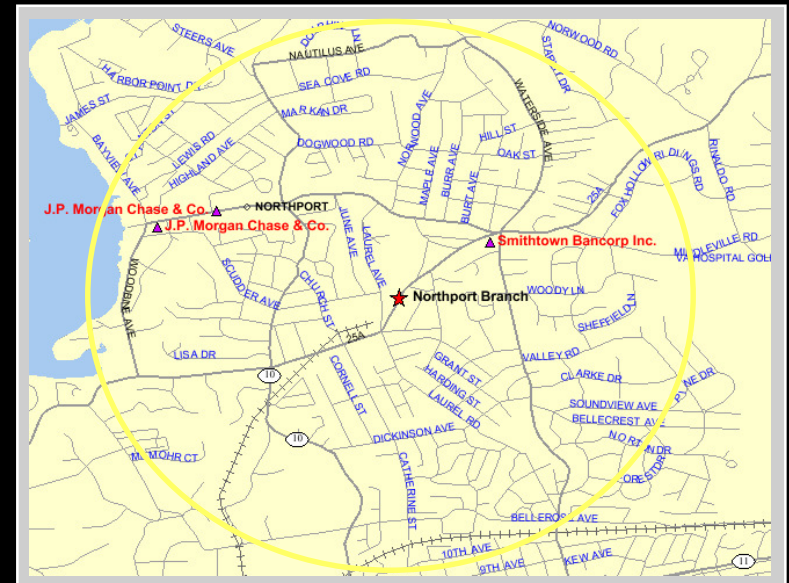
# All Spatial Types in Oracle 10g



# Spatial Query Via SQL

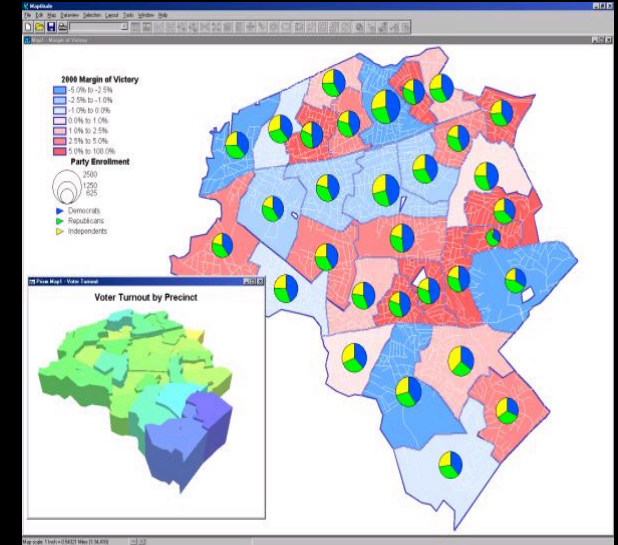
**Find all competitor's branches within 2 miles of the Northport branch...**

```
SELECT c.name, c.location
FROM organizations c,
     bank b
WHERE b.site_id = 1604
     AND SDO_WITHIN_DISTANCE(c.location,
                              b.location,
                              'distance=2 unit=mile') = 'TRUE'
```



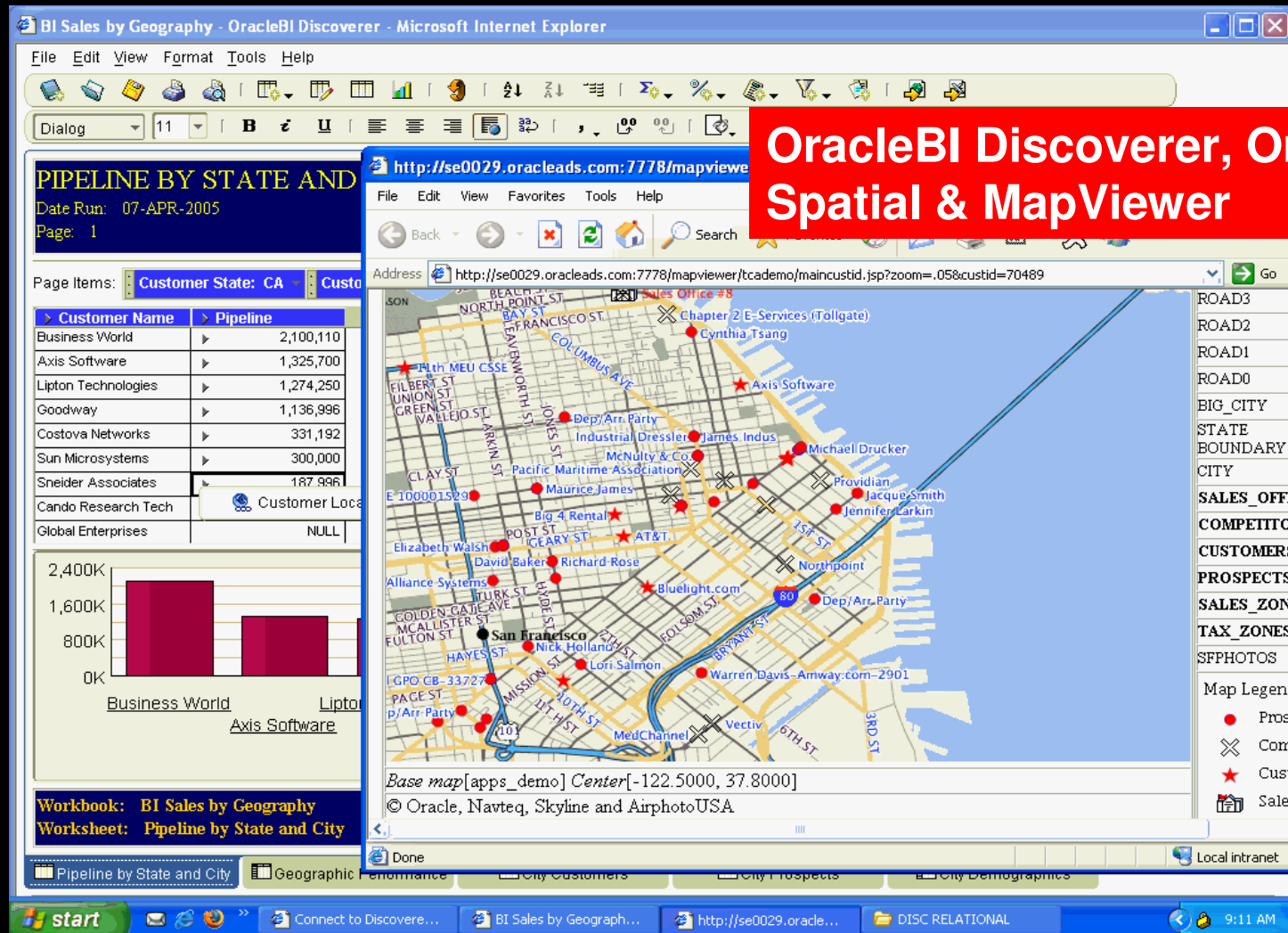
# Spatial Analytic Functions

- **Discovery based on Spatial Patterns**
  - Explicitly materialize spatial relationships
- **Usage**
  - Insurance risk analysis, crime analysis
  - Demographic analysis, customer profiling
  - Epidemiology, Facility placement
  - Insurance Risk analysis:
    - cluster house-holds based on high risk neighborhoods
  - Identify business prospects across a region:
    - examine the average incomes across different regions of the space





# Immediate Business Benefit: Integrate Any Business Intelligence Platform



OracleBI Discoverer, Oracle  
Spatial & MapViewer

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# Utilize Oracle Features and Functionality to enhance GIS Apps.

- Oracle Advanced Security Option
- Oracle Label Security
- Oracle Workspace Manager
- Oracle Data Guard
- Oracle Partitioning
- Oracle Real Application Clusters
- Oracle Advanced Replication
- Oracle Platform openness and extensibility...

# Technical Benefits

**“If you know how to use relational databases, you know how to manage spatial data with Oracle Spatial.”**

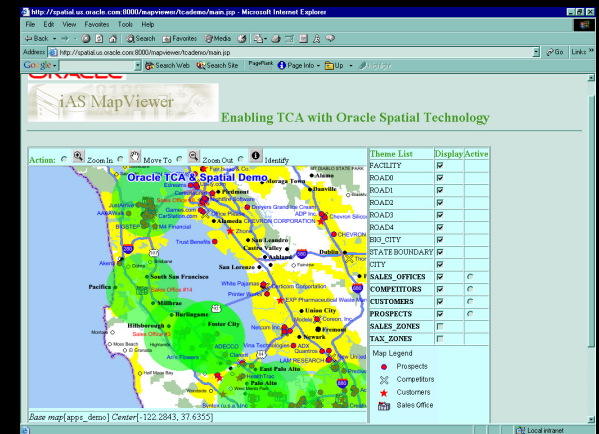
***High level of  
integration with GIS  
software***

- Same access methods (SQL, XML, and JAVA / CORBA)
  - Select, insert, update, delete
- Same features available
  - Replication, distributed, security, parallel, ...
- Same utilities
  - Load, import, export, backup, OEM, ...
- SAME DATABASE
  - Single database for spatial and non-spatial data

# **Deploying Location-based, GIS data using the OracleAS 10g**

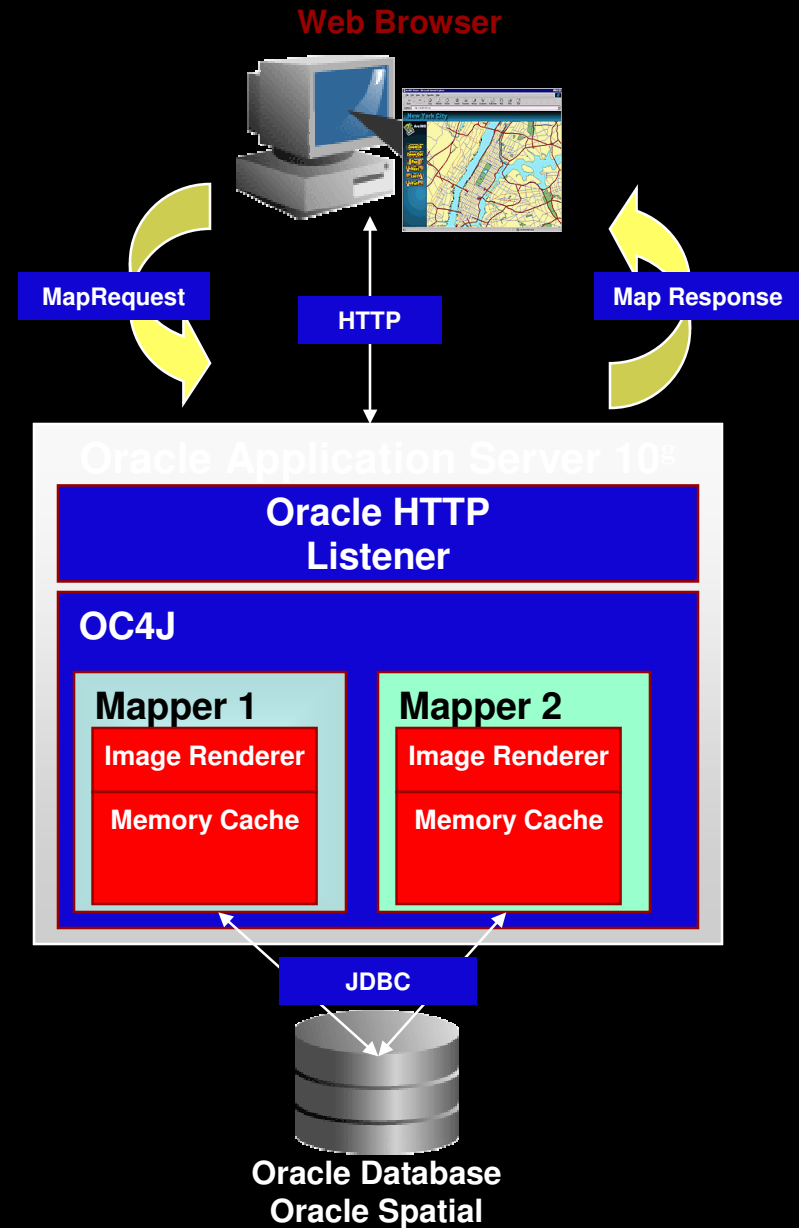
# Oracle Application Server 10<sup>g</sup> MapViewer

- No cost feature of the Oracle Application Server
- Supports vector and raster data
- Easily publishes spatial data to the web
- Centralized managed symbology, annotation and map definition rules
- Provides an XML API, Java API, JSP Tag library and OGC WMS interface



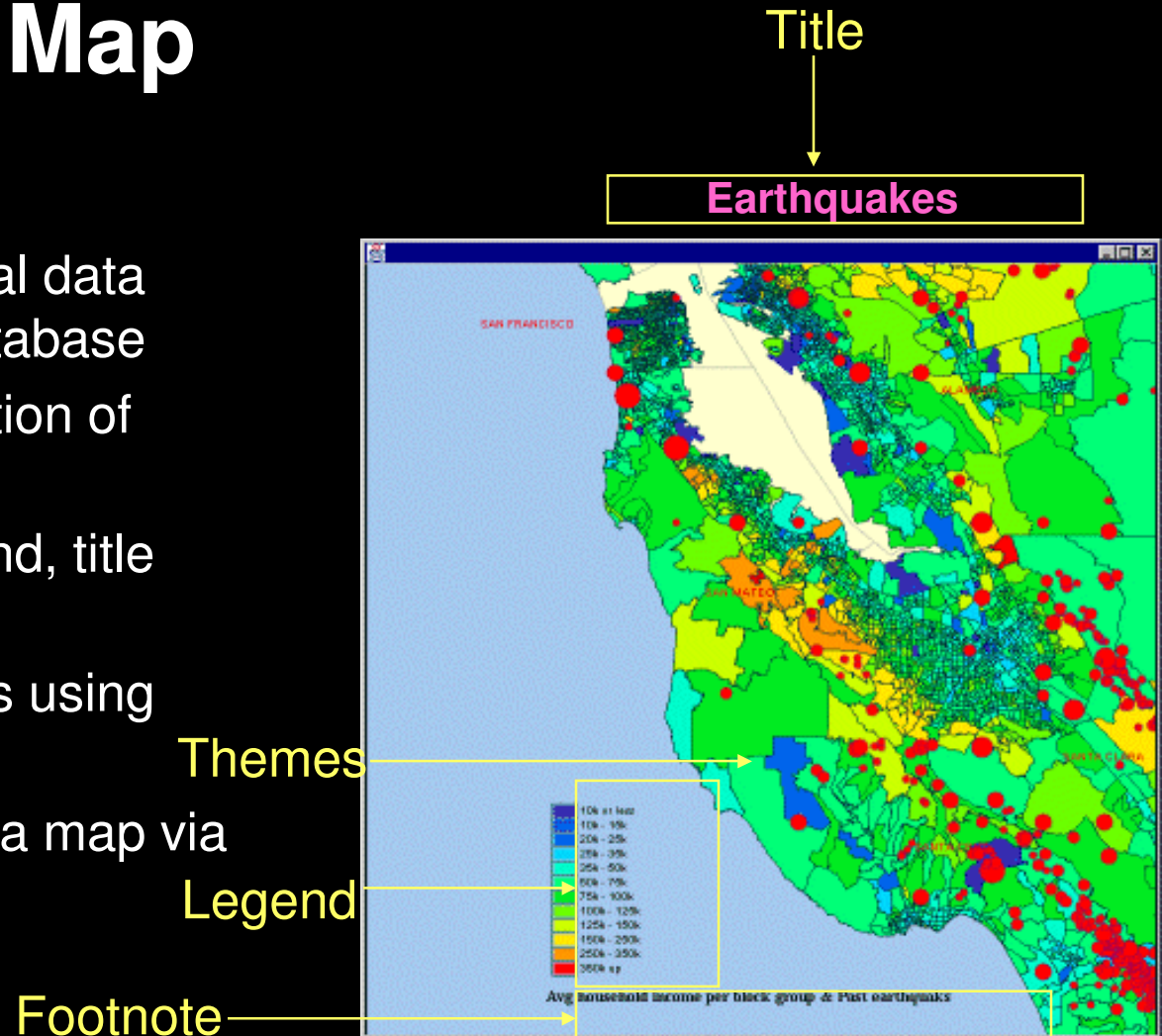
# MapViewer Characteristics

- Scalable. Stateless.
- Makes use of JDBC connection pooling and caching
- Caches Mapping Metadata (basemap/theme/style definitions)
- Caches geometric and image data in the mid-tier.
- All data queried from Oracle database



# MapView: Map

- Renders from spatial data stored in Oracle database
- Defined as a collection of themes
- May contain a legend, title and footnote
- Users request maps using via a MapRequest
- MapViewer returns a map via a MapResponse



# MapView: Layer Vectors and Rasters

- Draw intelligence from vectors and rasters on the fly
- Use SVGs to dynamically render movement etc.



# OracleAS 10g Location Based Services

- **Java APIs** - ingest online web services: geocoding, routing, mapping, YP, traffic, mobile positioning
- **Region Modeling** - associates services (billing, personalization) by (geographic) “regions”
- **Location Caching** - caches caller’s phone number & location to minimize wireless network pinging.
- **Location Privacy** - manages based on LBS service type, permissions, and subscription.
- **Location Marks** - Manages user defined locations of interest (home, work, PIM addresses)



# Immediate Business Benefit: Integrate Any Enterprise Application Platform

Oracle Applications - ADS Vision LE0040

File Edit View Folder Tools Navigate Window Help

Field Service Dispatch Center

**Tasks**

View By  
**Assigned**

Number

- ☐ 15428
- ☐ 15442
- ☐ 15446
- ☐ 15432
- ☐ 15434
- ☐ 15582
- ☐ 15572
- ☐ 15568
- ☐ 15574
- ☐ 15450
- ☐ 15449
- ☐ 15636
- ☐ 15638
- ☐ 15512
- ☐ 15514
- ☒ 15635
- ☐ 15516

**Overview** **Service Request** Escalations Spares Product Resources Address

Number **12419** Ordered **16-APR-2002 05:30:11** Unit

Summary **street light hit by car**

Problem

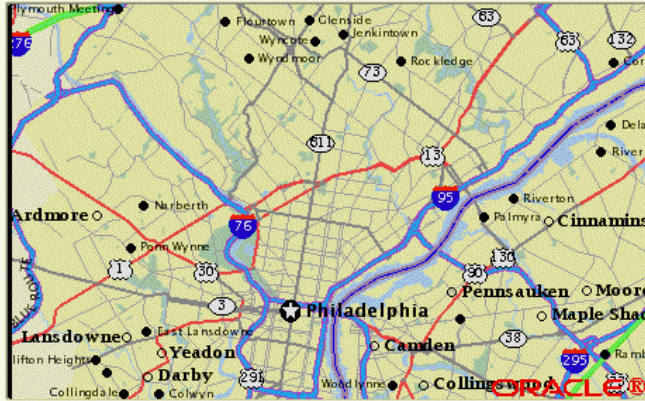
Resolution

**Service History**

**Task**

Number **15635** Status **Assigned** Respond By Effort **2 HRS**

**Plan Board** **Gantt** **Map**



**Service Area**

Reset **NOT USED**

**Zoom**

In Out

**Navigate**

↑ ↓ ← →

**Tasks**

Show Clear

Auto Schedule Advise... Goto... Refresh More...

Record: 1/1 | | | | <OSC>

# Partner Support

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# Working with Leading Partners

**autodesk®**

**INTERGRAPH**

**PCI**  
Geomatics  
Committed to GEO-Intelligence Solutions

**BENTLEY**

**ESRI**

**Skyline**  
DELIVERING THE DIGITAL EARTH™

**Acquis**

**GE**

**espatial**  
spatially enabling business

**NAVTEQ™**

**MapInfo**

**ionic**

**GDT™**  
GEOGRAPHIC  
DATA TECHNOLOGY

**Sprint.**

**Atar**  
INFORMATIC

**radcore**

**exor**

**caris**

**BYERS**  
ENGINEERING  
COMPANY

**Geodon**

**SAFE SOFTWARE**

**ObjectFX**

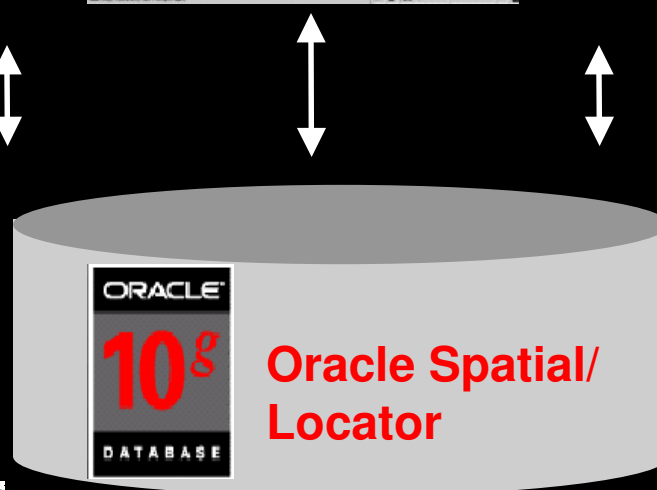
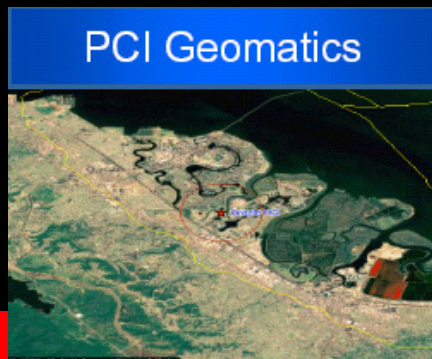
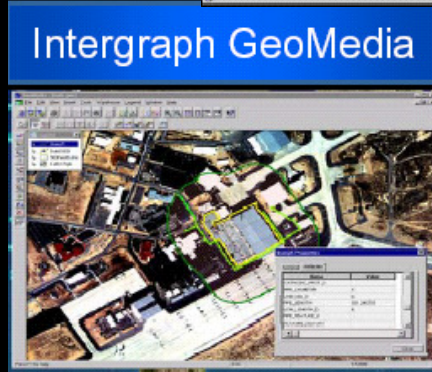
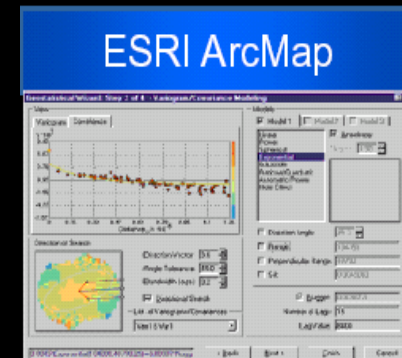
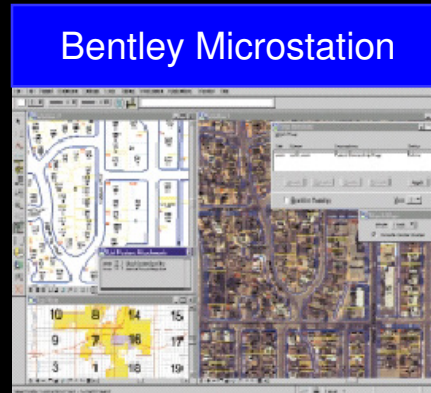
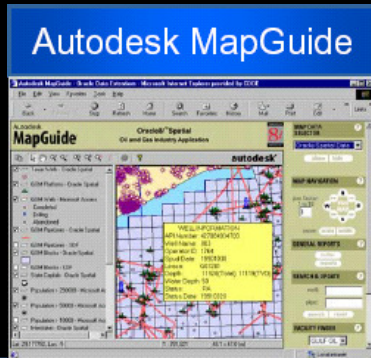
**apic**

**Laser-Scan**

**Tele Atlas**

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# Oracle Spatial Solution Providers



**Skyline  
Smallworld  
Laser-Scan**



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# Summary

- Location information is as ubiquitous as attribute and scalar information
  - Oracle Locator, Spatial and MapViewer location-enable the entire enterprise
  - New models to support changing needs and analysis
- Most comprehensive integration with partner tools in GIS and LBS
- And it just keeps going...

# Q U E S T I O N S A N S W E R S

<http://technet.oracle.com/products/spatial>

[http://www.oracle.com/database/cm\\_spatial\\_new.html](http://www.oracle.com/database/cm_spatial_new.html)

Pro Oracle Spatial – Brand new book on Amazon.com

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