

REGIONAL INTEGRATION OF INTELLIGENT TRANSPORTATION SYSTEMS (RIITS) SMART-NET INTEGRATION PROJECT

Project Description:

This project will establish a high-speed connection through the South Bay SMART-Net to connect RIITS to a broadband internet service provider. This connection will create a secondary high-speed network connection that will supplement existing and planned fiber connections deployed in the sub-region to enhance data exchange and provide a central storehouse for transportation-related operational data. Several regional partners such as the County of Los Angeles Department of Public Works (LACDPW), California Department of Transportation (Caltrans), and others will have reliable access to data that could support planning, policy, and operational decision-making. Attachment A provides a high-level logical diagram illustrating the connections.

Project Benefits:

RIITS coordinates with data-contributing partner agencies and manages, operates, and maintains RIITS. For example, Southern California 511 is the regional traveler information program that operates within RIITS. Additionally, it provides partner agencies with a central repository to exchange data across city and county jurisdictions through the RIITS communication network. The RIITS network provides users with the potential to utilize data for system performance evaluation, planning and policy analysis and the improvement of traffic management operations. With the secondary connection, RIITS becomes more reliable and resilient with increased network redundancy. In addition, SMART-Net would provide increased bandwidth and consequentially allow for

KEY PROJECT ATTRIBUTES & STAKEHOLDERS

1. Leverages SMART-Net to provide high-speed data connections
2. Provides broadband internet connection redundancy at a reduced cost
3. Provides backbone network for future RIITS connections



the exchange of high-resolution data at a lower cost. Connection to SMART-Net will not only maintain connection to the Los Angeles County's Information Exchange Network (IEN), City of Los Angeles Automated Traffic Surveillance and Control (ATSAC), and Caltrans' Los Angeles Regional Transportation Management Center (LARTMC), but it permits for possible future data connections (such as connections to traffic management centers, transit operation centers, etc.) through RIITS and other participating South Bay cities.

Project Need:

Currently, the RIITS Program lacks broadband internet redundancy. RIITS loses broadband internet connectivity frequently, leaving RIITS partners vulnerable to unreliable access to data, which also has the potential to adversely affect real-time system operations. With the secondary high-speed connection to SMART-Net's broadband service provider, RIITS will be able to better manage access to transportation data in the region. Additionally, it allows RIITS to ingest high-resolution data flows that require higher bandwidth that is not be possible with its current architecture.

Dependencies:

For this project to move forward, the SMART-Net service provider will need to establish a broadband connection with RIITS, located in the Metro Headquarters in Downtown Los Angeles. RIITS would be established as an additional node on SMART-Net to provide regional communications for transportation organizations.

Cost:

It is anticipated that the fixed costs associated with the establishment of this fiber optic connection can be covered under the South Bay SMART-Net Project, which will deploy regional broadband connections between city nodes in the South Bay Cities subregion. RIITS will work with the South Bay Cities Council of Governments (SBCCOG) to identify any additional costs necessary to establish the RIITS connection that are beyond the scope of the South Bay SMART-Net project and cover the costs under the RIITS Program budget.

Schedule:

This project can be implemented in conjunction with the build-out of the SMART-Net project. Planning for the establishment of the connection should commence 6 months prior to the completion and activation of the SMART-Net broadband service to RIITS. The network design

and implementation should be coordinated by SMART-Net contractor and the RIITS Program Administrator during this period with the connections established and operational within 2 months after the SMART-Net broadband connection is activated.

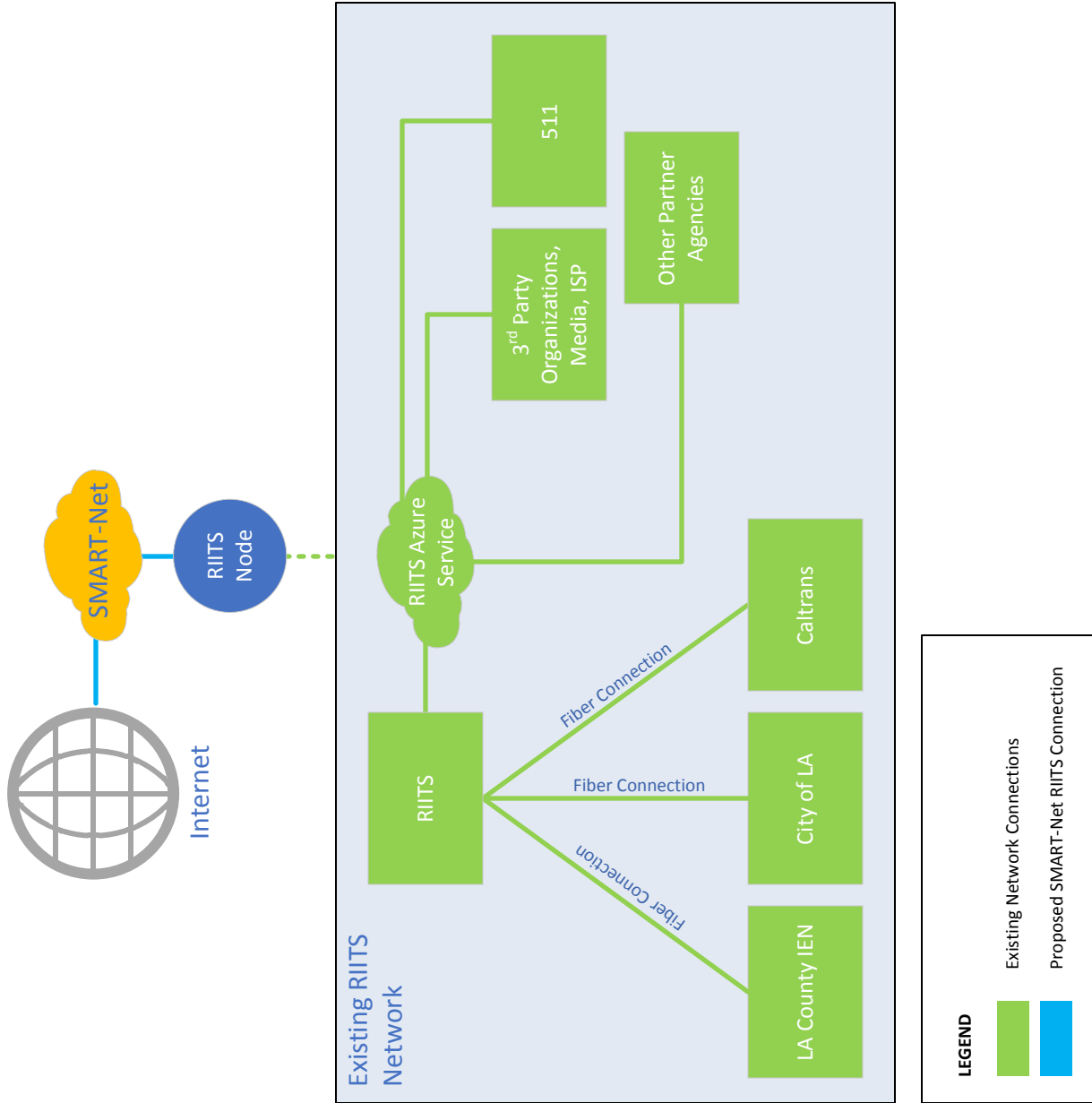
Project Concurrence:

RIITS Program

South Bay Cities Council of Governments

Metro Highway Program, ITS

Attachment A



LA COUNTY DPW TRAFFIC CONTROL SYSTEM AND INFORMATION EXCHANGE NETWORK SMART-NET INTEGRATION PROJECT

Project Description:

This project will establish a virtual private network (VPN) connection through the South Bay SMART-Net to connect traffic signals in six cities (cities of Carson, El Segundo, Hawthorne, Lawndale, Lomita, and Manhattan Beach) to the County of Los Angeles (County) traffic management center (TMC) in Alhambra. The VPN will also connect traffic control systems (TCS) in four cities (cities of Gardena, Inglewood, Redondo Beach, and Torrance) to the County TMC. The County will also establish a SMART-Net node in Alhambra to make the connection to the South Bay subregion. Attachment A provides a high-level logical diagram illustrating the connections.

The VPN connection will create a secondary high-speed network connection that will supplement existing and planned wireless and wired connections being deployed in the subregion to enhance central monitoring and control of the local traffic signals in six cities in the region (cities of Carson, El Segundo, Hawthorne, Lawndale, Lomita, and Manhattan Beach). The VPN connection through the South Bay SMART-Net will also provide a secondary high-speed network connection to the South Bay cities that are part of the Information Exchange Network (IEN).

Project Benefits:

By establishing a secondary high-speed connection to the SMART-Net, the County of Los Angeles will be able to maintain communications with traffic signal control field elements (traffic signal controllers, detectors, cameras, etc.) in the

KEY PROJECT ATTRIBUTES & STAKEHOLDERS

1. Increases reliability of central traffic signal monitoring and control for multiple cities within the SB region
2. Leverages SMART-Net to provide high-speed data connection to signal control field elements and the County TMC
3. Provides additional traffic signal control communications redundancy at a reasonable cost
4. Leverages SMART-NET to provide high speed data connection to the IEN



region when there are service disruptions along the fiber-optic line currently used to connect Los Angeles County Department of Public Works (LACDPW) to the South Bay subregion. The increased communications reliability will allow LACDPW to more consistently and effectively leverage the capabilities of the County's central traffic control system (KITS) that is used to monitor and control the intersections along the major arterial corridors in the region. More reliable communications will ensure the County can monitor the operations of existing traffic signal control assets, centrally adjust traffic signal timing in real-time as needed, provide greater insight into corridor operations and maintenance needs, allow for the exchange of data needed to support the central distribution of signal phase and timing (SPaT) information, and support the growing number of signal-related intersection mobility and safety applications being implemented throughout the County. Additionally, a secondary network will also enable the County IEN to send and push data to the respective IEN sites located in the South Bay subregion.

Project Need:

Currently, the signalized intersections communicating with the County KITS central traffic control system are connected to the County TMC through a fiber-optic communications connection running through the City of Los Angeles ATSAC to the County TMC in the City of Alhambra. When this connection goes down, LACDPW loses the ability to centrally monitor and control the existing South Bay traffic signals managed and maintained by the County, which includes the signals in the cities of Carson, El Segundo, Hawthorne, Lawndale, Lomita, and Manhattan Beach. This project will create necessary communications redundancy that will minimize any potential disruption in service and allow for the central traffic signal control system benefits to be maintained in a more consistent manner. This will effectively allow the County to participate in event and incident management with those that are part of the LA County KITS system.

In addition, the County can properly control system elements and select appropriate timing plans when needed for cities that are part of the LA County KITS system. The secondary high-speed connection will enhance video distribution capabilities to the County who maintains and owns cameras in the South Bay subregion.

Currently, about 70% of the South Bay agencies are connected to the LA County IEN through various connection methods. By establishing a secondary high-speed connection through the

SMART-Net, all IEN sites in the South Bay subregion will have a redundant connection to the County's TMC.

Below is a table of what TCS each agency in the South Bay subregion has, as well IEN details.

	Agency	TCS type	IEN Connection	Connection Method*
1.	Carson	KITS	Yes	T1
2.	El Segundo	KITS	Yes	Fiber
3.	Lawndale	KITS	Yes	Fiber
4.	Lomita	KITS	Yes	Cell Broadband
5.	Hawthorne	KITS	Yes	Fiber
6.	Manhattan Beach	KITS	Yes	Fiber
7.	Gardena	QuickNet	Yes	Fiber
8.	Inglewood	Transparity	Yes	T1->Fiber
9.	Redondo Beach	KITS/Centracs	No	VPN and Fiber
10.	Torrance	Centracs	Yes	Fiber
11.	Hermosa Beach	None	None	N/A
12.	Palos Verdes	None	None	N/A
13.	Palos Verdes Estates	None	None	N/A
14.	Rancho Palos Verdes	None	None	N/A
15.	Rolling Hills Estates	None	None	N/A

* Indicated as a connection method by each city is how the final run of communication is coming back to the County from the Cities. Except for Carson and Lomita, all Cities are making use of the LADOT fiber.

Dependencies:

For this project to move forward the County will need to establish a SMART-Net node adjacent to the County's TMC in Alhambra that will connect the County to the South Bay. In addition, the County will need to establish a VPN connection from the County Node to another SMART-Net node (e.g. City of Manhattan Beach). This VPN connection ensures bi-lateral communications is maintained.

Cost:

It is anticipated that the fixed costs associated with the establishment of the node and VPN connection can be covered under the SMART-Net grant. Additionally, there are funds available

to support center-to center and center-to-field communications in multiple South Bay Traffic Forum Call for Projects grants provided by Metro to LACDPW to support this type of work.

Schedule:

This project can be implemented in conjunction with the build-out of the South Bay SMART-Net project. Planning for the establishment of the VPN should commence 6 months prior to the completion and activation of the SMART-Net broadband service in the City of Manhattan Beach and LACDPW. VPN design and implementation should be coordinated by both all participating agencies during this period with the VPN connection established and operational within 2 months after the SMART-Net broadband connection is activated.

Project Concurrence:

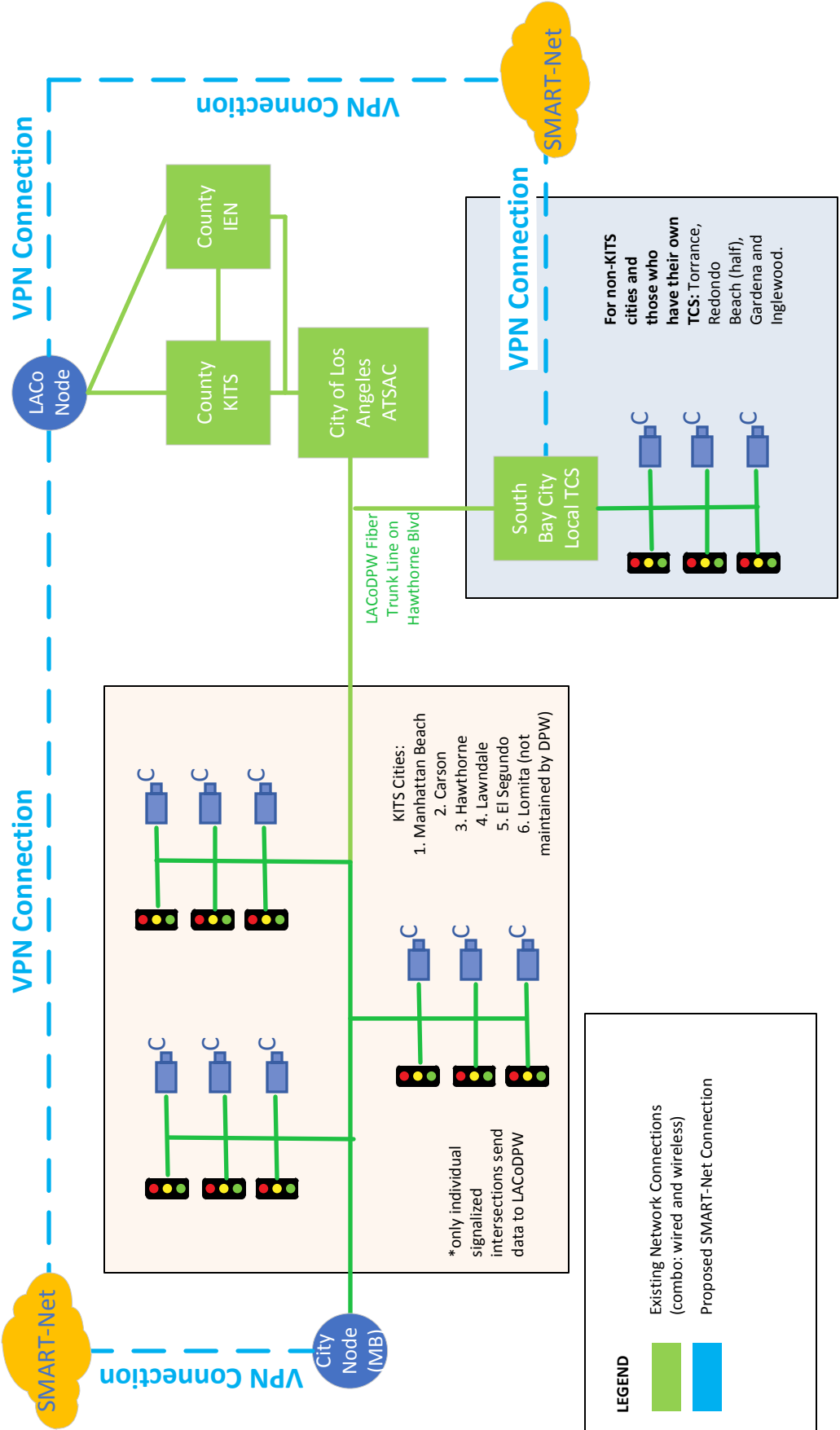
City of Manhattan Beach

Los Angeles County Department of Public Works

South Bay Cities Council of Governments

Metro Highway Program, ITS

Attachment A



MANHATTAN BEACH TRAFFIC CONTROL SYSTEM SMART-NET INTEGRATION PROJECT

Project Description:

This project will establish a virtual private network (VPN) connection through the South Bay SMART-Net to connect traffic signal control field elements on Artesia Blvd, Aviation Blvd, Highland Ave, Manhattan Beach Blvd, Marine Ave, and Rosecrans Ave Blvd in the City of Manhattan Beach (City) to the County of Los Angeles (County) traffic management center (TMC) in Alhambra. This VPN connection will create a secondary high-speed network connection that will complement existing wireless and fiber connections deployed in the subregion to enhance central monitoring and control of the local traffic signals in the City. Attachment A provides a high-level logical diagram illustrating the connections.

Project Benefits:

By establishing a secondary connection to the fiber-optic local traffic signal control network in Manhattan Beach, the County will be able to maintain communications with traffic signal control field elements (traffic signal controllers, detectors, cameras, etc.) in the City when there are service disruptions along the fiber-optic line currently used to connect LA County Department of Public Works (LACDPW) to the South Bay subregion. The increased communications reliability will allow the County to more consistently and effectively leverage the capabilities of the County central traffic control system (KITS) that is used to monitor and control the intersections along the major arterial corridors in the City. More reliable communications will ensure the County can monitor the operations of existing traffic signal control assets, centrally adjust traffic signal timing in real-time as needed, provide

KEY PROJECT ATTRIBUTES & STAKEHOLDERS

1. Increases reliability of central traffic signal monitoring and control for the major arterial corridors in the City of Manhattan Beach
2. Leverages SMART-Net to provide high-speed data connection to signal control field elements and the County TMC
3. Provides additional communications resiliency for other South Bay County operated intersections.



greater insight into corridor operations and maintenance needs, allow for the exchange of data needed to support the central distribution of signal phase and timing (SPaT) information, and support the growing number of signal-related intersection mobility and safety applications being implemented throughout the County.

Project Need:

Currently, the signalized intersections communicating with the County's KITS central traffic control system are connected to the County's TMC through a fiber-optic communications connection running through the City of Los Angeles ATSAC to the County's TMC in Alhambra. When this connection goes down LACDPW loses the ability to centrally monitor and control the existing South Bay traffic signals managed and maintained by the County, including the signals in Manhattan Beach. This project will create a necessary communications redundancy that will minimize any potential disruption in service and allow for the central traffic signal control system benefits to be maintained in a more consistent manner.

Dependencies:

For this project to move forward the City will need to connect to the South Bay SMART-Net and establish a VPN connection through the broadband connection to the County's TMC in Alhambra. Furthermore, LACDPW will need to support the City in establishing the VPN to ensure bi-lateral communications is maintained across the newly established VPN connection. This project will also need to be coordinated with the delivery of the Manhattan Beach Advanced Traffic Signal (MBATS) System project that is being considered to deploy additional detection, CCTV cameras, fiber optic signal interconnect, and new signal control hardware and firmware along major corridors in the City.

Cost:

It is anticipated that the fixed costs associated with the establishment of this VPN connection can be covered under the MBATS System project which will deploy fiber-optic communications to all signalized intersections along the afore mentioned corridors within the city limits. Additionally, there are funds available to support center-to-center and center-to-field communications in multiple South Bay Traffic Forum Call for Projects grants provided by Metro to LACDPW to support this type of work. The ongoing costs to maintain the VPN connections will need to be absorbed by the City and LACDPW. There are no additional ongoing recurring costs for the City or the County as the recurring broadband needs to support the VPN will be

covered under existing and future SMART-Net or other broadband service agreements for each respective agency.

Schedule:

This project can be implemented in conjunction with the build-out of the South Bay SMART-Net project. Planning for the establishment of the VPN should commence 6 months prior to the completion and activation of the SMART-Net broadband service in the City. VPN design and implementation should be coordinated by both participating agencies during this period with the VPN connection established and operational within 2 months after the SMART-Net broadband connection is activated.

Project Concurrence:

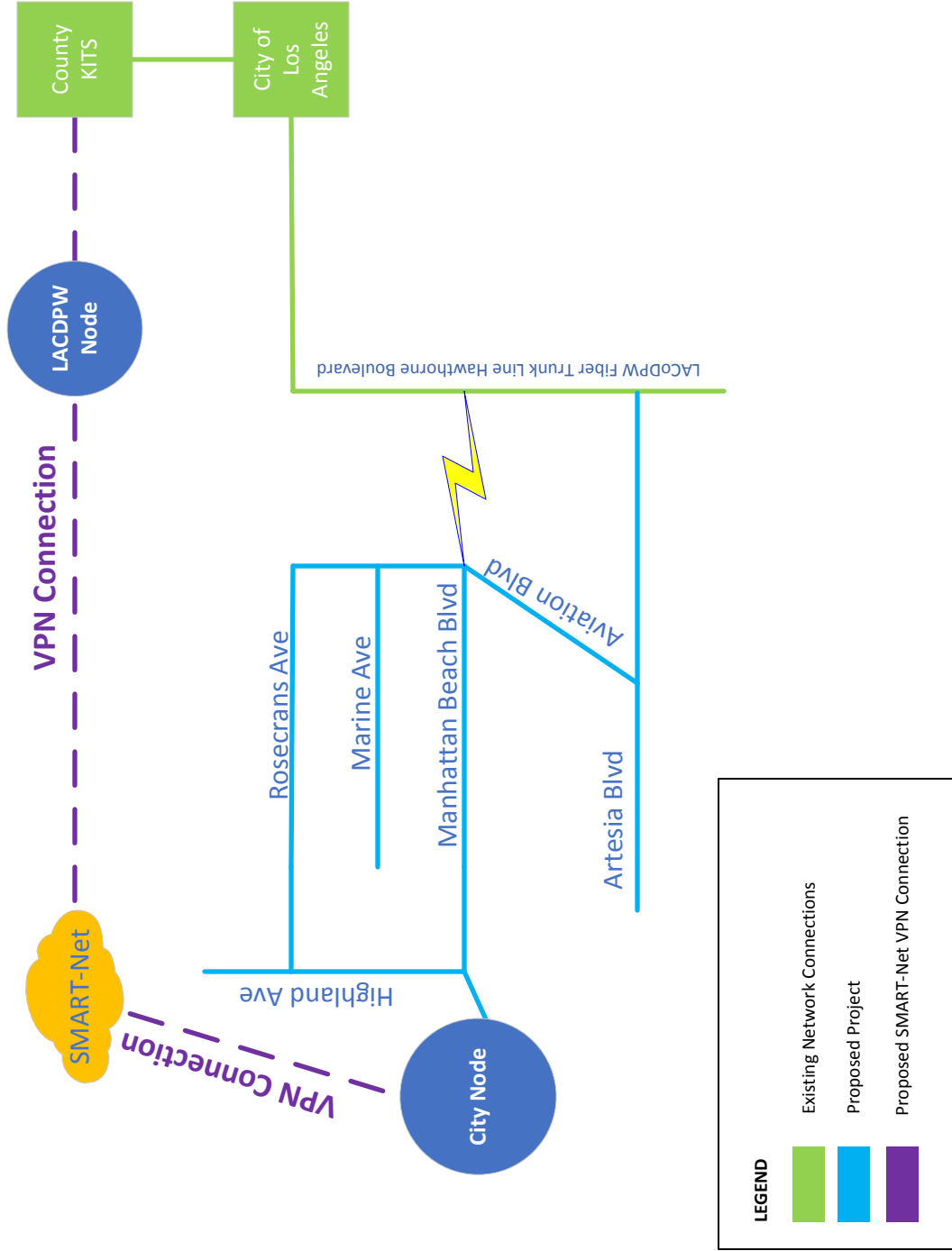
City of Manhattan Beach

Los Angeles County Department of Public Works

South Bay Cities Council of Governments

Metro Highway Program, ITS

Attachment A



SIGNAL PHASE AND TIMING (SPaT) DATA SHARING AND SMART-NET INTEGRATION PROJECT

Project Description:

This project will establish a secured connection through the South Bay SMART-Net to connect an agency's central traffic control system (TCS) to a 3rd party data server. This secured connection will create a high-speed network connection that will have the ability to share signal phase and timing (SPaT) data from the TCS to vehicles that are equipped to receive the data. Attachments A and B provides a high-level logical diagram illustrating the connections.

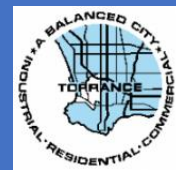
With advances in connected vehicle technology and applications, SPaT data from the traffic signal controller is being used to create applications to provide countdown and/or speed advisories as a vehicle approaches an intersection. The application, known as Eco-Approach and Departure or Eco-Drive, is currently integrated in passenger vehicles (such as Audi). Traffic Technology Services (TTS) is a data provider to automotive OEMs and pushes out the SPaT data through its servers.

Project Benefits:

By providing SPaT data to passenger vehicles, there is the opportunity for drivers to reduce harsh driving maneuvers, accelerate or decelerate accordingly at intersections, and maintain safe driving speed along streets. This may result in managed congestion, reduction in incidents at intersections, and improvement in air quality conditions.

KEY PROJECT ATTRIBUTES & STAKEHOLDERS

1. Ability to share Signal Phase and Timing (SPaT) data to vehicles to manage congestion and acceleration/deceleration at intersections.
2. Leverages SMART-Net to provide high-speed data connection to third-party data service providers (such as Traffic Technology Services [TTS]).
3. Manages congestion, reduces incidents, and improves air quality.



Project Need:

Currently, a secured connection can be established at an agency's traffic management center to share SPaT data with TTS. However, these connections may not offer high-speed capabilities. Since SPaT data needs to be pushed out on a second-by-second basis to ensure accuracy at the intersection, the South Bay SMART-Net project would provide the high-speed connection to TTS.

Dependencies:

While this project will establish a direct secured connection through the broadband connection, there are dependencies with the City of Manhattan Beach Traffic Control System SMART-Net Integration project and Los Angeles County Department of Public Works (LACDPW) Traffic Control System and Information Exchange Network SMART-Net Integration Project. If the City of Manhattan Beach and LACDPW projects are implemented, it will create a communications redundancy for LACDPW to share SPaT data to TTS or 3rd party data service provider.

In addition, the City of Torrance is proposing a Transportation Management System Improvements project through the Measure M Transportation System and Mobility Improvements Program. This project proposes to install managed ethernet switches city-wide at all signalized intersections. The ethernet switches would provide the City of Torrance the ability to communicate and monitor the field devices at each intersection. Also, the City of Torrance would need to establish a SMART-Net node in order to utilize the broadband connection. With this node, the project would allow for the transmitting of SPaT data from each intersection to the City's central traffic control system, and ultimately sharing data with TTS through the secured connection established through SMART-Net.

Cost:

It is anticipated that the fixed costs associated with the establishment of this secured connection can be covered through 3rd party agreements with the respective agency.

Schedule:

This project can be implemented at any time once the agency's TCS can support SPaT data sharing. The design and implementation should be coordinated by both participating agencies and TTS or 3rd party data service provider.

Project Concurrence:

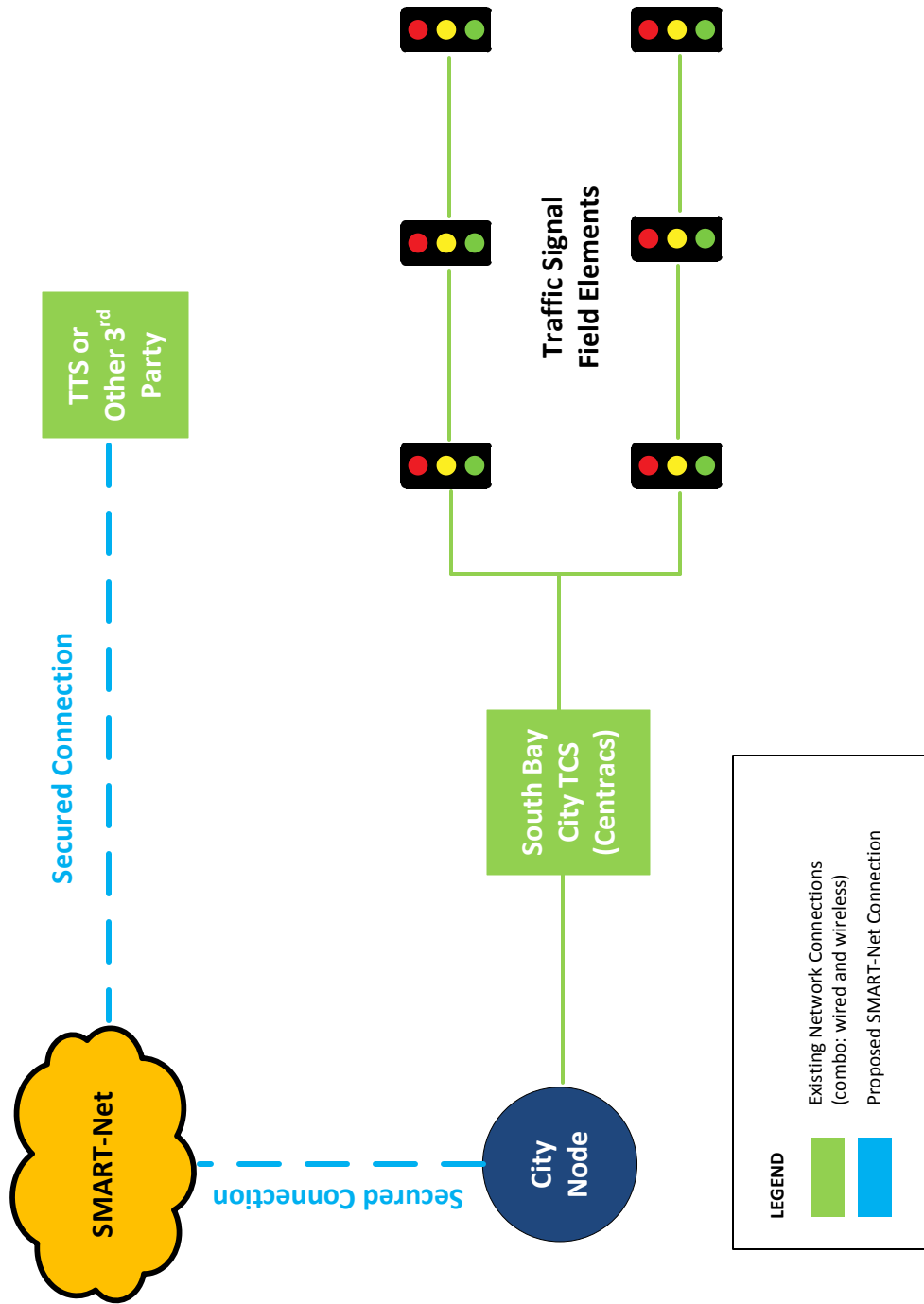
City of Torrance

Los Angeles County Department of Public Works

South Bay Cities Council of Governments

Metro Highway Program, ITS

Attachment A



Attachment B

