



Broadband Infrastructure Application
Submission to NTIA – Broadband Technology Opportunities Program

Submitted Date: 7/1/2010 2:37:52 PM	Easygrants ID: 7835
Funding Opportunity: Broadband Technology Opportunities Program	Applicant Organization: LOS ANGELES REGIONAL INTEROPERABLE COMMUNICATIONS SYSTEM AUTHORITY
Task: Submit Application - BTOP	Applicant Name: Felipe Perez

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A. General Application Information

Applicant Information	
Name and Federal ID for Applicant	
DUNS Number	962696089
CCR # (CAGE)	61RW8
Legal Business Name	LOS ANGELES REGIONAL INTEROPERABLE COMMUNICATIONS SYSTEM AUTHORITY
Point of Contact (POC)	MARK OUNE 2139747363 Ext. moune@ttc.lacounty.gov
Alternate POC	RAYMOND MIYAGAWA 2139747350 Ext. rmiyagawa@ttc.lacounty.gov
Electronic Business POC	SCOTT POSTER 3238812461 Ext. sposter@la-rics.org
Alternate Electronic Business POC	FELIPE PEREZ 3238818299 Ext. felipe.perez@la-rics.org

Name and Contact Information of Person to be Contacted on Matters Involving this Application:	
Prefix	
First Name	Felipe
Middle Name	
Last Name	Perez
Suffix	



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Telephone Number	323-881-8299
Fax Number	
Email	felipe.perez@la-rics.org
Title	Project Manager

Additional Contact Information of Person to be Contacted on Matters Involving this Application:

Project Role	Name	Phone	Email
Secondary Point of Contact	Mike , Thayer	8182279300	mthayer@deltawrx.com

Environmental Point of Contact

Prefix: Ms. Name: Yang, Nancy Suffix: Telephone Number: 3232672922 Title: Telecommunications Engineer

Organization Classification

Type of Organization	Other
Is the organization a small business?	No
Does the organization meet the definition of a socially and economically disadvantaged small business concern?	No



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Authorized Organizational Representative	
AOR Name	POSTER, SCOTT
Result	Applicant Authorized

Project Title and Project Description

Project Title: The Los Angeles Public Safety Broadband Network: LA-SafetyNet

Project Description: LA-SafetyNet will provide a single, highly reliable broadband wireless data network dedicated to all police, fire, and EMS personnel throughout Los Angeles County. The 290-site LTE system will initially support over 34,000 users, allowing emergency responders in the field to access and share high-speed, life-saving multi-media information via mobile devices.

CCI Priority Checklist

The following items were selected from the CCI Priority Checklist:

1. This project will deploy Middle Mile broadband infrastructure to community anchor institutions.
5. This project will deploy Middle Mile broadband infrastructure to public safety entities.
7. This project will deploy Middle Mile broadband infrastructure and the applicant has proposed to contribute 30 percent or more in non-federal cost match.

Comprehensive Community Infrastructure Components

The following items were selected from the Comprehensive Community Infrastructure Components:

- Middle Mile
- Last Mile Non-Rural

BIP Applicants



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Have you also applied to BIP for funding in the sample proposed funded service area?

- No

If Yes, please provide the project title and Easygrants ID number:

Title of Joint BIP Application:

Easygrants ID:

Other Applications

Is this application being submitted in coordination with any other application being submitted during this round of funding?

- No

Easygrants ID	Project Title

If YES, please explain any synergies and/or dependencies between this project and any other applications.

Individual Background Screening

Is the Applicant exempt from the Department of Commerce requirements regarding individual background screening in connection with any award resulting from this Application?

- Yes, Applicant is exempt because it is a unit of a state or local government

If the answer to the above question is "No," please identify each key individual associated with the Applicant who would be required to complete Form CD-346, "Applicant for Funding Assistance," in connection with any award resulting from this Application:

Name	Title	Employer



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B. Executive Summary, Project Purpose and Benefits

Essay Question

Executive Summary of the proposed project:

LA-SafetyNet will deliver instant, mission-critical information to 34,000 first responders who protect the lives and property of 10,000,000 residents throughout the Los Angeles region.

Problem Statement

The existing mobile data systems used by public safety first responders in the Los Angeles Region severely limit the amount and type of information that can be accessed and generated by field users. Access to a highly reliable broadband data system is necessary to support the modern, data-intensive, situational awareness applications that are needed by fire and law enforcement personnel.

Background

The Los Angeles area is one of the most demographically and geographically diverse areas in the country. Our region is home to 10 million residents from more than 140 countries who speak over 200 different languages. Our geography includes mountains, deserts, valleys and 70 miles of ocean coastline. The elevation of our land varies from sea level at the coast to 10,000 foot high mountains. The region is home to the second largest city in the United States and two national forests.

Throughout this diverse land, the lives and property of our residents are protected by 50 law enforcement and 31 fire service agencies that use a variety of voice and mobile data communications technologies. Unfortunately, due to the variations in voice radio technology and spectrum, the ability of public safety agencies in Los Angeles County to talk to each other during routine or emergency incidents is limited. Additionally, many of our departments have deployed traditional public safety mobile data systems, but their limited bandwidth has restricted our users to simple character-based messaging and database queries.

Partnerships



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To address these challenges, the Los Angeles Regional Interoperable Communications System (LA-RICS) Authority was formed to explore the development of a single, shared voice and data communications system for all public safety agencies within the greater Los Angeles region. Initial feasibility studies indicated that by leveraging the various independent agency efforts currently underway, a shared regional communications system would not only be possible, but would best meet the needs of the entire regional public safety community.

Consequently, the City of Los Angeles, the County of Los Angeles, the Los Angeles Unified School District and 82 other municipalities and public sector entities within the greater Los Angeles region joined the Authority. The purpose of the Authority is to construct, own, operate and maintain public safety mobile voice and data systems. A 17-member Board of Directors, comprised of first responder stakeholders from the greater Los Angeles region, governs the Authority.

Based on the 700 MHz broadband waiver we received, LA-RICS has put together a comprehensive plan to develop a robust LTE network that provides advanced mobile data features with the reliability of a traditional public safety system. Within the LA-RICS region, this system will directly impact 1,483 Community Anchor Institutions (CAI), including 422 public safety sites.

System Design

LA-SafetyNet will provide LTE broadband services to first and second responders. The network will enable “desktop extensions” for users – allowing all of the applications currently used on existing wired networks to be delivered in the field. Computer-aided dispatch, law enforcement queries, real-time streaming video, medical telemetry, patient information and tracking, geographical information systems and a host of other applications will be supported by the network. In the event of regional event requiring mutual aid from outside Los Angeles County, responding agencies will be provided broadband network access on LA-SafetyNet.

Additionally, we will provide middle mile broadband services via the fiber and microwave network that connects LTE base stations to the Core switching elements. Middle mile access will be offered to fire, EMS, law enforcement, hospitals and other community anchor institutions throughout the Los Angeles County wireless service area.



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LA-SafetyNet includes 290 LTE base station locations distributed to provide service throughout Los Angeles County. The base stations are interconnected via existing or new fiber or microwave links. To achieve highly reliable service, three redundant core network elements (Evolved Packet Cores) will be deployed at existing data centers. Each LTE base station will be deployed with existing or new backup UPS and generator power and redundant HVAC systems.

LA-SafetyNet is designed as a scalable wireless network architecture that can be seamlessly expanded to support increased capacity wherever needed. Our network is also designed to be integrated into any future regional and national LTE efforts, such as the proposed Border Broadband Initiative.

Costs

The overall cost of the project is estimated to be \$245M. Of this amount, nearly \$73.5M is cash and in-kind contributions, which results in a request for funding of \$171.5M. Of the total budget, \$216M will be used towards the Last Mile system and \$29M towards the Middle Mile system.

Deployment

LA-SafetyNet will be deployed in three years. The first year will be spent procuring equipment and services, securing sites and initiating the zoning, permitting, and environmental compliance process. In the second year, we will build new towers and develop additional sites as needed for broadband equipment, as well as deploy sites that are ready for implementation. In the third year, the base stations and ancillary equipment (microwave, generators, UPS) will be deployed to complete the system.

Initially, it is expected that more than 34,000 LTE modems will be deployed for use in laptop computers. However, it is anticipated that the number of modems could double over the eight year operational period. Additionally, if affordable handheld devices become available during that period, the user base could exceed 100,000.

Regional Impact

It is estimated that this project will generate 292 direct job years, 1,100 indirect job years, and 789 induced job years. In addition, LA-SafetyNet will create a large, new market for public safety broadband software applications, which could result in substantial innovation and additional jobs that have not been quantified.



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Overall Benefits to the Region and Nation

LA SafetyNet will provide the highly reliable broadband wireless services required by the 34,000 public safety personnel throughout Los Angeles County. It will enable first responders to instantly access mission critical information that can dramatically improve the outcomes of our emergency responses as well as provide access to new applications that will revolutionize and enhance public services and community protection. We will also work to implement LTE broadcast voice over IP (VOIP) push-to-talk capabilities that meet the demands of public safety users.

Additionally, if funded, LA-SafetyNet will be a national incubator for public safety wireless infrastructure and data application innovations. Our region's large geographic size, tremendous diversity and broad user base will be an attractive test-bed for innovative public safety applications. Our system will become a national model and we will commit to sharing and providing guidance, implementation and operational insights as well as lessons-learned to the PSST and other regional initiatives. Development of LA-SafetyNet will not only significantly improve the abilities of first responders in the LA region, it will provide a wealth of information that will improve broadband deployments throughout the nation.

Project purpose:

LA-RICS SafetyNet will provide first responders with immediate access to mission critical information that can dramatically improve the outcomes of our emergency responses. Historically, many of our departments have deployed traditional public safety mobile data systems, but their limited bandwidth has restricted our users to simple character-based messaging and database queries. LA-SafetyNet will provide dedicated, resilient broadband access to 34,000 first responders across Los Angeles County, improving public safety for the 10,000,000 residents they serve.

As our environment changes and the risks from terrorism, man-made and natural disasters increase, law enforcement officers and firefighters require data-intensive situational awareness applications that are not supported by our traditional networks. Recent developments in broadband wireless communications have exponentially increased network data throughput, which will enable the greater Los Angeles (LA) region's public safety community to share



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crucial information across jurisdictions to support emergency responses for both day-to-day and catastrophic events.

Rapidly evolving cellular and wireless technologies have driven consumer demand for phones and devices in the commercial market that support high download and upload speeds, GPS capabilities, and on-demand video streaming. These capabilities have been tailored for business and personal use, but first responders could leverage these same technologies to download video from a reported fire, share real-time GPS location information, or access photos of wanted persons from a police cruiser.

Although first responders want these advanced capabilities, there are key differences between the types of networks that consumers and first responders need. While consumers may tolerate network performance problems, first responders have unique needs for performance, survivability and reliability that are not being met by the current commercial networks. Coverage is also an issue for commercial services. Our experience has shown that the carriers have only limited interest in deploying new technologies to sparsely populated regions due to their limited subscriber base. First responders, on the other hand, require coverage throughout the County, including in the mountainous areas where wildfires are prevalent and in the small communities and major thoroughfares of the remote desert.

The recent allocation of 700 MHz spectrum to the first responder community will allow us to develop a robust 4G network that provides advanced features with the reliability of a traditional public safety system. Use of the LTE standard will provide significant economies of scale that will allow our network to be deployed faster and more cost effectively.

Our proposed 700 MHz network will have extensive dedicated capacity for day-to-day public safety operations. LA-SafetyNet has been designed to deliver a minimum throughput of 768 kbps downstream and 200 kbps upstream, as required by BTOP. We fully expect the proposed network to exceed these minimum requirements through most of the service area. Furthermore, LA-RICS is pursuing concepts that would enable vehicular-based eNodeBs (base stations) or LTE relays to further augment coverage in select remote areas of the County.

In the event of a large-scale incident, LA-RICS will control the priority, quality of service, and capacity of the system to optimize its allocation to user groups and/or applications. This level of



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control will enable LA-RICS to achieve the highest levels of efficient and effective interoperable utilization of the broadband network and spectrum.

LA-SafetyNet will deliver essential data to first responders throughout the LA region. It will provide field personnel access to desktop capabilities (internet access, email, database searches, report generation, etc.) and situational awareness applications (e.g., on-scene video feeds, force deployment information, etc.) The network will also facilitate high-speed data sharing between field personnel and will deliver critical broadband data connectivity between control and command centers, dispatch facilities, and other fixed public safety locations.

Law enforcement, fire service, and emergency medical services (EMS) agencies would be direct beneficiaries of LA-SafetyNet. Community anchor institutions such as K-12 schools and community colleges would benefit from LA-SafetyNet through their organizations' public safety arms. Hospitals would benefit as part of the regional EMS network. Although the intent of this project is not to provide direct broadband service to the general public, LA-SafetyNet is intended to provide first responders with the same communications capabilities in both underserved and served communities across the entire County.

If funded, LA-SafetyNet will be a national incubator for public safety wireless infrastructure and data application innovations. Our region's large geographic size, tremendous diversity (high-rise commercial centers, mountains, valleys, beaches, deserts and forested areas), and broad user base will be an attractive test-bed for innovative public safety applications. Our system will become a national model and we will commit to sharing and providing guidance, implementation and operational insights, and lessons-learned to the PSST and other regional initiatives. Development of LA-SafetyNet will not only significantly improve the abilities of first responders in the LA region, it will provide a wealth of information that will improve broadband deployments throughout the nation.

Recovery Act and Other Governmental Collaboration:

The LA-RICS Land Mobile Radio (LMR) system and the LA-SafetyNet broadband data system are complementary communications systems serving the public safety community of Los Angeles County. Investments in each are mutually supportive. The LA-RICS LMR system has received the following federal Recovery Act grant, which will indirectly impact LA-SafetyNet:

1. Justice Assistance Grant/ American Recovery and Reinvest Act (JAG/ARRA) FY 2009



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- Grant Award = \$14,103,968
- Purpose – Site improvements for land mobile radio (LMR) system

LA-RICS is currently in the procurement process to implement a new Land Mobile Radio (LMR) system throughout Los Angeles County. JAG/ARRA funds will be used to offset site improvement costs – such as upgraded shelter space, strengthened antenna structures, or improved back-up power systems – at 10 to 15 mountaintop sites that will be part of the LMR system. Although these sites are at an elevation not conducive to LTE coverage specifications needed for the broadband system, LA-RICS anticipates the opportunity to co-locate the voice system infrastructure and LA-SafetyNet infrastructure at several of these sites.

By coordinating funding directed towards shared infrastructure, LA-RICS avoids the need to invest in unnecessary redundant infrastructure. This allows for more efficient investment of limited funds into coverage, capacity, and resiliency in public safety communications.

Fit with BTOP CCI Priorities:

Together, LA-RICS and its partners are committed to enhancing and expanding communications interoperability throughout the County and to exceeding BTOP CCI Priorities and broadband access objectives. LA-SafetyNet will directly deploy broadband infrastructure to public safety entities, such as law enforcement, fire service, and emergency medical services. In addition, the network will incorporate and support Community Anchor Institutions (CAI) such as schools and hospitals. Demonstrating the potential impact of this network, LA-RICS members will provide a 30% cash and in-kind cost match.

•Public Safety:

As one of the 21 700 MHz broadband wireless applicants awarded a waiver by the Federal Communications Commission (FCC) to implement a 700 MHz wireless network, LA-RICS recognizes the tremendous impact that BTOP funding could have in accelerating wireless broadband access for public safety. The Los Angeles region’s public safety community lacks access to a dedicated, resilient wireless broadband network. Neither government-operated mobile data networks nor existing commercial cellular operators offer the priority access, coverage, or reliability necessary to deliver mission-critical public safety data to first responders in the field, making public safety an unserved community. Therefore, LA-SafetyNet is primarily a wireless Last Mile network designed to provide critical 700 MHz broadband wireless network services to the 34,000 public safety personnel across L.A. County. LA-SafetyNet is designed to provide public safety broadband wireless services to all population centers of the County and to all



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critical infrastructure facilities, including the Ports of Long Beach and Los Angeles, the Los Angeles International Airport, the Los Angeles Memorial Coliseum and many others. LA-SafetyNet will provide broadband services to all designated fire staging areas throughout the County to support broadband communications requirements during wildfire events and other emergencies throughout the County. LA-SafetyNet is designed to deliver minimum data throughput of 768 kbps downstream and 200 kbps upstream to provide in-vehicle service throughout the entire service area and to deliver in-building service within various high-density building areas, including downtown Los Angeles.

•Community Anchor Institutions:

In compliance with CCI grant objectives, LA-RICS has incorporated community anchor institutions (CAI) and public safety sites in the network design and will provide CAIs with access to the wireless network in accordance with FCC 700 MHz regulations governing public safety conditional use of the spectrum. The current LTE design leverages 422 public safety facilities including 69 police stations and 292 fire stations. The CAIs include 929 schools, 9 community colleges, and 122 hospitals and medical centers. The LA-SafetyNet architecture integrates these facilities into the system design, as well as access to existing LA-RICS-member fiber and microwave capabilities. The FCC is currently re-evaluating spectrum access rights, and if additional access to CAIs is approved, LA-RICS will evaluate expanding network access to those new institutions, including private entities such as utilities and others where mutual benefits can be derived. LA-RICS is open to private-public partnership opportunities in the future, however, today's shifting FCC regulatory environment and the limited time to investigate such partnership opportunities leads us to initially focus on a public sector solution. In this context, the existing LA-RICS ownership and governance model, a Joint Powers Authority of 85 member jurisdictions, is the structure best suited for the proposed network. LA-RICS is proud of the partnerships we have formed in order to bring dedicated wireless broadband services to our public safety community. By working together, LA-RICS has developed a network design that incorporates existing public assets and resources to serve 1,483 combined public safety and CAI facilities.

•Middle Mile Support:

LA-SafetyNet provides an excellent opportunity to provide reliable Middle Mile interconnections to our own member law enforcement and fire stations, as well as to hospitals and other potential CAIs as deemed appropriate. In the event that a man-made or natural disaster incapacitates the regional Internet traffic, LA-SafetyNet will supply continued communication with those facilities over the Middle Mile network connecting LTE base stations to the Core switch and internet.



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The LA-SafetyNet Middle Mile infrastructure includes a wide-scale network of new and existing microwave and fiber broadband that will provide capacity beyond the requirements for LTE backhaul to support limited but critical Middle Mile broadband connectivity. Given the quantity of CAI facilities throughout the 4,000+ square miles of Los Angeles County, it is not possible to provide all facilities with wired, Middle Mile connectivity; however LA-SafetyNet will deliver such services where they are most critical to public safety and most valuable to the overall network. Furthermore, the network design is optimized to provide LTE wireless service to these locations, ensuring at least some level of broadband service to each site. Each facility design will use these connections on a secondary basis to ensure communications with field-based personnel and with core network services. It is important to clarify that the priority for this project is to provide field-based LTE coverage, and not Middle Mile services. This Middle Mile connectivity is a by-product of the Last Mile design and affords the opportunity to provide these “lifeline” services.

•30% Cost Match:

Lastly, to further satisfy CCI Priority objectives, LA-RICS has included a 30% funding match towards the Middle Mile broadband infrastructure. This match is comprised of in-kind land and communications infrastructure, as well as a cash contribution including labor.

Is the applicant seeking a waiver of the Buy American provision pursuant to section x.Q of the NOFA?

- No

Is the applicant delinquent on any federal debt?

- No

If Yes, justification for delinquency:

Are you seeking a waiver of any requirement set forth in the NOFA that is not mandated by statute or applicable law?

- No

Is the applicant a current recipient of a grant or loan from RUS?

- No



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C. Partners

Are you partnering with any other key institutions, organizations, or other entities for this project?

- No

If YES, key partners are listed below:

--

Description of the involvement of the partners listed above in the project.

The Los Angeles Regional Interoperable Communications System (LA-RICS) was formed to explore the development of a single, shared voice and data communications system for all public safety agencies within the greater Los Angeles region. Initial feasibility studies indicated that by leveraging the various independent agency efforts currently underway, a shared regional communications system would not only be possible, but would best meet the needs of the entire regional public safety community. As a result, the City of Los Angeles and the County of Los Angeles, in collaboration with other municipalities and public sector entities in the region, drafted a Joint Powers Agreement (JPA) to create the LA-RICS Joint Powers Authority.

Together with the City of Los Angeles, the County of Los Angeles, and the Los Angeles Unified School District, 82 other municipalities and public sector entities within the greater Los Angeles region have become members of the LA-RICS JPA. The purpose of the JPA is to construct, own, operate and maintain public safety mobile voice and data systems. A 17-member Board of Directors, comprised of first responder stakeholders from the greater Los Angeles region, governs the Authority. If this grant request is successful, we will successfully integrate the proposed 700 MHz LTE network into our regional interoperable communications plans and activities.

Key executive management and technical members of the LA-RICS partnership have contributed extensively to the development of this BTOP grant, as well as to the design of the proposed LA-SafetyNet. LA-RICS partners will continue to contribute to the project through the grant due diligence and eventual implementation phase of the program. LA-RICS operational support will be provided by LA-RICS member agencies and jurisdictions consistent with the JPA governance agreement. Based on the direction of the Board of Directors, LA-RICS executive and middle managers provide key strategic and operational decision making in the areas of procurement,



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technology, community outreach and partnerships, interoperability and standard operational procedures, among others. This regionally comprehensive governance structure will facilitate the funding, planning, implementation and operation of LA-SafetyNet.

All LA-RICS members will have access to the LA-SafetyNet wireless broadband system and will jointly operate the network. Access to the middle mile component of the LA-SafetyNet will be limited to select public safety agencies and other Community Anchor Institutions based on their critical needs and the available throughput over the fiber/microwave backbone network. LA-RICS members will be responsible for the continuity of LA-SafetyNet operations and will contribute a prorated share of the annual operational cost based on their share of network users. In return for this funding commitment, members will have unrestricted access to the network. Additional network subscribers will be added over time and will also share in the prorated cost of all network operational expenditures (labor, materials, utilities, leases, etc.).

The members of LA-RICS are excited to deliver critical broadband wireless communications capabilities to our communities through LA-SafetyNet. The partners are actively supporting the grant initiative and will support the implementation and operation of the system. Letters of support and commitment from all 17 members of the LA-RICS Board of Directors have been provided to illustrate our support. Additionally, similar support and justification letters have been provided by all United States Congressional Representatives from the 18 Congressional Districts that cover the City of Los Angeles and Los Angeles County.

As of the submission date of this BTOP grant application, LA-RICS has not proposed to form a traditional private-public partnership with non-government entities to deploy and operate the proposed 700 MHz broadband network. We are confident that the LA-RICS Joint Powers Authority has the ability and leadership to successfully implement the proposed project. Our partners' cooperation, commitment to interoperable communications and ability to fund and staff the project, will ensure LA-SafetyNet's successful implementation and long term continuity of operational support and funding. However, we remain open to exploring relationships with regional commercial cellular operators. We recognize that the breadth of their current cellular networks are extensive and that access to their existing cell sites, switching facilities and interconnection to the Public Switched Telephone Network and the Internet could be mutually beneficial and cost effective. We were unable to discuss the cooperative nature of this "partnership" with regional cellular operators during the preparation of this grant proposal due to the Request for Proposals we currently have open.



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LA-RICS is also interested in exploring partnership opportunities with organizations in the utility industry. Network access and cost sharing arrangements might be mutually beneficial for LA-RICS and these organizations. In the limited timeframe available to prepare and submit this BTOP grant, and in response to Federal Communications Commission restrictions on access beyond public safety and local government to the 700 MHz network, such exploratory discussions were not possible.

LA-RICS will further explore reasonable and beneficial partnership opportunities in the near future and we have great confidence in the Joint Powers Authority to plan, implement, fund and operate the proposed LA-SafetyNet.

D. Congressional Districts

Applicant Headquarters

- California

Project Service States

California

Project Service Areas

California - 22

California - 25

California - 26

California - 27

California - 28

California - 29



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California - 30

California - 31

California - 32

California - 33

California - 34

California - 35

California - 36

California - 37

California - 38

California - 39

California - 42

California - 46

Will any portion of your proposed project serve federally recognized tribal entities?

➤ No

Indicate each federally recognized tribal entity your proposed project will serve.

Have you consulted with each of the federally recognized tribal entities identified above?

➤ No



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Submission to NTIA – Broadband Technology Opportunities Program**

Submitted Date: 7/1/2010 2:37:52 PM	Easygrants ID: 7835
Funding Opportunity: Broadband Technology Opportunities Program	Applicant Organization: LOS ANGELES REGIONAL INTEROPERABLE COMMUNICATIONS SYSTEM AUTHORITY
Task: Submit Application - BTOP	Applicant Name: Felipe Perez

E. Service Area Details

Is the applicant seeking a waiver for providing less than 100% coverage of a service area?

- Yes

Project Details

Service Area Type: Last Mile
Service Area Name: Los Angeles County
Rural Classification of the Last Mile Service Area: Non-Rural
Service Status of the Last Mile Service Area: Served

If Service Status is "Underserved" please select at least one applicable option from this list.

Total Square Miles in Service Area: 4,060
Total Population in Proposed Service Area: 9,848,011
Total Number of Households in Service Area: 3,133,744
Total Number of Businesses in Service Area: 901,948
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: 1,483
Unemployment Rate in the Service Area: 12
Median Income in the Service Area: 55,452
Estimated Percentage of Households with Access to Broadband:
Estimated Percentage of Households Subscribing to Broadband:

F. Community Anchor Summary

Community Anchor Summary	
Schools (k-12)	929
Libraries	0
Medical and Healthcare Providers	122



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Public Safety Entities	422
Community Colleges	9
Public Housing	0
Other Institutions of Higher Education	1
Other Community Support Organization	0
Other Government Facilities	0
TOTAL COMMUNITY ANCHOR INSTITUTIONS	1483
Historically Black colleges and Universities	0
Tribal Colleges and Universities	0
Alaska Native Serving Institutions	0
Hispanic Serving Institutions	0
Native Hawaiian Serving Institutions	0
TOTAL MINORITY SERVING INSTITUTIONS	0

G. Project Benefits

Demographics	
Jobs	
How many direct jobs-years will be created from this project?	292



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How many indirect jobs will be created from this project?	1110
How many jobs will be induced from this project?	789

Methodology used to estimate jobs:

LA-SafetyNet will directly create 292 jobs during its implementation phase, indirectly create 1,110 jobs and induce 789 jobs. LA-RICS based the implementation jobs estimate on lessons learned from previous system deployments. Supplementing this approach, the Council of Economic Advisors (COEA) methodology was used to estimate indirect and induced jobs.

Project implementation will last 3 years and employ 292 direct personnel. Direct implementation jobs cover the project’s design and construction phase. This staff includes communications and civil engineers, tower manufacturers, facilities construction and improvement personnel, LTE equipment vendors, project management staff, and other project support. Indirect jobs are estimated at 1,110 personnel. The COEA methodology (Project Cost/\$92k * 64%) estimates a total of 1,402 direct and indirect jobs created by LA-SafetyNet. Subtracting the direct job-years described above produces an indirect jobs estimate.

Induced jobs are estimated at 789 personnel. This COEA calculation used the total cost of the project divided by the \$92,000 per job year figure and the recommended 36% rate to produce an estimate.

Project Impact:

Overview:

LA-SafetyNet will provide the highly reliable broadband wireless services required by the 34,000 public safety personnel throughout Los Angeles County. It will enable the region’s police, fire, EMS, EMA and other public safety personnel to utilize critical applications they currently use at their desktops, as well as existing and planned mobile applications, required during typical and emergency field operations. Extending access to desk-top data sharing and interoperability to support day-to-day and emergency requirements will lead to greater protection for the citizens and public safety personnel of Los Angeles County. Coupled with the LARICS voice radio system, it will provide world-class situational awareness to ensure more optimal incident prevention, response and management.

Need:



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The lack of a highly reliable, robust, interoperable broadband wireless network throughout Los Angeles County has stifled public safety’s full use of, and field reliance on, some critical data applications. Current commercial cellular networks are often unreliable during emergency events and are not a cost effective option to provide broadband access to all public safety personnel in the LA-RICS service area. Because of the risks to regional public safety operations, it is not feasible to rely on solutions that are not always available or cost effective. With the LA-SafetyNet broadband wireless network designed to be as resilient as the LA-RICS Land Mobile Radio network, there will be a dramatic increase in the utilization of all wireless data applications, especially those that require broadband speed and capacity. Moreover, the region’s public safety recruits are increasingly computer savvy, so the new broadband infrastructure will become a catalyst for innovations to further improve public safety operations and mission critical response, prevention, and management.

LA-SafetyNet:

The LA-SafetyNet broadband data network will provide robust, dedicated mobile access to critical information and capabilities that will revolutionize and enhance public services and community protection. Since LA-SafetyNet will be dedicated to public safety personnel, all network capacity will be available for public safety utilization. LA-SafetyNet will also facilitate the prioritization of services, data throughput and network congestion management to best fit the individual user group requirements of LA-RICS personnel and those of regional and national first responders roaming throughout the extended Los Angeles County area. Furthermore, by constructing the network with multiple redundant and reliable components, it will survive the types of natural and man-made failures that plague commercial wireless broadband services. All LA-SafetyNet base station and Core switching facilities will be constructed to public safety site-hardened standards.

LA-SafetyNet will deliver essential data to first responders throughout the LA region. It will provide field personnel access to desktop capabilities (internet access, email, database searches, report generation, etc.) and situational awareness applications (e.g., on-scene video feeds, force deployment information, etc.) The network will also facilitate high-speed data sharing between field personnel and will deliver critical broadband data connectivity between control and command centers, dispatch facilities, and other fixed public safety locations.

Coverage:



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LA-RICS will deliver targeted, high quality in-building service into all critical infrastructure facilities – such as the Ports of Long Beach and Los Angeles and Los Angeles International Airport – during the initial implementation plan. However, we anticipate that only a limited degree of in-building coverage throughout the rest of the region will be available from the initial system implementation. Because Los Angeles is a dense metropolitan area, in-building communications can be quite limited. Although it is expected that hand-held devices will be available in the coming years, the low output power of broadband devices is expected to limit in-building coverage. Furthermore, initial broadband devices will not have direct mode (unit-to-unit) communications capabilities when the network is unreachable.

Due to these factors, it is probable that our in-building, broadband communications needs will not be fully achieved within the initial operational phases of the network. LA-RICS intends to offset this impact by prioritizing in-building coverage at key locations, through roaming agreements with commercial cellular operators, and by continually adding new base station locations during future operational phases of the network to expand coverage into critical in-building environments.

Connectivity:

To the extent possible, the system will also provide last mile and middle mile connectivity to existing public safety facilities including fire stations, police stations, and hospitals. The inclusion of these facilities enhances data sharing capabilities with and among affected locations in the event of a major regional incident that might otherwise disrupt communications. All public safety community anchor institutions and other CAIs will have access to the LTE last mile and middle mile transport networks connecting LTE sites and the Core switch wherever possible to further facilitate data communications and interoperability with those facilities. Because LA-SafetyNet is designed to cover all population centers in the extended Los Angeles County area, all County CAI facilities will be within the LTE wireless service area and will indirectly benefit from the access and capabilities provided to the County’s public safety community.

Spectrum Efficiency:

LA-RICS will actively manage LA-SafetyNet to ensure the 10 MHz of FCC allocated broadband spectrum meets the needs of responders in the field. For example, we anticipate that the system will provide streaming video to field personnel and support real-time video to and from incidents on the ground.. However, the number of video streams and their respective resolution will be limited in any given geographic area under the current spectrum allocation. LA-RICS intends to



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continually monitor bandwidth requirements and to augment the proposed system with additional sites within high traffic areas to supplement LA-SafetyNet capacity.

Effectiveness:

Public safety communications are needed most when conditions are at their worst. As a result, very high system reliability during day-to-day and catastrophic events is a vital requirement for a robust public safety grade broadband solution. Furthermore, in consideration of today’s economy, it is more important than ever that any solution be affordable and sustainable. As a partnership among 85 jurisdictions covering all of Los Angeles County, LA-RICS has an opportunity now to not only increase first responder and community safety and satisfaction but to decrease dependencies on expensive, unreliable commercial carrier services via a dedicated public safety wireless broadband network solution. LA-SafetyNet will deliver cost-effective, highly reliable middle mile and last mile broadband services to the County’s public safety users and CAIs so they can leverage the same tools and resources available on the commercial market as well as innovative technologies and applications designed for public safety.

Vulnerable Populations:

This BTOP grant is designed to provide funding to implement a public safety 700 MHz wireless LTE network. Vulnerable population groups are not overrepresented among first responders, the direct beneficiaries of LA-SafetyNet.

However, the nearly 10,000,000 residents of Los Angeles County will be the ultimate beneficiaries of the improved public safety outcomes driven by LA-SafetyNet. Across Los Angeles County, several vulnerable population groups are overrepresented relative to the national population. These socio-economically disadvantaged communities, and their percentage share of the County population, are listed below:

- People of Color: 71.1%
- Language Other Than English Spoken at Home: 56.2%
- Adults over 25 without a High School Diploma: 30.1%
- Individuals below poverty level: 15.1%
- Population with Disability over 5 years: 20.4%
- Population less than 5th grade education: 6.7%

Level of Need:



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The LA-RICS public safety community needs a reliable broadband wireless network to support day-to-day and emergency response communications. Four fundamental drivers justify the requirements for public safety broadband networks: the availability of service, network reliability, the coverage footprint, and the throughput footprint. However, these networks must be cost effective and available to all public safety, second responders such as public works and transportation, and other critical infrastructure industry subscribers.

While there are limited low throughput mobile data networks operational today in the LA-RICS service area, they are not scalable and cannot support critical field applications including access to the internet, streaming video, CAD, GIS and desktop capabilities to responders in the field. The only broadband wireless networks available to public safety are commercial cellular networks. While these networks will support some of the required public safety field applications, they cannot support the network reliability requirements needed, have throughput limitations, and are far too costly for wide scale utilization. When public safety communications are needed the most during major planned and unplanned events and emergencies, they must contend with the general public for commercial network resources and access. It is precisely during these critical points in time when data communications become mission critical and lives are at stake. At other points in time, man-made or natural events will incapacitate the commercial broadband networks and be unable to sustain even the most basic services.

The commercial networks are not designed to survive the harshest of man-made or natural events, which are exactly when public safety networks must perform reliably. As a result, prolonged power outages and other incidents will eliminate commercial coverage, or, at best, limit access and throughput. Commercial carriers also have little incentive to provide service to areas with low population or business densities and often do not provide service in many of these areas. The proposed LA-SafetyNet broadband network will deliver dedicated capacity on a highly available infrastructure, constructed to public safety standards. These standards include back-up power generators and batteries, redundant critical network components and redundant backhaul capabilities, among other features to ensure the highest levels of network reliability.

While the proposed LA-SafetyNet network does not initially cover the entire geographic area of Los Angeles County, the network is designed to deliver service to over 99% of the County's population, to all critical infrastructure facilities, and to most of the roads that extend into the remote County areas to enable broadband communication from those relay points. For example, all County fire department staging areas deployed during the forest fire season, which are located



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in densely forested State and Federal forest lands, will be served by LA-SafetyNet. In addition, because LA-RICS will control both the infrastructure and the 700 MHz spectrum allocation, temporary sites can be deployed to accommodate communication needs in these remote areas. LA-SafetyNet is scalable and will be expanded over time to cover additional geographic areas of the County. It is also designed using the Long Term Evolution (LTE) broadband wireless technology standard as required by the Federal Communications Commission (FCC) and the Public Safety Spectrum Trust (PSST). LA-SafetyNet will be scalable to and interoperable with regional, state and national communications systems, integrating into efforts such as the Border Broadband Initiative.

With respect to “competitive service offerings” within the LA-SafetyNet service areas, if in fact commercial cellular carriers are rightfully classified as competitors, there are four commercial wireless service providers in Los Angeles County that currently provide some level of broadband mobile service. They include Verizon Wireless, AT&T, Sprint, and T-Mobile. Of these service providers, AT&T, Verizon Wireless, and Sprint are providing 3G data network throughput services while T-Mobile provides 2G data speeds and throughput service. AT&T, Verizon Wireless and T-Mobile have published their objectives to deploy LTE broadband networks in the near future and will all be candidates for roaming agreements with the proposed LA-SafetyNet broadband. The AT&T and Verizon Wireless published coverage maps illustrate that these carriers currently provide the greatest percentage of the broadband service within the county. Sprint and T-Mobile have coverage throughout the populated basin; however, they have only limited coverage in the more rugged terrain areas of the county.

LA-SafetyNet is a special private network that will deliver last mile and limited middle mile services to all government and agency members of LA-RICS. The network is not designed to deliver broadband services to unserved or underserved residents within the proposed service area. However, due to the unavailability of reliable and cost effective broadband wireless services to the LA-RICS public safety community, we believe LA-SafetyNet will deliver the required broadband service to a critical underserved community – first responders – which does not have the economic means to deploy such a network in the absence of the federal funding offered through the BTOP grant.

H. Technology

Technology Type



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Indicate the technology that will be used to deliver last mile services. The following items were selected:

Wireless - Terrestrial Mobile

Other:

Technology Questions

Methodology for Area Status:

LA-SafetyNet is intended to serve a population not typically considered an unserved or underserved community by BTOP grant standard definitions. However, the fundamental objective of this special round of the BTOP grant is to provide a critical federal funding opportunity for public safety to design and deploy a 700 MHz Long Term Evolution (LTE) wireless broadband network. By extending the BTOP grant funding opportunity to the recently approved 700 MHz Broadband waiver applicants, the NTIA acknowledges that public safety communities are currently unserved or underserved in their requirement for a private, reliable, high capacity mobile broadband network.

Public safety within Los Angeles County is indeed underserved by wireless broadband services that can meet public safety's unique requirements. Commercial cellular networks within the proposed LA-SafetyNet area currently do not always meet public safety data throughput requirements when it is needed most (e.g. during emergencies and disasters). They rarely offer reliable network access at all locations (e.g. rural or remote areas) nor harden wireless sites to public safety-grade operations (back-up generator, redundant infrastructure components, and backhaul).

Therefore, while the service area is not technically classified as unserved or underserved, for the purpose of this application, the proposed public safety end users of this network should be classified as underserved considering the lack of access to broadband services that satisfy public safety requirements.

Description of Network Openness:



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Following the release of the Second NOFA, the NTIA has determined that single-purpose 700 MHz public safety network BTOP grant applicants are exempt from compliance with the Nondiscrimination and Interconnection requirement. As LA-SafetyNet is intended to provide service solely to the public safety community and to eligible Community Anchor Institutions as defined by the Federal Communications Commission (FCC), LA-SafetyNet satisfies the requirements of the FCC’s Internet Policy Statement.

However, all certified public safety personnel will be able to access the network subject to usage agreements and terms. LA-RICS will provide access to all personnel who satisfy FCC Part 90 rules including private, public safety entities. We will also provide service to roaming public safety personnel providing mutual aid within Los Angeles County to facilitate data sharing among these users as well as LA-RICS personnel and their home facilities as appropriate.

The system will be interconnected with the Internet allowing access to LA-RICS approved services and information as needed by LA-RICS agencies. In addition, the system will be interconnected to a roaming clearinghouse to provide authentication services for incoming and outgoing roaming users.

System Design:

The LA-SafetyNet 700 MHz broadband wireless system is based on the Third Generation Partnership Project (3GPP) Release 8 technology, also known as Long Term Evolution (LTE). LTE is an international wireless standard recently adopted by the PSST and FCC as the 700 MHz wireless broadband standard for public safety. The standard describes a network architecture that includes subscriber devices (UE), base stations (eNodeB), switching centers (evolved packet core [EPC]), and other internal components and the interfaces between components. ENodeBs and the EPCs will be interconnected via fiber optic and microwave transport to the LA-RICS core providing access to the LA-RICS intranet, the internet, commercial telephony (landline and cellular), and internet access networks. We will also interconnect the LTE network to our public safety land mobile radio (LMR) network to ensure optimal capabilities for end users of both systems.

Last mile and middle mile network diagrams are included in Section 18 that depict the LA-SafetyNet architecture. The proposed 290 eNodeB facilities will be located at LA-RICS members’ existing LMR sites; Sheriff and police stations; fire stations; libraries; other



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government facilities; and at commercial cell sites or other private facilities. The network includes three EPCs to provide critical geographic redundancy and optimal backhaul design and management.

LA-RICS recently issued a Request For Proposal (RFP) for a wireless broadband system, limiting our ability to communicate directly with LTE vendors and commercial cellular providers. As such, until the procurement is complete, LA-RICS will remain open to various business models. Our RFP will allow for leveraging of commercial cellular assets for various components, if warranted. As there are no guarantees that a commercial cellular provider will offer a solution that meets our requirements, however, LA-RICS assumes that we will provide all LTE system elements and that we will host those elements using as many government-owned facilities as possible to reduce capital and operational costs.

The foundation of the system uses the LA-RICS 2.5 gigabits per second fiber backbone. Three redundant Internet points of presence (POP) at existing members' data centers leverage aggregate symmetrical capacity of 331 Mbps for Internet peering. We will leverage these spaces and their direct connections to the Internet to minimize associated project capital and operational costs. These facilities are already hardened with backup generators, have ample HVAC capacity, and are staffed 24/7. Finally, LA-SafetyNet will include voice over IP application services to include cell phone like calling as well as push to talk.

The wireless system will use the 700 MHz public safety broadband spectrum, based on the waiver received from the FCC for LA-RICS use. A total of 10 MHz of spectrum (one 5 MHz pair) will be employed. Los Angeles County's terrain is highly diverse, including mountainous areas in the Northeast of the County and flat areas near the coast, presenting a particularly challenging geography to provide wide-area wireless coverage. The area includes some of the densest building construction in the country, creating substantial obstructions, while coastline areas facilitate propagation (and interference). The proposed base stations employ a three-sector antenna architecture with 20 Watt power amplifiers to ensure enhanced coverage and capacity. Subscriber devices have an output power of 200 mW. To accommodate various usage scenarios, we assume that modems will be USB-based, connected to laptop computers, and operated from within mobile vehicles. Handheld terminals will be deployed once commercially available.

LA-SafetyNet will be deployed in a frequency reuse of one configuration. As such, LA-RICS will be able to seamlessly add new sites to the system to address future coverage or capacity



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issues. Furthermore, we expect the initial hardware will be capable of future LTE releases (e.g., Release 9 and 10) to improve capacity, add features, and enhance operability. For example, future releases will allow LA-RICS to employ improved cell phone-like voice services over the public safety grade network. Additionally, it is anticipated that a future release will support “relays,” which we expect will be key in providing comprehensive coverage at an incident – perhaps providing high levels of in-building coverage. Finally, 3GPP specifications allow for various critical response and situational awareness-related services, such as geo-positioning services that will allow LA-RICS to locate personnel in need of aid or the closest unit for dispatch.

LTE has been identified as the national standard for Public Safety wireless broadband, due to its high bandwidth, voice and data capability, and, perhaps most importantly, its roadmap for the future. LTE will be able to provide voice services, video and multimedia, database access and many other services in one device and in one frequency band. This is crucially important to the future of public safety interoperability.

Further, as major cellular operators have chosen to deploy LTE in the 700 MHz band, public safety will benefit from the massive economies of scale created by the demand for base stations and consumer devices, as well as an increase in available bandwidth and coverage. The research and development stimulated by the commercial cellular community will result in increased innovations in network and user equipment capabilities. Today’s cellular phones include a GPS receiver, Bluetooth transceiver, high quality camera, and other innovations that will be beneficial to public safety. LA-SafetyNet will continually benefit from consumer-driven innovation, allowing the system to grow to meet the evolving needs of first responders in the field.

Is the applicant seeking a waiver pursuant to section IX.C of the NOFA so as to sell or lease portions of the award-funded broadband facilities during their life?

No

I. Project Budget

Project Budget		
	Federal Grant Request	Match



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Last Mile	148,333,800	67,431,256
Middle Mile	23,241,112	6,100,849
Total	171,574,912	73,532,105

Project Budget Total: \$245,107,017

Match Percent: 30.0%

Projects Outside Recommended Funding Range:

The total budget for LA-SafetyNet is \$245 million. This budget is justified by three factors: 1) we have 34,000 public safety first responders serving 10 million people spread over 3 million households, 2) our users require consistent service over more than 4,000 square miles of extremely diverse and challenging terrain, and 3) we need a public-safety grade communications system that functions reliably during natural and man-made catastrophes.

Our first responders must protect a population greater than that of 42 of the 50 United States and it is our intent to provide each resident of the region the same robust level of service, regardless of their level of income or geographic location. As such, LA-SafetyNet is designed to cover 99% of the population and 89% of the County’s total land area. With nearly 3,134,000 households throughout the region, LA-SafetyNet achieves this goal of unified, uniform protection at a cost estimated to be only \$78.22 per household.

Los Angeles County’s terrain is highly diverse, including mountainous areas in the Northeast and flat areas near the coast, which makes providing uniform wide-area wireless coverage particularly difficult. Additionally, our extremely dense areas of high-rise buildings create severe coverage impediments, while our coastline areas experience increased radio propagation that can also cause interference at surrounding sites. Despite these factors, LA-SafetyNet is designed to provide coverage throughout the County’s most mission-critical areas and buildings, including all Community Anchor Institutions and critical infrastructure locations. Service will also be delivered to all fire department staging areas (including those within the County’s mountains and ravines) to facilitate interoperability during the large scale forest fires that plague our County during the dry season.

Finally, LA-SafetyNet must provide a level of resiliency and reliability beyond typical commercial networks, which are not designed to survive the harshest of man-made or natural



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events. As a result, prolonged power outages and other incidents that reduce commercial coverage or system performance are significant threats to fire and law enforcement personnel. The proposed LA-SafetyNet broadband network will deliver dedicated capacity to first responders on a highly available infrastructure, constructed to modern public safety standards. This robust level of performance is essential to LA-SafetyNet, as a lower level of reliability would significantly compromise the purpose of the system. LA-RICS strongly feels that the unique nature of our environment and our need to meet the mission critical requirements of first responders justifies the budget for this project.

Outside Leverage	
Applicant is providing matching funds of at least 20% towards the total eligible project costs?	Yes
Matching cost detail	<p>LA-RICS is proposing a 30% contribution, totaling \$73,532,105 million, to the total project cost of LA-SafetyNet. This cost match is comprised of \$29,971,691 million in cash and labor contributions, and \$43,560,414 million worth of in-kind contributions.</p> <p>Direct Cash and Labor Costs The direct cash contribution will be applied during the three-year implementation of LA-SafetyNet and will directly offset Network and Access equipment costs. This cash totals \$24,892,978 million. In addition, LA-RICS considers the cash outlay for labor costs as part of its cash contribution.</p> <p>LA-SafetyNet requires staff to assist with the design, build-out and implementation of the system. LA-RICS member agencies will continue to contribute engineering and project management staff to the project. The valuation of the in-kind labor contribution is based on the subset of LA-RICS positions that will be directly involved in LA-SafetyNet. This does not include staff that is fully dedicated to the LA-RICS LMR voice system. The calculated value of this labor over three years of project implementation is \$5,078,713.</p>



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	<p>In-Kind Cost Categories LA-RICS has categorized in-kind contribution resources into four categories: (1) microwave radio links, (2) fiber optic links, (3) real estate for LTE sites, and (4) network operations centers. Overall, the in-kind value of assets in each category is based on averages of both known and estimated costs, as well as the percentage of the asset’s use that will be allocated to LA-SafetyNet.</p> <p>Microwave Links The region’s current microwave backhaul network supports both voice and data radio systems throughout Los Angeles County. The build out and implementation of LA-SafetyNet will increase the demand on this backhaul network and existing microwave links (hops) contributed by LA-RICS members.</p> <p>LA-RICS members possess 170 microwave hops; 56 of these hops will be employed by the LA-SafetyNet backhaul network. The current average value of each hop, inclusive of equipment, infrastructure, and installation, is approximately \$250,000 per hop. Load projections require that 30% of the total capacity of these links be allocated to LA-Safety net. Multiplying the number of hops by the average value of each hop by the average percentage utilization of each hop produces an in-kind microwave link value of \$4,200,000.</p> <p>Fiber Optic Cable LA-SafetyNet will require a robust fiber network to meet its backhaul requirements. LA-RICS members currently utilize a significant amount of fiber optic cable for their backhaul network, of which a portion is leased, either from a different government agency or a third party private network. The in-kind fiber match includes only the value of the member-owned fiber.</p> <p>LA-SafetyNet will utilize approximately 131,502 feet of member-</p>
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	<p>owned fiber. The value, per foot, of fiber is based on the cost of purchasing, laying, and lighting that fiber. Based on the system design, LA-SafetyNet will utilize 75% of this fiber’s capacity. Combining these factors leads to an estimated \$1,899,768 in-kind fiber contribution.</p> <p>Real Estate for LTE Sites The acquisition of real estate for radio sites represents a significant cost in a regional communications system. LA-RICS is defraying this cost by using member-owned land, particularly existing LMR sites and the rooftops of public safety buildings, to locate the LTE sites. This member-contributed real estate is being treated as part of the cost match. However, due to time constraints, the present value of a comparable site lease was used as a proxy estimate for that actual land value.</p> <p>The limited time between LA-RICS receiving the FCC waiver for use of the 700MHz PSST spectrum and the deadline for submitting a BTOP application did not permit a site-by-site market value/ square footage analysis of the existing 204 member-contributed sites. The present value of a comparable lease was selected as a reasonable proxy for the actual value of this real estate. The Chief Executive Office of Los Angeles County reports that rooftop leases in the County range from \$1,600-\$3,000 per month.</p> <p>LA-RICS used the low end of these figures to approximate a conservative value for the contributed real-estate, using the present value of a comparable lease as a proxy for the capital value of the contributed space. Selecting a value of \$1,600 per month in lease costs, LA-RICS performed a Present Value calculation with a 10-year lease and a discount rate of 1.5%. This provides an approximate average value of \$177,065 per site. Over 204 sites, that in-kind contribution is \$36,121,260.</p>
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	<p>It is emphasized that the capitalized value of a 10-year land lease is not proposed as an in-kind contribution. Rather, LA-RICS offers the actual value of member-owned real estate as the in-kind match, and uses the methodology above to conservatively calculate that value in lieu of a lengthy 204 site real estate analysis.</p> <p>Network Operations Centers The LA-SafetyNet design incorporates three existing, member-owned Network Operations Centers (NOCs) distributed throughout Los Angeles County. These NOCs will house the system’s three switching centers (Evolved Packet Cores) and will provide redundancy and fault tolerance for the network. The centers support multiple communications systems, and their in-kind contribution to LA-SafetyNet is based on the share of each NOC’s capacity that will be dedicated to LA-SafetyNet.</p> <p>Each NOC is located within a larger dispatch or emergency management facility. LA-RICS calculated the share of each facility’s value comprised by the NOC, multiplying the NOC’s percentage share of the facility’s square footage by the facility’s overall cost. The LA-SafetyNet network design projects that the system will utilize approximately 35% of each NOC’s capacity. Multiplying the value of each NOC by its 35% utilization produces an in-kind NOC contribution of \$1,339,194.</p>
Unjust enrichment	<p>LA-RICS is not a recipient of federal funds for any expenses specifically requested under this BTOP grant application, nor will LA-RICS request any duplicative future federal funding for equipment or services purchased with this BTOP award. As the LA-RICS Land Mobile Radio system and LA-SafetyNet broadband data system are complementary communications systems, federal investments in each are mutually supportive.</p> <p>LA-RICS is currently in the procurement process to implement a new Land Mobile Radio (LMR) system throughout Los Angeles County.</p>



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	<p>LA-RICS, through its member jurisdictions, has applied for and received federal grants to purchase equipment in support of this project. This equipment will partially support the implementation of LA-SafetyNet by upgrading shared communications sites. The following federal grant will indirectly impact LA-SafetyNet:</p> <ol style="list-style-type: none"> 1. American Recovery and Reinvest Act JAG (JAG ARRA) Fiscal Year 2009 <ol style="list-style-type: none"> a. Grant Award = \$14,103,968 b. Purpose – Site improvements for LMR system. <p>The allocation of these funds is intended to offset site improvement costs – such as upgraded shelter space, strengthened antenna structures, or improved back-up power systems – at 10 to 15 mountaintop sites that will be part of the LMR system. Many of these sites are located at an elevation not conducive to LTE coverage specifications. However, LA-RICS anticipates the opportunity to co-locate the voice system infrastructure and LA-SafetyNet infrastructure at several of these sites.</p> <p>LA-RICS will continue to make coordinated, complementary, cost-effective investments in both our LMR system and LA-SafetyNet throughout their implementation and operation. However, we will never seek funding from two separate grant sources for the same expense.</p>
<p>Disclosure of federal and/or state funding sources</p>	<p>LA-RICS is the recipient of several federal grants through the Department of Homeland Security, the Department of Commerce, and the Department of Justice. These grants are intended to assist in the design, construction and implementation of a new Interoperable Voice Radio Communications system throughout Los Angeles County, but this funding will not directly be applied to the build out of LA-SafetyNet. However, as both the LA-RICS voice radio system and LA-SafetyNet are directed at improving public safety communications, the systems, and the funding, are related.</p>



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	<p>LA-RICS’ existing grants come from dedicated public safety programs and are intended to help local, regional, and State government agencies improve homeland security and public safety. The two recipients of these grants, currently administering these funds on behalf of LA-RICS, are the City of Los Angeles and the County of Los Angeles. These two distinct jurisdictions, each members of the LA-RICS Joint Powers Authority, collaborate in an effort to enhance public safety throughout the region. Each jurisdiction annually receives grants from federal sources and, in coordination with regional working groups and approval authorities, allocates funds to further the goal of regional interoperable communication. The following are the four different grant funding sources LA-RICS will employ as it designs, constructs and implements its Interoperable Voice Radio system:</p> <ol style="list-style-type: none"> 1. Urban Area Security Initiative (UASI) Grant Program <ol style="list-style-type: none"> a. Fiscal Year 2008: \$29,383,270 b. Fiscal Year 2009: \$26,596,695 c. Fiscal Year 2010 (Pending): \$25,507,599 2. State Homeland Security Grant Program (SHSGP) <ol style="list-style-type: none"> a. Fiscal Year 2007: \$3,875,500 b. Fiscal Year 2008: \$6,800,000 c. Fiscal Year 2009: \$6,700,000 3. Public Safety Interoperable Communications (PSIC) Grant <ol style="list-style-type: none"> a. Fiscal Year 2007: \$22,278,786 4. American Recovery and Reinvestment Act JAG (JAG ARRA) <ol style="list-style-type: none"> a. Fiscal Year 2009: \$14,103,968
Budget reasonableness	The proposed LA-SafetyNet is a private 700 MHz wireless broadband network dedicated to the City of Los Angeles, Los Angeles County and the entire independent County jurisdictional public safety



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	<p>community. LA-SafetyNet is a last mile project and is a unique grant opportunity for 700 MHz waiver applicants to provide broadband services and internet access to a critical, yet underserved community—public safety. In compliance with the budget reasonableness requirements, our objective is to justify the investment required to deliver reliable broadband wireless access to all critical LA-RICS service areas including nearly all the population in the County (3,133,774 households) and Community Anchor Institutions (CAI).</p> <p>LA-SafetyNet will initially provide wireless access cards and handheld terminals for 34,000 public safety personnel. The network will provide highly reliable broadband voice and data communications for approximately 3,626 sq. mi. of the County. The proposed service area includes geographic regions unserved by commercial carriers for economic reasons. Roughly one-third of the project’s cost is dedicated to providing and ensuring highly reliable service. These costs are based on extensive experience in designing and deploying reliable public safety radio sites and systems. The redundancy components include core infrastructure with redundant power and backhaul. Interoperable public safety communications networks must withstand natural and man-made disasters and these are vital and reasonable project investments to achieve that objective.</p> <p>The LA-RICS project team based the cost for LTE eNodeB infrastructure, the Evolved Packet Core, and subscriber devices on budgetary pricing received from multiple LTE equipment vendors. Research was conducted with the primary LTE infrastructure and end user terminal device vendors to develop a Rough Order of Magnitude (ROM) budget. Direct vendor pricing could not be requested due to a current procurement that precludes direct vendor communications. Pricing for new towers, site leases, generators, UPS, and other related equipment together with the cost to permit, construct, and cut sites into service are based on our collective experience in operating public</p>
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	<p>safety grade networks in the LA-RICS service area.</p> <p>We are confident that the proposed budget accurately reflects what the proposed project will cost. Moreover, LA-RICS is confident that these LA-SafetyNet costs are not only reasonable, but represent a wise investment in the safety of 34,000 first responders and 10,000,000 residents spread over 4,000+ square miles of Los Angeles County.</p>
Demonstration of need	<p>Los Angeles County faces major obstacles in its pursuit of wireless broadband communications. Commercial cellular systems are designed to maximize revenue and often lack enough coverage or system capacity to support mission critical, first responder events, e.g., man-made and natural calamities. As a result, a hardened and dedicated public safety broadband wireless network is required for first responders in the region. The FCC has acknowledged the requirement for public safety broadband and fully supports public investment to deliver on this critical need.</p> <p>At a time when the State of California is battling high operational deficits and California’s municipal governments are regularly reducing critical services and furloughing employees, we lack the economic means to fund our own network. The federal assistance offered to LA-RICS through the BTOP grant program is essential to providing the proposed LA-SafetyNet to our first responders and the communities they serve. We have investigated all internal means to independently fund the proposed LA-SafetyNet and, in absence of federal funding, we would have to indefinitely delay the implementation of this critical communications network.</p> <p>The \$172M level of federal funding requested represents 70% of the projected \$245M total budget. We have increased our matching contribution above the required 20% matching funds to demonstrate our regional commitment to the program. Furthermore, we have taken diligent efforts to design a practical, cost effective LTE wireless network. Our proposed system delivers the coverage, throughput and</p>



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	<p>capacity that our first responders need, as we cost-effectively maximize the use of existing resources.</p> <p>While we can calculate a Net Present Value (NPV) for this project based on an arbitrary discount rate, we do not think that NPV is an appropriate measure of the value of this project. We do not utilize NPV in prioritizing our projects, as do profit making enterprises that have revenue generating projects competing for the same capital pool. LA-RICS is a government entity that answers to the residents and businesses in our jurisdictions; we are not concerned with investors that demand revenue from their investments to be maximized. LA-RICS members are charged with protecting the lives and property within our communities.</p> <p>The investments we make in technology are not quantitatively measured in profits or market share; instead, our investments are evaluated on their ability to enhance the safety of our communities. Implementing LA-SafetyNet will undoubtedly save lives and protect property. Furthermore, the network will be an important tool to help deter crime and prevent terrorism, and it will enhance situational awareness and response times for the entire public safety community. Any NPV calculation will be unable to quantify these benefits LA-SafetyNet will provide. For this reason, we contend that the NPV analysis does not apply to this project.</p>
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Funds to States/Territories

States	Amount of Federal Grant Request
California	171,574,912

Funds to States/Territories Total: \$171,574,912



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J. Historical Financials

Matching Funds			
	2007	2008	2009
Revenue	17,796,054,000	18,520,046,000	18,820,967,000
Expenditures	16,540,094,000	18,981,971,000	19,973,323,000
Net Assets	17,177,198,000	17,313,128,000	16,129,494,000
Change in Net Assets from Prior Year	1,523,433,000	135,930,000	-1,152,356,000
Bond Rating (if applicable)	Aa3	Aa3	Aa3

K. Project Readiness

BTOP Organizational Readiness

LA-RICS is an established regional collaboration of governments and public safety agencies that have extensive experience in deploying wide area wireless networks. The City of Los Angeles, the County of Los Angeles, and the Los Angeles Unified School District, together with 82 other municipalities and public sector entities within the greater Los Angeles region, have become members of the LA-RICS Joint Powers Authority (JPA). A 17-member Board of Directors, comprised of first responder stakeholders from the region, governs the Authority. LA-RICS partners will continue to contribute to the project through the grant due diligence and eventual implementation phase of the program. LA-RICS operational support will be provided by LA-RICS member agencies and jurisdictions consistent with the JPA governance agreement. Based on the direction of the Board of Directors, LA-RICS executive and middle managers provide key strategic and operational decision making in the areas of procurement, technology, community outreach and partnerships, interoperability and standard operational procedures, among others. This regionally comprehensive governance structure will facilitate the funding, planning, implementation and operation of the proposed LA-SafetyNet.

We have issued a Request For Proposal to purchase a LMR voice system and mobile data system and expect to receive proposals in August 2010. Once a vendor is selected and our design is



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finalized, we will solidify radio site availability, finalize negotiations with the property owners and otherwise prepare the sites in parallel with the full system deployment. We will also determine whether the LTE system will be self maintained, vendor maintained or a combination of both. From experience, the most challenging and time consuming aspect of wide-area wireless deployments is acquiring base station host sites. As such, our conceptual design utilizes a substantial number of sites that are already part of our land mobile radio networks and also leverages existing government sites and commercially available tower sites.

We have also begun the process of defining cost-sharing mechanisms to determine how the operational costs will be distributed among the LA-RICS member entities. We do not intend to deploy sales or billing systems as we expect a simplified cost-sharing and recovery mechanism. Each member entity already provides customer care to its LMR and IT users. Members also provide critical break-fix services for their LMR infrastructure and subscriber assets. We are confident that we can leverage our experience and expertise to provide quality network operations and customer care for this project.

Construction and Vendor Contracts

LA-RICS will engage qualified and experienced contractors and vendors to work with LA-RICS member government personnel to design and deploy LA-SafetyNet. Our team has multiple experienced engineers, technologists, program managers and business strategists who supported the proposed LTE system design and grant application. We will integrate these professionals into our program to ensure a timely and cost effective program.

LA-RICS personnel and consultants had informational discussions with potential LTE system vendors who are eager to deploy equipment no later than the first half of 2011. LA-RICS members can also leverage some existing purchasing vehicles for alterations to existing sites. Commercial carriers have expressed an interest to leverage their cell sites, core networks, and contracts for eNodeB equipment but have explained that a number of internal approvals are required prior to finalizing the service offering to public safety. We prefer to leverage our existing government assets with commercial sites where prudent to expedite the system deployment. However, the final implementation solution and vendor relationship must meet our requirements for reliability, security, redundancy and cost effectiveness, among others.



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On April 5, 2010, LA-RICS issued an RFP for a LMR voice radio system with options for broadband and narrowband mobile data solutions. We will continue our discussions with potential broadband vendors after we receive proposals on August 4, 2010.

Customer Base

The 85 member entities of LA-RICS Joint Powers Authority (JPA) have a total existing customer base of 34,000 public safety personnel spread throughout the extended area of Los Angeles County. This includes first responder agencies such as police, fire, and EMS. While each of the LA-RICS members currently provide their own mobile data services on traditional networks, it is anticipated that each of the agencies will migrate to the LA-SafetyNet LTE network after it is implemented.

In addition, LA-RICS will invite any other public safety, public service, regional authority and other Community Anchor Institution (CAI) eligible users in the region to become direct subscribers on the system. This could include over 21,000 personnel from second response agencies, such as transportation and public works, throughout the LA-RICS region. This would also include up to 12,500 other users from the State of California, Federal, County and local jurisdiction schools and community colleges and any other public, private and CAI users who qualify as public safety users under FCC rules.

Finally, we will invite any public safety roamers to receive mutual aid access when they enter the coverage footprint of the LA-SafetyNet network.

Licenses, Regulatory Approvals and Agreements

The following licenses, approvals, and agreements are required to support the implementation of the LA-SafetyNet broadband network:

- FCC Authorization: LA-RICS has received a waiver from the FCC to operate in the 700 MHz public safety broadband block. LA-RICS will satisfy all FCC and Public Safety Spectrum Trust (PSST) requirements as appropriate, including the submission of an interoperability showing.

- Tower, Building, and Land Leases: LA-RICS currently has agreements to locate three redundant Enhanced Packet Core (EPC) systems at existing LA-RICS partner data centers. In addition, LA-RICS has blanket authorization from public safety agencies, schools, libraries, and other government facilities to host base stations, but a formal lease must be developed for each



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site. LA-RICS must also secure tower and/or land leases for a number of proposed commercial sites and for new builds.

- Backhaul, Local-Loop: LA-RICS will develop access agreements with member agencies to leverage access to existing regional fiber optic and microwave backhaul as well as to leverage an existing backhaul agreement with Time Warner to provide IP connectivity.

- Zoning, Permitting and Environmental Studies: All existing sites have the required permits. All proposed site construction and development will adhere to the required zoning, permitting and environmental study obligations as appropriate.

SPIN Number

Not Applicable

L. Environmental Questionnaire

Project Description

The proposed LA-SafetyNet broadband wireless construction activities will include the installation of 290 cell sites and NOC facilities with cabling, radio transceivers, IP backhaul equipment, centralized servers and network control. The majority of the new equipment will be installed on or within existing infrastructure; this will include transceiver antennas and associated cabling on towers/masts and in existing buildings. The RF transceiver equipment and controllers will be installed either within existing shelters or indoor equipment spaces or within new external slab-mounted NEMA rated enclosures.

If transceiver antennas cannot be installed on existing structures, LA-RICS proposes new self-supporting towers or monopoles at heights ranging from 30 to 120 feet AGL. New construction may be required for the transceiver equipment including a prefabricated shelter or slab-mounted NEMA enclosure. For either the placement of a slab-mounted NEMA enclosure or the construction of a prefabricated shelter, grading will be required to level the site location. Site preparation will follow local code and will primarily consist of leveled land over a layer of



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crushed stone sub-grade and a surface level of gravel. LA-RICS members have extensive experience with the permitting, construction and implementation of environmentally sound radio facilities and will adhere to all local, state and federal environmental obligations on the proposed project.

Property Changes

Of the proposed total 290 cell site and NOC facilities, 216 of these sites are located on public land owned by LA-RICS members. The remaining sites will be located on private land or commercial sites owned or leased by the wireless operators and/or tower management companies. Approximately two-thirds of the planned sites are existing transceiver site compounds, both public and privately owned. For these sites, no new land will be cleared, excavated or fenced within an existing transceiver site.

The remaining sites may require some minor excavation, or surface leveling, to support the placement of a new tower/monopole and/or a shelter. The total approximated land area would not exceed 400 sq ft and new transceiver sites will be fenced. The Los Angeles County Zoning Permit Application package requires an accurate survey of the planned site. Each application is compared against the land use records of the county. All proposed sites are zoned as either commercial or industrial.

There are no planned sites to be constructed on federally owned land.

Buildings

If new construction is required, two antenna mounting options will be considered; tower or monopole. Two structure construction options will also be considered; a shelter or enclosure with slab.

The transceiver antennas will be mounted on either a self-supporting tower or monopole. The tower or monopole height will vary between 30 & 120 feet AGL depending on the radio propagation requirements and/or the applicable zoning restrictions for each site. Both structures will be mounted on a concrete foundation sized to meet structure loading requirements. For example, a 45' AGL monopole would require a foundation of approximately 5.5 cubic yards.



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The radio shelter will be used to house the transceiver equipment and facilitate future expansion of the site as may be appropriate. The shelter will not exceed 14' width x 30' length x 12' height and LA-SafetyNet will use the smallest NEMA standard code buildings when possible. The shelter will typically be prefabricated or constructed to zoning code and will be placed on a prepared level surface constructed to not damage the permeability of the surface ground area thus ensuring minimal to no rain water runoff. The enclosure would be installed on a leveled concrete slab.

All new linear structural design and placement will be carefully selected so that the public rights-of-way are not disturbed.

Wetlands

Wetlands preservation is governed by the state of California and Los Angeles County ordinances. According to the County of Los Angeles, Ordinance 2010-0030Z of Title 12 "Environmental Protection" extends the federal definition of wetlands to include "land within the coastal zone which may be covered periodically or permanently with shallow water and includes saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats and fens".

As is required by the County site construction permitting process, the environmental review is evaluated during "Phase II" of the planning/zoning process.

LA-SafetyNet's current design does not contain planned sites on wetlands. If construction is deemed to be near a designated wetland, Los Angeles County will ensure that the construction activity is fully compliant with all environmental protection regulations with regard to wetland conservation.

Critical Habitats

The vast majority of LA-SafetyNet facilities will be installed at LA-RICS member police, sheriff, and fire station facilities on existing radio towers and buildings, or on new towers and equipment shelters to be installed at these locations. All new construction will follow City of Los Angeles, Los Angeles County, or the applicable local jurisdiction's site permitting processes as mandated. All respective codes include a comprehensive critical habitat and endangered species



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assessment. To the best of our knowledge no proposed LA-SafetyNet facilities are located within or near critical habitats, or will affect any threatened, endangered or candidate species.

Los Angeles County has an extensive review process of all construction permits to ensure that planned construction activities will not affect critical habitats. The environmental impact study will take special care to identify any species near to the site and will categorically ensure full compliance with its obligations. The results of the study will be included into the Zoning Permit Application. During Phase II of the Zoning Permit Application process, the environmental review will evaluate each site's impact on protected species as well as its biological and geological impacts. If it is deemed that additional information is required, the Case Planner can order additional studies or plan revisions.

Floodplain

Los Angeles County maintains comprehensive maps and studies that depict areas designated as a floodplain, which are detailed and annunciated in Chapter 22, "Supplemental Districts" of the County's building code guidelines. The floodplain maps and studies designate the flood plain limits for 100C or 100-year and 500C or 500-year frequencies.

All LA-SafetyNet proposed site locations have been validated against this database and determined to be outside of a 100 or 500-year floodplain.

Protected Land

There are 307 places listed on the United States National Register of Historic Places located throughout Los Angeles County. Five of these sites are further designated as National Historic Landmarks of the United States. They are the Gamble House, the Hale Solar Laboratory, the Rose Bowl, and two sites at the Jet Propulsion Laboratory (the Space Flight Operations Facility and the Twenty-Five-Foot Space Simulator). Twenty-five of these Registered Historic Places are historic districts which include numerous buildings and other structures. The historic districts include the Hollywood Boulevard business district and four large areas in Downtown Los Angeles: the Plaza Historic District, Little Tokyo, the Spring Street Financial District and the Broadway Theater District.



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Although there are numerous historic places within the County, none of the planned LA-SafetyNet sites are situated on historic sites. During the planning process, the Case Planner will present the Initial Study results and if necessary can require a redesign of the site design to meet the State Historic Preservation Office (SHPO) requirement to include the addition of fences, walls, landscaping, change of materials, colors, and styles to ensure a harmonious integration with its environment. The LA-SafetyNet site development team will work closely with the SHPO and the Los Angeles County Department of Regional Planning to ensure full compliance with the state and federal regulations and view-shed compliance.

Coastal Area

The entire Los Angeles County is within a federally mandated coastal zone management area (CZMA). Therefore, Los Angeles County will submit a design that is in full compliance with the National Environmental Policy Act requirements and will include full Environmental Impact Statements (EIS) for each site location. Each site will be carefully designed to have no foreseeable effects on any land or water use or natural resource of the coastal zone, as required under the Coastal Zone Management Act of 1972 (as amended Coastal Zone Protection Act of 1996).

Brownfield

LA-RICS reviewed the brownfield site maps from the Environmental Protection Agency, the state of California and Los Angeles County and determined that no construction is planned to be within an existing brownfield site.



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Uploads

The following pages contain the following uploads provided by the applicant:

Upload Name	File Name	Uploaded By	Uploaded Date
Service Offerings and Competitor Data	LARICS ID 7835_BTOP_CCI_Service And Competitor - Final.xls	Perez, Felipe	07/01/2010
Network Diagram	LARICS ID 7835_LA Network Diagram LTE - Final.pdf	Perez, Felipe	06/30/2010
Build Out Timeline	LARICS ID 7835_Build-Out Timeline -Final.pdf	Perez, Felipe	07/01/2010
List of Community Anchors and Points of Interest	LARICS ID 7835_CCI Anchor Detail and POI - Final.xlsx	Perez, Felipe	06/30/2010
Management Team Resumes and Organization Chart	LA-RICS ID 7835_Org Chart_and_Resumes.pdf	Perez, Felipe	06/30/2010
Government and Key Partnerships	LARICS ID 7835_Partner_Letters.pdf	Perez, Felipe	06/29/2010
Historical Financial Statements	LARICS ID 7835_Los Angeles County Financials 2008-2009.pdf	Perez, Felipe	06/30/2010
Historical Financial	LARICS ID 7835_Los Angeles	Perez, Felipe	06/30/2010



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Statements	County Financials 2007 - 2008.pdf		
Budget Narrative	LARICS ID 7835_Budget_Narrative.pdf	Perez, Felipe	07/01/2010
Detailed Budget	LARICS ID 7835_Detailed Budget.xlsx	Perez, Felipe	07/01/2010
Pro-forma Forecast	LARICS ID 7835_CCI_FinancialProjections-Final 2.xls	Perez, Felipe	07/01/2010
Subscriber Estimates	LARICS ID 7835_SubscriberEstimates - Final.xls	Perez, Felipe	06/30/2010
Dashboard Metrics	LARICS ID 7835_KeyMetrics - Final.pdf	Perez, Felipe	07/01/2010
Service Area Data	LARICS ID 7835_CCI Service Areas_LA County CA -Final.xlsx	Perez, Felipe	06/30/2010
Waivers	LA-RICS ID 7835_Last Mile Coverage Waiver - Final.pdf	Perez, Felipe	07/01/2010
Network Maps	LARICS ID 7835_LA Coverage Plot Basin Detail.pdf	Perez, Felipe	06/29/2010
Network Maps	LARICS ID 7835_LA Coverage	Perez, Felipe	06/29/2010



**Broadband Infrastructure Application
Submission to NTIA – Broadband Technology Opportunities Program**

Submitted Date: 7/1/2010 2:37:52 PM		Easygrants ID: 7835	
Funding Opportunity: Broadband Technology Opportunities Program		Applicant Organization: LOS ANGELES REGIONAL INTEROPERABLE COMMUNICATIONS SYSTEM AUTHORITY	
Task: Submit Application - BTOP		Applicant Name: Felipe Perez	

	Plot Catalina Detail.pdf		
Network Maps	LARICS ID 7835_LA Coverage Plot North County Detail.pdf	Perez, Felipe	06/29/2010
Network Maps	LARICS ID 7835_LA Coverage Plot System Overview.pdf	Perez, Felipe	06/29/2010
BTOP Certifications	LARICS ID 7835_Authentication-Certification_Poster.pdf	Perez, Felipe	06/28/2010
SF-424 C and D	LARICS ID 7835_SF424CandD.pdf	Perez, Felipe	07/01/2010
Supplemental Information	LARICS ID 7835_700MHz_Waiver_Order.pdf	Perez, Felipe	07/01/2010
Supplemental Information	LARICS ID 7835_LA-RICS_JPA_Agreement.pdf	Perez, Felipe	06/29/2010
Supplemental Information	LARICS ID 7835_Congressional Dist Maps.pdf	Perez, Felipe	06/29/2010
Supplemental Information	LARICS ID 7835_LA County Delegation Letter of Support.pdf	Perez, Felipe	06/30/2010