SPATIAL

March 2007
Oracle Spatial User Conference

ORACLE®

SPATIAL

Oracle Spatial User Conference

March 8, 2007
Henry B. Gonzalez
Convention Center
San Antonio, Texas USA

ORACLE SPATIAL

March 2007
Oracle Spatial User Conference

Karen Bachmeyer

Technical Director
Intergraph Corporation
SG&I Division

ORACLE SPATIAL

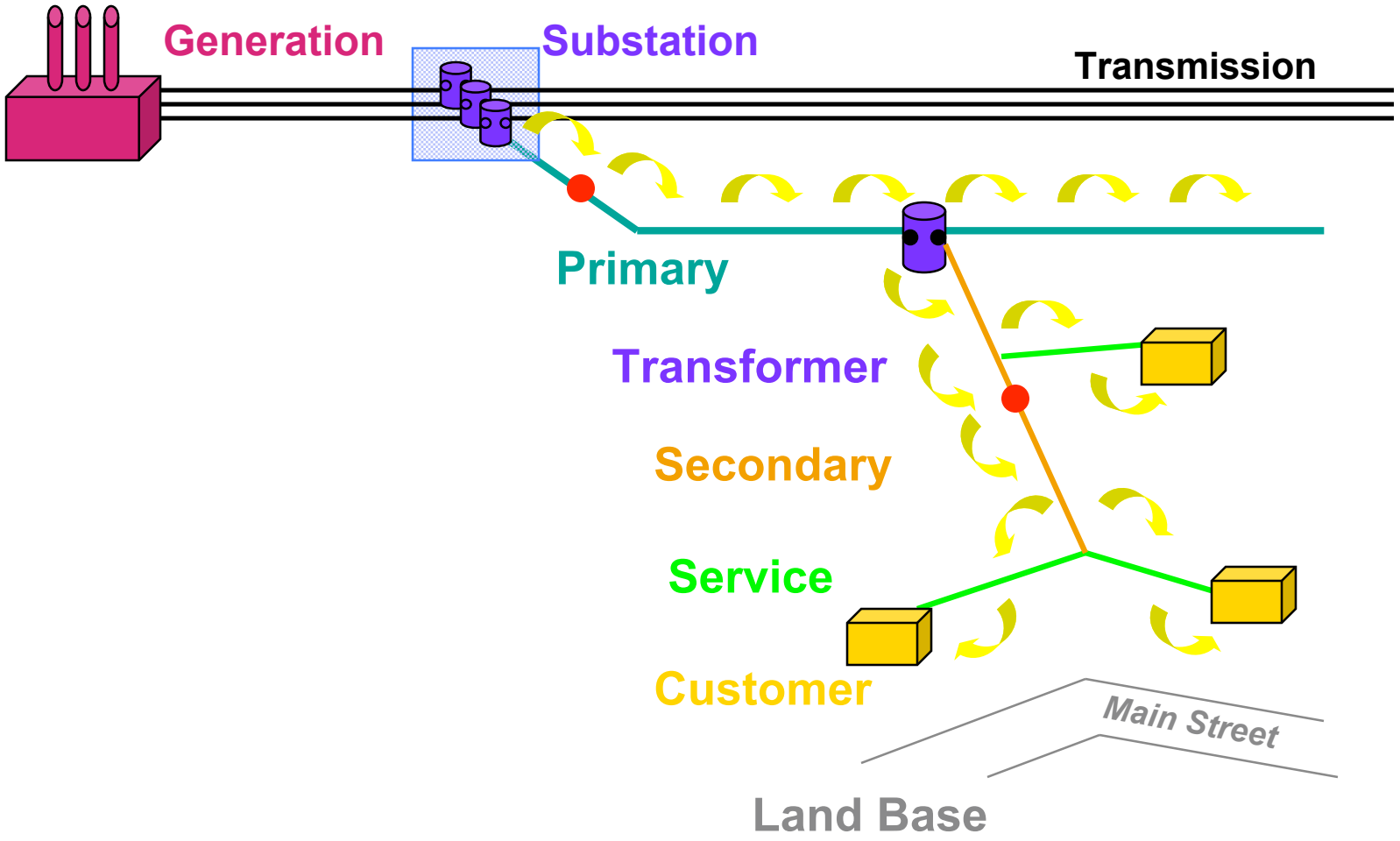
March 2007
Oracle Spatial User Conference

Using Oracle Spatial for Managing Multiple Enterprise Workflows in Utilities

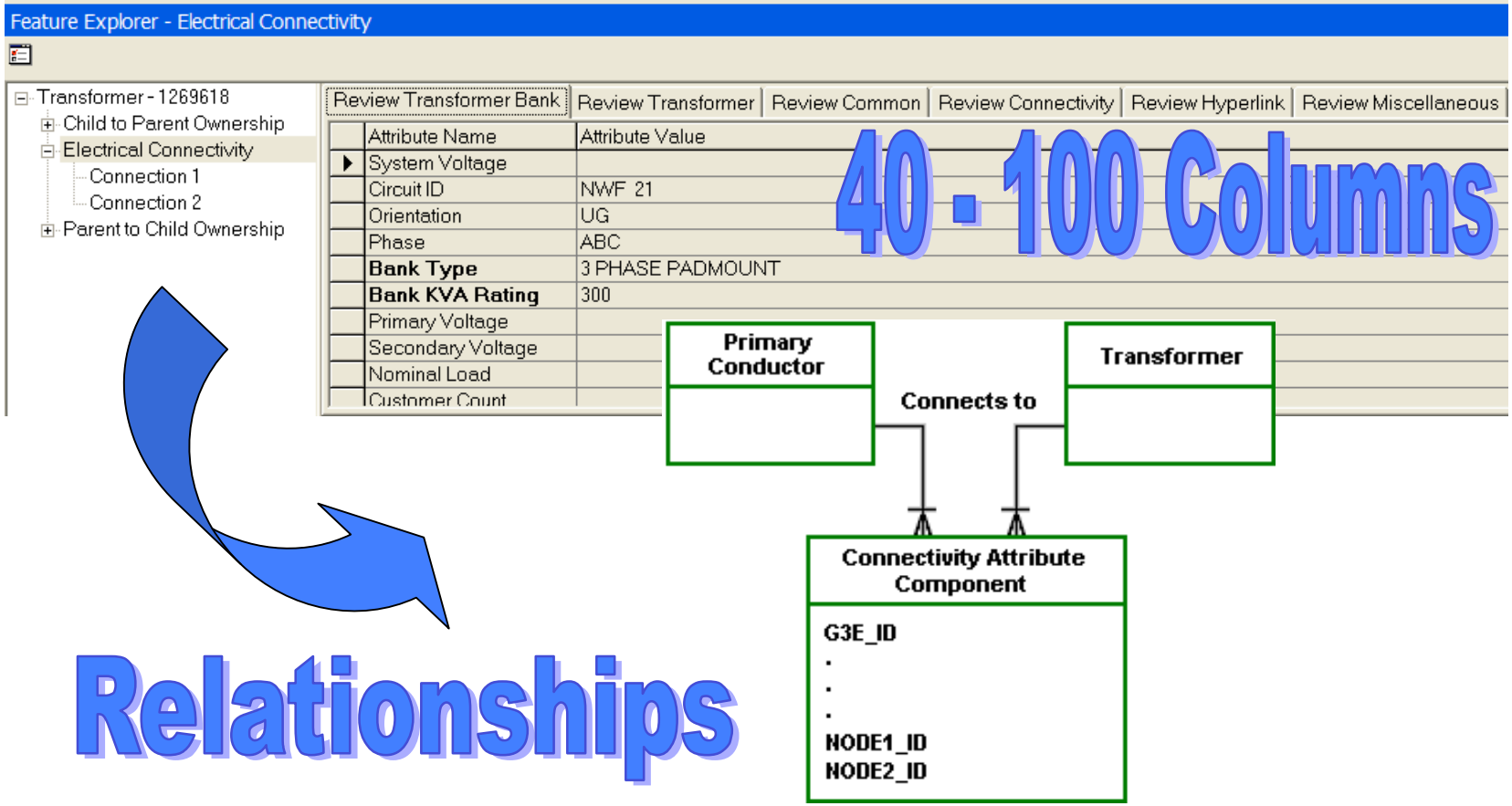
Utility Repository

- Utility companies track a multitude of equipment and assets
- Heavily attributed with:
  - Equipment characteristics
  - Relationships to other equipment
  - Work tracking history
- Location – what “spot” on the earth?
  - Just another attribute

Utility Network



Assets and Attribution



Asset Location

You are here!

Historical Corporate Repository

- Proprietary system for location storage
  - Specialized API or tools required to populate and edit
- Two-phase commit required
  - Synchronize creation and edit of location and other attributes
- Difficult interchange between agencies
  - Data translation or extraction tools required

Corporate Repository Benefits

- Open data storage
  - No specialized software required
- Standard IT practices
  - Report building to include geometry is an extension of traditional report
- Scalability inherent in Oracle
- Readily available IT staff
  - No specialized programming languages
  - Standard disaster recovery processes apply

Oracle Spatial!

Spatially Enabled Applications

- Utility companies need to know relative position of customer to servicing equipment
  - Outage management
  - Maintenance and inspection scheduling
- Crews need to be routed to work locations efficiently
  - Field force automation
  - Mobile work force management applications

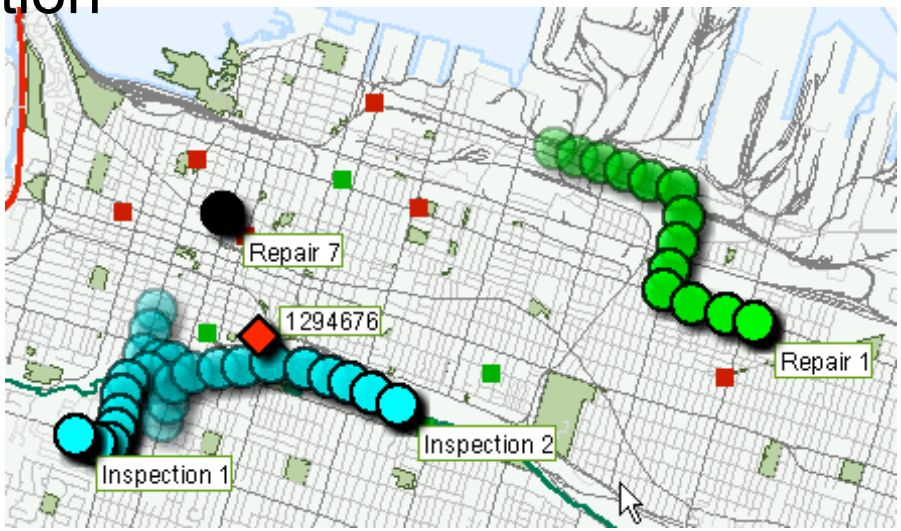
Example Applications

- Call Before You Dig
  - 1,230,000 Google matches

Call Before You Dig

State law requires that before anyone begins digging or excavating, they need to first make the "One Call" for utility locates.

- Field Force Automation
  - Dispatching
  - Tracking field crews



Expanding Necessity of Data

- Get more out of your data
  - Get it to more users
- Enable better business decisions with more accurate data
  - Oracle data warehouse for data mining by various applications

Recognizing the User

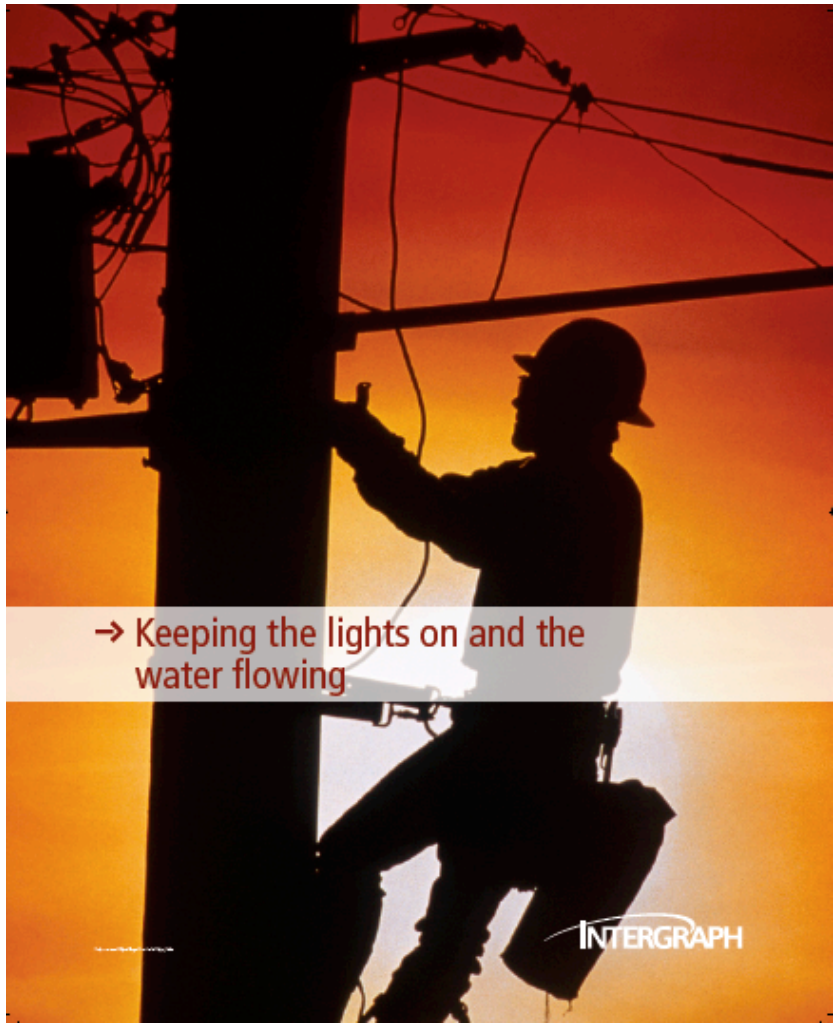
- One application or many?
  - Users have diverse skills and needs
- Software applications should help user do his job better
  - Tune presentation of data to each user
  - Restrict available functions to simplify training and support

Many Tools – One Repository

- Utilize the Oracle database as the central repository
- Many applications will access the repository directly
- External data easily integrated
  - Use Oracle tools for both import and export
- Specialized data sets can be created with common data access techniques

Anytown, USA Utility Workflows

- Engineering design
- Planning analysis
- Outage inquiry
- Spatial reporting



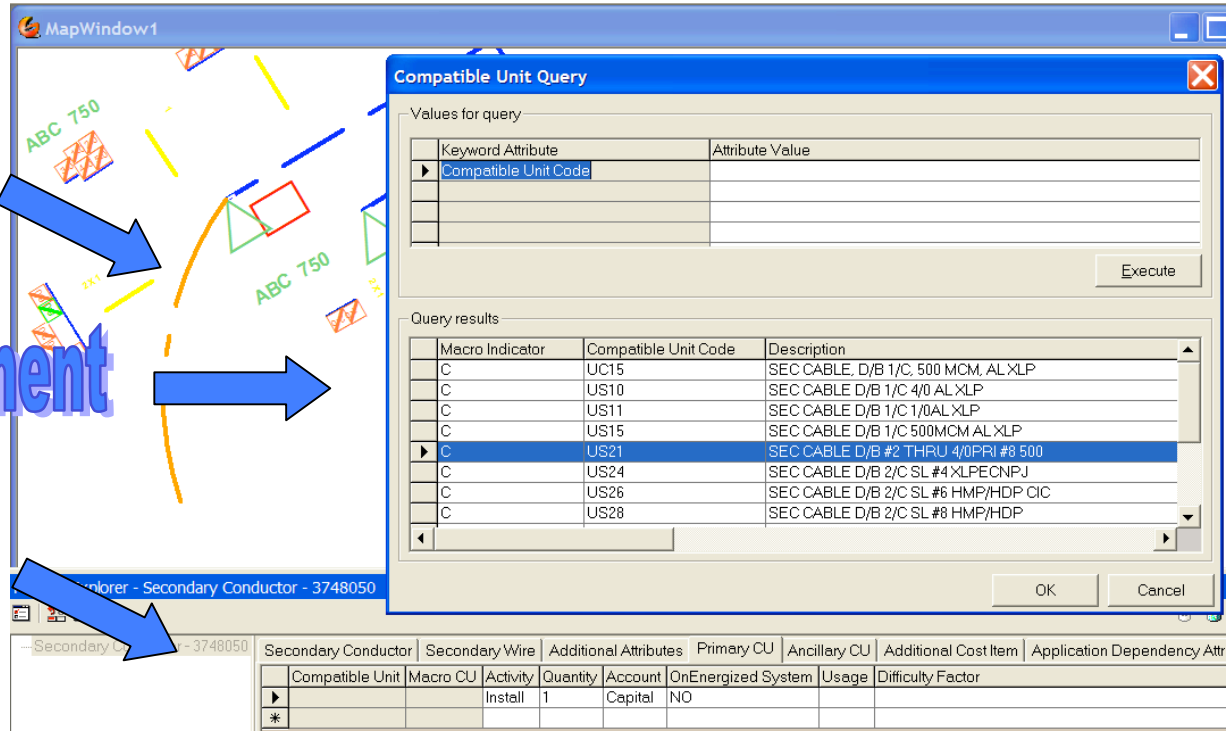
Engineering Design

- Traditional workhorse of GIS applications
- Builds the centrally managed data warehouse

Geometry

Work Management

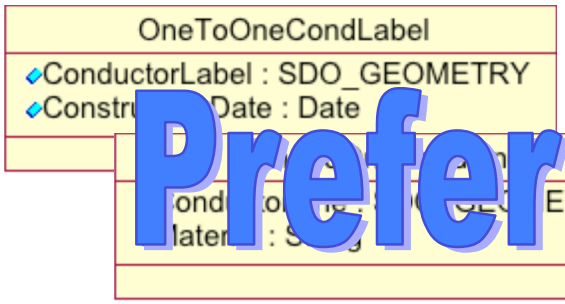
Attributes



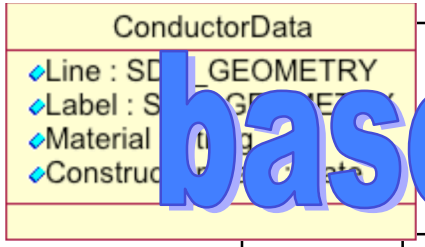
Data Model Considerations

- Utility deals with many geographic elements
  - Streets, conductors, parcels, labels, annotation
- User must have control over
  - What is displayed
  - What is considered in spatial queries
- Data entity-relationship consideration
  - One-to-one mapping of graphic to SDO_GEOMETRY column
  - Multiple graphic columns per table
  - Many-to-one mapping of graphic to SDO_GEOMETRY columns

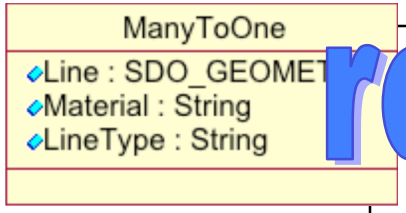
Data Model Example



RowID	ConductorLine	Material
2	<Geometry>	Copper



			Construction
2	<Geometry>	Copper	3/4/2007



			LineType
	<Geometry>	Aluminum	Conductor
2	<Geometry>	Copper	Conduit

Preferred modeling based on workflow requirements

Planning Analysis

- What-if scenarios using data warehouse
  - How to handle population growth
  - Analyze areas with high outages for rebuilding
- Using an enterprise repository means:
  - Data immediately available after design
  - No conversion, translation or batch imports

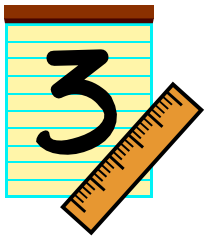
Example Analysis

- Substation reporting tool
  - Determine the amount of underground cable per substation
- Data involved
  - Primary Conductor (linear), Breaker (point), Substation (area)
  - Breaker owned by substation
  - Breaker carries name of circuits energized by this substation
- For each substation
  - Find circuit names from owned breakers
  - Find all primary conductors with associated circuit names
  - Create a collection geometry per substation
  - New derived data: PRICOND_SUB

INTERGRAPH

VIDEO

Substation Reporting

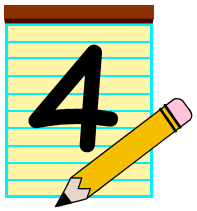


Outage Inquiry

- Simplified interface for novice users
- Ready access to same data warehouse
  - Or an easily managed public replica
- Data involved
  - Outages by type
  - Substations
  - Preconfigured thematic presentation of conductors

V I D E O

Tree Outages



Spatial Reporting

- Expand the typical use of database tools
- Tax reports created through database queries and standard IT report tools
- Census + utility data query
  - Determine number of poles per county
  - Use in tax assessment

D E M O N S T R A T I O N

Database Reporting

Other Repository Uses

- Integration with land management
  - City, county and state governments
- Ready sharing of data between agencies
  - Permit clearances
  - Share plans between different utilities
- Applicable to any industry
  - Electric, gas, water, communications
  - Unique in many workflows but same benefits

Summary

- Utilities manage large amounts of data
- Applications must address diverse end-user workflows
- Enterprise repository can greatly simplify application management
- Spatial data – managed by Oracle Spatial – adds value to the utility enterprise
  - Enables better, more cost-effective business operations

Q&A

THANK YOU

ORACLE®
SPATIAL