# 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
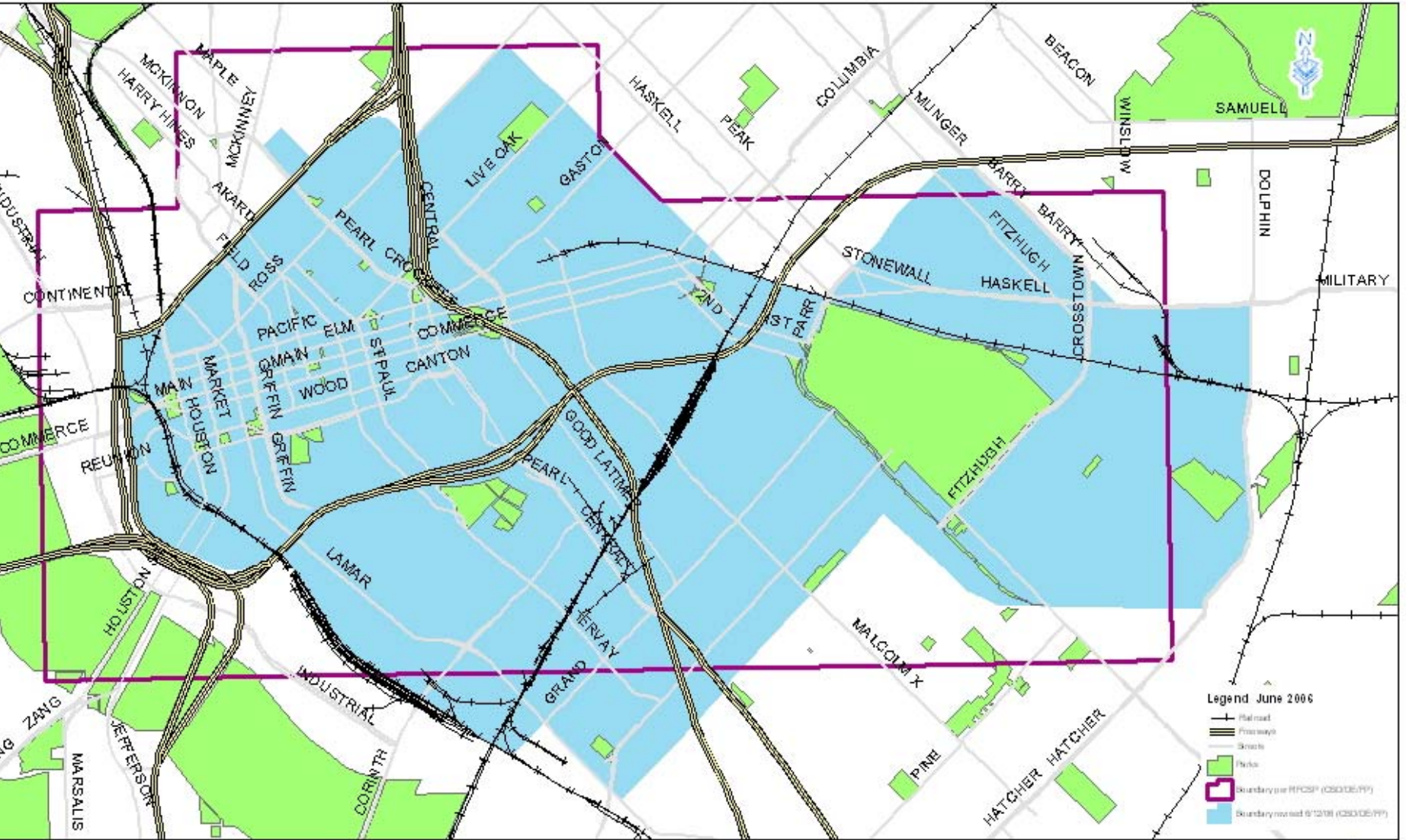
- Central host processor interfaces to billing system

# Fixed Network Architecture
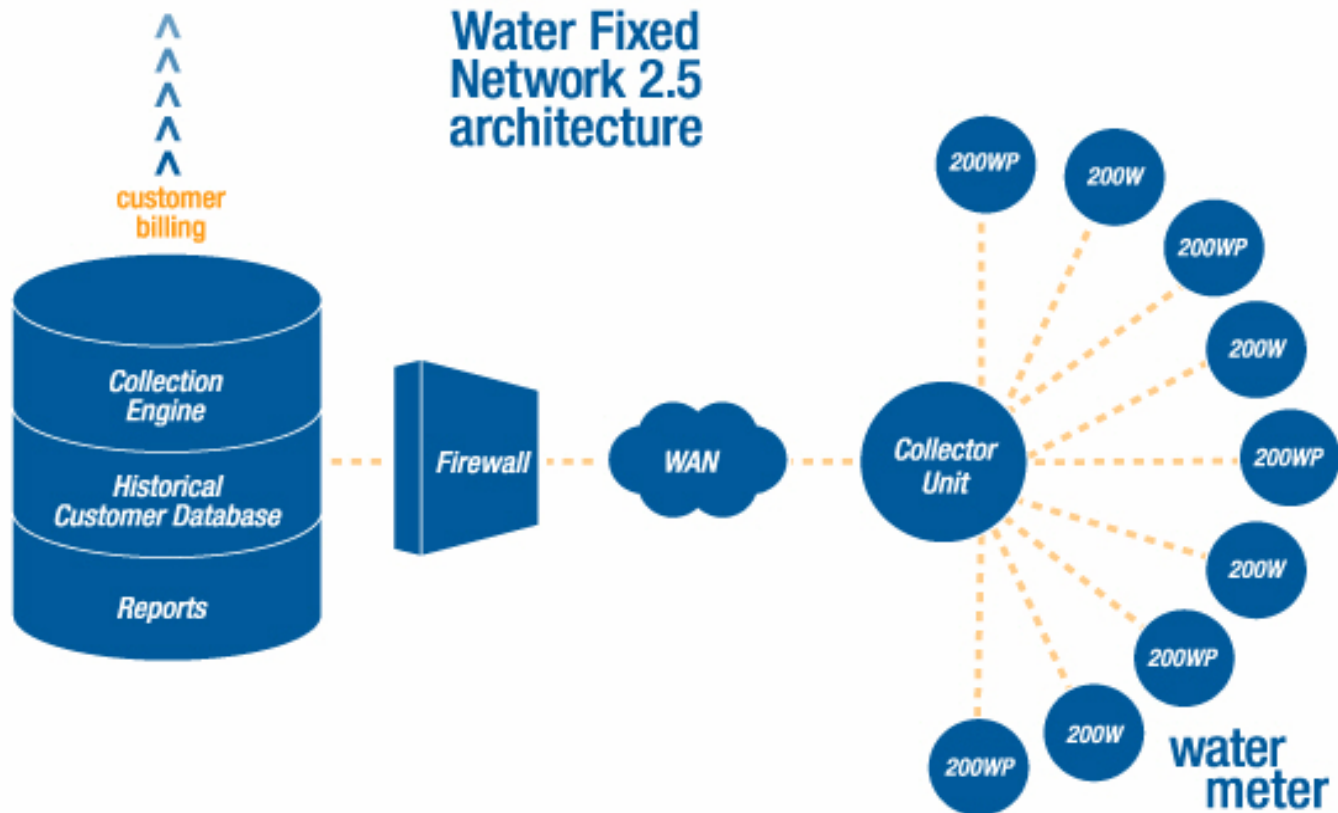
# Installation Example of Data Module

# AMR June 2006



**Legend June 2006**
- Railroad
- Freeways
- Streets
- Parks
- Boundary per RFPCSP (CSO/DE/PP)
- Boundary revised 6/12/06 (CSO/DE/PP)

# 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
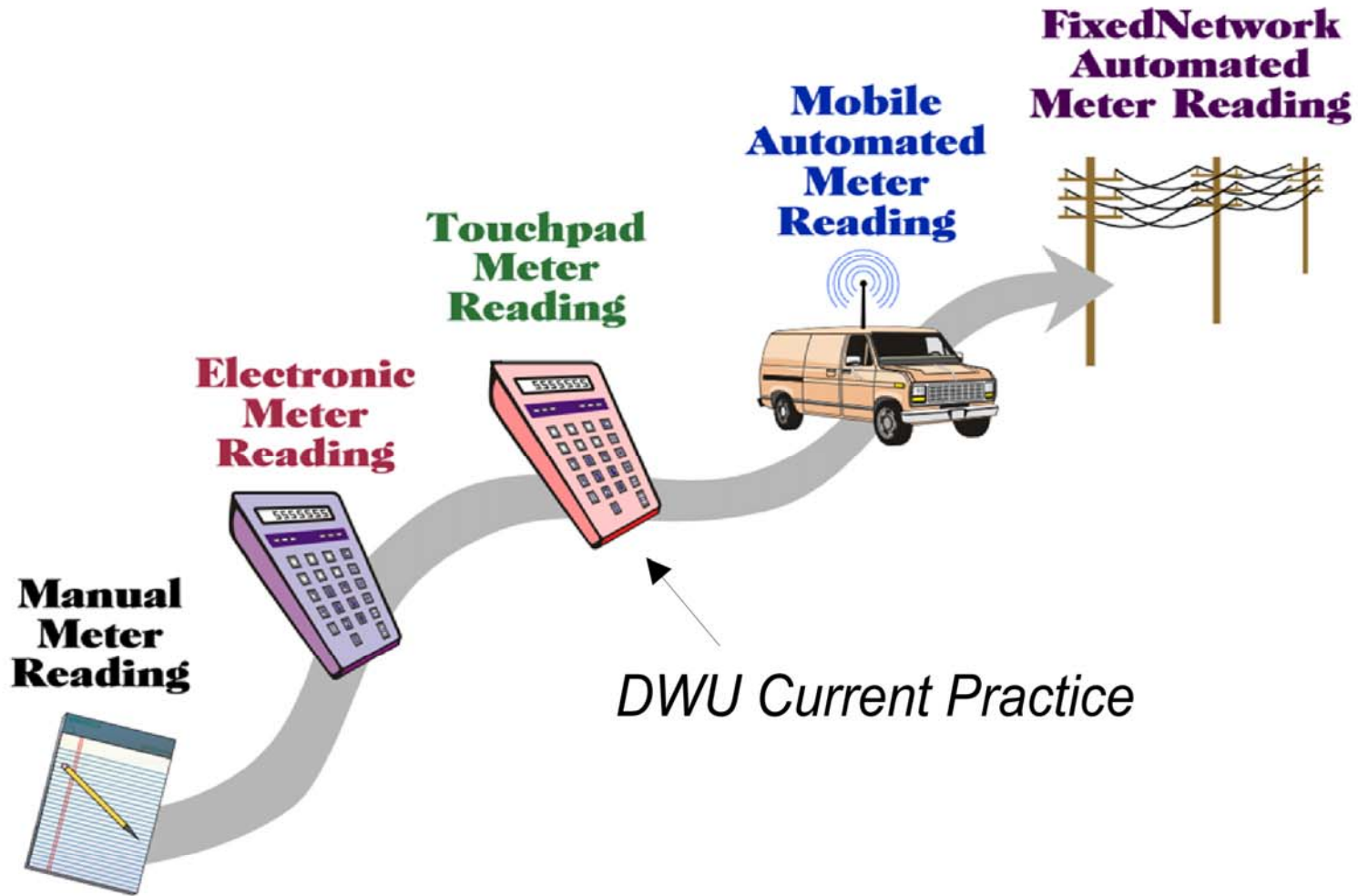  - Andrea Gibbons, Sr. Project Manager CIS

# 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 to 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 <u>meter reading only</u>
  - 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

**FixedNetwork Automated Meter Reading**

**Mobile Automated Meter Reading**

**Touchpad Meter Reading**

**Electronic Meter Reading**

**Manual 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

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

- <u>Commercial</u> - Replace all commercial accounts with Fixed Network or Mobile system. Approximately 44,000 meters

- <u>Central Business District (CBD</u>) - 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
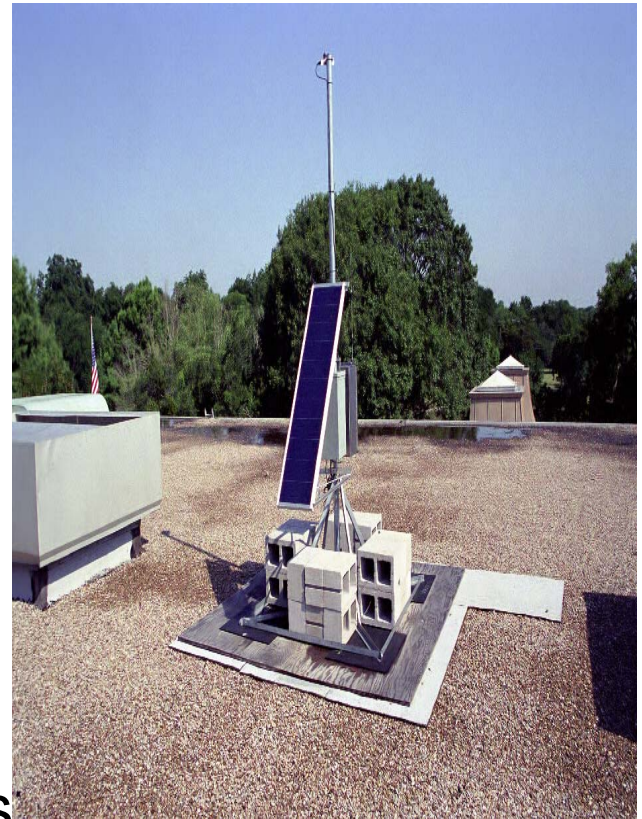
# Assumptions Used for All Options

- **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

| Option | Implementation Cost | No. of Meters | Positions | Results over 20 years |
|---|---|---|---|---|
| Fixed Network City wide | $78M | 300,000 | Delete 66 positions | $30M Loss |
| Mobile System – City Wide | $72M | 300,000 | Delete 56 positions | $22M Loss |
| Fixed Network Commercial only | $20M | 40,000 | Delete 11 positions | $5M Loss |
| Fixed Network -Central Business District-only | $2M | 3,300 | Delete 2 positions | $0.5M Gain |

# Options Comparison Findings

| Option | Results |
|---|---|
| Fixed Network - City wide | Initial cost high |
| Mobile System - City Wide | Initial cost high |
| Fixed Network - Commercial only | Staff reduction low |
| Fixed Network - Central Business District-only | Meter location concentrated, needs two meter readers for each meter. The most difficult and unsafe meters to read |

# 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