Geographic Information System (GIS)

Consolidation/Redesign Effort

Program Goals

- Improve citywide GIS function
- Improve processes
- Better serve City with GIS services
- Consolidate and redesign

Presentation Overview

- Team & Functional Review
- Processes
- Changes / Recommendation

Cross Functional Team

Project Sponsors – Mike Shellito, Hong Sae

Project Manager – Scott Adrian

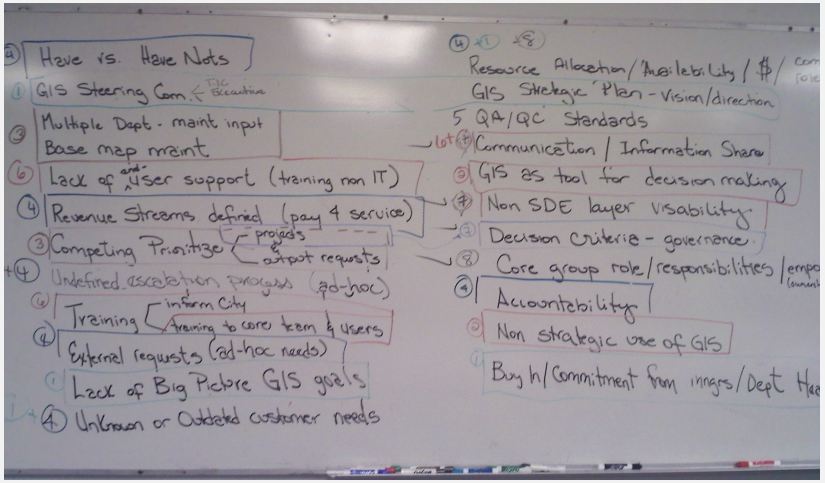
Department	Working Group	Management Group
Electric	Neil Blomquist	Rick Corral
Environmental Utilities	Roy VanNess Jon Heisler	Kelye McKinney
Fire	Dorothee Moss	Kevin Dickson
Human Resources		Linda Hampton
Information Technology	Marc Ball Brian Johnson	
Parks	Rjahja Canlas	Tara Gee
Planning	Joe Allen	Mike Isom
Public Works – Engineering Public Works – Streets	Joey McKinney Matt Nelson	Jason Shykowski

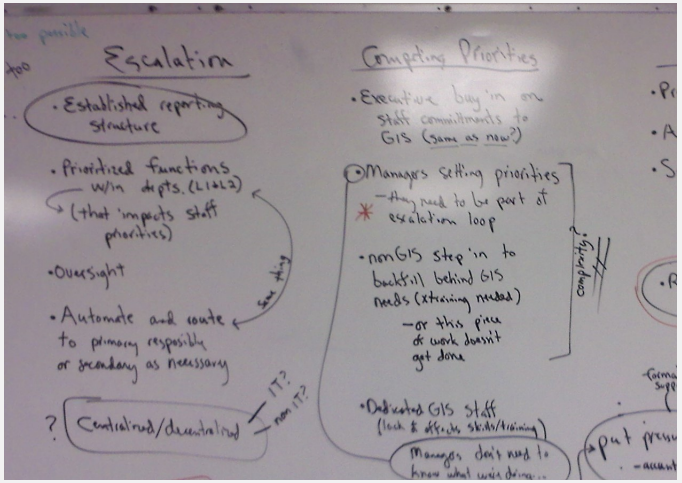
Team Process

- Meeting Time
  - 7 weeks/21 meetings
  - 60 hours/person
  - Weekly check-in with LSS sponsor
- Assignments
  - Task inventory, cost of services
  - Impacts to GIS function, issue prioritization
- Tools
  - DMAIC process
  - Voice of Process (VOP)
  - Root Cause Analysis
  - Balanced Scorecard

Problem Statement

- Issues have surfaced in several key areas of the citywide GIS function:
  - Competing Priorities
  - Inefficient Resource Allocation
  - Ineffective Enterprise GIS Vision

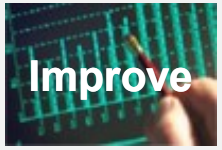




DMAIC Process

- **Define** – define the scope/goal and magnitude of the consolidation and redesign opportunity
- **Measure** – collect and measure data that will determine the factors having influence over citywide GIS function
- **Analyze** – search for key factors having the biggest impact on GIS processes and determine root causes
- **Improve** – identify solutions to improve GIS
- **Control** – control the plan to ensure the recommended solutions can be sustained

DMAIC Process Roadmap



Activities

- Identify Problem
- Complete Charter
- Develop SIPOC Map
- Map Business Process
- Map Value Stream
- Gather Voice of the Customer & Voice of the Business
- Develop CCR's & CBR's
- Finalize Project Focus

- Identify Key Input, Process and Output Metrics
- Develop Operational Definitions
- Develop Data Collection Plan
- Validate Measurement System
- Collect Baseline Data
- Determine Process Performance/Capability
- Validate Business Opportunity

- Propose Critical X's
- Prioritize Critical X's
- Conduct Root Cause Analysis on Critical X's
- Validate Critical X's
- Estimate the Impact of Each X on Y
- Quantify the Opportunity
- Prioritize Root Causes

- Develop Potential Solutions
- Develop Evaluation Criteria & Select Best Solutions
- Evaluate Solution for Risk
- Optimize Solution
- Develop 'To-Be' Process Map(s) and High-Level Implementation Plan
- Develop Pilot Plan & Pilot Solution

- Develop SOP's, Training Plan & Process Control System
- Implement Process Changes and Controls
- Monitor & Stabilize Process
- Transition Project to Process Owner
- Identify Project Replication Opportunities
- Calculate Financial Benefits

Tools

- Pareto Charts
- Project Selection Tools
- PIP Management Process
- Value Stream Map
- Various Financial Analysis
- Charter Form
- Stakeholder Analysis
- Communication Plan
- SIPOC Map
- High-Level Process Map
- Non-Value Added Analysis
- VOC and Kano Analysis
- RACI and Quad Charts

- SIPOC Map
- Operational Definitions
- Data Collection Plan
- Statistical Sampling
- Measurement System Analysis (MSA), Gage R&R
- Constraint Identification
- Setup Reduction
- Generic Pull
- Kaizen
- TPM
- Control Charts
- Process Capability, Cp & Cpk

- Pareto Charts
- C&E Matrix
- C&E/Fishbone Diagrams
- Brainstorming
- Detailed 'As-Is' Process Maps
- Basic Statistical Tools
- SupplyChainAccelerator Analysis
- Non Value-Added Analysis
- Hypothesis Testing
- FMEA
- Box Plots
- Interaction Plots
- Simple & Multiple Regression
- ANOVA

- Brainstorming
- Benchmarking
- Process Improvement Techniques
- Line Balancing
- Process Flow Improvement
- Replenishment Pull
- Purchasing and Sales Strategy
- Poka-Yoke
- FMEA
- Solution Selection Matrix
- 'To-Be' Process Maps
- Piloting and Simulation

- Control Charts
- Standard Operating Procedures (SOP's)
- Training Plan
- Communication Plan
- Implementation Plan
- Visual Process Control
- Process Control Plans
- Project Commissioning
- Project Replication
- Plan-Do-Check-Act Cycle

Citywide GIS Function (Define)

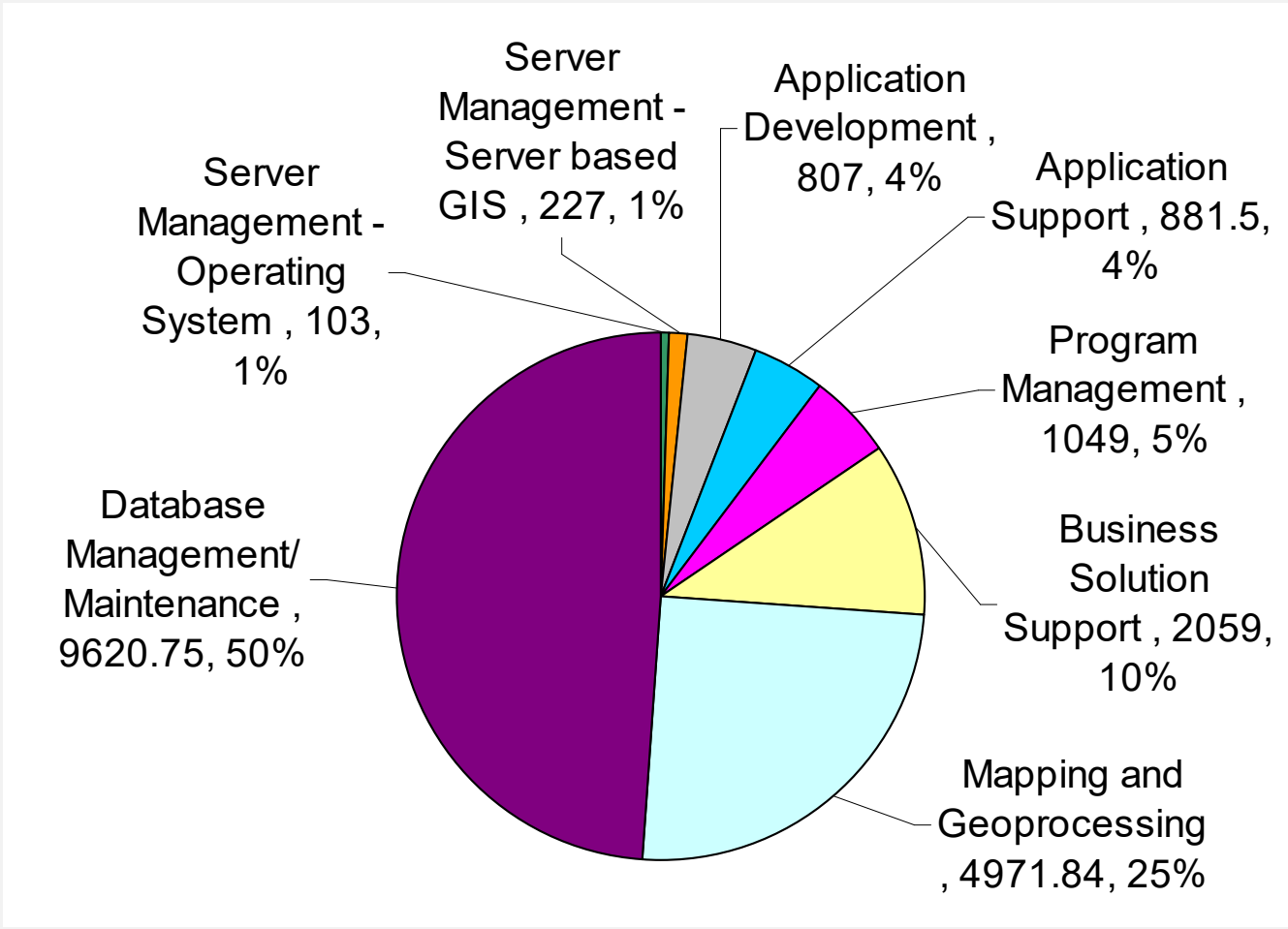
- Establish baseline
- 8 key GIS business processes, 10 subprocesses, 151 tasks
- Maintenance and operations concentrated in 7 departments (Electric, EU, FIRE, IT, Planning, Parks, Public Works)
- 17* staff, 11.2 FTEs of work, 9.7 available FTEs

Business Processes (Define)

Application Development	Design and development GIS applications, web services, and software extensions. Also includes application maintenance.
Application Support	Support GIS software including installation, configuration, and upgrades. Also includes Tier 3 incident management and training
Business Solution Support	Support customers with GIS business process and workflow design; system design; and data modeling and design.
Database Management / Maintenance	Perform ArcSDE install/upgrade, versioning, compress/tune/config, replication; manage unstructured data; maintain geographic data layers and locators.
Mapping and Geoprocessing	Perform and automate functions such as mapping, reporting, spatial analysis, and geocoding. Also includes EOC support.
Program Management	Manage GIS program and coordinate distributed resources
Server Management - Operating System	Operating system configuration, patches; server monitoring
Server Management - Server-based GIS	Disk space management and GIS system configuration; GIS server software administration and configuration

Citywide GIS Function (Define)

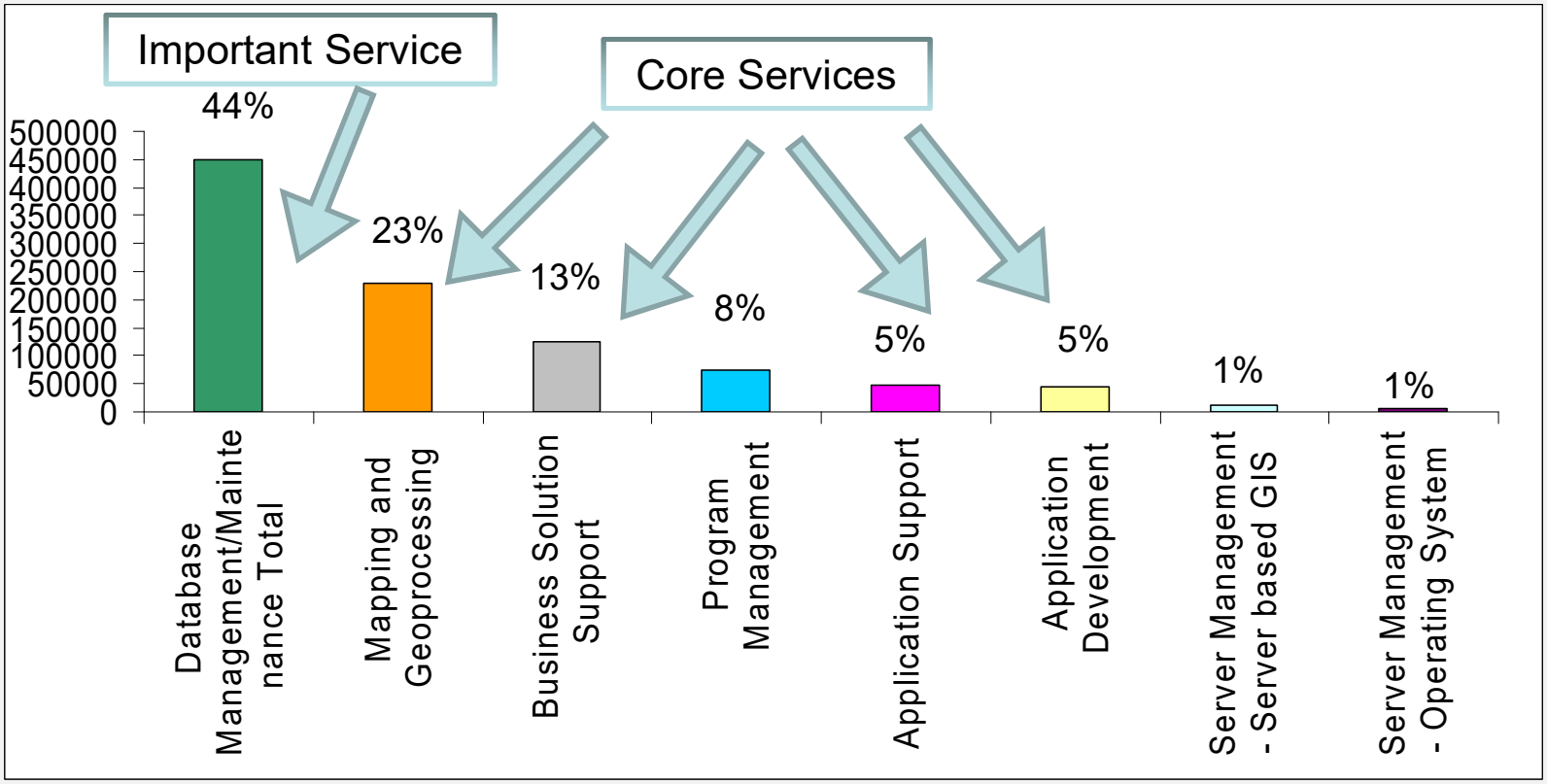
Hours by Business Process



Issues Impacting GIS (Define)

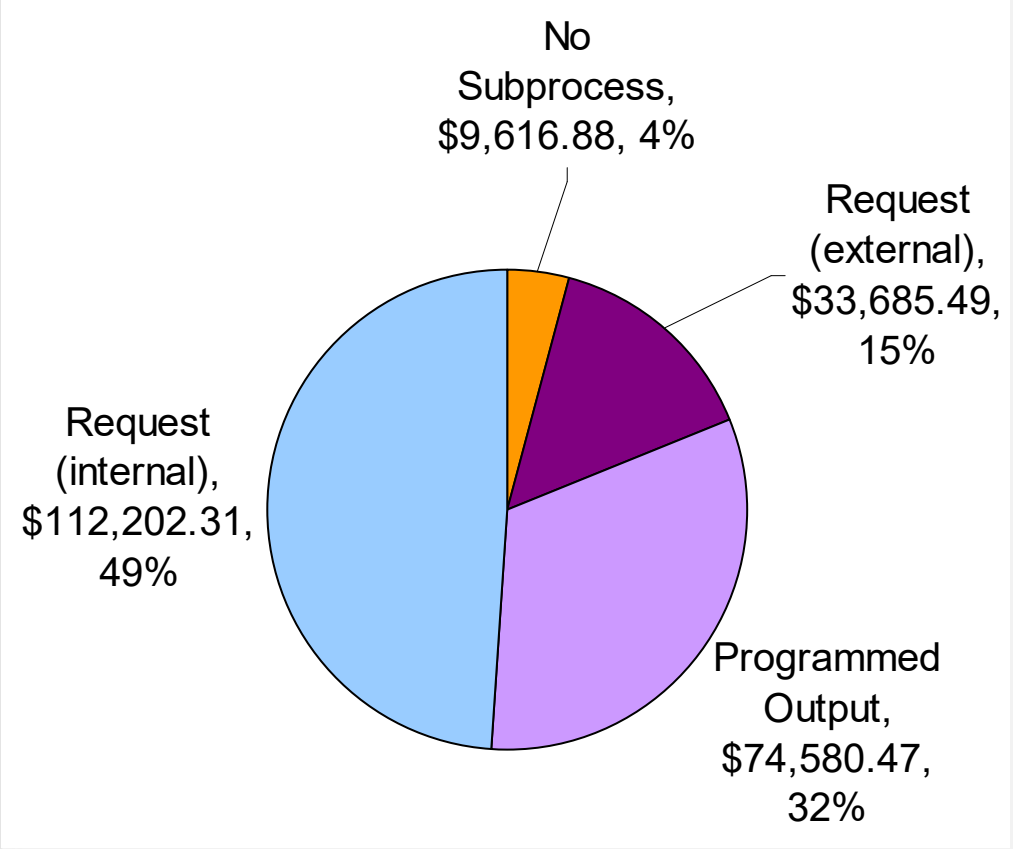
1. Competing priorities
2. Inefficient resource allocation
3. Ineffective enterprise GIS vision
4. Underutilization of GIS
5. Ineffective communication
6. Insufficient training for resources and end-users

Cost of Citywide GIS (Measure)



Total cost of service $989,012 (salary and benefits, no revenue offsets)

Output Costs (Measure)



25% of service cost

GIS Requests

- Emergency Operations Center (EOC)
- Internal (GIS depts)
- External (nonGIS depts)
- Programmed Output (scheduled, repeated)

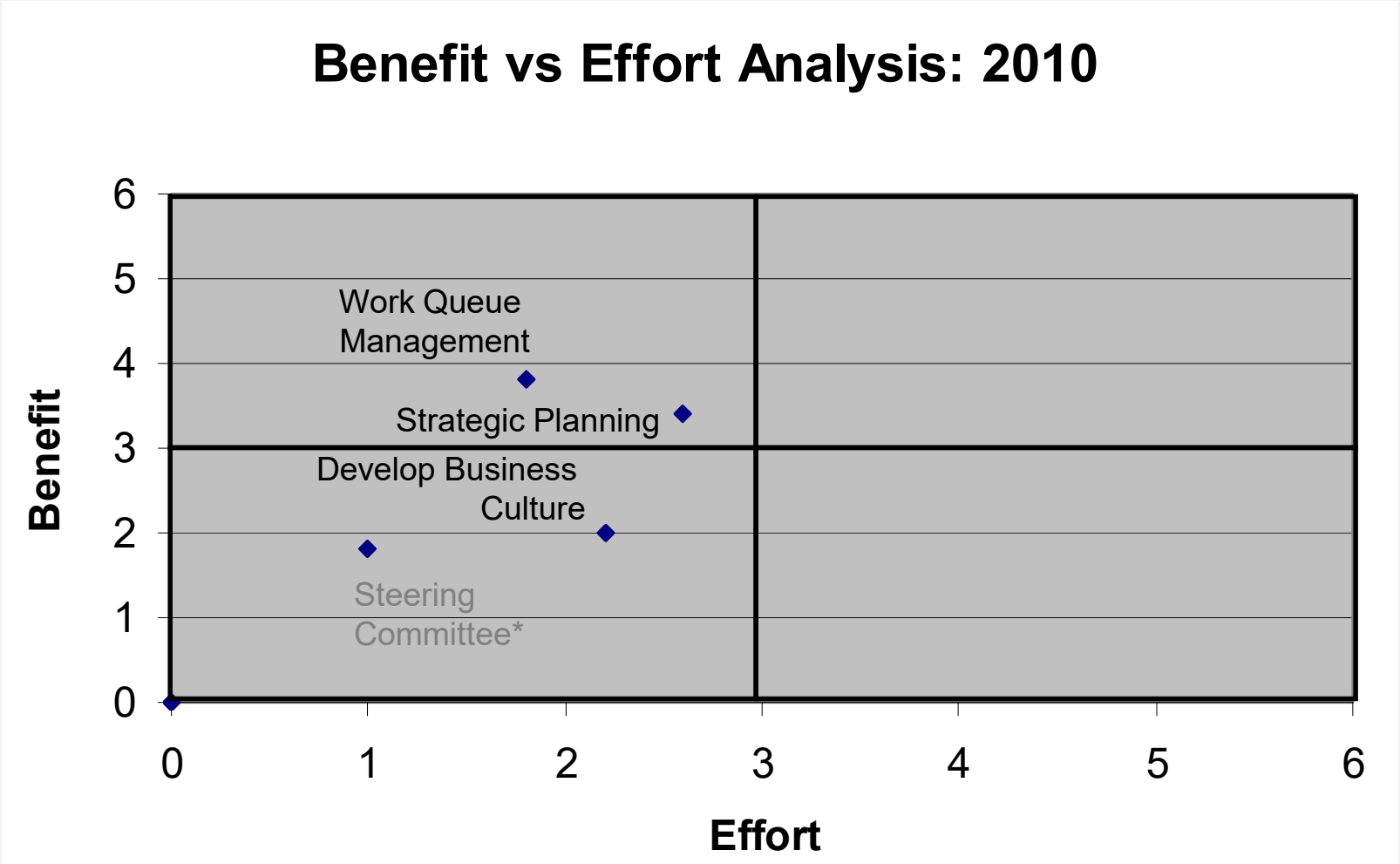
Root Cause (Analyze)

Issue	Cause	Changes
Competing Priorities	Not communicating with executive level Silo approach, dept-first/city-second view No management/core group oversight Reactive to external influences	Improved service
Inefficient Resource Allocation	Inconsistent awareness of need at management level Different reporting/financial structures Resources not cross-trained Inconsistent service model Tasks not in job description, no time/resources	Better work distribution Improved use of GIS resources
Ineffective Enterprise GIS Vision	Not demonstrating business value Focused on the immediate Not communicating at executive level	Engaged executives Clear direction

Solutions (Improve)

- Work Queue Management
  - Tools, performance measures
  - Filters/gates, oversight
  - Process redesign
- Strategic Planning
  - New vision, strategic/business plan
  - Organization structure (includes steering committee)
  - Needs assessment (customer voice)
- Develop Business Culture
  - Review task inventory/improve processes
  - Implement business model

Balanced Scorecard (Improve)



*Initially scored separate but now included in Develop Business Culture

Recommendations (Improve)

Working Team			
	Short (3 months)	**Mid (6 months)**	**Long (12 months)**
Work Queue Management	Tools Performance Measures Filters/gates	Process Redesigns	Oversight
Strategic Planning	Define Organization Create New Vision	Needs Assessment Communication Buy-in	Strategic/Business Plan
Develop Business Culture	Review Task Inventory	Process Improvements	Implement Business Model

Project plan and timeline required

Recommendations (Improve)

Program Manager*			
	Short (3 months)	**Mid (6 months)**	**Long (12 months)**
Redefine Core Team	Fulltime GIS resources	Baseline competencies	Redesign team

*Consensus has not been reached because of the following:

- Handling nonGIS responsibilities affected by realignment.
- Evaluation of risk/work disruption, effectiveness, implementation cost and time.
- Involvement of management to address related issues.

Changes to Date

- Realigned server operations
  - 103 Hours/$5,597 per year
- Reduced 2 part time positions
  - Environmental Utilities – Retirement
  - Information Technology – GIS intern

Still in discussion

- Team definition (roles, team boundaries)
- Requiring account numbers for requests
- Handling general versus enterprise fund
- Management decision – create smaller GIS footprint?

Conclusions

- Lean Six Sigma (LSS)
  - DMAIC process & toolset
  - Information and data-driven decision approach
- Consolidation/redesign process
  - Unclear expectations to some
  - Communication/buy-in are key
  - Consensus/non-consensus recommendations
- Presenting Options to Senior Management
  - What are the options?