



# FEASIBILITY REPORT

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PREPARED FOR  
THE COUNTY OF ROCKLAND

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JUNE 2, 2008

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## PROJECT OVERVIEW

In recognizing the potential benefits of advanced wireless networks for Rockland, Rockland County Executive C. Scott Vanderhoef in his 2007 State of the County Address formally announced the creation of Rockland County Wireless Initiative, with a goal of connecting all of Rockland County by providing residents, schools and businesses with cost-effective, high-speed access to the internet. Following a competitive Request for Proposal (RFP) process, the County selected the consulting firm Civitium (siv it' ē um) to conduct a feasibility study with the goal of determining if Rockland County should facilitate a countywide wireless broadband network. The scope of this study is summarized in the following table.

#	Study Area	Description
1	Broadband Market Analysis	Collect and analyze data to understand the Rockland broadband market, including availability, pricing, competition, and user uptake. This included an in-depth review of major broadband providers and services, an analysis of various research reports, structured interviews with major wired and wireless providers, and the development of a strategic framework to estimate consumer adoption of municipal Wi-Fi.
2	Stakeholder Outreach and Analysis	Seek feedback from a wide range of County leaders, departments and community members to gauge their support for a wireless network, the needs it should meet and aspirations it should strive to achieve. This included five (5) in-depth interviews with key community leaders, nine (9) focus groups, a town hall meeting, 85 completed goals prioritization survey, 14 completed public safety technology survey and 502 provided comments via County web site survey. In total, more than 600 people took the time to offer their opinions and viewpoints on the feasibility and desirability of a countywide wireless project.

#	Study Area	Description
3	Internal Needs Assessment	To answer practical questions about the current and planned uses of wireless technology in the County, as well as conceptual questions about prioritization of goals for the initiative. This included a workshop, a needs assessment survey, and briefings and information sessions with County leaders.
4	Technology Assessment	Consider the strengths and weaknesses of various wireless technologies, describe a conceptual architecture for a countywide Wi-Fi network, and gain insight into the unlicensed radio frequency (RF) environment throughout the County.
5	Asset Inventory	Identify the quantity, quality and suitability of various assets (e.g. optical fiber, street light poles, etc.) that may be leveraged to construct a countywide wireless network. This included a categorization of asset types, workshops with key County agencies and departments, an analysis of geographic information systems (GIS) data, and a review of various policies, procedures and other relevant documents.
7	Business Model Analysis	Collect and analyze data from a variety of sources to determine the most appropriate business model for Rockland Wireless Broadband initiative. This included a review of case study projects, definition of candidate business models, validation of each candidate model against key criteria, and development of preliminary financial estimates.

This report represents Civitiium’s findings, conclusions and recommendations following completion of the study.

## EXECUTIVE SUMMARY

### INTRODUCTION

Since 2003, hundreds of cities have pursued similar projects, though few have matched the scale and complexity of Rockland. The vision and goals outlined when the project was announced were forward-thinking and ambitious, and the County has pursued these goals with a level-headed and inclusive approach – with a perfect balance of enthusiasm tempered by objective, critical thinking.

Municipal Wi-Fi refers to an initiative sponsored by a local government to affect the deployment of Wi-Fi technology across the community. Wi-Fi is a wireless technology brand owned by the Wi-Fi Alliance. It refers to a set of product compatibility standards for Wireless Local Area Networks (WLANs) based on the IEEE 802.11 specifications.

As the municipal Wi-Fi market has evolved, the intersection between politics, business, technology and public policy has produced an intense, worldwide debate over the role local government can and should play to ensure that robust broadband services exist in the communities they serve. Should local government play a passive role and simply facilitate entry by the private sector? Should it act as a catalyst and facilitator to stimulate new private investment? Should it become a provider of commercial services, on a wholesale or retail basis? Should it focus only, or initially, on infrastructure for municipal use? Can the private market be relied solely upon to create robust market conditions and meet community needs?

There are no wrong or right answers to these questions. Despite basic similarities that may exist between Rockland and other major counties and cities, the goals of Rockland wireless broadband initiative, the makeup of its broadband market, the policy positions of its leaders, the desires and viewpoints of its citizens and businesses, and many other factors demand that these decisions be made within each community. We believe the inclusive approach taken during this study will enable decisions to be made that are unique and appropriate for the Rockland community.

A project of this type holds the promise of immeasurable benefit for Rockland, but despite this promise, the community benefits of broadband have proven costly to achieve, time consuming to realize, and nearly impossible to measure in other communities. As for major cities in the U.S., only Philadelphia has reached a point of near-completion of its network, and it faces troubling new challenges with its private-sector partner. Technology innovation has also continued at a frantic pace, not only with Wi-Fi, but with WiMAX and other standards that could affect the viability, sustainability and market acceptance of the network originally envisioned by the County.

In addition to these dynamic and interrelated factors, the municipal Wi-Fi marketplace went through a market-correction while this study was being performed, sparked by a pullback of private investment and resulting in increased financial demands being placed on local governments. It seems the only constant with municipal Wi-Fi is change.

As this report will show, there are risks and challenges that must be faced if the County proceeds forward with Rockland wireless broadband initiative. We caution that it may not be possible to achieve all of the goals originally defined without accepting substantially more financial risk than was commonplace in other major projects.

While the efficiency of local government, health of the local economy, and degree of social equity are themselves very important issues, we are compelled to also stress the longer-term impact of broadband on Rockland’s ability to compete with surrounding counties. Just as energy prices, real estate conditions, transportation networks, proximity to trading markets and other major factors have and will affect the ability for Rockland to compete in the 21<sup>st</sup> Century, so too we believe will be the ability for Rockland residents to access the Internet’s increasingly rich content, media and services over very high-speed connections.

*“[W]e are entering into a phase where we are going to see the digitization, virtualization, and automation of almost everything. The gains in productivity will be staggering for those countries, companies, and individuals who can absorb the new technological tools.”*

*T. Friedman, The World is Flat:  
A Brief History of the Twenty-first Century*

Regardless of the path the County chooses to take with Rockland Wireless Broadband initiative, we believe it is paramount that the County and the community continue to play an active role in their digital future. The County should consider the wireless broadband project as part of a process rather than an event – a process to ensure that the vast benefits of the Internet are available to all in Rockland County.

If the County ultimately achieves its goal to affect the deployment of an advanced countywide wireless broadband network, it will likely be confronting new issues in parallel; fiber to the premise, existing and new barriers to technology adoption (e.g. training, computer hardware, support), continued advances in technology, evolving business models, changes in consumer behaviors, and many more that cannot even be envisioned at this time.

Playing a more active role in community technology may also present new challenges not faced previously by the County with other critical infrastructure projects. The very nature of technology is that it quickly becomes obsolete to make way for new innovations and breakthroughs, which is particularly true in wireless. It is not uncommon for private technology companies to force obsolescence and disruption of their existing investments in order to keep pace with the market, and the County will not be exempt from these forces.

Civitium’s goal during this study was to produce the most objective, informed, accurate and up-to-date information and analysis to help facilitate the many important decisions that the County will need to make. To that end, the following sections summarize our findings and recommendations.

### SUMMARY OF FINDINGS

The tables below summarize the findings from this study for each area of the project’s scope:

Broadband Market Analysis Findings		
#	Finding	Summary
1	Broadband <u>services are widely available</u>	The majority of Rockland households (as high as 91%) have access to at least one fixed, residential broadband service; either DSL or cable modem service. <sup>1</sup> In addition to fixed residential services, there are at least three (3) wireless broadband providers that offer 3G coverage. A rapidly growing number of areas enjoy two “next generation” wired broadband services including Verizon’s FiOS fiber network and Cablevision’s Optimum Online fiber network.
2	Existing <u>providers target premium services</u>	Our service and pricing analysis suggest that most existing broadband providers focus on higher average revenue per user (ARPU) customers through tying and bundling services together, and through deploying new higher-end services. While these motivations and actions are appropriate for investor-owned organizations and they create benefits for consumers with advanced needs, the end result is a market that may be “over shooting” the needs and ability to pay of many low-income citizens and small businesses.

<sup>1</sup> As documented in our detailed analysis, this is partly based on our assumption that the near-universal digital cable television and DSL infrastructure in the County is equipped to support Internet service.

Broadband Market Analysis Findings (cont.)		
#	Finding	Summary
3	Wi-Fi provides the best <b><u>price-to-performance ratios</u></b> for subscribers	While the price-to-performance ratio of broadband services shows Wi-Fi the best, it will likely fail to achieve meaningful uptake in a business model that is dependent on taking market share away from fixed residential. The challenge for Rockland will be to identify and exploit the unique strengths of Wi-Fi compared to existing alternatives to meet mobility needs.
4	For a successful and competitive service offering of Wi-Fi, <b><u>Rockland will be challenged to identify and exploit the unique strengths of Wi-Fi</u></b> as compared to existing alternatives	Regardless of the business model chosen by the County, the municipal Wi-Fi market has clearly highlighted the importance of considering the productivity and efficiency benefits that this type of network can bring to municipal agencies. The County will need to focus intently on understanding its current and future wireless needs, building business cases for promising municipal applications, and validating any returns on investment for these applications.
5	<b><u>Private-sector investment in a countywide municipal wireless network is unlikely</u></b>	Based on the reaction of incumbent broadband providers, large ISPs and competitive wireless startups to the current municipal Wi-Fi market conditions, it is unlikely that these entities will accept the <b><u>full</u></b> investment risk to deploy a <b><u>countywide</u></b> Wi-Fi network. The market is not conducive to enticing these companies to finance and deploy a countywide network, at least not without anchor tenancy commitments that we believe will exceed the volume of Wi-Fi services that the County can reasonably consume. Despite this lack of investor confidence in countywide deployments, there will continue to be viable options to finance targeted Wi-Fi initiatives going forward (e.g. grant-funded projects, public-private pilot expansions, ad-hoc Wi-Fi, etc.)

Stakeholder Outreach and Analysis Findings		
#	Finding	Summary
6	<b><u>The community supports the development</u></b> of a wireless network	The community supports the development of a wireless broadband network. While the intensity of support varied among stakeholder groups, most agreed that a county-sponsored network could add to the quality of life in the County and help achieve a variety of social justice, economic development and civic objectives, including supporting small business, strengthening education, improving mobility, enhancing service delivery and fostering civic engagement.
7	The <b><u>network must be sustainable</u></b>	Stakeholders offered varying thoughts on the appropriate role of the public and private sectors and on the service offerings, pricing and terms that should be available. But they fully understand that a business model must be developed that generates sufficient revenues to enable the network to be paid for, maintained and upgraded.
8	The <b><u>County needs to play a strong role</u></b>	Stakeholders feel that the County needs to play a strong role in any wireless broadband initiative regardless of the business model selected. They believe the County needs to pull everyone together to craft a clear vision for the project, build support and find a sustainable business model.
9	The <b><u>County should set and enforce policies</u></b> for level and quality of services provided over the network	Stakeholders feel that pricing and terms need to be carefully crafted to support the ongoing development of the network while also ensuring that no resident or neighborhood receives an inferior level or quality of service. Privacy and security are concerns shared by all stakeholders. The need to protect children from harmful content is a particular concern of educators and parents.
10	As part of Comprehensive Plan public outreach, <b><u>County should include telecommunication element</u></b>	The County should commission an effort to add a telecommunications element to the Comprehensive Plan process that is currently in progress. The telecommunication element should guide the future development and deployment of both fixed and wireless broadband in the County.

Internal Needs Assessment Findings		
#	Finding	Summary
10	The <u>County's internal wireless needs are extensive</u>	The County has a large, diverse and growing need for wireless communications services to support its internal operations. During this study, County departments identified 24 existing and planned wireless applications that could improve the delivery of County services. However, a comprehensive business case has not been developed to estimate the savings, cost avoidance or productivity benefits that a countywide Wi-Fi network could enable.
11	Internal departments <u>identified several common wireless needs</u>	The County should strongly consider the potential benefit of having multiple departments collaborate on implementing common wireless solutions for similar applications such as field access to GIS, remote camera and video surveillance and remote building access.

Technology Assessment Findings		
#	Finding	Summary
12	<b><u>Municipal Wi-Fi alone cannot meet all identified needs</u></b>	It is unlikely that any single technology, including Wi-Fi, will meet all internal and community needs that exist today and in the future. A wide variety of needs were identified, some mobile uses; while others are more appropriate for a fixed application. Some require indoor coverage; while others require outdoor coverage only. Some of the identified applications were high capacity; and others did not require significant capacity. Due to the wide range of variants, an approach that encompasses a hybrid of technologies is deemed most appropriate for the County.
13	Municipal Wi-Fi <b><u>excels at low cost and device ubiquity</u></b> , but it is <b><u>weak on stability and ubiquitous coverage</u></b>	Municipal Wi-Fi technology has both strengths and weaknesses when compared to existing broadband services. Its strengths are its low cost to deploy and its ubiquity in mobile devices. Its weaknesses are its instability and lack of ubiquitous coverage. If these strengths and weaknesses are recognized, municipal Wi-Fi can be applied to solve targeted internal and community needs.
14	<b><u>Municipal Wi-Fi is not a universal alternative</u></b> to existing broadband services	A dense, urban scale municipal Wi-Fi network is unlikely to provide a universally-available, technically viable, low-cost alternative to existing services. Rather than adopt municipal Wi-Fi <i>instead of</i> existing services, we find that most consumers will likely use it as a low-cost <i>complement</i> for their nomadic Internet access needs.
15	The <b><u>wireless technology landscape</u></b> in Rockland County <b><u>will change significantly</u></b> in the coming years.	The factors that could have an effect on Rockland County in the moderate term include (1) the Clearwire/Sprint focus on WIMAX, and the AT&T / Verizon focus on LTE for Tier 3 markets; (2) the outcome of the now-concluded 700MHz C-Block auction and the yet to be auctioned D-Block; (3) IEEE 802.22 WRAN and the corresponding unlicensed whitespace technologies; and (4) continued expansion of 3G (EVDO/UMTS) by incumbent providers.
16	The <b><u>public safety agencies</u></b> of Rockland County have <b><u>growing broadband technology needs</u></b> .	Currently, the mobile wireless broadband capabilities for public safety agencies in Rockland County are limited. As the need for public safety applications grow, there is a significant motivation to update current systems to support these applications. Currently, the County operates on a 19.2kbps RDLAP system which does not have the capability to support broadband data, video, or other emerging public safety applications.

Asset Assessment Findings		
#	Finding	Summary
17	<b><u>The County lacks a robust, high-capacity backbone core</u></b>	As technology evolves and network capacity increases to support applications throughout the County, the need will grow to have a high-capacity backbone core. Currently, the County is dependent upon leased line infrastructure for critical telecommunications and does not have a municipally owned backbone core infrastructure.
18	The <b><u>County lacks significant vertical infrastructure</u></b> needed to support a robust broadband data network	The assets at the County’s disposal are significant in terms of municipal owned land parcels, making up a total area of 6.65 square miles. However, the number of locations with significant vertical elevation needed to implement high site broadcast or microwave locations are lacking; both in the quantity and quality of these assets. Therefore, from the perspective of asset availability and suitability, the County would need to pursue the procurement of additional assets or the construction of tower facilities to support a robust broadband data network. The County’s radio communications project may provide additional towers in the future.
19	The <b><u>County lacks significant fiber optic infrastructure</u></b> needed to support a robust broadband data network	The County of Rockland does not own, or have the right to use, significant optical fiber networks throughout the County, a significant investment would need to be made by the County or a private partner to build or lease an optical fiber infrastructure or alternative high capacity backbone in support of a robust broadband data network. Should the County consider investing in a fiber network, the departments would have the advantage of using the optical fiber networks to create a more robust, high-performance wireless network for municipal use.
20	The <b><u>County lacks significant access to broadband radio spectrum</u></b> needed to support a robust broadband data	The County currently has access to semi-exclusive licensed frequency in the 4.9GHz band and in the Common Carrier / Private Operational Fixed Microwave band for individual point-to-point licenses. Access to these licensed frequency bands is common for a local municipality and does not represent a significant license holding for the County. Civitium explored whether or not the County of Rockland has access to the ITFS Education Spectrum/2.5GHZ licenses. Civitium found that the School Districts do not have any licenses to use ITFS Education Spectrum.

21	<p>The <b><u>County geography presents a challenge</u></b> for the implementation of a ubiquitous, high capacity, non-line of sight wireless technology</p>	<p>Rockland County has significant elevation variations ranging from 0' (sea level) to 1306' at its highest point. The topological variances and rolling hills throughout the County will have an effect on most wireless systems, creating shadowing in some areas which will require an increased number of base stations or access units to compensate.</p>
22	<p>The <b><u>foliage conditions present a challenge for the implementation</u></b> of ubiquitous, high capacity wireless technology</p>	<p>The County has a high density of foliage clutter in the spring and summer seasons. Dense foliage significantly increases shadow areas of radio propagation and often increases node density. Due to the high density of large deciduous foliage throughout the County, a significant seasonal variation in foliage clutter is experienced between summer and winter seasons. These factors create a significant issue for the initial design and ongoing management and optimization of a broadband wireless system due to how these environmental changes effect radio propagation. The challenging issue of foliage clutter is usually magnified with increase in frequency range; therefore lower frequency options would be preferred for the County.</p>
23	<p><b><u>Geographical features and populous zones will create significant exclusionary zones</u></b></p>	<p>Based on exclusion of parklands and large water bodies, it is estimated that a minimum of 56.5 square miles will be considered preliminary exclusion zones. Additional exclusion zones would likely be required based on low population density in certain areas that would not support a business case for wireless coverage area inclusion.</p>

Business Model Analysis Findings		
#	Finding	Summary
24	<b><u>Private-sector investment in a countywide municipal wireless network is unlikely</u></b>	Based on the reaction of incumbent broadband providers, large ISPs and competitive wireless startups to the current municipal Wi-Fi market conditions, it is unlikely that these entities will accept the <b><u>full</u></b> investment risk to deploy a <b><u>countywide</u></b> Wi-Fi network. The market is not conducive to enticing these companies to finance and deploy a countywide network, at least not without anchor tenancy commitments that we believe will exceed the volume of Wi-Fi services that the County can reasonably consume. Despite this lack of investor confidence in countywide deployments, there will continue to be viable options to finance targeted Wi-Fi initiatives going forward (e.g. grant-funded projects, public-private pilot expansions, ad-hoc Wi-Fi, etc.)
25	<b><u>A paid municipal Wi-Fi alternative</u></b> to existing broadband services <b><u>is not viable</u></b> , and advertisements alone cannot support free access	A business model that positions municipal Wi-Fi as an unbundled, consumer-paid alternative to existing broadband services is unlikely to be viable, whether publicly or privately financed. Prior attempts to provide free access and achieve a return based solely on advertising have not been successful to-date.
26	A countywide network is <b><u>ultimately</u></b> required to meet <b><u>all internal and public safety needs</u></b> identified during this study	In order to meet all of the internal needs identified during this study, an integrated, carrier-grade, countywide wireless broadband network will ultimately be required. Municipal Wi-Fi technology can be deployed to meet targeted needs using an incremental deployment strategy (e.g. through the deployment and expansion of radio communications project, hot-spots or hot-zones).
27	County needs to <b><u>develop comprehensive business case</u></b> for desired applications	The County has a large, diverse and growing need for wireless communications services to support its internal operations and service delivery efforts. While these needs are identified through the project and the planned/desired wireless applications across many departments, no comprehensive business case has been developed that would accurately estimate the cost to upgrade applications, estimate cost reduction, cost avoidance or productivity benefits that a countywide wireless network could enable.

## ANALYSIS OF FINDINGS

This study finds that the Rockland community is supportive of a wireless broadband network, that the County has an important role to play, and that there are real, tangible opportunities to leverage wireless broadband to meet internal and community needs.

From a technology viewpoint, we find that no single wireless technology alone can meet all of the wireless needs identified, but an approach that encompasses a hybrid of technologies (Wi-Fi, 4.9 GHz, WiMAX, 700MHz, LTE 3G/4G) will meet the majority of the County and community identified needs.

From a market viewpoint, we find that municipal Wi-Fi as an unbundled, consumer-paid service is unlikely to provide a universal, viable alternative to existing broadband services. We also find that advertising fees alone are unlikely to generate sufficient revenue to achieve a financial return on such an investment.

From an asset viewpoint, the County lacks the facilities for the construction of a countywide wireless network. For such a network to be feasible, construction of some tower high site facilities would be required. Additionally, the county would require construction of some optical fiber or high-frequency microwave facilities to serve as the backbone network to support a wireless access infrastructure.

From a public safety viewpoint, we find that the County operates on a 19.2kbps RDLAP system, which does not have the capability to support broadband data, video, or other emerging public safety applications. 4.9 GHz network can permit public safety agencies to implement on-scene wireless networks for streaming video, rapid Internet and database access, and transfers of large files such as maps, building layouts, medical files, and missing person images. It also allows these agencies to establish temporary fixed links to support surveillance operations. This allocation gives every jurisdiction in the country access to spectrum for deployable, interoperable, broadband communications.

From a financial viewpoint, we find that a countywide 4.9 GHz public safety network will cost between \$2.8-3.5 million to build and \$800K per year to operate and maintain if combined with the \$30 million Radio Communications Capital Project. We find that the private sector will not pay to build a public use only network and the County will have to cover the cost to build the network. We find that the County may be able to secure State or Federal grants to help offset the cost to build the 4.9 GHz network.

## CONCLUSIONS

**We conclude that the deployment of a countywide Wi-Fi network is not feasible for Rockland County at this time, but as outlined below, there are steps the County can take to further its objectives.**

The findings from this study and the experiences of similarly-situated cities and counties suggest that achieving the goals of the Rockland Wireless Broadband initiative will require a long-term, multi-year commitment. At the same time, there are real, immediate needs that exist today - both for County agencies and the community. To balance these short-term needs and long-term goals, we recommend that the County remain committed to a countywide vision, but proceed forward with an incremental investment and deployment strategy.

**We recommend the County, when ready, and in partnership with Radio Communications project, adopt a business model for 4.9 Ghz network that is initially public-owned and operated. We recommend the County and the towns leverage their assets to deploy municipal 4.9 GHz technology using a phased and targeted deployment strategy. This model should remain flexible to evolve over time, incorporating opportunities to expand the network's coverage area as the radio communication new towers are deployed.**

## RECOMMENDED NEXT STEPS

The next steps described below are organized into short-term, medium-term and long-term categories, which will aid the County in balancing the need to lay a foundation for future success, while at the same time taking action to produce immediate results.

Plan Element	Impact Horizon	Description
Short-term	0-6 months	Engage in tactical programs to meet immediate needs
Medium-term	6-18 months	Perform planning and program development to justify further investment
Long-term	18+ months	Develop a leadership and governance structure for long-term success

### SHORT-TERM PLAN: TACTICAL PROGRAM EXECUTION

We recommend the County take the following steps to address immediate needs that were identified during this study:

- ◆ **Explore Specialized Community Needs with Incumbent Service Providers.** The County should engage incumbent broadband providers in discussions to explore whether “lifeline”/small business rates for their existing products can be established and offered to specialized communities based on agreed-upon qualification criteria (e.g. income level, free lunch program participation, disadvantaged business etc.) Incumbent providers routinely contribute to community development efforts, and it may be possible to align the County’s goals with their valid revenue, profit and other business goals.
- ◆ **Expand Town Pilot Programs.** The towns have participated in several pilot programs over time, some through publicly-owned networks and others in partnership with wireless ISPs. The County should look to see if expansion of these programs to additional neighborhoods is feasible based on the needs identified in community outreach report.
- ◆ **Launch Ad Hoc Wi-Fi Seed Program.** The County should perform a rapid evaluation of existing ad hoc Wi-Fi solutions (e.g., from companies like FON and Meraki, and in conjunction with non-profit organizations whose mission

includes addressing digital inclusion) and execute a program to “seed” these deployments in communities throughout the County.

- ◆ **Develop and Release an Industry-wide RFI.** Due to the uncertainty that exists in the municipal Wi-Fi market, we advise the County to solicit input from the private sector on its view of municipal Wi-Fi and how its business offerings may align with the County’s policy goals. The County’s RFI should seek input not only from current broadband providers, but also from the broader technology ecosystem. This may include content producers, content aggregators and distributors, device manufacturers, traditional media companies such as newspapers and television stations, interactive media companies, internet search companies, advertisers, entertainment companies, Internet telephony providers, e-commerce companies and key industries such as automotive, healthcare, banking and transportation.

### **MEDIUM-TERM PLAN – FURTHER PLANNING AND PROGRAM DEVELOPMENT EFFORTS**

This study identified a wide range of wireless needs across county agencies and the community at large. However, calculating the total investment required to meet these needs, to evaluate the benefits that may result from each application, and to map requirements to a detailed engineering design for the network went beyond the scope of this study.

For these reasons, we recommend that the County engage in the following planning and program development activities. These activities should produce the more detailed requirements, financial estimates, business cases and digital inclusion policies that are required before more substantial investments can be justified.

- **Municipal Wireless Business Case Development** - The County should engage in an effort to prioritize and evaluate the business cases and returns on investment (ROI) for mobilizing applications across various county agencies. The results of the needs assessment performed during this study may be used as a starting point for prioritizing the applications that will be considered. In addition to estimating the cost reduction or cost avoidance that may be possible through the use of an alternative wireless network to support these applications, it will be necessary to consider productivity savings and other hard and soft benefits, as well as any additional capital and operating expenditures required for mobilization (e.g. new or upgraded software, handheld or vehicle-mounted devices, business process re-engineering, middleware and back-office integration, etc.) The results of this business case development should guide future County investments to expand the initial wireless zones that may be deployed by collaborating with incumbent broadband providers.

- ◆ **Municipal Comprehensive Plan** – The County should commission an effort to add a telecommunication element to the Comprehensive Plan process that is currently in progress. The telecommunications element should guide the future development and deployment of both fixed and wireless broadband in the County. Telecommunications cuts across several elements from economic development, to transportation, to public safety and disaster preparedness, to government efficiency and effectiveness to community quality of life.
- ◆ **Digital Inclusion Strategy and Plan** - The County may decide to commission the development of a detailed digital inclusion strategy and plan for Rockland. This strategy and plan should consider the experiences and best practices from case study projects, document the status of the divide in the County, define the key barriers to computer and Internet usage, define practical approaches to addressing these barriers, and outline the costs and benefits for executing the resulting plan. The County may opt to commission this work and provide the resulting strategy and plan for consideration by the committee referenced above, or it may choose to defer the effort to be performed by the nonprofit community.
- ◆ **Network Engineering and Finance Study** – The County should commission engineering and finance study for a countywide 4.9 GHz network. This should be performed in partnership with Radio Communications Project based on the strength of its assets and its similar internal needs. The study should consider an initial zoned deployment for internal use, with a phased deployment over time to open the network for department and other agency use.

## LONG-TERM PLAN – ESTABLISH LEADERSHIP AND GOVERNANCE STRUCTURES

We recommend the County develop a leadership and governance model that defines two (2) “platforms” or levels of authority and responsibility to ensure the policies and programs that are put in place are sustainable over the long-term, even through new administrations and board of supervisor elections. The platforms include:

- ◆ **A Platform for Community Sustainability.** The County should form an ICT (Information and Communications Technology) Executive Committee, made up of key County representatives as well as leadership from towns, villages, education, healthcare, utility, public safety, economic development, business, industry and other relevant stakeholders. This committee may be referred to as an advisory board, task force or other designation, but for the purposes of this report, we will refer to it as an Executive Committee. A clear charter for this committee should be developed, which should include at a minimum serving as an advisor on broadband and technology policy issues and providing guidance on the development and execution of technology-related programs that are

“external-facing.” The widening of focus from broadband to ICT is intentional, as we propose that the County’s broadband policies and programs over time will only provide the foundation for applications and services, which will also require focus and guidance. Participation on this committee would on a volunteer basis, and we estimate the costs for regular meetings and other activities to be minimal.

- ◆ **A Platform for Disaster Preparedness.** The County should form a Rockland Public Safety Network Committee made up of key County representatives as well as leadership from town and village police/fire/emergency-services/ambulance agencies; State and Federal homeland security agencies; disaster preparedness organizations; transportation agencies, and healthcare organizations. This committee may be referred to as an advisory board, task force or other designation, but for the purposes of this report, we will refer to it as a Public Safety Broadband Committee. A clear charter for this committee should be developed, which should include at a minimum serving as an advisor on broadband and technology policy issues relating to public safety 4.9 GHz network and providing guidance on the development and execution of applications to run over the network. Participation on this committee would on a volunteer basis, and we estimate the costs for regular meetings and other activities to be minimal. As an alternative, the County may want to combine these activities into the existing radio communications committee.

We propose that the leadership and governance structure above will provide a sustainable foundation for the County to achieve its goals for the Rockland wireless initiative and initiatives that may evolve in the ICT area over time.

**CLOSING**

Civitium’s goal during this study was to produce the most objective, informed, accurate and up-to-date information and analysis to help facilitate the many important decisions that the County will need to make. With the help of hundreds of participants during the process, we feel we have accomplished that goal.

Civitium wishes to thank the Rockland Wireless Advisory Group for its oversight and guidance throughout the study, Douglas Schuetz for his leadership and direction, the dozens of agencies, organizations and individuals for their time and valuable input.

The data collected and analysis performed, as memorialized in this report, provides the County with the information needed to move forward and achieve its vision for Rockland wireless broadband.