Automated Meter Reading Implementation

Finance, Audit and Accountability Committee
Quality of Life Committee
August 15, 2006
Purpose

• Provide a recap to the committee of the development of an Automated Meter Reading (AMR) program

• Obtain committee recommendation to forward to full Council for award on August 23, 2006 a contract with Itron, Inc. for implementation of automatic meter reading
Background

• Department explored AMR implementation as part of its’ continuing efforts to improve efficiency and performance

• Objective was to determine if AMR would be more efficient and cost effective than manually reading water meters

• Pilot program was conducted on several types of AMR systems to aid in decision making for the type of system best for Dallas
Background, cont.

- Benefit analysis (2003) was performed on four options and submitted to City Auditor’s Office for their review, approval, and recommendations.
- Conclusion was to proceed with installations (commercial, industrial, residential) and initiate program in the Central Business District.
- Project update provided to Finance and Audit Committee May 24, 2004.
Background, cont.

- Request For Competitive Sealed Proposal advertised July 2004
  - Install AMR in the Central Business District and Fair Park/Deep Ellum communities
  - Provide estimated costs to install Fixed Network Data Collectors throughout the City of Dallas to provide ability to expand AMR in the future for existing accounts and new development
- ITRON selected as turn-key vendor October 2005
- 10 year revenue bonds were issued in April 2006 to fund this project
- Provided update to Committee on Privatization and Innovation June 2006
Project Services to be Provided by Itron

- Provide project management, engineering, installation, and training to support project implementation
- Provide all computer hardware and software for a Fixed Network
- Install 6 Cell Control Units (CCU) to collect data from meter endpoints and forward to host processor
- Provide and install AMR ready meters with endpoints (7,310 meters)
- Assist City in securing 1.4GHz FCC license
How Does a Fixed Network Operate?

• Information is transmitted by radio frequency from the meter endpoint to the solar powered collector unit
• Information is transmitted by cell phone frequency from the collector to the central host processor
• Central host processor interfaces to billing system
Fixed Network Architecture
Installation Example of Data Module
Project Cost

• Project cost of $3,750,580
  – Installation of AMR compatible meters
    $2,695,252 (includes all labor and materials)
  – Data modules - $874,444
  – Itron hardware/software - $180,884
Future Implementation

• Development of city-wide business case
• Perform analysis of revenue enhancement and potential cost savings related to Phase I
• Review advancements for data transmission
Future Implementation, cont.

• Review current business processes for changes needed as we migrate from manual meter reading to automated meter reading
  – Technical support and maintenance for meter endpoints and collectors
  – Host processor/software support
  – Customer service interface

• Continue to pursue innovative and cost effective methods to measure customer consumption
Recommendation

• Approve forwarding contract with Itron, Inc., in the amount of $3,750,580, for implementation of automated meter reading to full Council for award on August 23, 2006
Appendix
Selection Process

• Received four responses to RFCSP
  – Itron, Inc.
  – Datamatic
  – Northrop Grumman
  – Honeywell

• Selection committee composed of:
  – Maria Alicia Garcia, Director OFS
  – Charles Stringer, Assistant Director DWU
  – Andrea Gibbons, Sr. Project Manager CIS
Current Meter Reading Practice

• Process:
  – Meter reader drives to the start of the route and walks to each individual meter on the route
  – The meter read is entered into a hand-held device at each meter location
  – The data in hand-held the device must be downloaded and then transferred into the mainframe supported billing system
Current Meter Reading Practice, cont.

• Costs for meter reading only
  – Annually $2.6M
  – 55 meter readers and 11 water field representatives for industrial meters (costs include salaries, benefits and overtime)
  – Vehicle, mileage and fuel costs
  – Uniform costs

• Benefits
  – Low salary costs
  – High accuracy rate
Evolution of Meter Reading

- Manual Meter Reading
- Electronic Meter Reading
- Touchpad Meter Reading
- Mobile Automated Meter Reading
- Fixed Network Automated Meter Reading

DWU Current Practice
Meter Reader at Work
DWU Analyzed Six Options

- Convert Citywide to Fixed Network AMR
- Convert Citywide to Mobile System
- Convert the commercial customers only to Fixed Network AMR
- Convert the Central Business District to Fixed Network AMR
- Convert the Central Business District to Mobile*
- Convert commercial customers only to Mobile System*

* Options not included in cost benefit analysis
Definition of Options

- **Citywide** - Replace every meter on the water system including residential and commercial accounts. Use the Fixed Network or Mobile System. Approximately 304,000 meters.

- **Commercial** - Replace all commercial accounts with Fixed Network or Mobile system. Approximately 44,000 meters.

- **Central Business District (CBD)** - Replace only those meters in the CBD. Fixed Network only. Approximately 3,400 meters.
Automated Options
Mobile System

• Process:
  – Individual meters are retrofitted with a device that will transmit the meter read to a receiver
  – Vehicles are retrofitted with a receiver to collect the meter read data as the vehicle drives within a certain distance from the transmitter
  – A disk with meter reads is manually transferred to the billing system
Automated Options
Fixed Network System

• Process:
  • Individual meters are retrofitted with a device that will transfer the meter reads at pre-specified intervals to collection units on top of buildings or structures
  • Meter read data is then transmitted to host server
  • Server will transfer data to the billing system
Assumptions Used for All Options

• Economic Benefits of AMR
  – Reduce FTEs, salaries, and benefits (55 Meter Readers and 11 field employees)
  – Reduce costs associated with manual system
  – Early deposit of funds due to earlier billing and collecting

• Other Benefits
  – Potential for enhanced revenue as inaccurate meters are replaced

• Used a 20 year term for all options
• Compared the cost of the option to the manual system
• Used a 4.5% interest rate for financing cost
## Options Compared

<table>
<thead>
<tr>
<th>Option</th>
<th>Implementation Cost</th>
<th>No. of Meters</th>
<th>Positions</th>
<th>Results over 20 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Network City wide</td>
<td>$78M</td>
<td>300,000</td>
<td>Delete 66 positions</td>
<td>$30M Loss</td>
</tr>
<tr>
<td>Mobile System – City Wide</td>
<td>$72M</td>
<td>300,000</td>
<td>Delete 56 positions</td>
<td>$22M Loss</td>
</tr>
<tr>
<td>Fixed Network Commercial only</td>
<td>$20M</td>
<td>40,000</td>
<td>Delete 11 positions</td>
<td>$5M Loss</td>
</tr>
<tr>
<td>Fixed Network - Central Business District-only</td>
<td>$2M</td>
<td>3,300</td>
<td>Delete 2 positions</td>
<td>$0.5M Gain</td>
</tr>
</tbody>
</table>
## Options Comparison Findings

<table>
<thead>
<tr>
<th>Option</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Network - City wide</td>
<td>Initial cost high</td>
</tr>
<tr>
<td>Mobile System - City Wide</td>
<td>Initial cost high</td>
</tr>
<tr>
<td>Fixed Network - Commercial only</td>
<td>Staff reduction low</td>
</tr>
<tr>
<td>Fixed Network - Central Business District-only</td>
<td>Meter location concentrated, needs two meter readers for each meter. The most difficult and unsafe meters to read</td>
</tr>
</tbody>
</table>
Benefit Analysis Results for Citywide System

- **Cost for Automatic Fixed Network** $78M
  - Readings would be submitted to our system through radio waves

- **Cost for Automatic Mobile System** $72M
  - Readings would be gathered as an employee with an equipped vehicle drove through the area

- **Over 20 years the Automated Fixed Network System costs** $30M more than current manual system

- **Major cost impacts:**
  - Revenue bond funded over 20 yrs
  - Reduce staff by 66 positions
  - Only meter reader positions would be eliminated if the entire city is converted to an AMR system

*Presented to Finance and Audit Committee December 2003*