



CITY OF BOYNTON BEACH AGENDA ITEM REQUEST FORM

COMMISSION MEETING DATE: April 17, 2012

NATURE OF AGENDA ITEM	☐	OPENINGS	☐	PUBLIC HEARING
	☐	OTHER	☒	CITY MANAGER'S REPORT
	☐	ANNOUNCEMENTS/PRESENTATIONS	☐	UNFINISHED BUSINESS
	☐	ADMINISTRATIVE	☐	NEW BUSINESS
	☐	CONSENT AGENDA	☐	LEGAL
	☐	BIDS AND PURCHASES OVER \$100,000	☐	FUTURE AGENDA ITEMS
	☐	CODE COMPLIANCE AND LEGAL SETTLEMENTS		

REQUESTED ACTION BY CITY COMMISSION: PROPOSED RESOLUTION NO. R12-038 - Approve proceeding with a negotiated settlement and agreement with Sensus Metering Systems, Inc. (Sensus) to replace current and future failed registers of Automated Meter Reading (AMR) systems under warranty with Advanced Metering Infrastructure (AMI) in exchange for the development of a contract/service agreement with Sensus as a sole source provider to replace all AMR units with AMI technology in order to standardize meter reading equipment and regain meter reading efficiency.

EXPLANATION OF REQUEST: The City currently operates a Sensus based AMR (Drive by Radio Read) system that was installed in the late 1990s and early 2000s that is quickly reaching the end of its useful life. However, a majority, but not all, of these meter registers are still under warranty.

Meter reading equipment failures (not the Sensus meters themselves) have grown significantly since 2006 and provide a significant liability to City staff for the required supplemental manual reading necessary to cover unheard meters. The unheard meter level has reached a point of critical mass whereby warranty replacement no longer will meet the growing demands for meter maintenance when coupled with requirements for typical work order management associated with the operations.

With the meter reading equipment reaching the end of its operational life, the City must take immediate action regarding its meter infrastructure and establish plans to implement a migration strategy that begins to lower the number of manual reads required within each reading cycle.

Is Sensus a Sole Source Provider?

If the City were to merely replace the current and future failing AMR (Drive by Radio Read) registers with the same Sensus product, there would be little question that the City would make the replacement with the Sensus product since some registers are currently under warranty. The AMR registers are stored in our Warehouse as replacement parts. However, the sole source question arises when we explored replacing the Sensus AMR registers with the upgraded Sensus AMI registers as this is not currently addressed in our City Procurement policies. This is even confirmed by the attached letter from the County Inspector General who we asked to review our plan. However, the Inspector General did not consider the following Business Case or operating efficiencies.

Business Case to Select SENSUS as Sole Source Provider

During 2011, the City engaged the services of a consulting firm, DavenportLawrence, to assess the operational components of the City's billing and collections operations within the Finance Department. Following months of observation, research, and analysis, the firm provided a findings report to the City that prioritized meter infrastructure re-design and upgrade as the most important and immediate need.

Because so many functions rely on the efficiency and accuracy of the work by Utility's Meter Services Department, the business case for migrating the City's Sensus AMR/RadioRead meter reading infrastructure to the Sensus AMI/FlexNet meter reading infrastructure solution was both the best operational and the best financial option for the City. The following is a statement of the financial values of the recommended solution:

Value Statement	Opportunity	Financial Impact	Summary of Value
Value Statement 1	Value of Warranty	\$525,000	6,000 endpoints at \$87.50 eliminated from cost. Does not include future warranty replacement value. Existing failure rate is 630 units per month at a value of \$87.50 per failed unit and \$15 for labor on installation.
Value Statement 2	Leveraged Pricing	\$637,500	Midpoint reduced pricing difference for similar AMI meter reading infrastructure projects saving \$21.25/unit.
Value Statement 3	SENSUS Special Provisions	\$580,322	Equipment credit of \$370,322, credit for full cost of 2 Tower Gateway Base stations valued at \$120,000, and \$90,000 for warranty labor. Labor credits allowed for future failures are not included in value calculation but available through provisions agreement.
Value Statement 4	Integration with Customer Information System	\$45,000	Estimated deferred cost for customized integration with CIS by new vendor.
Value Statement 5	Cost Reductions and Enhanced Revenue	\$175,000	FTE reductions and reallocations for Utility meter reading. Additionally, AMI improves meter reading accuracy, and enhances collections efforts thereby lowering delinquencies (currently more than 32% of receivables)
Total	Financial Value Utilizing SENSUS as a Sole Source	<u>\$1,962,822</u>	This total value is based on the current state of operations and agreements and does not project future anticipated value from warranty replacements and account delinquency reductions.

In addition, if Sensus were not selected as the sole source provider for the meter reading infrastructure, it would likely require the complete replacement of the water meters in addition to the meter reading infrastructure at several times the cost and time needed; neither of which the City can afford at this stage.

Sensus as a Sole Source

A sole source procurement approach for Advanced Meter Infrastructure (AMI) was selected based on a number of contributing factors that support the need to maintain compatibility with Sensus meters currently installed in the City service area throughout the multi-year migration from AMR to AMI. In addition, Sensus is chosen based on:

- Warranty utilization to replace AMR meter reading technology at no cost.
- Interface with Sungard billing software not integrated with all other vendors.
- AMR/AMI integrated meter reading not available through other vendors.

Summary of Financial & Operational Impacts

The City (1) considered a number of options related to the activities necessary to improve the automated read-rate of approximately 30,000 meters and (2) researched the costs and benefits of each alternative. The financial and operational evaluation includes consideration of other aspects (training costs, data conversion, historical record archive retrieval, equipment standardization, and hardware and software interfaces) and a discussion of regulatory, personnel, and customer relations issues.

Options for improving efficiency and effectiveness of meter infrastructure considered:

- Option A: Replacement, at cost, of failed meter transmitters and registers within existing work demands including troubleshooting and manual reads
- Option B: Bid and award alternative vendor AMR technology
- Option C: Bid and award AMI technology
- Option D: Extend agreement with Sensus and apply migration over three years

Option	Operational/Financial Impact Level	Primary Conditions of Solution
A: AMR SENSUS	HIGH/HIGH	Sensus RadioRead has a high failure rate and is no longer promoted by the company as an alternative automated solution. Labor costs are extremely high with RadioRead. If reliability was improved from 20% to a 6% failure rate the annual cost for labor is estimated at \$36,000 per month or \$432,000 per year. Receivables continue to increase due to hampered collection efforts.
B: AMR BID	HIGH/HIGH	Bid and selection for AMR is an option but would require a full transmitter change out and integration at a high cost. Dual read of incompatible systems would create challenges within Meter Services and risks associated with Customer Information System (CIS). Estimated costs for AMR through a new vendor would exceed CIP funding allocations.
C: AMI BID	MODERATE/HIGH	On-going operational costs would be comparable to Sensus but CIS integration would present operational challenges and full migration costs would exceed current CIP funding allocations.
D: AMI SENSUS	MODERATE/MODERATE	Reliability is achieved at less than a 1.5% failure rate, dramatically reducing labor costs associated with manual reads and troubleshooting. Estimated cost for deployment of Sensus AMI is less than current CIP funding. Delinquent receivables will reduce dramatically as field crews have significant capacity increases for account management.

Sensus AMI Performance

While recognizing the failure rate within the AMR/RadioRead environment, Sensus is regarded as a significant and reliable provider of AMI meter reading technology. With over 21% of the market share in smart meter technology, the AMI FlexNet solution is deemed a significant improvement alternative to manual and RadioRead operations while meeting stringent reliability standards not currently available to customers of AMR.

The stated performance rate supported by Sensus for the City's AMI FlexNet project is 98.5% reliability for each of the transmission periods every six hours of each day and has been field

verified by other AMI users for performance. For successful migration, the system must perform seamlessly under concurrently operating AMR and AMI as a mixed system utilizing the same technology with a common interface to the City's CIS.

HOW WILL THIS AFFECT CITY PROGRAMS OR SERVICES? With an existing failure rate of approximately 20% or 6,000 meter registers of the total 30,000 and growing, Meter Services employees can no longer manage the current state of the meter reading system and back office employees can no longer effectively manage billing and collections operations.

In consideration of all conditions and components of a comprehensive meter migration to AMI technology, the City project team has indicated that a long-term solution for utility meter reading should be approached to minimize both cost and operational impacts. Evaluation of all options independently and without bias has uncovered a clear direction of choice for moving the infrastructure to high performance.

Given the following values of:

- warranty upgrades,
- improved utility revenues,
- special provisions by Sensus,
- favorable unit cost allocations,
- integration simplicity with the Customer Information System, and
- consideration for impacts to operations,

The best solution for the City is to migrate to AMI/FlexNet with Sensus. By eliminating the need for development and implementation of a procurement process, the City gains critical time in reversing the trend of failed meters that require manual reads causing resources to be expended beyond capacity. The proposed solution and migration agreement with Sensus will include specific performance parameters and milestones to ensure efficient and effective operation of the system and adherence to the planned project goals and objectives.

FISCAL IMPACT: Sensus has agreed to work quickly with the City of Boynton Beach to resolve the approximately 6,000 unheard (unread) meters with new AMI product deployment between now and September 30th of 2012 through warranty replacement in parallel to product credit utilization of \$185,161. This parallel initial change-out phase will provide the ability of the City to shift approximately 9,000 meters, or 30% of the entire City system, for only the cost of installation of the credit portion of the phase. It is estimated that the labor component will not exceed \$66,000 at \$20 per meter endpoint and is fully funded through the current fiscal year CIP for meter replacements.

The financial and operational benefits of the Sensus AMI/FlexNet solution provides a clear direction for the City to immediately address major operational impacts resulting from the current automated system.

Elimination of practically all manual reads and related troubleshooting work orders will allow City resources to re-direct limited staff to supporting account management orders from Customer Relations. City staff has mapped a process for meter migration that maximizes the operational and financial benefits of a continued relationship with Sensus through sole sourced agreement.

Project Schedule with Funding Allocations

The project is funded in the 2011-2012 CIP Adopted Budget for \$3,121,000 over the next two years. The following schedule anticipates a three (3) plus year migration and the related costs net of Sensus warranty replacement costs.

Project Milestone	Units Installed	Equipment Costs	Labor Costs	Total Costs	Milestone Notes
Project Planning Infrastructure Design May, 2012	0	\$ 6,500	\$ 25,000	\$ 31,500	The City will select a qualified firm to provide pre-deployment planning services and project management infrastructure.
Year 1 - Through September 30, 2012	9,000	\$ -	\$ 66,000	\$ 66,000	Installation of warranty replacement upgrades and first year credit utilization.
Year 2 - Through September, 2013	7,000	\$ 427,339	\$ 140,000	\$ 567,339	Assuming completion of credit utilization at \$185,161
Year 3 - Through September, 2014	7,500	\$ 656,250	\$ 150,000	\$ 806,250	Meets minimum purchase requirements as contained in project plan.
Year 4 - Through September, 2015	6,600	\$ 577,500	\$ 132,000	\$ 709,500	Meets minimum purchase requirements as contained in project plan.
Subtotal	30,100	\$ 1,667,589	\$ 513,000	\$ 2,180,589	AMR to AMI Equipment Migration Only
Added CIP Costs - FY 2012 & 2013	0	\$ 85,000	\$ 165,000	\$ 250,000	Includes tower construction-\$15,000, added IT data storage-\$50,000, added IT equipment costs-\$20,000. Labor costs includes IT contract labor costs-\$65,000 plus migration project management-\$100,000
Contingency 10% of above Subtotal plus added CIP costs	0	\$ 175,259	\$ 67,800	\$ 243,059	Included for project overruns, labor adjustments, excessive register repair, etc.
Total	30,100	\$ 1,927,848	\$ 745,800	\$ 2,673,648	Total of \$2,673,648 compared to the adopted \$3,121,000 CIP allocation for an estimated project under run of \$447,352.

The AMI FlexNet IT operating costs ranges from \$80,000 to \$90,000 annually. These costs may be offset in part by a limited reduction in meter staffing.

ALTERNATIVES: Not to proceed with a negotiated settlement and agreement with Sensus Metering Systems, Inc. or to replace current and future failed registers of automated meter reading (AMR) systems under warranty with advanced metering infrastructure (AMI).

Not recommended since time is of the essence to replace the continually failing registers of automated meter reading (AMR) systems under warranty with advanced metering infrastructure (AMI) in order to efficiently and effectively read water meters on a timely basis to protect Utility revenue for water consumption and the resulting billing.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29

RESOLUTION NO. R12-038

A RESOLUTION OF THE CITY OF BOYNTON BEACH, FLORIDA, APPROVING PROCEEDING WITH A NEGOTIATED SETTLEMENT AND AGREEMENT WITH SENSUS USA, INC., TO REPLACE CURRENT AND FUTURE FAILED REGISTERS OF AUTOMATED METER READING (AMR) SYSTEMS UNDER WARRANTY WITH ADVANCED METERING INFRASTRUCTURE (AMI); AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City currently operates a Sensus based AMR system that was installed in the late 1990s and early 2000s that is quickly reaching the end of its useful life; and

WHEREAS, City staff has negotiated a settlement and agreement with Sensus USA, Inc., to replace current and future failed registers of Automated Meter Reading (AMR) systems under warranty with Advanced Metering Infrastructure (AMI) in exchange for the development of a contract/service agreement with Sensus as a sole source provider to replace all AMR units with AMI technology in order to standardize meter reading equipment and regain meter reading efficiency; and

WHEREAS, upon recommendation of staff, the City Commission has determined that it is in the best interest of the residents and citizens of the City of Boynton Beach to proceed with a negotiated settlement and agreement with Sensus USA, Inc., to replace current and future failed registers of Automated Meter Reading (AMR) systems under warranty with Advanced Metering Infrastructure (AMI).

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF BOYNTON BEACH, FLORIDA, THAT:

Section 1. The foregoing "Whereas" clauses are hereby ratified and confirmed as being true and correct.

1 Section 2. The City Commission of the City of Boynton Beach, Florida, hereby
2 approves proceeding with a negotiated settlement and agreement with Sensus USA, Inc., to
3 replace current and future failed registers of Automated Meter Reading (AMR) systems under
4 warranty with Advanced Metering Infrastructure (AMI), a copy of the project plan is attached
5 hereto as Exhibit "A".

6 Section 3. That this Resolution shall become effective immediately.

7 **PASSED AND ADOPTED** this 17th day of April, 2012.

8 CITY OF BOYNTON BEACH

9
10 Woodrow L. Hay
11 Mayor - Woodrow L. Hay

12
13 William Orlove
14 Vice Mayor - William Orlove

15
16 Mack McCray
17 Commissioner - Mack McCray

18
19 Steven Holzman
20 Commissioner - Steven Holzman

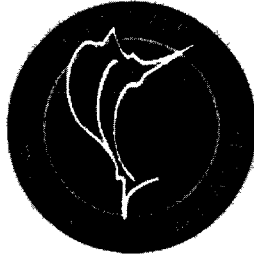
21
22 Marlene Ross
23 Commissioner - Marlene Ross

24 ATTEST:

25
26 Janet M. Prainito
27 Janet M. Prainito, MMC
28 City Clerk



CITY OF BOYNTON BEACH, FLORIDA



Advanced Meter Infrastructure Project Basis

Migration from AMR to AMI for the City of Boynton Beach

Prepared in cooperation with DavenportLawrence, Inc

2/15/2012

The migration of Automated Meter Reading (AMR) to Advanced Meter Infrastructure (AMI) requires a unique balance of financial, operational, and procedural components aligned for uninterrupted operation of meter reading functions. The City of Boynton Beach is positioned well to take full advantage of advanced technologies in order to manage utility operations proficiently while focusing on quality customer service.

ADVANCED METER INFRASTRUCTURE PROJECT BASIS
MIGRATION FROM AMR TO AMI

TABLE OF CONTENTS

<u>Subject</u>	<u>Page Number</u>
Cover	1
Table of Contents.....	2
Executive Summary: Overview and Basis for Sole Source Migration from AMR to AMI	
Project Basis.....	3
Summary of Business Case.....	3
History	4
Value Statement 1 Warranty.....	5
Value Statement 2 Leveraged Pricing.....	5
Value Statement 3: Sensus Special Provisions.....	6
Value Statement 4: Integration with Billing/Collections & Work Order Management.....	6
Value Statement 5: Cost Reductions and Enhanced Utility Revenue.....	7
Sensus AMI Performance.....	8
Summary of Options – Financial and Operational Impacts.....	8
Solution Summary	9
Appendix A	
Sole Source Determination with Sensus for AMI Infrastructure.....	10
Sensus as a Sole Source.....	10
Appendix B	
AMI Project Goals, Parameters, and Basis	11
Recommendations for Migration Activities	11-14
Appendix C	
Technical Specifications of AMI / FlexNet	15-23
Appendix D	
Propagation Analysis Summary and System Overview.....	24
Appendix E	
Key Terms and Conditions for AMI Through Sensus for the City of Boynton Beach.....	25

EXECUTIVE SUMMARY: OVERVIEW AND BASIS FOR SOLE SOURCE MIGRATION FROM AMR TO AMI FOR THE CITY OF BOYNTON BEACH

PROJECT BASIS

The City of Boynton Beach currently operates a SENSUS based AMR RadioRead system that is quickly reaching the end of its useful life. Meter reading equipment failures have grown significantly since 2006 and provide a significant liability to City staff for the required supplemental manual reading necessary to cover unheard meters. The unheard meter level has reached a point of critical mass whereby warranty replacement no longer will meet the growing demands for meter maintenance when coupled with requirements for typical work order management associated with the operation of a utility. With an existing failure rate of approximately 20% or 6,000 meters, Meter Services employees can no longer manage the current state of the meter system and back office employees can no longer effectively manage billing and collections operations. With the equipment reaching the end of its operational life, the City of Boynton Beach must take immediate action regarding its meter infrastructure and establish plans to implement a migration strategy that begins to lower the number of manual reads required within each reading cycle.

SUMMARY OF BUSINESS CASE

During the early part of 2011, the City of Boynton Beach engaged the services of DavenportLawrence to assess the operational components of the City's billing and collections operations within the Finance Department. Following months of observation, research, and analysis, the advisory firm provided a findings report to the City that prioritized meter infrastructure re-design and upgrade as the most important and immediate need within the organization. Because so many functions rely on the efficiency and accuracy of the work by Meter Services, the business case for migrating the City's AMR/RadioRead meter infrastructure to the SENSUS AMI/FlexNet solution was both the best operational and the best financial option for the City. The following is a statement of the financial values of the recommended solution:

Value Statement	Opportunity	Financial Impact	Summary of Value
Value Statement 1	Value of Warranty	\$525,000	6,000 endpoints at \$87.50 eliminated from cost. Does not include future warranty replacement value. Existing failure rate is 630 units per month at a value of \$87.50 per failed unit and \$15 for labor on installation.
Value Statement 2	Leveraged Pricing	\$637,500	Midpoint pricing difference for similar AMI projects saving \$21.25/unit.
Value Statement 3	SENSUS Special Provisions	\$580,322	Equipment credit of \$370,322, credit for full cost of 2 Tower Gateway Basestations valued at \$120,000, and \$90,000 for warranty labor. Labor credits allowed for future failures are not included in value calculation but available through provisions agreement.
Value Statement 4	Integration with Customer Information System	\$45,000	Estimated deferred cost for customized integration with CIS by new vendor.
Value Statement 5	Cost Reductions and Enhanced Revenue	\$175,000	FTE reductions/reallocations for meter reading. Additionally, AMI improves meter reading accuracy, and enhances collections efforts thereby lowering delinquencies (currently more than 32% of receivables).
Total	Financial Value Utilizing Sole Source	\$1,962,822	This total value is based on the current state of operations and agreements and does not project future anticipated value from warranty replacements and account delinquency reductions.

HISTORY

The process of collecting user consumption data may be the single most important accuracy function of utilities for the sustainable management of service delivery to customers of the utility. The Meter Reading and Services Group for the City of Boynton Beach is responsible for collecting consumption data from approximately 34,000 accounts through 16 reading cycles each month. The diversity of tasks within the Meter Reading and Services Group requires a meter infrastructure that is highly reliable, efficient, and accurate in order to maintain customer satisfaction, proficiency in revenue collection, and the ability to manage field work orders appropriately. Unfortunately, the current operational condition of the City's meter infrastructure is causing operational impacts to service quality, revenue collection, work order management, and employee morale that is unmanageable as the meter system exists today.

Sensus began providing TouchRead infrastructure to the City of Boynton Beach through a piggy-backed contract originating with Seacoast Utilities effective August 5, 1997 and by a transition to Automated Meter Reading (AMR) in early 2000 through a piggy-backed contract originating with Clay County Utility Authority. Deployment of AMR began in 2001 and was concluded by the close of 2005.

The City of Boynton Beach implemented the SENSUS AMR infrastructure based on the understanding that the technology would allow the City to realize lower operational costs and higher read accuracy within the Meter Reading and Services group as well as improved safety in areas of high traffic congestion. Based on the commitments and benefits represented by SENSUS, the City made a capital investment of more than \$2 million in SENSUS TouchRead/RadioRead technology.

Equipment Distribution Type - City of Boynton Beach Utilities

MXU Style	Count	Percentage of Total
505C	16,874	56.17%
520R	7,675	25.55%
505B	5,489	18.27%
Unknown	1	0.00%
Grand Total	30,039	100.00%

The piggyback contract with Sensus executed by the City of Boynton Beach in 1997 and again in 2000 provides for certain warranty coverage specific to the type of equipment utilized. For the City of Boynton Beach the following allowances are available for accessory and attachment components to support AMR infrastructure:

<i>5/8" through 2" SR, SR II, PMM, Encoder Registers</i>	<i>10 Years</i>
<i>RadioRead MXU</i>	<i>20 Years</i>
<i>RadioRead MXU Batteries</i>	<i>20 Years (10 full, 10 Pro-rated)</i>
<i>Electronic Touchpad</i>	<i>10 Years</i>

VALUE STATEMENT 1: WARRANTY

The vast majority of equipment failures submitted for warranty fall within the defined warranty period based on the dates of original installation. At the end of 2005 the City completed the installation of 33,066 meters and currently there are 34,945 active meters. This change represents an increase of 1,879 new meters requiring MXU's during the period of analysis 2006 to August 15, 2011. Assuming the current failure rate of between 300 and 600 units per month continues throughout a three-year migration period from RadioRead to FlexNet, the City will be able to leverage the vast majority of 505C MXU units within warranty for upgrades to AMI without cost.

Value Statement 1: Migration of the existing AMR RadioRead equipment to FlexNet through the warranty replacement is anticipated the City will have the ability to upgrade more than 6,000 failed MXUs (transmitters) or 20% of all City owned endpoints estimated at a value of greater than \$525,000. This value does not include future projection of failure in which the latest failure rate is 630 units per month at a value of \$87.50 per unit and \$15 for labor on installation.

VALUE STATEMENT 2: LEVERAGED PRICING

For major meter companies, competition within the marketplace provides utilities with a significant opportunity to utilize competitive pricing in order to manage costs to the highest degree possible. For the City of Boynton Beach it is vitally important that the sole source selection of SENSUS is based on unique project parameters that cannot be duplicated by any other qualified vendor. Nonetheless cost management also is important to insure the City is paying a fair price for the technology and equipment received through the AMI contract.

With over 12 years of history between SENSUS and the City there is a clear and measurable relation between equipment pricing, history with the City, the desire to maintain and grow market share for SENSUS in South Florida, and the adverse outcomes to the company for lack of cooperation. Comparing the sole source pricing for the major components of the migration, MXUs (transmitters), it is clear that the City of Boynton Beach has leveraged pricing consistent with, or better than, pricing of comparable projects. In evaluating pricing, the following 520M transmitter examples have been identified as appropriate comparisons to insure the AMI project as designed herein is in the best operational and financial interests of the City financially, operationally, and organizationally while supporting quality customer service.

Utility	Approximate Number of Endpoints	MXU Unit Pricing	Cost Per 30,000 Units at Stated Price
City of Boynton Beach, FL	30,100	\$87.50/unit	\$2,625,000
Town of Cary, NC	57,000	\$94.99/unit	\$2,849,700
City of Panama City, FL	21,700	\$108.00/unit	\$3,240,000
Talquin Electric Co-op, FL	20,000	\$120.00/unit	\$3,600,000
Charlotte County, FL	54,000	\$135.00/unit	\$4,050,000

Value Statement 2. The value of migration with the incumbent vendor provides certain pricing leverages that allow the City the maximum return on its investment in the migration of AMR to AMI. The midpoint difference between SENSUS pricing related to other contracts is \$21.25 per unit and the overall estimated value of pricing leverages is \$637,500 over for the entire infrastructure replacement.

VALUE STATEMENT 3: SENSUS SPECIAL PROVISIONS

In the interest of maintaining a supplier relationship with the City of Boynton Beach as well as correcting the noted failures of the existing RadioRead system, the City and SENSUS have identified a number of mutually acceptable special provisions that enhance the benefits of an AMI system. These provisions result from many months of research and analysis of the various contributing components to the operation of the existing RadioRead system and how SENSUS would practically resolve the direct and indirect liabilities experienced by the City. As a result, both the City of Boynton Beach and SENSUS have established a mutually agreed upon Memorandum of Understanding that articulates the conditions that both parties could accept moving forward. (Appendix E)

Value Statement 3: The value of migration with the incumbent vendor provides certain financial and operational leverages that allow the City the maximum return on its investment in the migration of AMR to AMI. The overall estimated value of these special provisions is \$580,322 over three years.

VALUE STATEMENT 4: INTEGRATION WITH BILLING/COLLECTIONS & WORK ORDER MANAGEMENT SYSTEM

The City of Boynton Beach utilizes the SunGard/Naviline for Local Government Suite for its integrated information system that includes functional operation of Utility Billing and Account Maintenance. The City of Boynton Beach has already incurred most of the cost associated with creating the interface for the Sensus Solution and has also crossed the bridge of risk associated with this effort. This effort would include; design, development, testing, training and additional helpdesk support related to these updates for both financial and operational staff.

Value Statement 4: The value of migration with the incumbent vendor provides certain deferrals of costs and risk that reduce the required City investment or allow reallocation of funds to other project needs. The overall estimated value of integration costs deferral to support a successful integration effort between the City of Boynton Beach's financial system and a new solution is estimated to be \$45,000.

VALUE STATEMENT 5: COST REDUCTIONS AND ENHANCED UTILITY REVENUE

The inability of the existing AMR technology to perform within design tolerance creates a constant drain on the utility's human resources. This ongoing focus on technology replacement and repair shifts the focus of the utility operation from the many normal business functions to repair and work order management. The lack of functionality with the AMR technology also decreases the productivity of the meter reading process and maintenance functions supporting a system. The distraction of malfunctioning AMR technology prevents the meter reading services unit from focusing on many of the core functions required by the staff. The lack of focus has significant financial impacts to the City including activities associated with customer service such as account disconnects and reconnects, high bill, zero read meter inspections, and customer requested re-reads.

The Billing and Collections Department of the Utility is significantly hampered by failure of the AMR technology due primarily to the lack of capacity to perform service disconnections for non-payment by customers. Service interruption is proven as an industry standard for maintaining compliance with utility payment policies and limiting increases in the value of account delinquencies. The City's non-payment policy as it relates to service interruption is functionally disabled since the resources are focused primarily on repairing, replacing, and troubleshooting failing AMR technology. Therefore the shut-off for non-payment process (SONP) is driven by the limited capacity of the field crews in meter services to conduct service disconnections and re-connections and balance troubleshooting meter repairs and work orders associated with account maintenance. Clearly the City is burdened with growing receivables as a direct result of the inability of the meter services crew to perform the tasks necessary to implement the collections policy of the utility. Receivables over 90 days account for 32% of the total receivables of approximately \$1.6 million and is increasing at a rate of over 10% per year. This trend will only be improved if the human resources for the Meter Services Unit of the utility are able to return the focus to core functions of the group including adherence to the account management procedures of the City.

The increasing trend of aged receivables results in many accounts that are difficult to collect at best. Noted in several benchmark studies, there is a direct relationship between the age of a receivable account and the percentage of that account that is collectible. Accounts aged beyond 90 days are considered less than 75% collectible on average and accounts aged beyond one year have a less than 25% probability of collection. Without the ability to focus on the collections policy of the City the Utility receivables will continue to increase over time and the financial stability of the Utility will continue to deteriorate.

The field work order system is important to the operational functionality of the utility and is essential to addressing many of the core functions of the service delivery and customer service needs. The existing state of the work order system is simply over-burdened with AMR malfunctions. The result of this tremendous volume of malfunctioning AMR work orders is that the system becomes subject to human error and mistakes, many of the normal customer service requests are not handled in a timely manner and many of the tasks are duplicated.

Value Statement 5: Improved performance of meter infrastructure will provide internal capabilities to increase revenue by lowering delinquencies, lowering costs for field work order management, and improving accuracy and performance of meter reading. The savings annually is estimated to exceed \$175,000 not including reductions of reduction of delinquency collections.

SENSUS AMI PERFORMANCE

While recognizing the failure rate within the AMR/RadioRead environment, SENSUS is regarded as a significant and reliable provider of fixed-base meter reading technology. With over 21% of the market share in smart meter technology, the FlexNet solution is deemed a significant improvement alternative to manual and RadioRead operations while meeting stringent reliability standards not currently available to customers of AMR. The stated performance rate supported by SENSUS for the City of Boynton Beach FlexNet project is 98.5% reliability for each of the transmission periods every six hours of each day and has been field verified by other AMI users for performance. For successful migration, the system must perform seamlessly under concurrently operating AMR and AMI as a mixed system utilizing the same technology with a common interface to the City's CIS.

SUMMARY OF OPTIONS- FINANCIAL AND OPERATIONAL IMPACTS

The City of Boynton Beach has carefully considered a number of options related to the activities necessary to improve the automated read-rate of its approximately 30,000 endpoints and researched the costs and benefits of each alternative. The financial and operational impacts evaluation includes consideration of other aspects (training costs, data conversion, historical record archive retrieval, and legacy hardware and software interfaces) and a discussion of regulatory, human resources, customer relations, and water supply issues.

Options for improving the efficiency and effectiveness of the City's meter infrastructure considered:

- Option A: Replacement, at cost, of failed meter transmitters and registers within existing work demands including troubleshooting and manual reads
- Option B: Bid and award alternative vendor AMR technology
- Option C: Bid and award AMI technology
- Option D: Extend agreement with SENSUS and apply migration over a three-year period

Option	Operational/Financial Impact Level	Primary Conditions of Solution
A: AMR SENSUS	HIGH/HIGH	SENSUS RadioRead has a high failure rate and is no longer promoted by the company as an alternative automated solution. Labor costs are extremely high with RadioRead. If reliability was improved from 20% to a 6% failure rate the annual cost for labor is estimated at \$36,000 per month or \$432,000 per year. Receivables continue to increase due to hampered collection efforts.
B: AMR BID	HIGH/HIGH	Bid and selection for AMR is an option but would require a full transmitter change out and integration at a high cost. Dual read of incompatible systems would create challenges within Meter Services and risks associated with Customer Information System (CIS). Estimated costs for AMR through a new vendor would exceed CIP funding allocations.
C: AMI BID	MODERATE/HIGH	On-going operational costs would be comparable to SENSUS but CIS integration would present operational challenges and full migration costs would exceed current CIP funding allocations.
D: AMI SENSUS	MODERATE/MODERATE	Reliability is achieved at less than 1.5% failure rate dramatically reducing labor costs associated with manual reads and troubleshooting work orders. Estimated cost for deployment of SENSUS AMI is considerably less than current CIP funding allocations. Outstanding receivables from delinquencies reduce dramatically as field crews have significant capacity increases for account.

SOLUTION SUMMARY

In consideration of all conditions and components of a comprehensive meter migration to AMI technology, the City of Boynton Beach project team has indicated that a long-term solution for utility meter reading should be approached to minimize both cost and operational impacts. Evaluation of all options independently and without bias has uncovered a clear direction of choice for moving the infrastructure to high performance. Given the values associated with SENSUS warranty upgrades, improved utility revenues, special provisions by the vendor, favorable unit cost allocations, integration simplicity with CIS, and consideration for impacts to operations, the best solution for the City is to migrate to AMI/FlexNet with SENSUS. By eliminating the need for development and implementation of a procurement process, the City gains critical time in reversing the trend of failed meters that require manual reads causing resources to be expended beyond capacity. The proposed solution and migration agreement with Sensus will include specific performance parameters and milestones to ensure efficient and effective operation of the system and adherence to the planned project goals and objectives.

SENSUS has agreed to work quickly with the City of Boynton Beach to resolve the approximately 6,000 unheard meters with new AMI product deployment between April 1st and September 30th of 2012 through warranty replacement in parallel to product credit utilization of \$185,161. This parallel initial change-out phase will provide the ability of the City to shift approximately 9,000 meters, or 30% of the entire City system, for only the cost of installation of the credit portion of the phase. It is estimated that the labor component will not exceed \$66,000 at \$20 per endpoint and is fully funded through the current fiscal year capital allocation for meter replacements.

The financial and operational benefits of the SENSUS AMI/FlexNet solution provides a clear direction for the City to immediately address major operational impacts resulting from the current automated system. Elimination of practically all manual reads and related troubleshooting work orders will allow City resources to re-direct limited staff to supporting account management orders from Customer Relations. The City of Boynton Beach staff has mapped a process for meter migration that maximizes the operational and financial benefits of a continued relationship with SENSUS through sole sourced agreement.

Project Schedule with Funding Allocations

Project Milestone	Number of Units Installed	Equipment Costs	Labor Costs	Milestone Notes
Project Planning Infrastructure Design March-April, 2012	N/A	\$6,500	\$25,000	The City will select a qualified firm to provide pre-deployment planning services and project management infrastructure
Year One- Through September 30, 2012	9,000	\$0	\$66,000	Installation of warranty replacement upgrades and first year credit utilization
Year Two- Through September, 2013	7,000	\$427,339	\$140,000	Assuming completion of credit utilization at \$185,161
Year Three- Through September, 2014	7,500	\$656,250	\$150,000	Meets minimum purchase requirements as contained in project plan
Year Four- Through September, 2015	6,600	\$577,500	\$132,000	Meets minimum purchase requirements as contained in project plan.
Subtotal	30,100	\$1,667,589	\$488,000	Subtotal of \$2,155,589 against CIP allocation of \$3,100,000.
Contingency 10%	N/A	\$166,758	\$48,800	Included for project overruns, labor adjustments, excessive register repair, etc
TOTALS	30,100	\$1,834,347	\$536,800	Includes \$215,558 for contingency for a total of \$2,371,147 against CIP allocation for a estimated project under run of \$728,853

APPENDIX A

SOLE SOURCE DETERMINATION WITH SENSUS FOR AMI INFRASTRUCTURE

Occasions may arise when competition among potential vendors is not possible for a particular procurement. These situations may occur when there is clearly and legitimately only one source capable of supplying the subject matter in a timely fashion, when there are special facilities or market conditions that result in only one source, or when there is only one source capable of supplying the subject matter in a timely fashion such that seeking competitive prices would be impractical.

A sole source procurement approach for Advanced Meter Infrastructure was selected based on a number of contributing factors that support the need to maintain compatibility with SENSUS meters currently installed in the City service area throughout the multi-year migration from AMR to AMI. Compatibility and use of a singular vendor for parts and service is paramount to minimizing maintenance costs and supporting future system upgrades for the City of Boynton Beach. The SENSUS company originated over 100 years ago and leads the industry in deployment of AMI technology and utility infrastructure systems. SENSUS provides proven stability and credibility in the metering marketplace with the ability to support its customers in operation both now and long into the future. Dedicated to research and development, SENSUS provides a clear track record of technology enhancements that promote advancements in functionality and service.

SENSUS AS A SOLE SOURCE

WARRANTY UTILIZATION: Limitations on staffing and operational funding constraints require the City of Boynton Beach to migrate the meter infrastructure initially using warranty replacement, including labor, since current budget allocations are not sufficient to make substantive changes to the system. SENSUS has agreed to replace existing unheard meter transmitters, currently estimated at approximately 6,000 units, with transmitters compatible with the upgraded FlexNet system. This no-cost meter upgrade along with compatible meter reading equipment under the warranty replacement provision provides a financial and operational opportunity for migrating over 10% of the entire meter infrastructure with very little direct costs to the City. This opportunity contains an estimated value of \$615,000 and cannot be duplicated by any other company providing AMI solutions for utilities. The process of standard bid and award would drastically exceed the ability of the incumbent vendor to replace failed meters and would prevent Meter Services for the City of Boynton Beach from operating the system as required for accuracy and timeliness.

INTERFACE WITH SUNGARD: Systems interface between SENSUS Regional Network Interface and the billing software provided by SunGard has been developed in a customized environment and is not designed to automatically integrate with other meter reading vendors. Integration challenges create financial and operational risks as software integration requires custom design, testing, and implementation for proper transfer of data between the meter reading and billing systems.

AMR/AMI INTEGRATED METER READING: With meter migration occurring over a three year period, the migration plan requires the ability of the vendor to maintain parallel meter reading capabilities. SENSUS has developed a vehicle based transceiver that provides dual reading and download capabilities thereby eliminating a paralleled reading infrastructure required if utilizing more than one vendor.

APPENDIX B

AMI PROJECT GOALS, PARAMETERS, AND BASIS

The City of Boynton Beach is working to formalize an agreement with the current meter vendor, SENSUS, to migrate its infrastructure fully from AMR to AMI. The goals for the project are to select and implement a fixed network AMI system that will:

- Provide remotely read real time meter data that is accurate and timely
- Detect water leaks within City distribution lines
- Provide almost “real time” meter readings for billing and customer inquiries
- Provide customers access to their usage data and trends
- Provide comprehensive data to support water production and water rate evaluations.

It is expected that the AMI system installation will be designed and activated by May of 2012. The project phases are sequential and will be worked with the assistance of the City Project Team and a selected project management firm. The Project Team will make recommendations to City Administration for approval.

The business case provides benefits to the City of Boynton Beach from the AMI system including:

- Improved cash flow through proper field resource utilization and billing accuracy
- Improved customer service through real time metering
- Reductions in meter maintenance, troubleshooting, and equipment costs
- Improved planning capabilities from enhanced data availability
- Improved conservation and water accountability
- Streamlined billing and invoicing processes

Several challenges have been identified during the evaluation phase of the project. These include:

- Retraining of staff to handle new jobs for changed processes
- Communications internally and externally to help transition the changes for employees and customers
- Financing the project during a time of capital constraints
- Staffing during the conversion process.
- Managing AMR operational issues during migration
- Meeting project milestones and financial projections
- Requiring accountability of vendor to meet expectations for migration and performance

Project challenges will be addressed within the comprehensive project plan developed upon authorization to proceed by the City Commission.

RECOMMENDATIONS FOR MIGRATION ACTIVITIES

After analysis of the anticipated benefits and requirements of each alternative, the business case supports the recommendation for selection of an AMI system in partnership with the incumbent vendor, SENSUS, for transmitting equipment only. It is further recommended that a project management firm be involved in system conversion including installation, training, interface with information technology, and project communications. The importance of communication with multiple stakeholders both inside and outside the utility is critical and will require project management focus beyond the resources currently available in-house. It is recommended that a point person be assigned with responsibility for

development and implementation of a project communication program and provide utility oversight for internal and external stakeholders.

In parallel to the approval process for migration of the meter infrastructure from AMR to AMI, the City is currently seeking qualified firms through the preparation and publication of a Request for Proposals to oversee the major milestones of the migration project. Major work phases that will follow award of the project management engagement include:

- Project infrastructure design (methodology, tools, project schedule, contractor oversight, budget, etc)
- Project administration and internal/external communication
- Ongoing implementation assistance including goal adherence, financial oversight, systems performance and integration, and training.

AMI Project Goals

Key project goals and objectives have been identified by City staff and consulting partners for the AMI project following the selection and implementation of FlexNet AMI that includes:

- Remotely read real time meter data that is accurate and timely
- Leak detection to minimize revenue loss and enhance customer service
- On-demand meter readings for billing and customer inquiries
- Providing data resources for rate analysis and justification
- Drastically reduce “unheard” meters and error troubleshooting and associated labor costs

Features of an AMI System

Billing accuracy, read reliability, and efficiencies of automated reading through advanced meter reading technology were the three most important features selected by the Project Team during the evaluation phase for the meter infrastructure design moving forward. Customer accesses to their usage data and timely data for planning purposes were also listed as priorities as well as seamless integration with the billing system. Consideration of these priorities was essential in the selection of the AMI system recommendation utilizing SENSUS FlexNet.

An AMI system will provide numerous benefits, some which can be measured and some which will improve levels of service to City utility customers.

1. Labor Cost Reduction – meter reads, previously obtained by RadioRead (drive-by) technology now will be automatically read remotely by sending a signal to each meter which will then send a signal back to the Regional Network Interface (RNI). Operating properly the AMR system requires staffing at the equivalent of 2FTEs and with the progressive failures the number of FTEs required to fulfill meter reading has escalated to 5 FTE's. Full AMI deployment will allow the reduction of staffing to less than 1 FTE. Some manual reading may continue to be required for unique meter installations and locations but the number of manual reads will be negligible. This change in labor assignments will occur over the 36 month installation program.
2. Water Loss Reduction– current water loss is approximately 10% of system production. This loss may be attributable to meter inaccuracies (master meters or customer meters), leakage, water main breaks, water used but not accounted for, and other causes. Regular measurements of the City's water distribution system provide critical data for evaluation of the significant contributors to water loss.

3. Customer Leak Detection and Management –leak detection will be an immediate and favorable financial result of the AMI system. Currently, customer leaks are detected by the customer or by the Utility at the reading point approximately every 30 days. The AMI system will flag customer leaks on a daily basis and the Customer Service Representative will have real-time data for notification to the customer before a leak gets too big or too expensive.
4. Fleet Cost Reduction– The current meter reading method requires about 3 vehicles. With AMI 1 vehicle will be required, which will reduce gas consumption and emissions.
5. Utility System Planning– the City’s distribution system, water supply, and storage capital plans are designed using some form of hydraulic modeling. This modeling has estimated water demands placed at nodes and AMI provides more precise customer demand inputs into the model.
6. Bill Accuracy – City Meter Services has a good track record for providing accurate readings to the billing system. With the sharp decline in reliability of the AMR/RadioRead system, the City has conducted a greater number of manual reads and, during times of hardship due to equipment failures, has applied estimated reading to various routes due to timing. With AMI fully deployed, the City will virtually eliminate manual reads and the related errors associated with manual data entry as well as always maintain real-time information on each of the approximately 34,000 accounts in the system.
7. Improved Customer Usage Data–the new system will support better customer information for a variety of customer purposes including customer budgeting, customer plumbing design, and troubleshooting pressure or flow issues. This data will be available on-line to the customer via Click2Gov or by phone thereby allowing customers will be able to resolve issues more quickly and efficiently.
8. Choice of bill payment date to customer – the new AMI system will facilitate offering a choice to customers to set their bill payment date to meet customer demands no longer encumbered by cycle reading and other operational limitations.

Organizational Challenges for Implementing an AMI System

Many of the functional areas of the City of Boynton Beach will be impacted with a new AMI system. The most significant concerns emphasized by the Project Team was obtaining the capital required for a system to meet their needs, establishing reliable field data collection for proper project planning, controlling excessive manual reads during migration, resource allocation, AMI reliability, and the internal requirements for managing the migration process. These challenges will provide the baseline service scope for the project management team and will be managed and/or resolved based on priority.

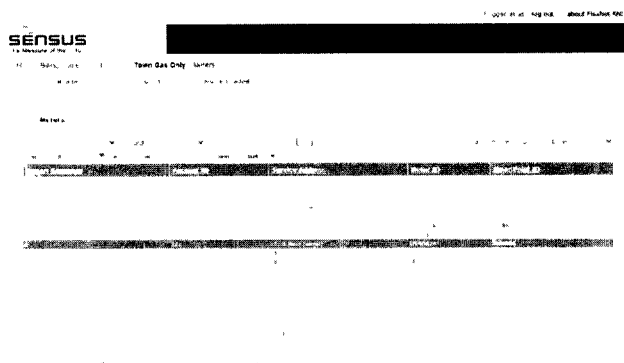
Timing of the Project

While the majority of the Project Team would like to see an AMI system fully implemented earlier than 2015, overall having the system fully implemented within three years was deemed adequate.

Functionality and Integration

The ability to communicate the basic meter reading information from the meter to the City and to the customer in a timely and efficient manner is the prime function of the AMI system. These readings and the use they represent will need to be stored, archived and made available through a comprehensive

Meter Data Management (MDM). The MDM will interface with all the major computer systems of the City of Boynton Beach CIS.



The primary MDM functions will be:

- Provide reading and comparative use information to billing system for monthly bills
- Provide information for Customer Service Representatives for answering calls, taking orders and interfacing with the customer
- Provide information to distribution system operations as needed

The AMI/FlexNet system will have the ability to recognize a new (or replaced) meter installed on a building or facility within the system when it becomes operational. The readings from that meter will be obtained, transmitted, archived and presented to City for installation in the City CIS. The system will also report meters no longer communicating and provide last read, date and time information to City.

Expected Life Cycle of AMI System

The life cycle of an AMI system is composed of five major segments – the meters with encoded head, the meter interface units, battery life, communications and system programs (software). Each of these segments has a different life cycle and is affected by different factors. The meter transmitting unit has a warranty of 20 years and a life expectancy beyond the warranty. The encoded head on the new technology meters operates with the use of a battery. The expected battery life for the encoded head is also designed for 20 years of performance. The encoded head has a low battery warning signal that can alert the Utility of an unexpected battery failure prior to the end of the 20 year lifecycle.

APPENDIX C

TECHNICAL SPECIFICATIONS OF AMI/FLEXNET

1. FIXED BASE SYSTEM OVERVIEW

The Fixed Base AMI System must provide two-way communication from the Host Software/Computer to strategically located Tower Gateway Basestations (TGB) and also have the ability to communicate down to the installed Meter Transceiver. The two-way communication should allow for time synchronization (+/- 1 Minute of NIST), firmware upgrade and programming options to the TGBs and also the Meter Transceivers. These applications must be performed "over-the-air" and without the need to visit a Smart Point. The communication from the TGB to the Meter Transceivers must utilize a primary licensed FCC Narrow Band two-way frequency. The System must be capable of migration from mobile to fixed base AMI and shall allow data collection (manual, mobile RF, and/or fixed base) to operate together seamlessly in a mixed system that utilizes the same technology with a common interface to the Utility's CIS. The System shall provide a secondary means of reading meters equipped with a fixed base Smart Point via a handheld device equipped with an RF transceiver.

The Fixed Base AMI System must be designed to provide coverage for all meters located within the specific utility territory to collect data. The Fixed Base System must have the ability to support conservation initiatives, off cycle reads, customer leak detection alerts, reverse flow and distribution line leak detection. During the programming initialization, the system should provide the ability to identify successful transmission and allow the installer the ability to verify transmission success while at the installation site. The data collection devices should incorporate a store-and-forward redundancy feature and should transmit the data to the back end system immediately upon receipt.

The Fixed Base Host Software shall provide numerous applications and/or feature sets to support various departments such as customer service, billing, operations, meter reading, revenue protection and others. The software should allow for configurable reports using the data collected. The software should provide pull down easy application screens for the end user to manage the system. Specific reports should be automated to inform the end user when alarm conditions occur or insufficient data has been collected from specific accounts and or regions. The software should also provide customizable usage graphs for applications that can be set to report daily/weekly/monthly and hourly data. The system will also provide the ability to incorporate mapping capabilities for proactive maintenance and analyzing purposes.

Definitions:

- **Fixed Base System ("System"):** The Fixed Base System consists of Fixed Base Host Software, Tower Gateway Basestations (TGB's), Communications backhaul/ Wide Area Network (WAN), and Fixed Base Radio Frequency Meter Transceivers to enable the remote collection of metering data from absolute encoder-equipped water meters or other compatible devices.
- **Host Software:** The Fixed Base Host Software package is installed on the host system at the utility site or a remote location. The Fixed Base Host Software shall manage the communication with the TGB's and Meter Transceivers. The host software will also serve as the interface to the Customer Information system (CIS) and/or billing system. The transfer process is initiated by a file transfer that utilizes an import and export process. The Fixed Base Host Software shall contain a graphic user interface (GUI), configurable reporting, automated processing capabilities and mapping. The host system will have the ability to interface to multiple billing and CIS systems. The host software will serve as the data collection repository from either a mobile and/or fixed base solution.

Definitions (continued):

- **Wide Area Network (WAN):** The WAN is the communications link between the Fixed Base Host Software and TGB's. The standard WAN backhaul is ethernet.
- **Tower Gateway Base station (TGB):** The TGB is the enclosed hardware/software that serves as the communication link between the Fixed Base Meter Transceiver and the Host Software. The TGB will incorporate two-way communication capabilities to receive, store and transmit meter data and commands immediately. The TGB must also have the ability to store up to thirty days worth of data in case of an unexpected loss of power or communications with the host software.
- **Fixed Base Radio Frequency Meter Transceiver:** The Meter Transceiver is the radio frequency data collection device that attaches to the meter for the purpose of collecting and transmitting meter reading data, unique identification numbers, operating status information and various alarms. The Meter Transceiver transmits on a Primary-Licensed Narrow band FCC frequency. The Meter Transceiver shall be a high-power (transmitting at up to two watts), two-way communication device that is available in both wall and pit mount configurations. The Meter Transceiver must also be available in configurations that can incorporate up to two meters. In addition, the Meter Transceiver must be programmable "over-the-air" to transmit both an hourly time-synchronized meter reading and usage/data transmitted to Host Software at a minimum of four (4) times per day. The Meter Transceiver must be capable of being programmed to transmit alarms for leak, broken pipe and reverse flow events.

2. FIXED BASE SOFTWARE OVERVIEW

The Host Software must exist as a browser-based application that runs on a server. The Host Software should interface with Sensus file layout format to interface to the Utility's CIS for meter reading. The Host Software should support fixed base AMI, handheld meter reading and mobile meter reading on one platform. The Host Software must support reading performance reports and advanced usage analysis capabilities. The Host Software must be able to export data to Microsoft Excel and Adobe PDF formats. The Host Software shall have the basic capability of providing the following data to utility on a daily basis for monthly billing applications:

- An hourly time-stamped meter reading taken from all water meters for monthly billing purposes from the Fixed Base Meter Transceiver;
- Hourly usage/consumption readings for resolution of customer billing disputes and improved customer service from the Fixed Base Meter Transceiver;
- Collect and report on the alarm data received from the Meter Transceivers (non-read, non-numeric read);
- Collect and report on the leak data received;
- Hourly Reading data for Meter Transceivers in the system that can report the consumption intervals for a selected time-frame.

2.1 Host Software Requirements

The Host Software must provide all the control needed in the network and provide for the essential functions of network management, meter communications, reporting, database configuration and alarms monitoring. It shall comply with prevailing industry standards and should run on a Windows-compatible computer. The Host Software must be able to interface with handheld and mobile meter reading software to enable a mixed meter reading approach that utilizes the same technology. The Host Software must interface to the utility's CIS/billing

software. The meter reading data communicated to the CIS system shall be provided in an ASCII flat file format. The server hardware must be provided by the vendor for installation at the host site. The user computer hardware is to be provided by the utility and must meet the following basic requirements.

Computers must meet the following minimum requirements:

- Windows 2000®/Windows XP®
- Intel 800-megahertz (MHz) processor or faster
- At least 512 megabytes (MB) of RAM (1 GB is recommended)
- At least 1.5 gigabytes (GB) of available space on the hard disk
- Microsoft Internet Explorer 7 or greater
- Keyboard and a Microsoft mouse or some other compatible pointing device
- Video adapter and monitor with Super VGA (1024 X 768) or higher resolution
- 56 kilobits per second (Kbps) or higher-speed modem
- Network adapter appropriate for the type of local-area, wide-area, wireless or home network you wish to connect to, and access to an appropriate network infrastructure; access to third-party networks may require additional charges.
- File transfer protocol (FTP) access

2.2 Information Requirements

The host software must support the following information requirements:

- Storing additional meter readings and status flag information from other monitoring devices (such as distribution line leak noise loggers,).
- Must support single and dual register meter information.
- Must support meter readings (4-8 digits) and Meter Transceiver ID numbers up to 10 digits.
- Must interface with handheld device and vehicle-based reading equipment to support mixed system operation.
- Must support GPS type data to identify locations of account geographically.
- Capability to store all meter data information obtained from the TGB's for 13 months.
- The System must be able to monitor the status of the WAN and alert the user in the event of a problem impacting communication between the TGB's and Fixed Base Software (Server receiving alarm information about signal strength, etc).
- The system must provide for the ability to monitor the status of the TGB and provide alarms back to the utility.
- The System must have the capability to monitor Meter Transceivers that have transmitted for the first time to identify successful installation and operation.
- The supplier must provide the service of remotely monitoring the system and have controls in place to ensure optimized system operation.
- There must be capability to monitor status/performance of the TGBs strategically located in the network.
- Diagnostics must be available such that operators can evaluate performance and send instructions "over-the-air" to optimize performance of the network.

2.3 Network Management

The Fixed Base system must provide a "Health Management" application within the host software to monitor the status of the TGB's. The network monitoring solution should provide data with regards to the Meter Transceiver transmission strength and its corresponding TGB and/or multiple TGB's. Reports should be available on a daily basis and must have the ability to alert appropriate personnel of certain triggered alarms.

2.4 Basic Functions

The Host Software must provide the ability to maneuver data to various reports and also to compatible software applications. The system should provide the ability to verify the percentage of reads received for particular areas and/or selected meter routes. This data should then be exposed to various configurable parameters set, such as high/low parameters to assure the accuracy of the data. Once this review has taken place, the data should then be grouped for exporting purposes to the billing and/or CIS system within the utility. The host software must also have the ability to group route information and both import and export that data to a handheld meter reading and/or programming device.

The Mobile Host Software must include the following:

- Loads to/unloads from the handheld devices by serial communications at a minimum speed of 19,200 bps and via Ethernet communications at a minimum speed of 10 Mbps.
- Provides database with optional backup/restore capability.
- Enables the user to specify the data to be exported from the database for transferring to the billing system.
- Enables the user to search the database for records matching specified information.
- Allows the user to define up to 100 notes.

2.4.1 Typical Read Cycle

In a typical Read Cycle, the Host Software must allow the following operations:

- Merging of routes into the existing database for loading onto a data collection device.
- Posting of readings from the data collection device onto appropriate accounts within the database.
- Creation of a backup copy of the routes within the database (including current system configuration files).
- Printing pre-selected reports.
- Exporting routes from the database to the utility billing system.

2.5. Reporting

The Host Software must provide normal reporting and exceptional reporting capabilities that must address basic operational requirements:

- The Host Software must have the ability to identify three types of reading information to include;
 1. Numeric reads (successful reads that can be used for billing)
 2. Non-numeric reads (reads that cannot be used for billing but may indicate a problem with the meter register or Meter Transceiver or tamper condition);
 3. No readings (no transmitted reading was received).
- The Host Software must allow the user to review total number and percentage of successful reads, unsuccessful reads, and no reads.

- Network Level Reports – must identify by day or date range, a summary of the total number and percentage of successful reads, unsuccessful reads, and no readings.
- TGB Level Report – must provide a summary of the total number and percentage of successful reads, unsuccessful reads and no readings.

Standard reporting to include the following information:

- Zero Consumption
- Unread Meter (no readings)
- Billing List (numeric reads)
- All Readings
- Invalid Readings (non-numeric reads)
- Meter ID Mismatch
- Meter Transceiver ID Mismatch
- Meter Transceiver Status
- Reading Summary (Statistics page, Read vs. Unread/Non-numeric)
- Reverse Flow Event
- Leak Events
- Acoustic Leak Loggers (such as the AMR Permalog on the distribution lines)

The Host Software must allow the user to select specific fields from the database to be exported to a third-party report generator for custom reports.

3. Tower Gateway Base station (TGB)

3.1 Basic Requirements

Must demonstrate the capability to collect data wirelessly from the Meter Transceiver and communicate back to the Fixed Base Host Software:

- The TGB must support two-way communications over an FCC primary licensed frequency with the Meter Transceiver and provide such functionality as priority alarms and over-the-air updates.
- The TGB must be flexible with regards to installation option
- The TGB must be AC powered.
- The TGB must provide memory back-up (30 days).
- The TGB must utilize a Linux operating system.
- The TGB must be able to support and process up to 50,000 Meter Transceivers.
- The TGB must have a battery backup capable of maintaining eight hours of support.

3.2 Wide Area Network (WAN) Backhaul Requirements

The TGB must be capable of using both a primary and secondary data links providing two-way ethernet TCP/IP with the following as WAN backhauls for data:

- Wired (DSL or cable)
- Wireless
- Wi-Fi
- Fiber
- Frame relay
- GPRS

3.3 Power Requirements

- The TGB must be powered via 110 - 220V AC.
- Upon power failure, the TGB shall retain the past thirty (30) days of meter data in a non-volatile memory.
- Upon start-up after power failure, the TGB must restore databases, tables, and logs to the previous state

3.4 Communication Requirements

- The TGB must have a transmitter capable of sending out thirty-five (35) watt transmissions.
- The TGB must log all events mentioned below and communicate to the host computer:
 - Link failures:
 - The TGB link failure time and date-to-the-Host must be logged and all data must be saved thirty (30) days.
 - The TGB must try continuously to re-establish a link to the host.
 - Reset:
 - The TGB must be able to be reset by the Host computer.
 - Manual reset functionality must be available.
 - The TGB shall transfer the past thirty (30) days of data stored in a non-volatile memory to the Fixed Base Host Software upon power up reset

3.5 Installation/Mounting Requirements

The TGB antenna should have the ability to be installed on the top of water towers. Other installation applications should include cell towers, tall buildings, and/or other elevated structures. The TGB must be powered by 110–220VAC.

3.6 Environmental Characteristics

- The TGB must have an operating temperature of -22°F to +140°F (-30°C to +60°C).
- The TGB must have a storage temperature of -40°F to +185°F (-40°C to +85°C).
- The TGB must have an operating humidity of 0 to 95% Non-Condensing.
- The TGB must have a NEMA 3R enclosure and pass the UL50 (Underwriter's Laboratory) rain test.
- The TGB must meet vibration requirement of MIL-810F.

3.7 Approvals

- The TGB must be UL Listed.
- The TGB must be CSA Approved.
- The TGB must meet FCC Part 90.

4. FIXED BASE METER TRANSCEIVER

The Meter Transceiver(s) must be an electronic device that allows for the connection to an absolute encoder register. As defined by pre programmed settings, the Meter Transceiver shall interrogate the encoder register and transmit the meter reading and other information to a Tower Gateway Base station. The Meter Transceiver shall be compatible with Sensus, Neptune (ProRead), Badger ADE, and Elster (Sensus protocol incorporated) absolute encoder registers. The Meter Transceivers shall attach to meters with Sensus encoder registers by Touch Coupler technology, or they shall easily retrofit to existing meters with encoder registers in the field. The

Meter Transceiver shall be manufactured in both non-pit and pit set models. The Meter Transceiver should have the capability to have at least two registers attached to one Meter Transceiver. The Meter Transceiver shall have the ability to be mounted on a wall. The pit set Meter Transceiver shall have the ability to be mounted in a pit set environment or an underground vault. The non-pit and pit set Meter Transceiver shall have the battery and electronics encased in High Density Polyethylene (HDPE) waterproof design.

4.1 Physical/Mechanical Requirements

Pit Set Meter Transceiver

- For pit or vault applications, the pit Meter Transceiver antenna shall be designed to be installed through the industry standard 1-3/4" hole in the pit lid with no degradation of transmission range. The pit set Meter Transceiver antenna unit will be capable of mounting to various types and thicknesses of pit lids — Cast Iron, Aluminum, Concrete, Composite or Plastic from 1/2" to 2-1/2" in thickness. The pit set Meter Transceiver design shall not require the replacement of the pit lid material to plastic to improve the propagation of the RF signal.
- The device shall be capable of operating at temperatures of -30°F to +165°F (-34°C to +74°C) and be 100% submersible.
- The Meter Transceiver circuit board and battery will be encapsulated in High Density Polyethylene (HDPE) for superior water ingress protection. The pit set Meter Transceiver must be suitable for operation in flooded pits and be able to be submerged for extended periods of time. The range will not be affected when the pit is flooded, provided the pit Meter Transceiver antenna is not submerged under water.
- The pit set Meter Transceiver antenna shall be made of a material to withstand traffic.
- The pit set Meter Transceiver shall provide a location for a tamper deterrent seal.
- The pit set Meter Transceiver must be capable of being field retrofit to existing meter using TouchCoupler connections or wired connections for encoder register installations.

4.2 Operation Specifications

- The supplying vendor shall be the sole manufacturer of the different elements comprising the fixed base system which include the Meter Transceivers, Data Collection devices, programmers and software.
- The Fixed Base System shall operate on a primary licensed FCC frequency within the 900-950 MHz band and operate within FCC CFR 47: Part 90 regulations for this band.
- The Meter Transceiver shall utilize two-way communications with the Tower Gateway Base station to allow for "over-the-air" communications between the two devices for re-programming and time synchronization.
- The Meter Transceiver shall be configurable via "over-the-air" communications.

4.2 Operation Specifications (continued)

- Power shall be supplied to the Meter Transceiver by a lithium battery and a capacitor. The Vendor shall warrant that any battery provided and installed in the Meter Transceivers by the Vendor shall be free of manufacture and design defects for a period of twenty (20) years - the first ten (10) years from the date of shipment from factory will be warranted for full replacement cost, and the second ten (10) years will be warranted on a prorated basis, as long as the Meter Transceiver is working under the environmental and meter reading conditions specified.
- The Meter Transceiver must allow for the option of a field-replaceable battery and be designed for minimum twenty (20) years life expectancy.
- The Meter Transceivers must be capable of reading two encoder registers at one time.
- The Meter Transceiver shall interface to Sensus, Neptune (ProRead) Badger ADE, and Elster (Sensus protocol incorporated) absolute encoder registers via a three-conductor wire or TouchCoupler technology without need for special configuration/programming of the Meter Transceiver.
- The Meter Transceiver shall transmit up to six times per day under normal transmission conditions without impacting the battery life. The Meter Transceiver shall have the ability for time synchronization.
- The Meter Transceiver programmer should have the ability to place the Meter Transceiver into the optimum transmission mode during programming.
- In addition, if the Meter Transceiver is configured in hourly usage, the Meter Transceiver shall provide the current meter reading and a data packet with hourly historical data.
- Each Meter Transceiver shall provide a unique pre-programmed eight digit identification ID number. Each Meter Transceiver shall be labeled with the ID number in both numeric and bar code form. The label shall also display FCC approval information, manufacturer's designation, and date of manufacture
- The Meter Transceiver shall transmit the encoder meter reading and a unique 8 digit Meter Transceiver ID number.
- Tamper - If wiring between the Meter Transceiver and encoder register has been disconnected/cut, a "non-reading" shall be transmitted indicating wire tamper. The System should have the ability to validate that the installation is successful at the installation site. The system shall also provide for the provision to interrogate the Meter Transceiver to extract a reading that will be displayed on the programmer. The installation tool shall display the Meter Transceiver ID number, valid meter reading and the signal strength (SNR = Signal to Noise Ratio) of the communication between the Meter Transceiver and Tower Gateway Base station.
- The Meter Transceiver shall have the capability of sending alarms for leak, tamper, and backflow when connected to an absolute encoder register and reading data from a distribution line leak detection device.

5. TRAINING AND SUPPORT

The vendor must support new and ongoing training sessions and material that relates to the operation and maintenance of the fixed base system. Vendor will provide a detailed schedule of training options and also perform on-site training sessions for various employees of the utility. The vendor proposal must also include other remote training alternatives for new and existing employees. The vendor must also support a user's conference/Forum in which users of the fixed base system have the ability to provide feedback for new products and best practices.

5.1 Support Services

The vendor shall have a fully trained Technical Support Department. The utility must have access to technical questions thru a telephone based support desk. The trained technicians should be capable of answering and responding to various requests such as, but not limited to:

- Hardware, operational maintenance questions and problems.
- Software operational questions and problems.
- Assisting customer with configuring reports
- Assisting with software updates
- Troubleshooting hardware issues
- Providing on-site training or evaluation as needed.

The Help Desk must be available weekdays between 8:00 a.m. and 6:00 p.m. EST with after-hours numbers available as needed.

5.2 Installation and Training

The vendor will provide a complete set of installation and operating instructions for all the components of the fixed base system. Onsite training by authorized vendor personnel or their representatives must be provided. The vendor must also arrange a pre-deployment meeting to identify the critical path items for installation and training needs.

6. WARRANTIES

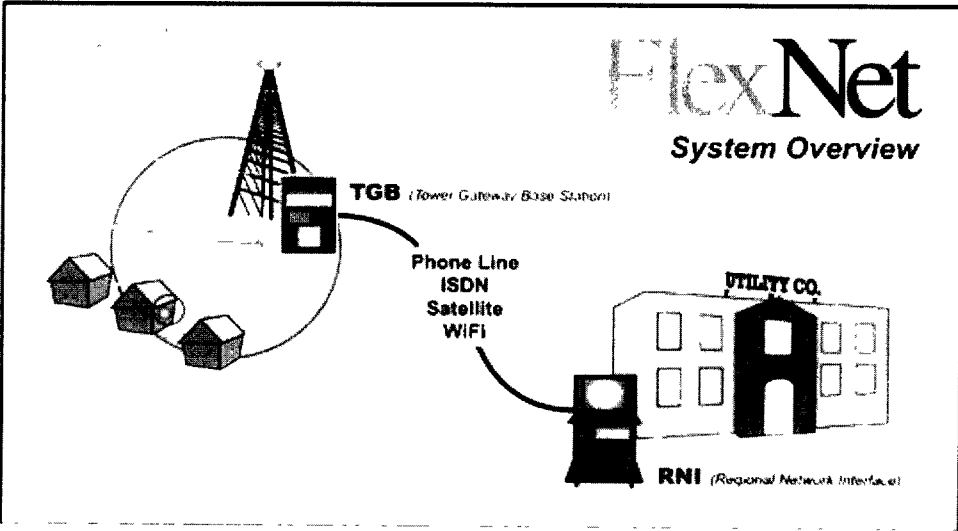
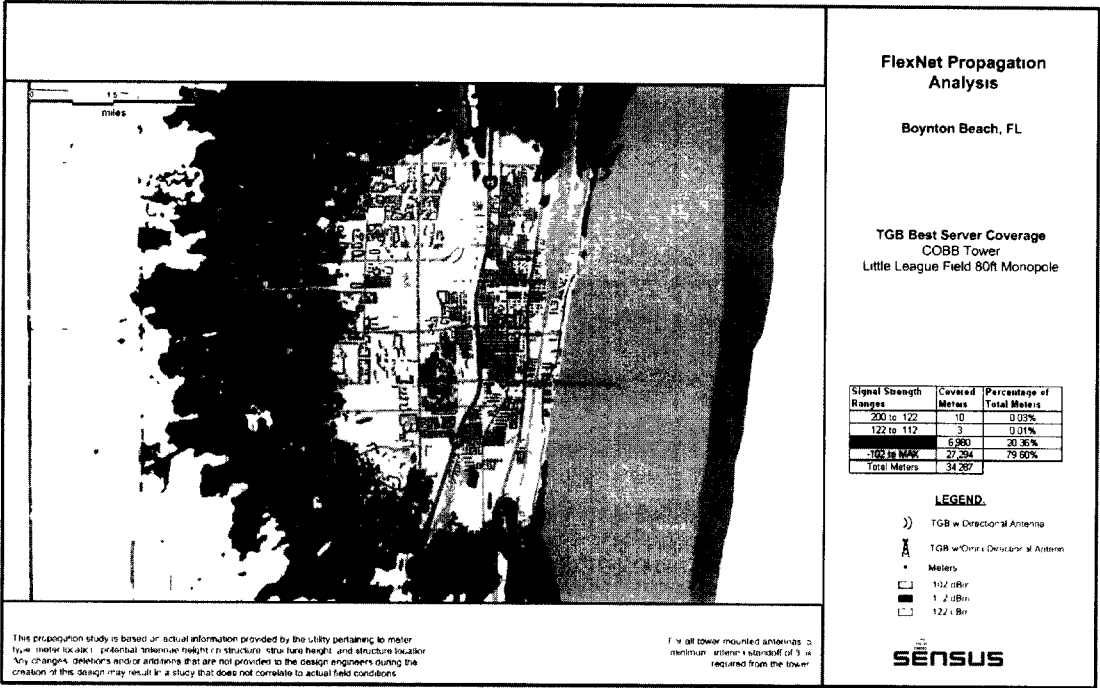
In evaluating bid submittals, warranty coverage will be considered. The Vendor shall be required to state its warranty and/or guarantee policy with respect to each item of proposed equipment. The procedure for submitting warranty claims must also be provided. As a minimum, the Meter Transceiver must have a twenty (20) year warranty and the Tower Gateway Base station (TGB) shall be warranted for one (1) year from date of shipment for defects in material and workmanship.

7. SYSTEM MAINTENANCE AND SUPPORT

In addition to warranty periods, Vendors are required to supply information on required or optional maintenance programs beyond the warranty period for both hardware and software. The location of and procedures for obtaining such support shall be stated. A toll-free Help Desk number must be provided for system support.

APPENDIX D

PROPAGATION ANALYSIS SUMMARY AND SYSTEM OVERVIEW



APPENDIX E**KEY TERMS AND CONDITIONS FOR AMI THROUGH SENSUS FOR THE CITY OF BOYNTON BEACH**

The City of Boynton Beach, under the following conditions, is committing to implement FlexNet AMI through a planned migration with SENSUS:

- SENSUS will provide a product credit of \$370,322 for material expenses related to RadioRead migration to FlexNet effective April 1, 2012 with an ability to utilize half of credit allocation (\$185,161) at 100%. The balance of the credit (\$185,161) applied at a utilization rate of 30% per purchase.
- SENSUS will provide and install 520Ms to replace all unheard 505C units identified with the AutoRead meter reading file within 60 days of agreement execution.
- SENSUS to provide at no cost to the City an upgraded VGB upgrade package within 60 days of agreement execution.
- SENSUS will provide the Network Infrastructure Upgrade fully operational on a schedule determined by the City at no cost to the City.
- SENSUS will provide replacement for all failed registers and MXUs under warranty until January 1, 2015 and all labor, or labor credit at an allocated rate of \$15 per unit, for the migration of SENSUS meters to FlexNet.
- SENSUS will utilize field data collection technology as prescribed by the City for any field work performed on City infrastructure.
- The City will replace all RadioRead MXUs that fail out of warranty with 520Ms at a fixed cost of \$87.50 per unit.
- SENSUS will accept all AMR equipment returns for credit as requested by the City.
- The City would commit to purchasing 520M units at the fixed rate of \$87.50 per unit under the following schedule:
 - Warranty Replacement Estimated 3,000 meters (Full credit utilization by April 30, 2013) Purchase commitment minimum of 6,500 units by September 30, 2013
 - Purchase commitment minimum of 7,500 units by April 30, 2014
 - Purchase commitment minimum of 8,500 units by April 30, 2015
 - Balance of conversion purchased by September 30, 2016 Estimated 6,500 meters remaining