



COST TECHNOLOGY

Intelligence • Analytics • ResultsSM

*South Dakota Department of Transportation:
Utilizing GIS for a Performance Management System*

Dave Wagner
Cost Technology, Inc.
March 27, 2007



Agenda

- Cost Technology information
- South Dakota DOT Performance Management Project
- GIS Application within the Project
- Conclusion & questions

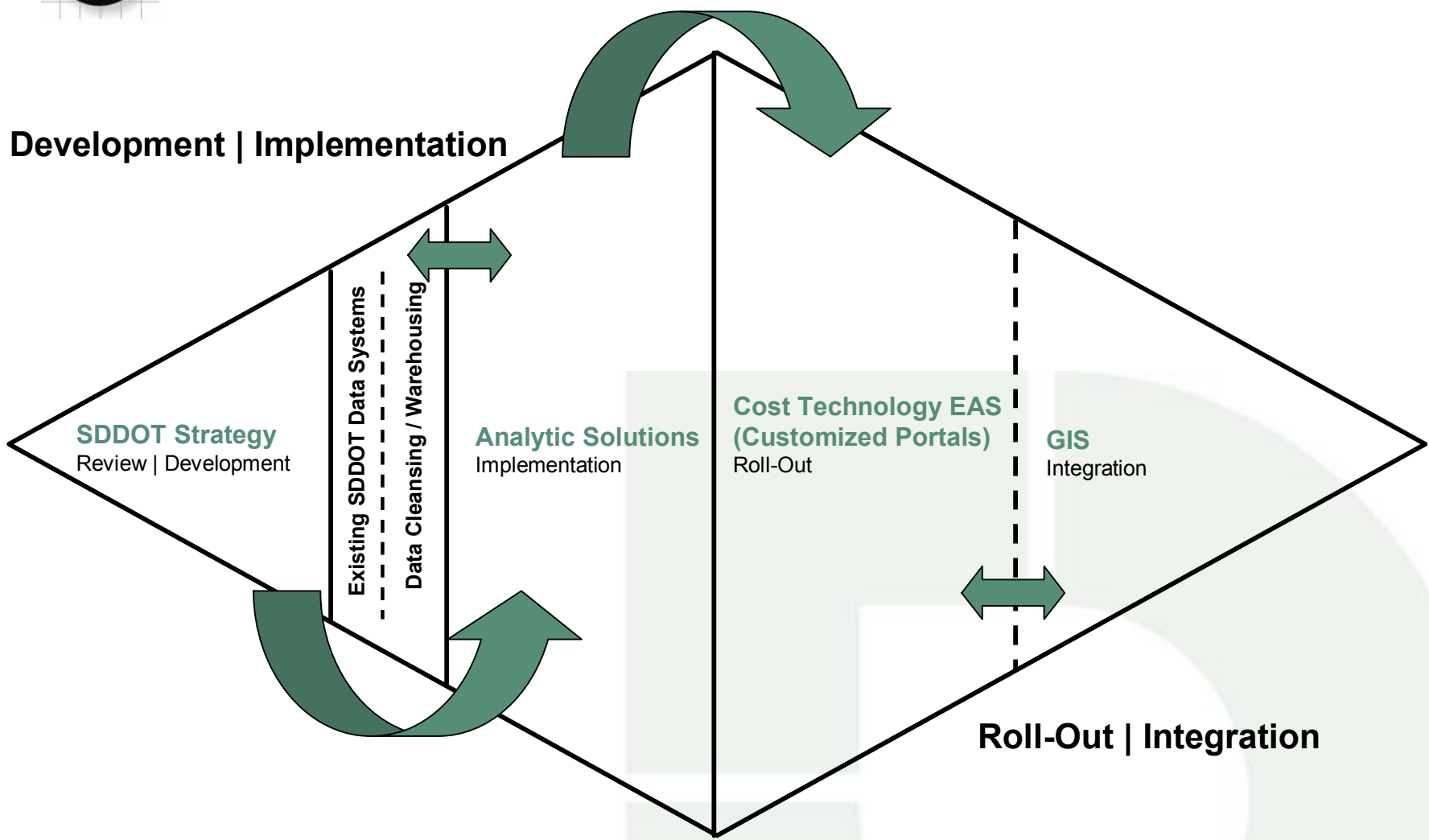


Cost Technology Information

- Founded in 1991 by Peter B.B. Turney, PhD
- Responsible for ABC innovations
- Provide business analytics and business performance optimization solutions
- Utilize GIS to deliver results



South Dakota DOT Project Progression

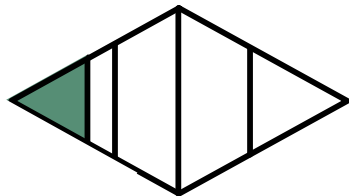




Review and Development

- Create a Performance Management System
 - **Develop performance measures**
 - Manage data in a strategically meaningful way
 - Conduct analysis to support strategic initiatives

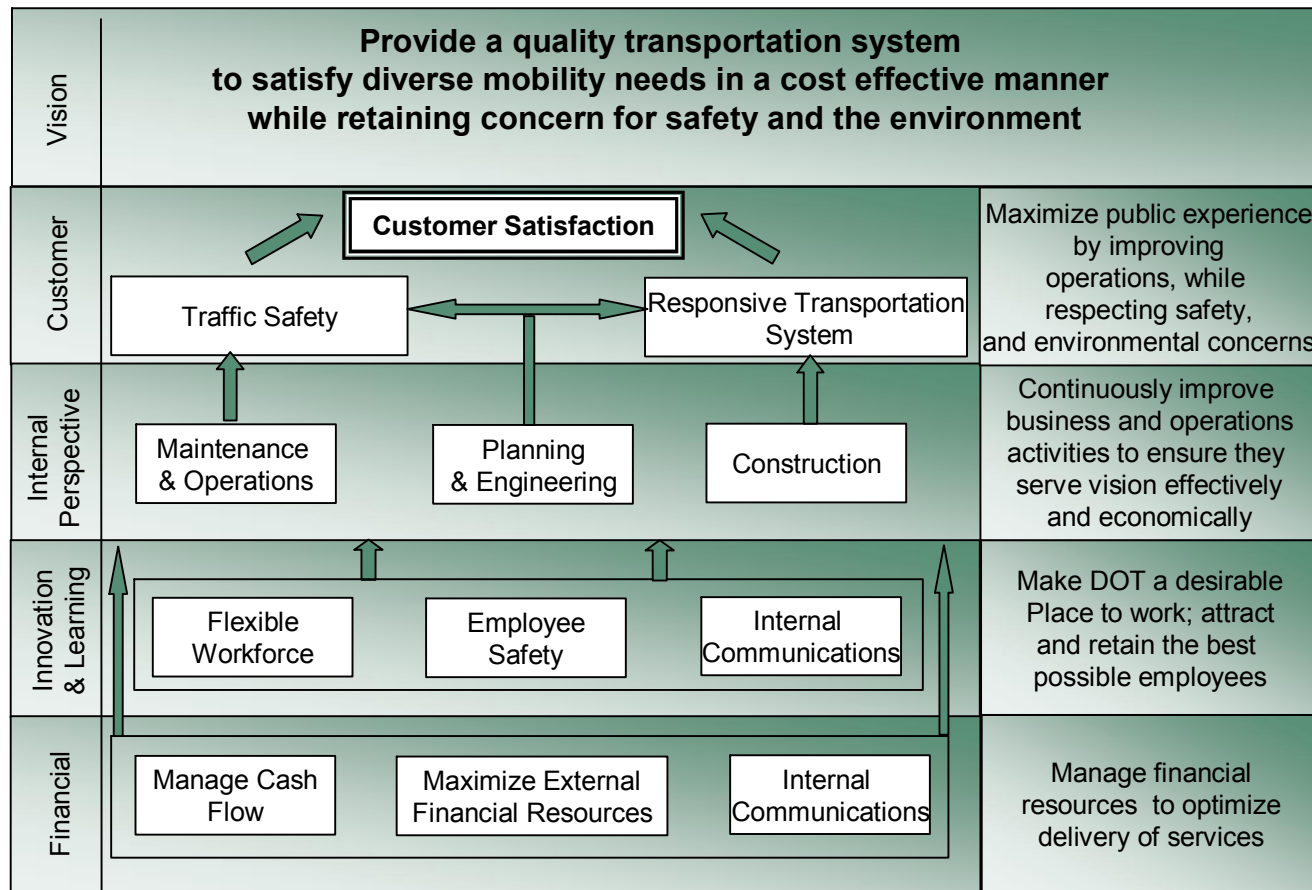
“We provide a quality transportation system to satisfy diverse mobility needs in a cost effective manner while retaining concern for safety and the environment”



SDDOT Strategy



Strategy map

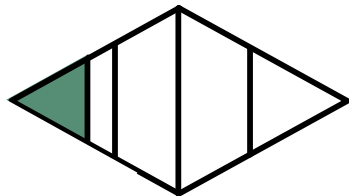




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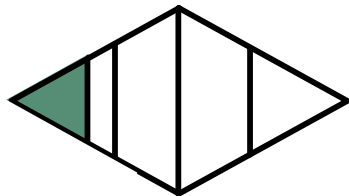
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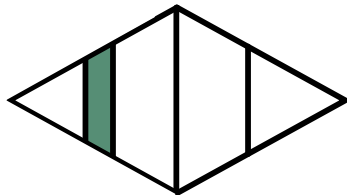
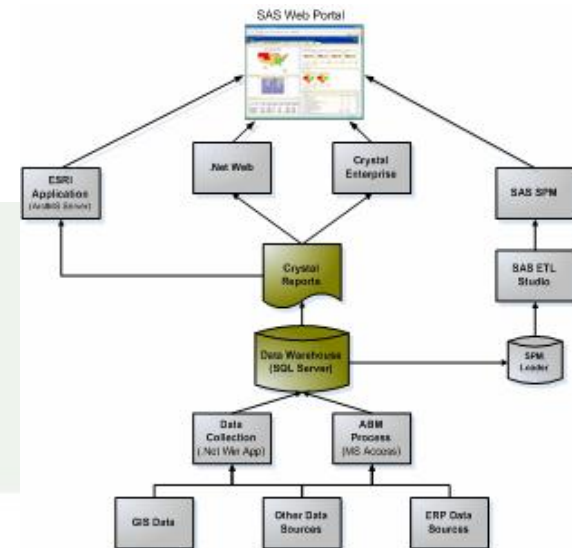


SDDOT Strategy



Data Cleansing & Warehousing

- Unique silos of information rectified in warehouse
- Combination of monthly updates and real-time access
- Statewide systems
 - Employee
 - General Ledger
- DOT-specific:
 - Equipment Management System
 - Inventory
 - Financial

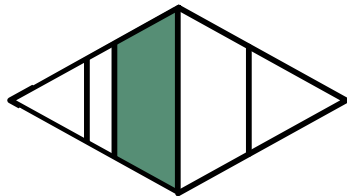


Existing SDDOT Data Systems



Implementation

- Activity Based Costing (ABC) model development
- Balanced Scorecard Development
- Process Evaluation/Re-engineering

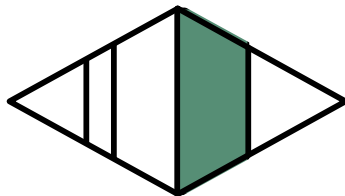
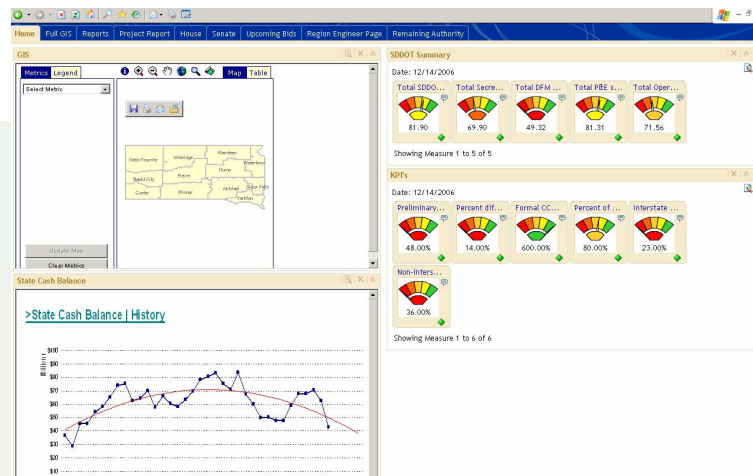


Analytic Solutions



Rollout

- Customized portals
- Key Performance Indicators (KPI)
- Performance Management
- ABC Reporting

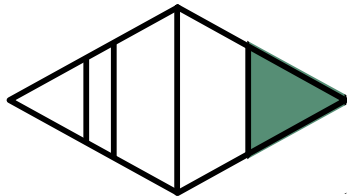
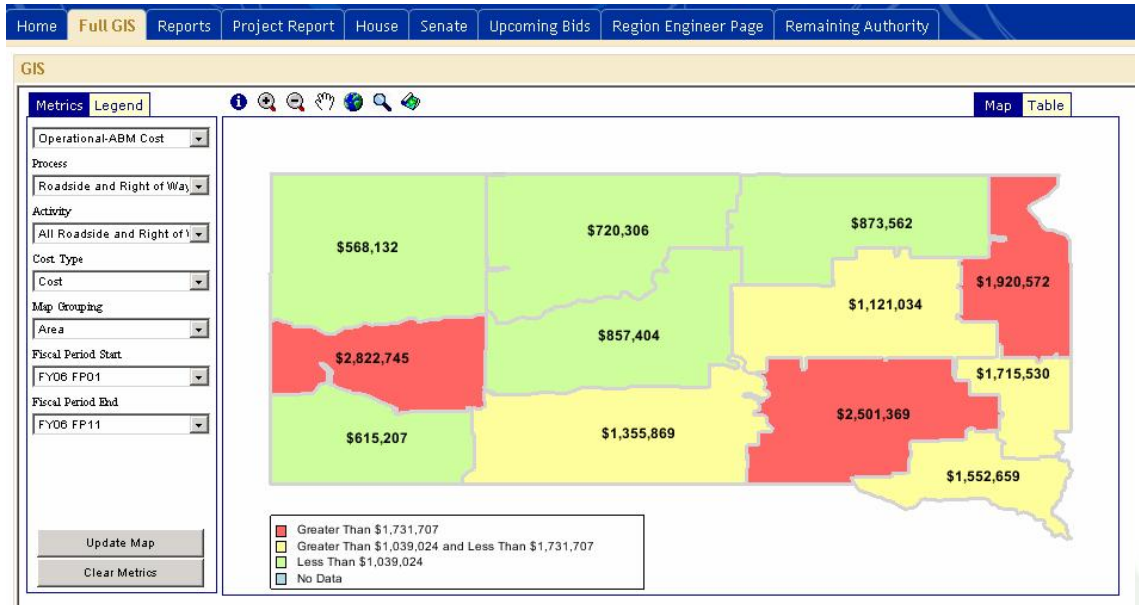


Enterprise Analytic System (Customized Portals)



GIS Integration

- GIS integrates all components of the EAS
 - ABM
 - SPM
 - Facilities
 - Inventory
 - Employees
 - Equipment
 - Budget Burn

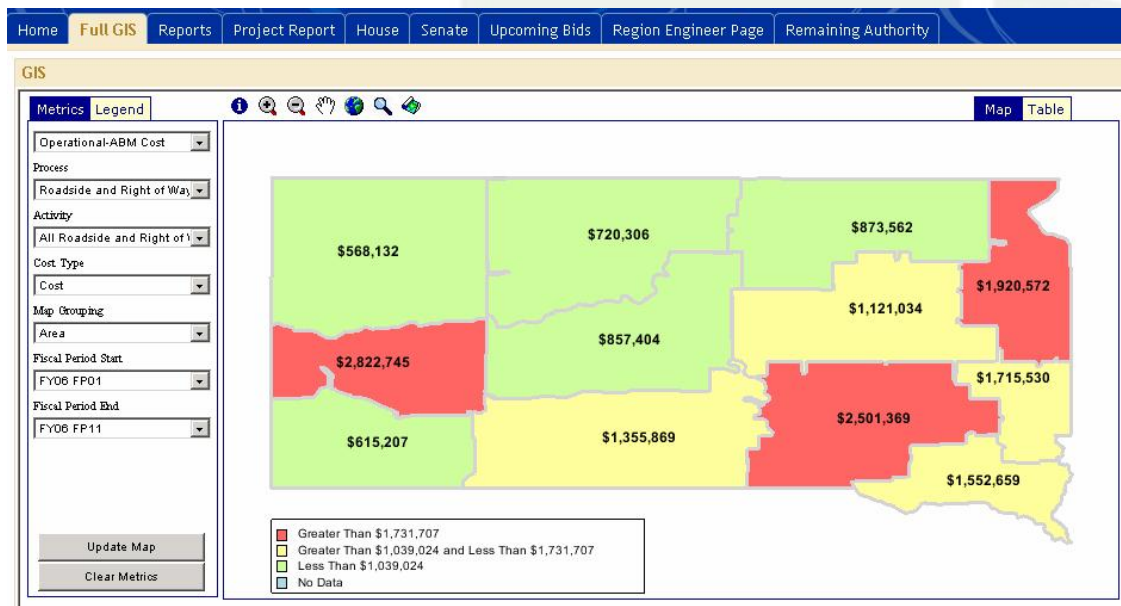


GIS



GIS Application Design

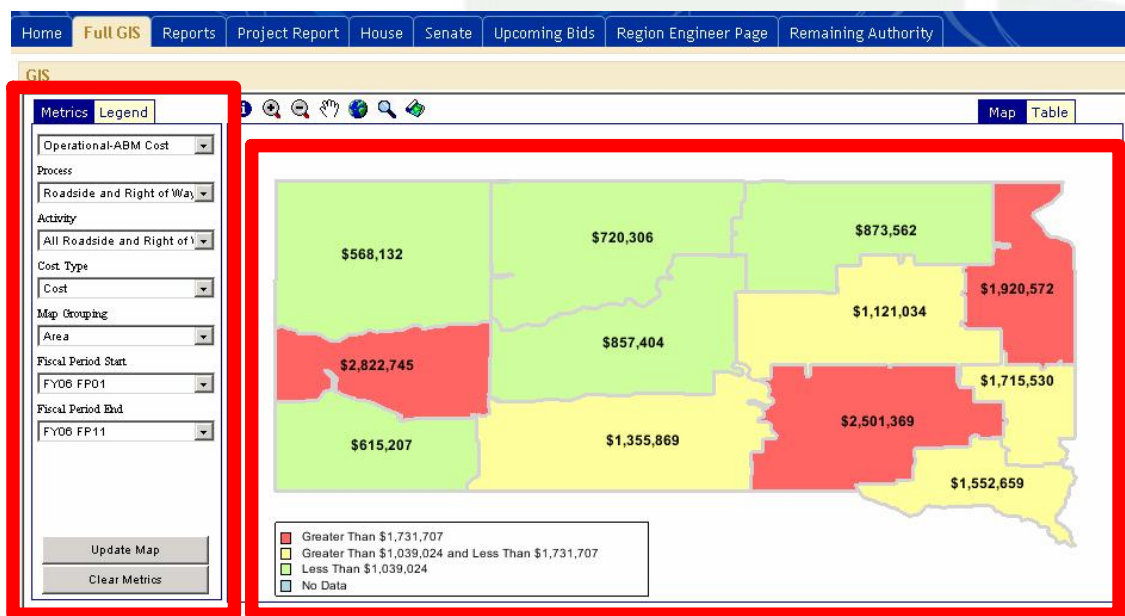
- Simple by design: ArcIMS
 - Pull down selections to create results
 - Associated tabular data
 - Access to existing SDDOT GIS data
 - Simple geographic and data access tools





GIS Application Design

- Simple by design
 - **Pull down selections to create results**
 - Performance information brought to life by GIS
 - “Drill-down” capability
 - Comparisons between map groupings and/or over time





GIS Application Design

- Simple by design
 - **Associated tabular data**
 - Pull-down choices remain visible
 - Data on the map is pulled from the underlying table

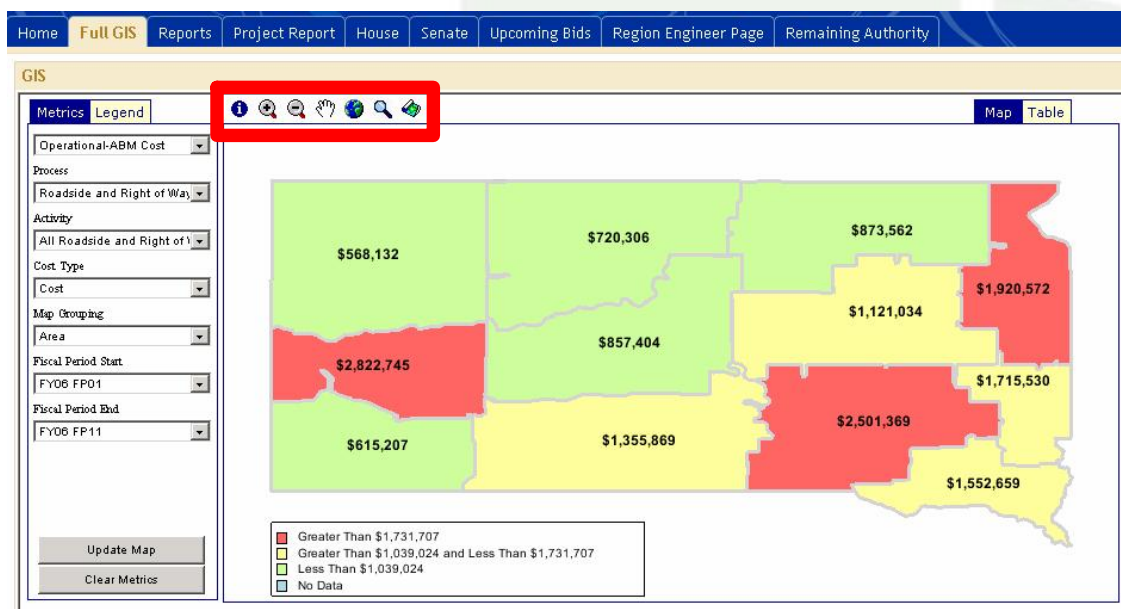
The screenshot shows a web-based GIS application interface. At the top, there is a navigation bar with tabs: Home, Full GIS, Reports, Project Report, House, Senate, Upcoming Bids, Region Engineer Page, and Remaining Authority. Below the navigation bar, there is a search bar and a 'Table' button highlighted with a red box. The main content area displays a table with columns: Name, Display Color, and Total. The table lists various locations and their associated costs. A sidebar on the left contains a 'Metrics Legend' panel, also highlighted with a red box, which includes several filter options: Operational-ABM Cost, Process, Roadside and Right of Way, Activity, Cost Type, Map Grouping, Fiscal Period Start, and Fiscal Period End. At the bottom of the sidebar are 'Update Map' and 'Clear Metrics' buttons.

Name	Display Color	Total
berdeen	Green	\$873,562.30
lle Fouché	Green	\$568,132.48
aster	Green	\$615,207.65
mon	Yellow	\$1,121,034.03
itchell	Red	\$2,501,369.22
obridge	Green	\$720,206.90
ere	Green	\$857,404.29
apid City	Red	\$2,822,745.40
oux Falls	Yellow	\$1,715,530.08
atertown	Red	\$1,920,572.85
inner	Yellow	\$1,355,869.40
ankton	Yellow	\$1,552,659.79



GIS Application Design

- Simple by design
 - **Simple geographic and data access tools**
 - Basic zooming & panning
 - Legend display
 - Info & Query tool





GIS Application Design

- Simple by design
 - **Access to existing SDDOT GIS data**

The screenshot displays a GIS application interface. At the top, a navigation bar includes links for Home, Full GIS, Reports, Project Report, House, Senate, Upcoming Bids, Region Engineer Page, and Remaining Authority. Below this is a 'GIS' header. The main interface features a map of a region with several roads highlighted in different colors (yellow, green, blue, orange). A legend on the left side lists various data layers, with 'STIP' and 'Highways' checked. A 'Layer Info' window is open on the right, showing a list of layers and their attributes. The 'NeedsBook' layer is expanded, showing a list of road segments with their IDs and corresponding attribute values.

Layer	Attribute	Value
NeedsBook (9)	1806	1996
	1806	1998
	014	3.70000004768
	014	2.81999993324
	014	4.88999998649
	014	3.5
	014	4.78000020981
	014	4.30000019073
	014	4.01999998093
Highways (2)	014	9.98999977112
	014	9.98999977112
	014	9.98999977112
	014	9.98999977112
	014	9.98999977112
	014	9.98999977112
	014	9.98999977112
	014	9.98999977112
	014	9.98999977112
	014	9.98999977112
	014	9.98999977112
STIP (2)	AC	TONS
	AC	TONS
	6	TONS
	6	TONS
	24	TONS
	24	TONS
	24	TONS
	24	TONS
	24	TONS
	24	TONS
	24	TONS



Conclusion

- Power of the System is the delivery of information
- GIS enhances the delivery of the information
- GIS provides access to DOT-proprietary data
- Additionally:
 - Cost Analytics model
 - Predictive equipment management analysis
 - Numerous storyboarding events
 - Customized reports



Cost Technology, Inc.

Questions and Comments