

# Location Analytics for Utilities Answering the 'Where' Questions

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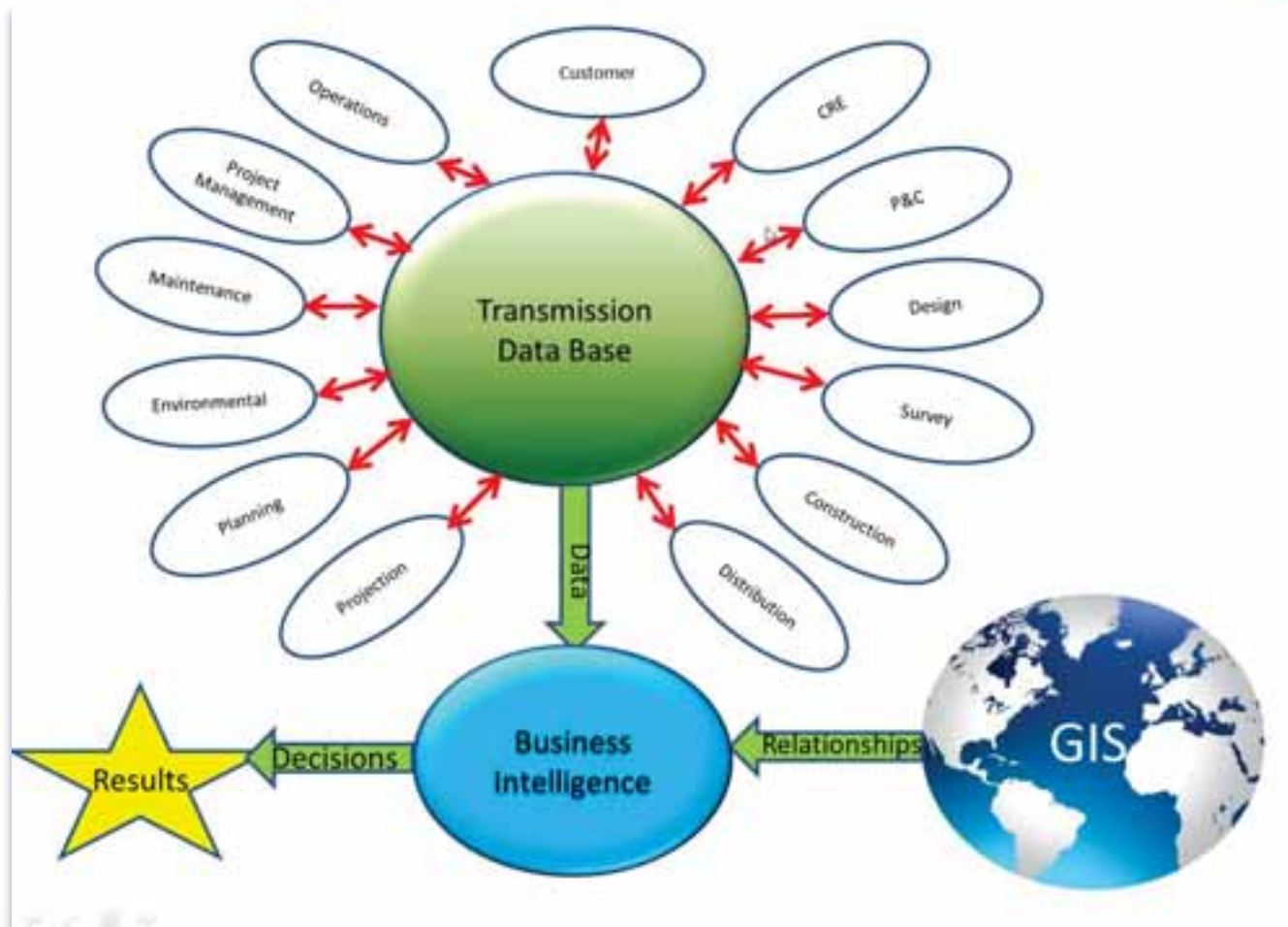
ESRI UC 2014

# APC Transmission BI

- Pilot Project
  - Started Mid 2010
  - Vendor: Rolta
- Current System
  - Oracle 11g
  - ~40 Individual ETLs
  - 21 Data Sources
  - 30+ Dashboards covering over 14 subject areas



# APC Transmission BI Vision



# Guided vs. Ad-Hoc

- Guided Navigation
  - Structured /Linear
  - Repetition
  - “Report”
- Ad-Hoc
  - Analysis
  - Flexible
  - Self-service

“A reporting application,  
not application  
reporting.”

“Let your analysts analyze,  
not data-mine.”

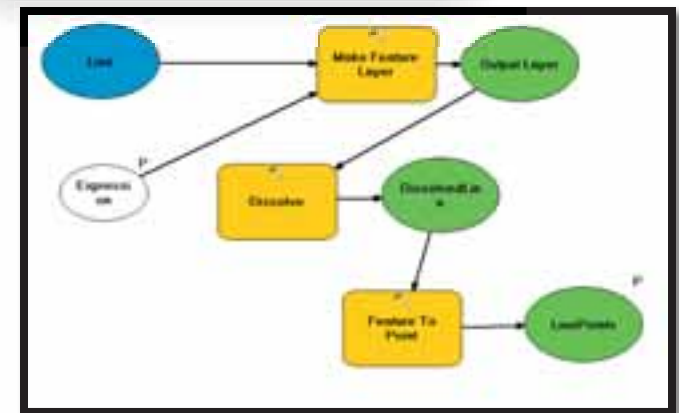
# Need For Geospatial BI

- Analytics
  - Answers in the Quiver
    - What and When
    - Hopefully... Why
  - Lacking the Where
- GIS/Map Services
  - Answers the Where
    - Difficulty with Ad-Hoc
    - Requires expertise

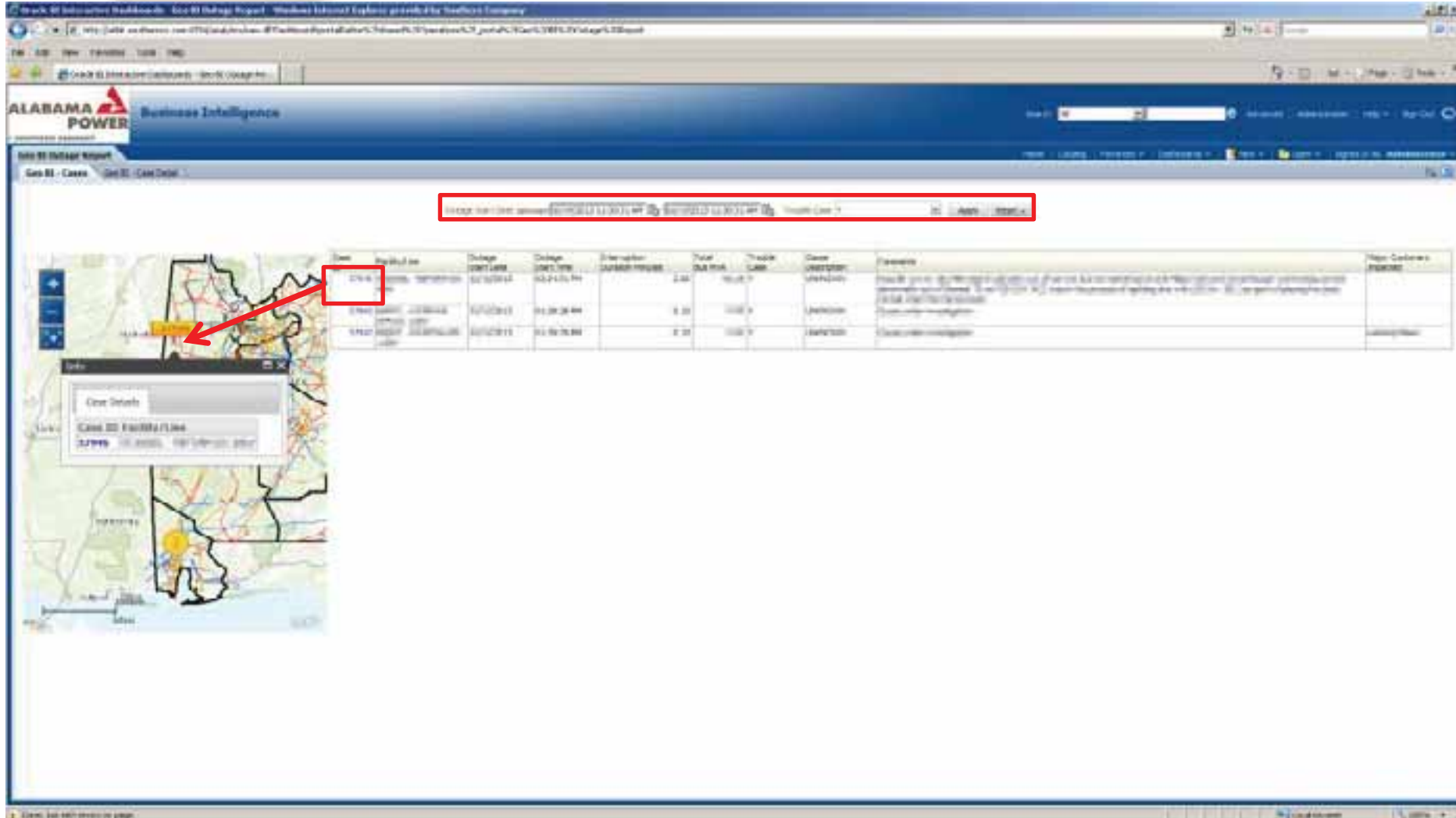


# Geo BI Implementation

- Map Creation
  - ArcGIS Server (Map Server)
  - REST Endpoint (10.0 and 10.1)
    - Background Maps
- Interaction with BI
  - Formed Expression
    - Geoprocessing Service
    - Graphic Overlay
  - JavaScript
  - Context Defines Results



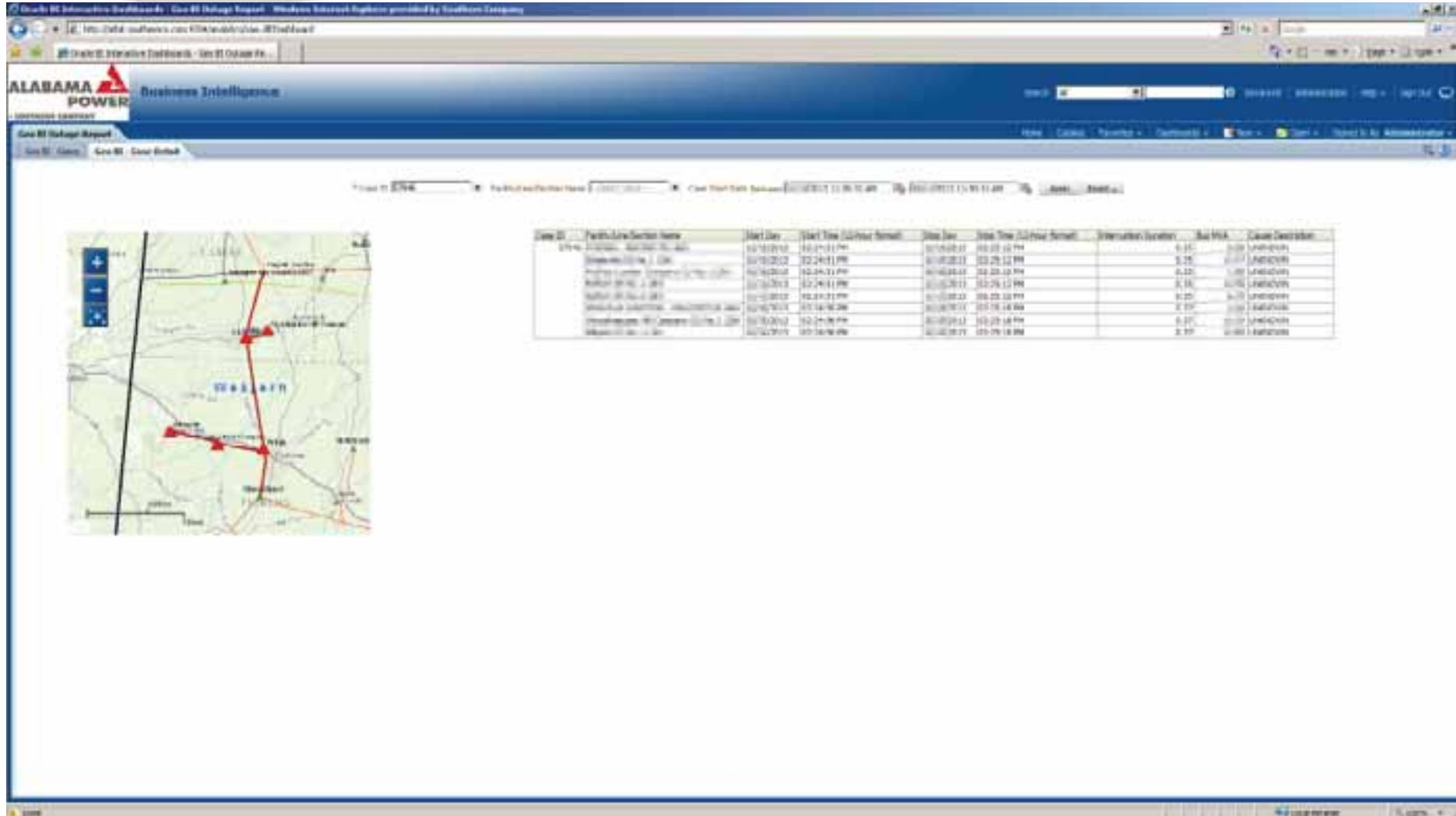
# Outages and Geo BI



The screenshot shows the Alabama Power Business Intelligence interface for an outage report. At the top, there is a navigation bar with the Alabama Power logo and 'Business Intelligence' text. Below this, a breadcrumb trail reads 'Outage Report > Geo BI - Cases'. A search bar contains the text 'FROM: 04/01/2014 TO: 04/01/2014' and 'Type: Case 1'. Below the search bar is a table with columns: Case ID, Start Date, End Date, Information, Total Duration, Priority, Case Description, and Case Details. The first row is highlighted with a red box, and a red arrow points from this row to a map on the left. The map shows a geographical area with a yellow circle indicating the location of the outage. A pop-up window on the map displays 'Case ID: 040414004' and 'Status: In Progress, Not Reported, Open'.

Case ID	Start Date	End Date	Information	Total Duration	Priority	Case Description	Case Details
040414004	04/01/14	04/01/14	...	...	...	...	...
040414005	04/01/14	04/01/14	...	...	...	...	...
040414006	04/01/14	04/01/14	...	...	...	...	...

# Outages and Geo BI



Case ID	Particular Section Name	Start Date	Start Time (24 Hour Format)	End Date	End Time (24 Hour Format)	Interruption System	Bus MVA	Cause Description
074	...	10/10/12	10:24:11 PM	10/10/12	10:25:10 PM	...	0.15	...
075	...	10/10/12	10:24:11 PM	10/10/12	10:25:10 PM	...	0.15	...
076	...	10/10/12	10:24:11 PM	10/10/12	10:25:10 PM	...	0.15	...
077	...	10/10/12	10:24:11 PM	10/10/12	10:25:10 PM	...	0.15	...
078	...	10/10/12	10:24:11 PM	10/10/12	10:25:10 PM	...	0.15	...
079	...	10/10/12	10:24:11 PM	10/10/12	10:25:10 PM	...	0.15	...
080	...	10/10/12	10:24:11 PM	10/10/12	10:25:10 PM	...	0.15	...
081	...	10/10/12	10:24:11 PM	10/10/12	10:25:10 PM	...	0.15	...
082	...	10/10/12	10:24:11 PM	10/10/12	10:25:10 PM	...	0.15	...
083	...	10/10/12	10:24:11 PM	10/10/12	10:25:10 PM	...	0.15	...
084	...	10/10/12	10:24:11 PM	10/10/12	10:25:10 PM	...	0.15	...
085	...	10/10/12	10:24:11 PM	10/10/12	10:25:10 PM	...	0.15	...
086	...	10/10/12	10:24:11 PM	10/10/12	10:25:10 PM	...	0.15	...
087	...	10/10/12	10:24:11 PM	10/10/12	10:25:10 PM	...	0.15	...
088	...	10/10/12	10:24:11 PM	10/10/12	10:25:10 PM	...	0.15	...
089	...	10/10/12	10:24:11 PM	10/10/12	10:25:10 PM	...	0.15	...
090	...	10/10/12	10:24:11 PM	10/10/12	10:25:10 PM	...	0.15	...



# Outage Analysis

ALABAMA POWER Business Intelligence

Worst Performing Cause Codes

The report at right lists in descending rank the Worst Performing Cause Codes, by Total Interrupted Duration (in minutes), based on the supplied filter criteria.

Transmission  
 North TSC  
 Central TSC  
 South TSC  
 Birmingham North  
 Birmingham South  
 Eastern  
 Western

Current Cause Code: None

Worst Performing Cause Codes

Based on Selected Filters, Ranked by Selected Coefficients

Event Description	Total Case Count	Percent of Total
Lightning	104	4.3%
POLE/STRUCTURE	98	3.9%
Power Storm	94	3.7%
LEADERS	91	3.6%
Line Maintenance	87	3.5%
WEATHER CONDITIONS	87	3.5%
Substation Maintenance	86	3.4%
Substation Trouble	85	3.4%
FUSED SWITCH	85	3.4%
Animal	84	3.4%
Customer Trouble	83	3.3%
Fail to Close	82	3.3%
Equipment Testing	81	3.2%
External Utility Trouble	81	3.2%
Tree Cut Falls	80	3.2%
OTHER	80	3.2%
System Condition	79	3.1%
Animal	79	3.1%
Accidental Tap	78	3.1%
Relay Misoperation	77	3.1%
Overvoltage	76	3.0%
WEATHER CONDITIONS	76	3.0%
Switching Error	75	3.0%
Line Worker	75	3.0%
Tree Cut Contact Class	74	3.0%
Undergrowth - Grow In	74	3.0%
Wind	73	2.9%
Line Worker	73	2.9%
Emergency Load Shed	72	2.9%
Emergency Request	72	2.9%
Shed Line - Company Error	71	2.8%
Shed Line - Grow In	71	2.8%
Under Frequency	70	2.8%
Generator	70	2.8%
Tree	70	2.8%
Grand Total	2414	100%

Organizational Hierarchy

# Outage Analysis

ALABAMA POWER Business Intelligence


ALABAMA POWER Business Intelligence

Worst Performing Cause Codes

The report at right lists in descending rank the Worst Performing Cause Codes, by Total Interrupted Duration (in minutes), based on the supplied filter criteria.

Case Description: Start Date: End Date: Apply: Reset:

Current Cause Code: None



Worst Performing Cause Codes

Based on selected filters, ranked by selected coefficient

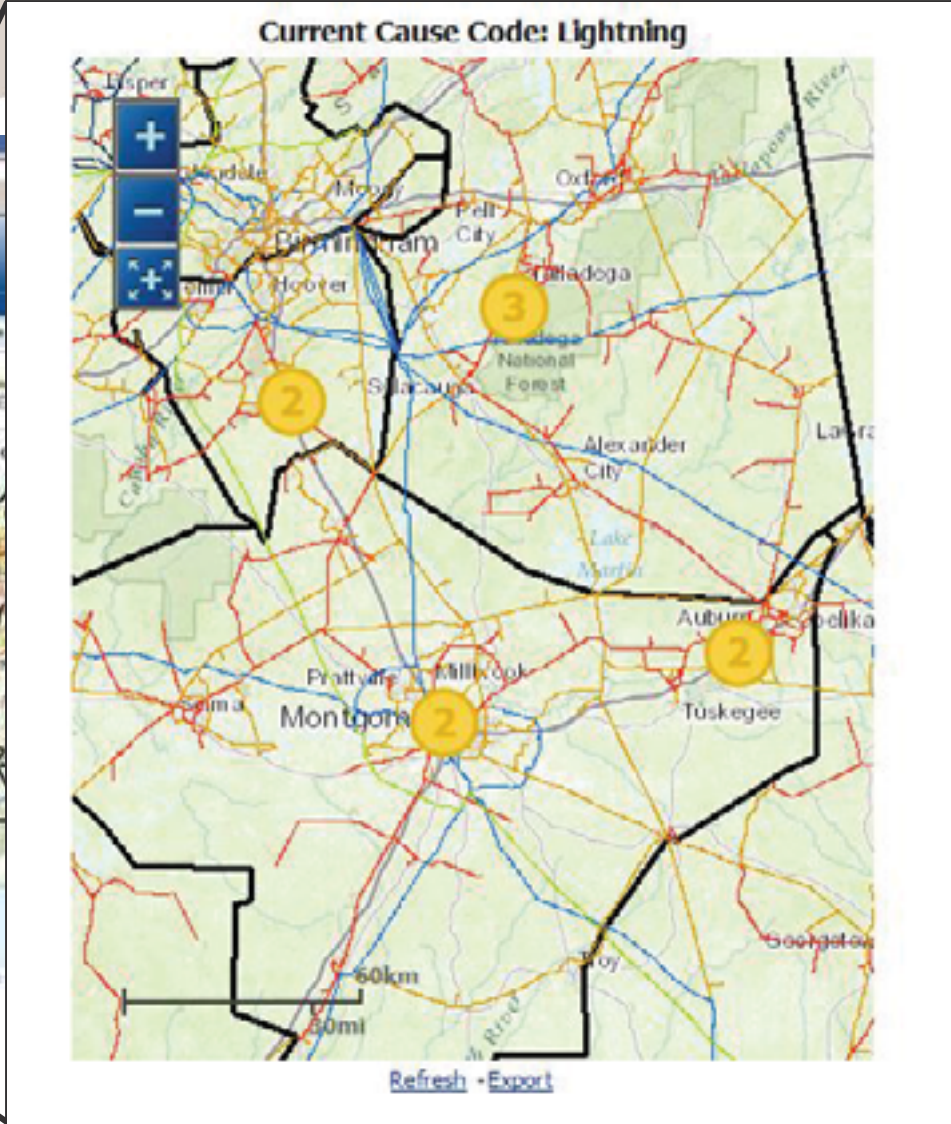
Case Description	Total Case Count	Percent of Total
Lightning	1	0.0%
Lightning - Case Level Detail	1	0.0%
Power	1	0.0%
Power - Show SAIS, SAPT Case Locations	1	0.0%
Power	1	0.0%
Power - Show NAPT Case Locations	1	0.0%
Line	1	0.0%
Line - Show SAIS, SAPT Case Locations	1	0.0%
WEATHER CONDITIONS	1	0.0%
Substation Maintenance	1	0.0%
Distribution Trouble	1	0.0%
PLANNED OUTAGE	1	0.0%
Animal	1	0.0%
Customer Trouble	1	0.0%
Fall in - DR A/D	1	0.0%
Equipment Testing	1	0.0%
External Utility Trouble	1	0.0%
Tree Cut Public	1	0.0%
OTHER	1	0.0%
System Condition	1	0.0%
Vehicle	1	0.0%
Accidental Tap	1	0.0%
Relay Misoperation	1	0.0%
Operation	1	0.0%
WEATHER CONDITIONS	1	0.0%
Smoking Fire	1	0.0%
Construction	1	0.0%
Tree Cut Contract Crew	1	0.0%
Undergrowth - Grow In - Road	1	0.0%
Construction	1	0.0%
Emergency Load Shed	1	0.0%
Emergency Request	1	0.0%
Shall Not in Company Data	1	0.0%
Site Tree Contact - Grow In	1	0.0%
Under Frequency	1	0.0%
Sanction	1	0.0%
Other	1	0.0%
<b>Grand Total</b>	<b>44</b>	<b>100.0%</b>

ALABAMA POWER Business Intelligence

Worst Performing Cause Codes

The report at right lists in descending rank the Worst Performing Cause Codes, by Total Interrupted Duration (in minutes), based on the supplied filter criteria.


Current Cause Code





**ALABAMA POWER** Business Intelligence

Customer Relationships (Infrastructure and Just In Time Suppliers)



**Just-In-Time Suppliers**

Company Name	Phone Number	Company Email	Company Phone	Home Phone
...	...	...	...	...

**Customer Details**

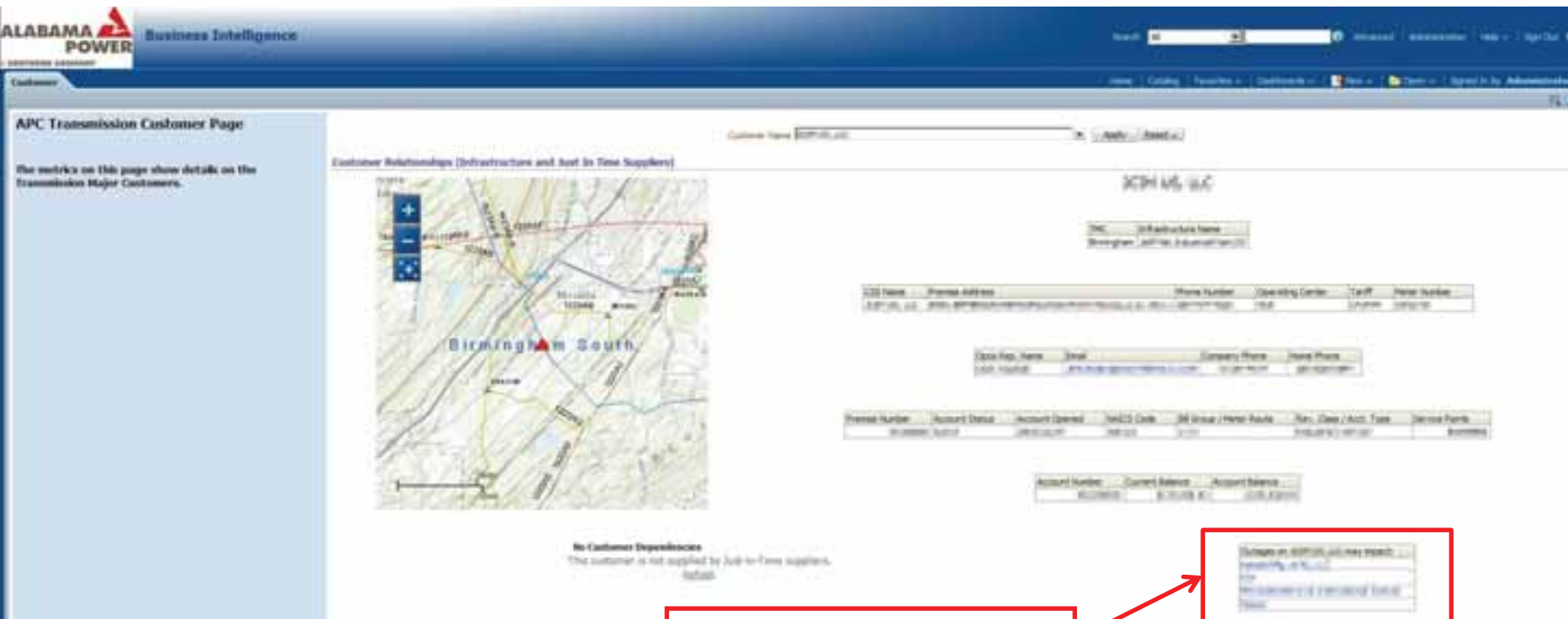
**Infrastructure Name**

**Customer Name** | **Phone Address** | **Phone Number** | **Operating Center** | **Staff** | **Home Number**

**Company Name** | **Email** | **Company Phone** | **Home Phone**

Phone Number	Account Name	Account Number	SACD Code	Bill Group / Meter Group	Start Date / End Date	Service Point
...	...	...	...	...	...	...

## Just-In-Time Supplier



**ALABAMA POWER Business Intelligence**

**Customer Relationships (Infrastructure and Just In Time Suppliers)**

Customer Name: SCPI US LLC

**SCPI US LLC**

300 Name: SCPI US LLC  
300 Address: Birmingham, Alabama, 35203-0001  
300 Phone Number: 205-333-1111  
300 Operating Center: 300  
300 Dept: 300

300 Rep. Name: 300  
300 Email: 300  
300 Company Phone: 300  
300 Service Point: 300

Service Number	Account Detail	Account Opened	SWIS Code	300 Area / Meter Point	300 Date / Acc. Type	Service Point
300	300	300	300	300	300	300

Account Number: 300  
Current Address: 300  
Account Balance: 300

**No Customer Dependencies**  
This customer is not supplied by Just-In-Time suppliers.

Customer Dependencies

Just-In-Time Customers



# Customer Focus

Potential Customer Impacts  
Does Not Include Distribution Outages

Load Shed Outage Cases

	Interruption Count				
	2013	2012	2011	2010	2009
Interruption	0	0	0	0	0
Outage	0	0	2	1	0

Outage Cases on Support Facilities (Lines)

	Interruption Count				
	2013	2012	2011	2010	2009
Interruption	0	0	3	1	0
Outage	0	1	3	0	0

Outage Cause Codes Last 5 Years



- FAILED EQUIPMENT
- Fall In - On Ray
- Lightning
- Wear/Storm
- OTHER
- WEATHER CONDITIONS

Interruption Count

Refresh

Just Maint. Suppliers

Scheduled Work Remaining for the Next Year

Customer Name	Infrastructure Name	Total Work Items				Total Work Items
		Above	Project Activity	STOP Work Order	TEAMS Work Order	
Alabama Power Company	High Voltage Service Area	2			1	3
Alabama Power Company	High Voltage Service Area				2	2
Alabama Power Company	High Voltage Service Area	1			1	4
Alabama Power Company	High Voltage Service Area				1	1
Alabama Power Company	High Voltage Service Area				2	2
Alabama Power Company	High Voltage Service Area				2	2
Alabama Power Company	High Voltage Service Area				1	1
Alabama Power Company	High Voltage Service Area				2	2
Alabama Power Company	High Voltage Service Area				1	1
Alabama Power Company	High Voltage Service Area				1	1
Alabama Power Company	High Voltage Service Area	2			1	3
Alabama Power Company	High Voltage Service Area				2	2
Alabama Power Company	High Voltage Service Area				1	1
Alabama Power Company	High Voltage Service Area				1	1
Alabama Power Company	High Voltage Service Area				1	1
Alabama Power Company	High Voltage Service Area				1	1
Alabama Power Company	High Voltage Service Area				2	2
Alabama Power Company	High Voltage Service Area				1	1

- Business Intelligence
    - Vision
    - Platform
  - Geospatial BI
    - Technology Integration
    - Identify Needs/Use Cases
- Solve the 4 "Where?" question!**

# QUESTIONS?