Automated Meter Reading Study and Installation

City of Marysville, Washington

Ken Alexander, P.E., Gray & Osborne, Inc.

Larry Larson, Public Works Superintendent, City of Marysville

Presentation Outline

- Background
- Study Objectives and Findings
- Request for Proposals
- Installation
- Operation

Background

- As of 2005 - 17,120 existing water connections
- Growing by 500 connections per year
- $2.5 million budget to implement AMR
- City's Original Goals
  - Immediate implementation over 2 - 3 years
  - Payback within 3 to 4 years
  - Fixed network AMR preferred, but Mobile AMR considered in analysis

Study Objectives

- Engineering Analysis
  - Screening Current AMR Technology
  - Life Cycle Costs for Various AMR Alternatives
- Financial Feasibility Study
  - Identify Current Meter Reading Costs as Baseline
  - Establish Key Assumptions
    - Meter Read Time
    - Meter Read Accuracy
    - Battery Life
  - Determine Net Present Value and Payback Periods for 3-5 Alternatives

Engineering Analysis

- Develop product screening criteria
- Evaluate specific products within criteria
- Identify preliminary costs (capital and O&M)

Engineering Evaluation Results – Fixed AMR

Fixed Network System	Water Service Meter and Register	Meter Transmitter Unit	Fixed Network Products	MFR	Total Score	Adequately Meets Criteria?
Arkion	12	12	10	6	**40**	No
Badger	12	7	6	13	**38**	No
Hexagram	12	15	12	15	**54**	**Yes**
Itron	12	11	8	15	**46**	No
Sensus	12	13	15	15	**55**	**Yes**
Possible Points	**12**	**20**	**17**	**15**	**64**	

Engineering Evaluation Results – Mobile AMR

Mobile Radio System	Water Service Meter and Register	Meter Transmitter Unit	Mobile Radio Products	Manufacturer	Total Score	Adequately Meets Criteria?
Badger	12	8	16	13	**49**	No
Datamatic	12	14	7	10	**43**	No
Itron	12	15	16	15	**58**	**Yes**
Master Meter	12	8	14	13	**47**	No
Neptune	12	14	14	15	**55**	**Yes**
Performance Meter	12	13	10	11	**46**	No
Sensus	12	15	16	15	**58**	**Yes**
Possible Points	**12**	**24**	**17**	**15**	**68**	

Financial Feasibility Study – Summary

Net Present Value for Immediate Implementation

Meter Reading System	NPV of Life Cycle Costs
Manual Read (Baseline)	$2,650,000
Mobile Read AMCO/Itron	$3,336,000
Mobile Read Neptune	$3,746,000
Mobile Read Sensus	$3,712,000
Fixed Network AMCO/Hexagram	$3,200,000
Fixed Network Sensus	$4,121,000

Financial Feasibility Study – Summary

Estimated Payback for Limited Implementation

AMR System	Data Collection System Cost	Payback in Years
Mobile Read AMCO/Itron	$30,000	8
Mobile Read Neptune	$45,000	9
Mobile Read Sensus	$32,500	6
Fixed Network AMCO/Hexagram	$193,500	16
Fixed Network Sensus	$186,500	17

A payback period of < 20 years indicates capital costs associated with installing collection components are less than the savings resulting from using AMR to read these meters.

Request for Proposals

- Fixed Network System
  - Data Collection Units + Billing Software Modifications
  - Performance Based Procurement – AMR Vendor Designs AMR Infrastructure
  - Procurement, Installation, Commissioning and Training under One Contract
- AMR Capable Meters
  - Initial Procurement of 3,000 AMR Capable Meters (new meters, registers and Meter Transmitting Units)
  - Two Follow-on Meter Procurements

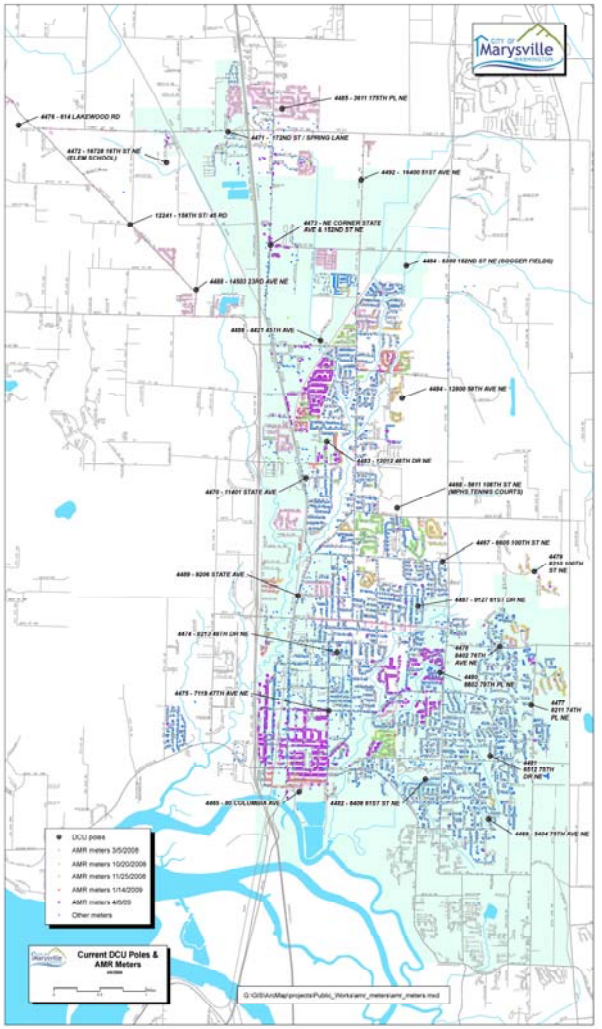
Installation

- Fixed Network Infrastructure
  - Contract Signed with Hexagram June 2006
  - Substantial Completion March 2007
  - Originally planned for 25 DCUs, currently have 27
- Phased Installation of AMR Meter Sets
  - 2007 (Phase 1) AMR infrastructure and 3,000 meters/MTU's – ($509K)
  - 2008 (Phase 2) 8,220 meters/MTU's-combination of single and dual port – ($1.234K))
  - 2009 (Phase 3) 4,500 Meters/MTU's – combination of single and dual port – ($833K)
  - 2010 (Final Phase) – All remaining meters installed

Installation

Meter Transmitter Unit (Dual Meter) + Meters and Registers

Installation



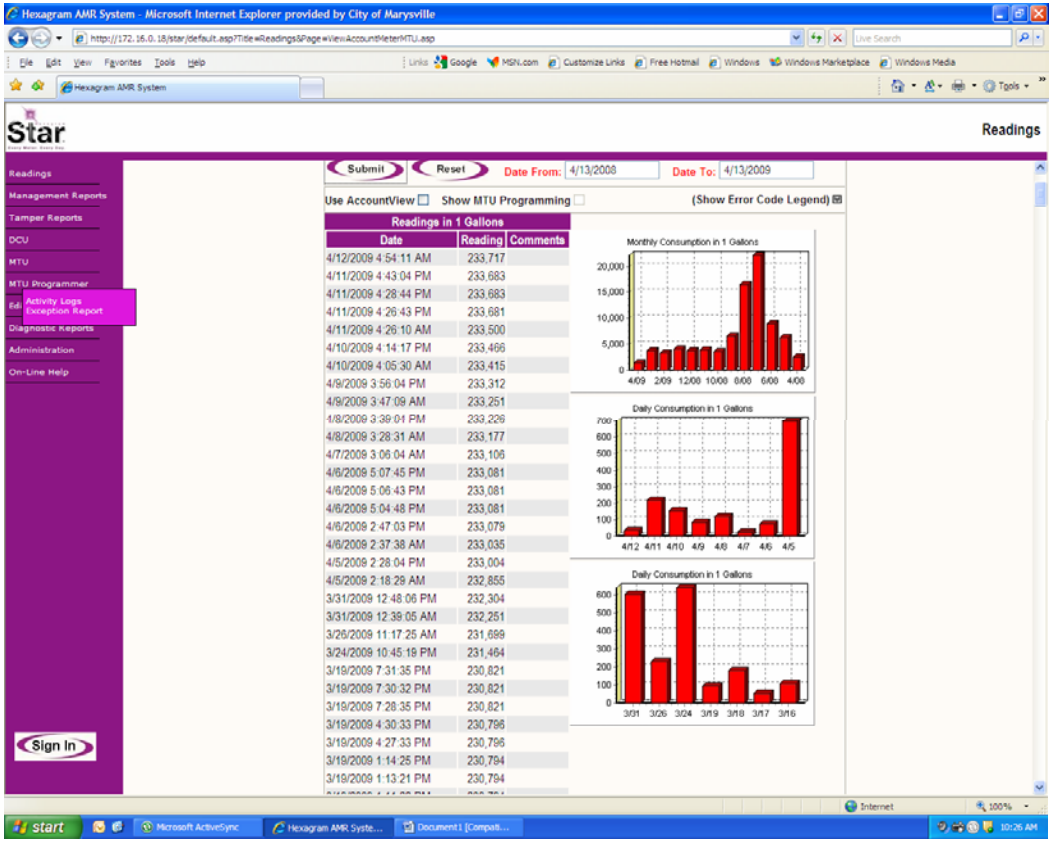
Data Collection Units (27 DCUs Total)

Operation & Maintenance

- Fixed Network System
  - Began operation early 2007
  - Substantial Completion March 2007
  - Verizon wireless bill - $500/month
- AMR Capable Meters
  - No significant problems with MTUs
  - City installs and programs all meters/MTUs with City Staff and temporary hires
  - Reduced meter reading staff to one person

Operation & Maintenance

- Diagnostics
  - Easily detects leaks
  - Easy to turn off/on remotely
- Billing
  - Easier to resolve billing disputes
  - Industrial use profiles



Summary

- Fixed Network System and ~18,000 connections Cost to Date = $2.576 million (original budget $2.5 million for 17,120 connections)
- Fixed Network Data Collection System in Operation 2 Years - No Significant Operating Problems
- Fixed Network has Low Operating Cost (less than 3¢/connection per month)
- Improved Water Use Diagnostics/Billing