



AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009

TRANSPORTATION INVESTMENT GENERATING ECONOMIC RECOVERY “TIGER DISCRETIONARY GRANTS”

CITY OF OXNARD

BOULEVARD RAIL IMPROVEMENTS AND TRANSPORTATION ENHANCEMENTS

**KEN ORTEGA, PUBLIC WORKS DIRECTOR
305 W. THIRD STREET
OXNARD, CA 93030
PHONE: 805-385-7900
FAX: 805-385-7907
EMAIL: KEN.ORTEGA@CLOXNARD.CA.US**

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NARRATIVE

The City of Oxnard, like many of the nation's communities, is facing significant economic challenges. With a population of approximately 194,905, the City of Oxnard (City) is the largest city in Ventura County and the 20th largest city in California. Located about 60 miles northwest of Los Angeles and 35 miles south of Santa Barbara in U.S. Congressional District 23, the City is both a coastal getaway and gateway between the greater Los Angeles area and the Central Coast.

Travel in the City and Ventura County is impacted by a variety of forces and it is projected that in the future the regional mobility problem will be exacerbated. The public policy experience in the Oxnard area, as with most regions, has been an inability to expand existing facilities or build new roads to meet the increasing demand. This is not only infeasible from a monetary perspective, but from a public support perspective; new roads mean more traffic, environmental concerns, etc. Yet, at the same time pressure is mounting to "do something" – to relieve congestion, improve incident management, provide viable alternatives, respond to seasonal variations and weather-related conditions, and to enhance mobility for today and years to come.

To overcome these challenges, it is imperative for the City to invest in innovative and intelligent transportation infrastructure that will provide both immediate economic stimulus and sustainable job growth. Toward this pursuit, the City has created the Boulevard Rail Improvements and Transportation Enhancements Project or "BRITE," an estimated \$20 million project designed to promote and preserve quality of life in the region. The program consists of two major components:

- 1) Implementation and effective operation of an Intelligent Transportation System, which will maximize the efficiency of existing City streets, improve public safety, and improve air quality; and
- 2) Rail Safety Enhancement projects, consisting of planned improvements to seven intersections and at-grade railroad crossings to provide for the safe, orderly movement of trains and vehicles through the City.

With available funding, the shovel-ready BRITE Project will help to create a more habitable and sustainable community through the development of infrastructure designed for the effective, efficient transportation of people and goods, and goods to the people.

INTELLIGENT TRANSPORTATION SYSTEM (ITS)

In 2005, City of Oxnard Traffic Engineering staff began the process of upgrading the City's traffic signal system. A crucial element of these planned upgrades is the strategic deployment of ITS strategies within the Oxnard region. The City hired a traffic management consulting firm, Iteris, in 2006 to complete the Oxnard ITS Master Plan. After a series of stakeholder meetings and an inventory of the existing system, a draft master plan was completed. In the spring of 2008, after significant outreach and consensus building activities including various City departments, Caltrans, County of Ventura, Gold Coast Transit, and City of Port Hueneme, the final master plan was completed.

Oxnard's ITS is intended to play a vital role in the creation of a more efficient multimodal transportation network by providing the ability to collect and process real-time traffic information for dissemination to, and reception from, public agency stakeholders.

This communication of traffic information is the key to any ITS. The objective is the communication between all of the City's traffic signals to a centralized control location where green time, the amount of time the light is green for a given direction, can be efficiently managed and existing traffic conditions communicated to drivers.

The ITS Master Plan achieves all of the following goals:

- Details a long-term ITS deployment strategy
- Inventories existing transportation infrastructure for use in future ITS deployments to maximize funding
- Improves public safety and incident response time
- Provides the tools to more efficiently manage existing transportation network
- Provides cost estimates for operations and maintenance and phased deployment of ITS strategies

- Employs Systems Engineering Best Practices
- Evaluates the City's existing traffic signal control system and assesses the suitability of this system based on functional requirements and user needs
- Develops a Concept of Operations to ensure the ITS Master Plan meets the City's current and future transportation management needs
- Addresses systems integration to support multi-jurisdictional coordination with additional City and regional stakeholders including Oxnard Police, Ventura County, neighboring cities, and other stakeholders including heavy rail, transit rail (Metrolink) and bus transit
- Complies with and becomes part of the adopted Southern California Associations of Governments Regional ITS Architecture
- Addresses the need for traveler information to the end user, the general public

The ITS Master Plan studied the priority of needs to determine the ideal timing for deployment of specific ITS projects to best benefit the Oxnard region. These projects were identified as near-term and long-term as follows:

- **Near-term projects** are those that address critical needs and are technically and institutionally ready for deployment. These near-term projects have been recommended for immediate Phase 1 deployment, pending available funding.
- **Long-term projects** are those that address needs that are not as critical, and/or require technologies or interactions that are not feasible in the near-term. These long-term projects have been recommended for Phase 2 deployment, which is planned for five years or more into the future.

For further information regarding the details of the ITS Master Plan, including project maps for each of the City's six geographic sections targeted for ITS deployment, please refer to the City's website at www.publicworks.cityofoxnard.org under Traffic Engineering Division.

ITS PHASE 1: NEAR-TERM PROJECTS

The focus of near-term projects is on immediate deployment. The ITS Master Plan identified specific signalized intersections and priority corridors in the Oxnard region for inclusion in Phase 1. These intersections were then grouped based on geographic location and intersection similarities. The intersection groups were prioritized based on vehicle volume, incident frequency, and input from the project stakeholders, resulting in the identification of six geographic sections targeted for communication system upgrades. These sections encompass all of the arterial corridors and both existing and future signalized intersections.

There are 179 ITS Master Plan intersections. The City's 2008 General Plan Option B recognizes 25 as below Level-of-service (LOS) C and the ITS Master Plan will improve 11. Currently, there are 13 intersections owned by Caltrans that will be relinquished to the City in the near future. Table 1 below summarizes the number of below LOS C intersections for each of the City's six geographic sections targeted for ITS deployment.

It is important to note that the City does have flexibility in the order in which the sections are deployed. Section 1 and Section 2 must be completed in this sequence. However, with the completion of these two sections, the City does have some flexibility in the order of deployment of Sections 3, 4 and 5. However, Section 6 does require the completion of Sections 1 and 3.

Projects corresponding with each section may include communications upgrades, traffic signal controllers upgrades, closed-circuit television (CCTV) cameras and other ITS device deployments. Other proposed improvements may include the installation of GPS clocks for synchronization purposes or the retention of the phone drops at isolated locations, if no other cost-effective means of communications can be achieved.

Additionally, the ITS Master Plan included the construction and integration of the City's Traffic Management Center (TMC) where City staff will have the tools and resources to implement and manage the City's ITS, as well as to share traffic data with other City Departments and outside agencies including Caltrans and Ventura County.

TABLE 1. Level-of-service (LOS) C Intersections by Geographic Section

	ITS Master Plan	2008 General Plan Update Option B	Improved by ITS	% Improved	Traffic Initiative	Improved by ITS	% Improved
Section 1: Downtown Oxnard	44	7	3	43%	5	4	80%
Section 2: Rose Ave., Rice Ave. & Gonzales Rd.	36	8	3	38%	11	5	45%
Section 3: Ventura Blvd. & Vineyard Ave.	30	1	0	0%	2	0	0%
Section 4: Channel Islands Blvd., Oxnard Blvd. & Pleasant Valley Rd.	18	6	5	83%	3	2	67%
Section 5: Port Hueneme Rd., Saviers Rd. & Ventura Rd.	28	2	0	0%	0	0	0%
Section 6: Oxnard Blvd., Channel Islands Blvd. & Pleasant Valley Rd.	23	1	0	0%	4	2	50%
Total	179	25	11	41%	25	13	52%

The proposed project sections and associated limits are summarized below.

Section 1 – Downtown Oxnard and Multi-Jurisdictional Communication Link – There are 44 ITS Master Plan intersections included in Section 1. The City's 2008 General Plan Update Option B recognizes 7 as below LOS C and the ITS Master Plan will improve a maximum of 3. The corridors included in this section were given the highest priority based on their proximity to essential City services and major Highways. The limits of work are listed below:

- Ventura Road: Gonzales Road to Stone Creek Drive (location of a future signal)
- Oxnard Boulevard: Vineyard Avenue to Wooley Road
- A Street: Second Street to Sixth Street
- B Street: Fourth Street to Sixth Street
- C Street: Second Street to Hill Street
- Gonzales Road: Victoria Avenue to Entrada Drive
- Wooley Road: C Street to Oxnard Boulevard

Section 1 improvements are envisioned to involve the installation of a communication hub and corresponding equipment and upgrading existing copper interconnect in existing conduit with fiber optic cable from Oxnard City Hall north along Oxnard Boulevard and west along Gonzales Road. Additional improvements for Section 1 are envisioned to involve CCTV camera and system detector deployments, emergency vehicle pre-emption (EVP), and communication upgrades. Specific locations proposed for traffic camera installation are Gonzales Road at Victoria Avenue, Ventura Road and Oxnard Boulevard, and Oxnard Boulevard at Fifth Street and Wooley Road/Saviers Road.

In support of the City's vision of a multi-jurisdictional transportation management system for ITS, a communication link is proposed between the Oxnard TMC, the Oxnard Police Department, the County of Ventura, and Caltrans.

The communication link is envisioned to be a combination of physical interconnect and virtual communications through a virtual private network (VPN). A VPN connection is proposed due to the excessive cost required to install fiber and conduit along Victoria Avenue between West Gonzales Road and Telephone Road, where Ventura County Transportation Commission (VCTC) is located.

Upgrading to Ethernet-based communications will require the City's traffic signal controllers to support Ethernet communications, which will involve the purchase of new Ethernet cards and replacement of non-compatible controllers. Depending on the condition of existing controller cabinets, it is assumed that there will be some existing controller cabinet replacements.

Section 1 also includes the implementation of communication hubs at the Oxnard TMC, and at the intersection of West Gonzales Road and North Ventura Road, as well as the upgrade to the City's traffic signal system, QuicNet/4. The system selected for the upgrade, which could be the newer version of QuicNet or a new signal system, will be tied to the discussions with Caltrans and VCTC regarding the VPN and the exchange of data.

Section 2 – Rose Avenue, Rice Avenue and Gonzales Road – There are 36 ITS Master Plan intersections included in Section 2. The 2008 General Plan Update Option B recognizes 8 as below LOS C and the ITS Master Plan will improve a maximum of 3. The corridors included in this section were given the priority based on their proximity to essential City services and major Highways. The limits of work are listed below:

- Rose Avenue: Auto Center Drive to Emerson Avenue
- Rice Avenue/ Santa Clara Avenue: Auto Center Drive to Wooley Road
- Auto Center Drive: Rose Avenue to Santa Clara Avenue
- Gonzales Road: Snow Avenue to Rice Avenue
- Wooley Road: Rice Avenue to Commercial Avenue
- Fifth Street: Rose Avenue to Del Norte Boulevard
- Camino Del Sol: Rose Avenue to Del Norte Boulevard
- Del Norte Boulevard: Camino Del Sol to 101 ramps (future)

Proposed Section 2 improvements include controller firmware upgrades, CCTV camera and system detector deployments, EVP, and communication upgrades. Depending on the capacity or the condition of existing controller assemblies, it is assumed that some cabinets will be replaced. Based on incident frequency and intersection signal operation, nine intersections were identified as potential locations for CCTV camera deployments.

Although the majority of the fiber optic cable proposed for Section 2 corridors will be installed in existing conduit, to minimize costs, a few intersections were noted as candidate wireless locations. Section 2 also includes the implementation of a communication hub at the intersection of East Gonzales Road and North Rose Avenue.

Section 3 – Ventura Boulevard and Vineyard Avenue – There are 30 ITS Master Plan intersections included in Section 3. The 2008 General Plan Update Option B recognizes 1 as below LOS C and the ITS Master Plan will improve 0. The limits of work are listed below:

- Hobson Way: Fifth Street to Wooley Road
- Ventura Road: Stone Creek Drive to Town Center Drive
- Ventura Road: Hill Street to Ivywood Drive
- Wooley Road: Ventura Road to Hobson Way
- Vineyard Avenue: Ventura Road to Central Avenue
- Oxnard Boulevard: Citrus Grove to 101 Ramps

Proposed Section 3 improvements include controller firmware upgrades, CCTV camera and system detector deployments, EVP, and communication upgrades. Depending on the capacity or the condition of existing controller assemblies, it is assumed that some cabinets will be replaced. Three intersections were identified as candidate locations for CCTV cameras.

Communication upgrades along Section 3 corridors are envisioned to involve the replacement of existing twisted pair copper signal interconnect cable (SIC) in existing conduit with fiber optic cable; closing communication gaps by

installing new conduit and new fiber optic cable or wireless communications; and installing new Ethernet switches and associated equipment for fiber optic cable inside controller assemblies. Where existing SIC conduit is available, new fiber optic cable will replace existing SIC in existing conduit. Section 3 also includes the implementation of a communication hub at the intersection of West Wooley Road and North Ventura Road.

Section 4 – Channel Islands Boulevard, Oxnard Boulevard and Pleasant Valley Road – There are 18 ITS Master Plan intersections included in Section 4. The 2008 General Plan Update Option B recognizes 6 as below LOS C and the ITS Master Plan will improve a maximum of 5. The limits of work are listed below:

- Channel Islands Boulevard: Saviers Road to Rice Avenue
- Pleasant Valley Road: Oxnard Boulevard (SR-1) to Squires Drive
- Rice Avenue: Channel Islands Boulevard to Hueneme Road
- Rose Avenue: Oxnard Boulevard (SR-1) to Pleasant Valley Road
- Oxnard Boulevard (SR-1): Date Street to Statham Road

Proposed Section 4 improvements include controller firmware upgrades, CCTV camera and system detector deployments, EVP, and communication upgrades. Depending on the capacity or the condition of existing controller assemblies, it is assumed that some cabinets will be replaced. Two intersections were identified as potential locations for CCTV cameras.

More than half of the intersections in Section 4 operate as isolated intersections. A few communicate through copper interconnect or phone drops. Where existing SIC conduit is available, new fiber optic cable will replace existing SIC in existing conduit. Section 4 also includes the implementation of communication hub at the intersection of East Channel Islands Boulevard and South Rose Avenue.

Section 5 – Port Hueneme Road, Saviers Road and Ventura Road – There are 28 ITS Master Plan intersections included in Section 5. The 2008 General Plan Update Option B recognizes 2 as below LOS C and the ITS Master Plan will improve 0. Costs are higher due to conduit and fiber optic cabling required to link Section 5 to Sections 1 and 4. The limits of work are listed below:

- Ventura Road: Hemlock Street to Hueneme Road
- Saviers Road: Elm Street to Hueneme Road
- Channel Islands Boulevard: Ventura Road to Saviers Road
- Pleasant Valley Road: Squires Drive to Ventura Road
- Hueneme Road: Ventura Road to Rice Avenue

Proposed Section 5 improvements include controller firmware upgrades, CCTV camera and system detector deployments, EVP, and communication upgrades. Depending on the capacity or the condition of existing controller assemblies, it is assumed that some cabinets will be replaced. Five intersections were identified as potential locations for CCTV cameras.

Most of the Section 5 intersections currently communicate through a combination of twisted pair copper SIC, and/or phone drops. A few operate as isolated intersections. Communication upgrades along Section 5 corridors are envisioned to involve the replacement of existing twisted pair copper SIC in existing conduit with fiber optic cable, closing communication gaps by installing new conduit and new fiber optic cable at adjacent intersections, and installing new Ethernet switches and associated equipment for fiber optic cable inside controller assemblies. Section 5 also includes the implementation of communication hub at the intersection of East Channel Islands Boulevard and Saviers Road.

Section 6 – Oxnard Boulevard, Channel Islands Boulevard and Pleasant Valley Road – There are 23 ITS Master Plan intersections included in Section 6. The 2008 General Plan Update Option B recognizes 1 as below LOS C and the ITS Master Plan will improve 0. The limits of work are listed below:

- Harbor Boulevard: Olivas Park Drive to Channel Islands Boulevard
- Channel Islands Boulevard: Harbor Boulevard to Patterson Road
- Victoria Avenue: Doris Avenue to Curlew Way

- Fifth Street: Harbor Boulevard to Patterson Road
- Wooley Road: Harbor Boulevard to Patterson Road
- Patterson Road: Fifth Street to Channel Islands Boulevard

Proposed Section 6 improvements include controller firmware upgrades, CCTV camera and system detector deployments, EVP, and communication upgrades. Depending on the capacity or condition of existing controller assemblies, it is assumed that some cabinets will be replaced. Two intersections were identified as potential locations for CCTV cameras.

More than half of the Section 6 intersections operate as isolated intersections. A few segments (most along Victoria Avenue and Channel Islands Boulevard) communicate through copper signal interconnect and phone drops. Communication upgrades along Section 6 corridors are envisioned to involve the replacement of existing twisted pair copper SIC in existing conduit with fiber optic cable, closing communication gaps at adjacent intersections, and installing new Ethernet switches and associated equipment for fiber optic cable inside controller assemblies. If costs become an issue, wireless communications can be used at intersections along both segments in lieu of the new conduit and fiber. No communication hubs are planned for Section 6.

ITS NEAR-TERM DEPLOYMENT STRATEGIES

The ITS Master Plan spells out how best to implement, operate and maintain an ITS, including operations and maintenance costs to ensure the ITS is sustainable. The ITS will provide for real-time traffic information allowing for quick reaction time to changing traffic patterns and/or roadway incidents. This is done by deploying traffic cameras, interconnection of all traffic signal controllers, and by keeping drivers informed of traffic conditions. Through this set up, green time can be managed more efficiently, thereby reducing congestion and pollution, including greenhouse gases caused by idling vehicles delayed in traffic. In support of the City's overall vision of a multi-jurisdictional transportation management system for the ITS, a communication link is proposed between the Oxnard Police Department, the County of Ventura, Caltrans, and the Oxnard TMC, described in detail below.

Traffic Management Center (TMC) – Operation and success of the City's ITS requires the construction of a new TMC to be located in the vicinity of the Oxnard Emergency Operations Center (EOC). The TMC will house the equipment needed to operate the ITS system. The TMC is the facility where a TMC operator will carry out traffic monitoring tasks and other day-to-day activities. The TMC will contain a video wall display system that will be the operational focal point of the TMC because it provides visual information for traffic management purposes and is visible to all operations staff. The City's goal is to have TMC operations capabilities from the EOC in the future.

There are six Ethernet communication hubs proposed, including one at the TMC. The system is comprised of two fiber optic loops: one for the west side and one for the east side of the City. These fiber optic loops and communication hubs comprise the Backbone Communication System for the City's ITS. This System assumes Ethernet based communications between the signalized intersections, the City and regional facilities.

Based on the City of Oxnard's existing conditions and the region's future needs and requirements, the following is a list of improvements proposed or recently initiated:

- Replacement of the existing QuicNet/4 system with the latest QuicNet central system
- Non-Caltrans traffic signal controller firmware upgrades to support Ethernet-based communications
- Deployment of Ethernet based communications
- Deployment of video surveillance systems and/or system detectors to monitor traffic operations
- Deployment of transit signal priority or bus rapid transit along priority bus route corridors
- Transition of existing traffic signals from Caltrans operation/maintenance to City operation/maintenance and vice versa
- Communication between the City, Caltrans, and the County of Ventura
- Secure remote TMC access for maintenance via laptop
- Automated notification of signal maintenance issues to City Street Maintenance staff
- Information sharing between different City departments
- Relocation of the existing TMC – *construction recently completed*

- Deployment of new EOC – *construction recently completed*

ITS PHASE 2: LONG-TERM PROJECTS

Phase 2 has identified long-term projects that are planned for five years or more into the future. Long-term projects may include the following:

- **Permanent Dynamic Message Signs (DMS)** – Permanent DMS will be deployed in the region to provide traffic information and direct traffic. Permanent DMS locations will be on main corridors leading to Highway 101, or at key locations within corridors where drivers can make detours to reduce congestion and decrease travel time. The signs will be managed from the Oxnard TMC.
- **Jointly deployed traffic cameras** – The City of Oxnard will work with the City of Port Hueneme and the County of Ventura to jointly deploy traffic cameras in areas where traffic conditions in both jurisdictions can be observed. The cameras will be viewable and controllable from the Oxnard TMC and at the joint-deployer agency.
- **Transit Signal Priority** – Gold Coast Transit and the City of Oxnard will work together to identify key intersections that may benefit from transit signal priority. Transit signal priority provides behind-schedule buses preemption at red lights, based on conditions established by both participants. Transit vehicles will be equipped with devices that communicate with signal controllers to request preemption.
- **Improved Traveler Information** – Traveler information will be disseminated to the public through a local web site and cable television. The information will be delivered from the Oxnard TMC. The web site may include notices of events such as construction, accidents, delays and congestion, as well as images from traffic cameras. The site may also contain a real-time map of travel times in the region. The cable television broadcast may also contain images from traffic cameras and alerts of events that may impact traffic.

Technology advancements may change how these projects will be deployed in the future and what the estimated costs would be. Due to these factors, City staff is not able to estimate the costs of Phase 2 at this time. For further information regarding Phase 2 of the ITS Master Plan, please refer to the City's website at www.publicworks.cityofoxnard.org under Traffic Engineering Division.

ITS PROJECT BENEFITS

The benefits of ITS are numerous, immediate and far-reaching, including the alleviation of traffic congestion, reduced greenhouse gases and fuel consumption, and improved transportation safety through a reduction in vehicle-related injuries and fatalities.

The source of these benefits is ITS' ability to respond in real time to changing traffic patterns. Signals are controlled by changing signal timing from a central control location; the effects of these changes are immediate. Through the use of CCTV cameras, operators are able to provide manual intervention and, if required, dispatch equipment and personnel to repair equipment failures or assist in incident removal in a coordinated method. These images can be shared with other departments within the City (e.g., fire department, police department, public works) and for integration with partner agencies such as the City of Port Hueneme, County of Ventura, and Caltrans.

Summarized below are several examples of the proven benefits of ITS from the U.S. Department of Transportation (DOT) ITS Joint Program Office's *"Investment Opportunities for Managing Transportation Performance through Technology,"* released January 16, 2009.

Phase 1 Benefits:

Traffic Signal Optimization/Retiming – The extent of benefits realized from traffic signal retiming depends on various factors including the quality of existing timing plans, street network configuration, and traffic patterns. However, the estimated benefit-to-cost ratio for optimizing signal timing plans, coordinating traffic signal control, and implementing adaptive signal control in California was found to be 17:1, and the Traffic Light Synchronization program in Texas demonstrated a benefit-to-cost ratio of 62:1.

Traffic Incident Management – Traffic incident management programs make use of a variety of ITS technologies to successfully detect, manage, and clear traffic incidents, improving safety for travelers by reducing the risk of secondary crashes, and reducing time and fuel wasted in traffic backups. Success builds from the ability of the programs to significantly reduce the duration of traffic incidents, from 15 to 65 percent, with the bulk of studies finding savings of 30 to 40 percent from incident management systems.

Surveillance and Detection – Many strategies for arterial, freeway, and incident management systems are enabled by traffic surveillance and detection technologies, including camera systems designed to provide frequent images or full-motion video critical for enabling active traffic management and incident response. A U.S. DOT evaluation of surveillance and detection systems shows a benefit-to-cost ratio of 5.6:1.

Phase 1 or Phase 2 Benefits:

Road Weather Information Systems – Road weather management systems mitigate weather impacts by using technology to promote safety, improve mobility, increase productivity, and protect the environment. Accurate and timely road weather information helps maintenance managers react proactively before problems arise, improving safety and reducing costs. Meteorologists at the transportation management center in Salt Lake City, UT provided detailed weather forecast information to maintenance staff, reducing labor and materials costs for snow and ice control activities at a benefit-to-cost ratio of 10:1.

Traffic Adaptive Signal Control – Traffic signal optimization provides coordination along arterials to improve traffic flow and reduce delays at traffic signals. Traffic Adaptive Signal Control systems coordinate the control of signals along arterial corridors, adjusting the lengths of signal phases based on real-time traffic conditions. Studies from 11 cities found delay reductions ranging from 5 to 42 percent after installation of Adaptive Signal Control, including an average delay reduction of 10 percent at 7 intersections in Los Angeles.

Transit Signal Priority – Transit Signal Priority (TSP) is a cost-effective method to make bus transit service more reliable. TSP helps transit vehicles improve schedule performance by granting them priority at signalized intersections when they are behind schedule. Through coordination with arterial management systems, TSP systems can improve service quality and transit agency productivity resulting in additional ridership. Experiences in 10 cities in the U.S. and abroad demonstrated a reduction of up to 20 percent in bus travel time using TSP.

Phase 2 Benefits:

Traveler Information/Dynamic Message Signs – Dynamic Message Signs (DMS) are traffic control devices used for traffic warning, regulation, routing and management, and are intended to affect the behavior of drivers by providing real-time traffic-related information such as traffic conditions, incidents, weather, construction, safety, and special events. A San Antonio, TX deployment of an integrated DMS and incident management system resulted in an estimated 5.7 percent reduction in delays, 2.8 percent decrease in crashes, and 1.2 percent decrease in fuel consumption annually. Additionally, the DMS can be used to provide public service announcements such as AMBER alerts.

ITS PROJECT COST ESTIMATE

The total estimated cost to complete ITS Phase 1 deployment is \$10,150,000 as detailed in Table 3 below.

TABLE 2. ITS Phase 1 Deployment Cost Summary

Description	Section 1	Section 2	Section 3	Section 4	Section 5	Section 6	Total
Plans, Specifications & Estimate							
Design	183,300	165,800	193,800	100,600	308,100	107,600	1,059,200
Subtotal	\$183,300	\$165,800	\$193,800	\$100,600	\$308,100	\$107,600	\$1,059,200
Construction (capital and support)							
Communication Hub	40,000	40,000	40,000	40,000	40,000	-0-	200,000
Camera System	50,000	90,000	30,000	20,000	50,000	20,000	260,000
Conduit	412,000	256,400	546,400	230,300	1,254,900	240,800	2,940,800
Fiber Optic Cable	233,700	279,000	251,100	92,600	269,200	97,900	1,223,600
Equipment Costs	98,000	118,000	70,000	74,000	66,000	102,000	528,000
Controller Upgrade	112,800	82,000	85,800	37,500	73,300	47,200	438,600
Contingency/CPI	266,500	247,100	250,200	182,700	158,900	121,600	1,227,000
Integration	436,200	379,500	470,800	228,200	860,600	244,700	2,620,000
Subtotal	\$1,832,500	\$1,657,800	\$1,938,100	\$1,005,900	\$3,081,000	\$1,075,600	\$10,497,200
Construction in Progress	(147,300)	-0-	(207,900)	(76,400)	(201,300)	(54,300)	(687,200)
Total Construction	\$1,685,200	\$1,657,800	\$1,730,200	\$ 929,500	\$2,879,700	\$1,021,300	\$ 9,810,000
TMC							340,000
GRAND TOTAL							\$10,150,000

RAIL SAFETY ENHANCEMENT

Each year, more than 12,000 vehicle-train collisions occur at public grade crossings, resulting in approximately 1,500 fatalities and 7,000 injuries. The causes of these accidents include visually obstructed railroad crossings, inadequate warning to drivers regarding oncoming trains and deteriorated railroad crossing conditions. Recently, three major collisions have occurred within the City of Oxnard at the Fifth Street and Rice Avenue railroad crossing. All of the accidents involved collisions between either Amtrak or Metrolink passenger trains and vehicles crossing the tracks. A video of the Amtrak accident can be seen courtesy of CBS News at <http://www.cbsnews.com/video/watch/?id=674663n&tag=related:photovideo>. Articles from the Ventura County Star describing the Metrolink accidents can be viewed at www.venturacounty.com/news/2009/aug/27/no-headline---nxxfctrain28/ and www.venturacounty.com/news/2008/mar/04/metrolink-train-hits-truck-oxnard/.

The Rail Safety Enhancement Project will provide for the secure and systematic movement of trains and vehicles through the City along Fifth Street, Oxnard Boulevard, and Vineyard Avenue. The improvements will enable the City to provide improved traffic flow and pedestrian safety through the railroad corridor with safety enhancements, traffic signal operation, reduced congestion, improved air quality and minimization of the conflict between vehicular/pedestrian traffic and the railroad at seven crossings in the City. The following intersections and at-grade railroad crossings are included:

Camino Del Sol and Oxnard Boulevard – Camino Del Sol exits an arterial east-west highway and connects to Oxnard Boulevard. Improvements to this intersection include constructing the Camino Del Sol roadway from Entrada Drive/Garfield Avenue to Oxnard Boulevard, installing railroad crossing arms at the railroad tracks, installing full traffic signal control at the intersection of Camino Del Sol and Oxnard Boulevard, modification of the center median on Oxnard Boulevard and installation of a sidewalk along Oxnard Boulevard to Camino Del Sol and over the railroad tracks. Signs will need to be installed per the Federal Highway Administration’s (FHWA) Manual on Uniform Traffic Control Devices requirements and fencing will be installed along the railroad right-of-way.

Project Summary:

- Install pre-signal with advance preemption to improve traffic flow on Oxnard Boulevard;

- Eliminate pedestrian crosswalk west of railroad crossing and install additional signs to guide pedestrians away from railroad tracks;
- Install detectable warning devices for the handicapped;
- Install fence to eliminate pedestrian traffic across railroad tracks;
- Add landscaping along railroad on Oxnard Boulevard; and
- Add additional signing and striping to reduce conflict points and improve traffic flow.

Project Benefits – Construction at this intersection will improve circulation within the City by providing another east-west corridor between Rose Avenue and Oxnard Boulevard. This will provide a more direct path of travel to some and a faster travel route to others. The distances driven between destinations will be reduced. The new roadway will also have increased capacity over Colonia Road at Oxnard Boulevard, the crossing it is intended to replace. The increased capacity will reduce delay. Reduction of distance driven and delay due to time spent in traffic will decrease overall fuel consumption and decrease the amount of pollutants introduced into the environment by idling or delayed vehicles. The improved connectivity will also reduce time spent commuting and that time can be utilized by individuals to increase their efficiency and possibly commerce.

Jobs Created – Jobs created by this project will include construction workers to install the pavement for the roadway. This will include concrete workers for installation of the planted median, sidewalks, pole foundations and concrete railroad tiles. Also, asphalt workers will be needed to install and stripe the new roadway and intersection. Electricians will be employed for the installation of street lights, traffic signal lights, railroad crossing safety equipment and communication wiring/conduit. Traffic signs will need to be installed as well as landscaping. Equipment ordered will create factory jobs nationwide. Landscaping will create continuing maintenance jobs.

Project Cost – The estimated cost to complete this project is \$3.6 million as detailed in Table 4 below.

TABLE 3. Rail Safety Enhancement Cost at Camino Del Sol and Oxnard Boulevard

Task	Cost
Plans, Specifications & Estimate	
Project administration costs	150,000
Subtotal	\$ 150,000
Construction (capital and support)	
Construction of Camino Del Sol between Entrada Drive & Oxnard Boulevard	1,000,000
Railroad crossing arms @ \$250K each	500,000
Train detection zone increase & conduit installation	600,000
Railroad crossing equipment upgrades (\$250K for concrete panels and \$200K to reset the tracks)	450,000
Purchase and install traffic signal poles and mast-arms	160,000
Controller, pull boxes, signs, signal heads and conduit	40,000
Installation of interconnect between signals	200,000
Relocation of utilities	500,000
Subtotal	\$3,450,000
TOTAL	\$3,600,000

Vineyard Avenue and Saint Mary's Drive – This is a major east-west arterial connection to the 101 Freeway. Improvements to this intersection involve eliminating the left turnout option from Saint Mary's Drive and increasing the radius for right turning vehicles turning from Vineyard Avenue onto Craig Drive. This would be accomplished by modifying the center median at the intersection and modifying the right turn pocket for vehicles traveling northeasterly along Vineyard Avenue and turning right onto Craig Drive.

Project Summary:

- Upgrade existing crossing by eliminating vehicular conflict point by adding a raised median island on Vineyard Avenue, and modifying existing access to Craig Avenue;
- Install pre-signal to improve safety and traffic flow on Vineyard Avenue;
- Install detectable warning devices for the handicapped; and

- Add additional signs/stripping to reduce conflict points and improve traffic flow.

Project Benefits – Prohibiting the left turnout option from Saint Mary’s Drive will eliminate the occurrence of accidents due to Vineyard Avenue traffic colliding broadside into left-turning traffic out of Saint Mary’s Drive. Accidents translate into traffic delays while the collision is being cleared from the roadway and lost productivity to individuals injured in the accident. Increasing the radius of the right-turn pocket will allow vehicles to make the turn quicker, thereby reducing back-ups due to vehicles having to slow down to make the turn. This is more important to delivery trucks accessing the commercial business along Craig Drive.

Jobs Created – Construction jobs will be created with this project. Concrete workers will be needed to modify the median and the right-turn pocket. Traffic signs and pavement markings will need to be installed to safely define the permitted vehicular moves.

Project Cost – The estimated cost to complete this project is \$1.8 million as detailed in Table 5 below.

TABLE 4. Rail Safety Enhancement Cost at Vineyard Avenue and Saint Mary’s Drive

Task	Cost
Construction (capital and support)	
Purchase and install traffic signal poles and mast-arms	160,000
Controller, pull boxes, signs, signal heads and conduit	40,000
Installation of interconnect between signals	100,000
Railroad crossing arms @ \$250K each	1,000,000
Advance railroad preemption	500,000
Subtotal	\$1,800,000
TOTAL	\$1,800,000

Gonzales Road and Oxnard Boulevard – This is a major east-west arterial connection to the 101 Freeway. Improvements to this intersection include the elimination of the pedestrian crossing on the east leg and the installation of a fence on either side of the railroad right-of-way. Eliminating the crosswalk would involve removing the striped crosswalk as well as the pedestrian head indicators for pedestrians crossing Gonzales Road east of Oxnard Boulevard. Signs would also be installed informing pedestrians where to cross. The fence and sidewalk would be installed along Oxnard Boulevard south of Gonzales Road.

Project Summary:

- Install pre-signal with advance preemption to improve traffic flow on Oxnard Boulevard;
- Eliminate the pedestrian crosswalk west of the railroad crossing and install additional signs to guide pedestrians away from railroad tracks;
- Install detectable warning devices for the handicapped;
- Install a fence to eliminate pedestrian traffic across railroad tracks;
- Add landscaping along the railroad on Oxnard Boulevard; and
- Add additional signing and striping to reduce conflict points and improve traffic flow.

Project Benefits – The elimination of the pedestrian crossing on the east leg will reduce the possibility of westbound right turning vehicles getting stuck on the railroad tracks while waiting for pedestrians.

Jobs Created – This project will create construction jobs to remove the painted crosswalk and sign posters to install the necessary pedestrian prohibition signs. Removal of the pedestrian signal heads will also require electricians to remove the heads and modify the traffic controller.

Project Cost – The estimated cost to complete this project is \$600,000 as detailed in Table 6 below.

TABLE 5. Rail Safety Enhancement Cost at Gonzales Road and Oxnard Boulevard

Task	Cost
Construction (capital and support)	
Removal of striped crosswalk and pedestrian signal heads and installation of traffic signs and posts, fencing and landscaping, and pre-signal pole.	600,000
Subtotal	\$600,000
TOTAL	\$600,000

Colonia Road and Oxnard Boulevard – This is an east-west commuter street. Improvements to this intersection involve closing Colonia Road east of the railroad tracks. The traffic safety improvement involves eliminating the conflict caused by vehicular and pedestrian traffic crossing over the railroad track to get to the intersection of Colonia Road and Oxnard Boulevard. Work will involve removal of the traffic signal at the intersection, removal of the railroad crossing arms and concrete panels, constructing a hammerhead-type turnaround on Colonia Road, installing sidewalk and landscaping along Oxnard Boulevard and installing fencing along railroad right-of-way. Construction of the hammerhead may involve a right-of-way purchase.

Project Summary:

- Close the street through the railroad crossing to eliminate vehicular traffic and pedestrian movements by adding fencing and landscaping;
- Remove the existing traffic signal and modify existing signs and striping to improve traffic flow on Oxnard Boulevard; and
- Remove existing railroad gates, equipment and concrete panels.

Project Benefits – Closing this intersection will improve safety. This crossing was constructed several decades ago, and while safety equipment has improved, the land constraints caused by full development of the surrounding parcels prevent the needed widening of the crossing.

Jobs Created – This project will create construction jobs to remove the asphalt across the railroad tracks at the intersection’s east leg to install the hammerhead-type turnaround; for the installation of curb, gutter and sidewalk within the hammerhead and along the east side of Oxnard Boulevard; and for the installation of fencing along the railroad right-of-way. Permanent work will be created for landscaping maintenance.

Project Cost – The estimated cost to complete this project is \$650,000 as detailed in Table 7 below.

TABLE 6. Rail Safety Enhancement Cost at Colonia Road and Oxnard Boulevard

Task	Cost
Plans, Specifications & Estimate	
Project administration, including plans and specifications	100,000
Subtotal	\$100,000
Right of Way (capital and support)	
Acquisition of an encroachment easement from Union Pacific Railroad (UPRR) for hammerhead turnaround.	150,000
Subtotal	\$150,000
Construction (capital and support)	
Removal of asphalt roadway, rail crossing arms/signals, & traffic signal	30,000
Pouring of sidewalk along Oxnard Boulevard	15,000
Re-striping	5,000
Installation of fencing and landscaping from the Oxnard Transportation Center (OTC) to Gonzales Road for the closure of Colonia Road, extension of center median to close turning possibility, and installation of landscaping	200,000
Concrete and asphalt on east side of the track	50,000
Installation of fencing and landscaping from OTC to Gonzales on east side of track	100,000
Subtotal	\$400,000
TOTAL	\$650,000

Cooper Road and Oxnard Boulevard – This is an east-west commuter road. Improvements to this intersection include restriping northbound Oxnard Boulevard to include an acceleration lane for northbound traffic turning right from Cooper Road. This will help prevent right turning vehicles from Cooper Road from having to stop on the railroad tracks while waiting to safely merge into northbound traffic. The curbs on the northeast and southeast corners will also be reconstructed with a wider radius to facilitate right turning trucks. A median island will also be installed on Cooper Road to prevent drivers on Cooper Road from trying to drive around the railroad crossing gate. The stop bar for westbound Cooper Road at the railroad crossing will also be shifted east of the railroad tracks to prevent cars from stopping on the railroad tracks. The west leg of the intersection comprising of the alley access will be closed. This will enhance safety by eliminating one approach of traffic. Lastly, fencing will be installed on railroad right-of-way to keep pedestrians off of the railroad tracks.

Project Summary:

- Install pre-signal with advance preemption to improve traffic flow on Oxnard Boulevard;
- Eliminate the pedestrian crosswalk west of the railroad crossing and install additional signs to guide pedestrians away from railroad tracks;
- Install detectable warning devices for the handicapped;
- Install fencing to eliminate pedestrian traffic across railroad tracks and add landscaping along the railroad on Oxnard Boulevard;
- Add additional signing and striping to reduce conflict points and improve traffic flow;
- Add a raised median on Cooper Road to improve safety and reduce conflict points with the railroad; and
- Close alley access on the west side of Oxnard Boulevard to improve safety and vehicular traffic on Oxnard Boulevard.

Project Benefits – Improved safety will reduce the occurrence of collisions between trains and vehicles and trains and pedestrians. This in turn will reduce delay to both vehicular and railroad traffic. Reduction in delay to rail traffic will translate into improved commerce.

Jobs Created – Jobs created with this project will involve labor for the installation of curb, gutter and sidewalk on Cooper Road over the railroad tracks and on Oxnard Boulevard west of the intersection; installation of a raised median on Cooper Road; removal of the driveway curb cut on the west leg of the intersection and reinstallation as a sidewalk, thereby closing off the alley access west of the intersection; and installation of fencing along the railroad right-of-way.

Project Cost – The estimated cost to complete this project is \$1,100,000 as detailed in Table 8 below.

TABLE 7. Rail Safety Enhancement Cost at Cooper Road and Oxnard Boulevard

Task	Cost
Plans, Specifications & Estimate	
Project administration, including plans and specifications	80,000
Subtotal	\$ 80,000
Right of Way (capital and support)	
Acquisition of encroachment easement from UPRR	150,000
Subtotal	\$ 150,000
Construction (capital and support)	
Upgraded crossing arms and controller	700,000
Widening of Cooper Road for a double right out and wider radius for right turns and re-striping	170,000
Subtotal	\$ 870,000
TOTAL	\$1,100,000

Rose Avenue and Fifth Street – These are major north-south arterials with access to the 101 Freeway. Improvements to this intersection include replacing the rubber tiles with concrete tiles at the railroad crossing, removing the pedestrian crossing on the north leg and increasing the advance warning time for westbound trains approaching from the east. Eliminating the pedestrian crossing on the north leg will involve removal of the striped

crosswalk and pedestrian indication heads, installation of pedestrian signs and modification to the traffic signal controller. Increasing the advance warning time will entail moving the train detection zone further east by several hundred yards, which typically involves running conduit along the railroad tracks.

Project Summary:

- Install pre-signal with advance preemption to improve traffic flow on Fifth Street;
- Eliminate pedestrian crosswalk west of railroad crossing and install additional signs to guide pedestrians away from railroad tracks;
- Install detectable warning devices for the handicapped; and
- Add additional signing and striping to reduce conflict points and improve traffic flow.

Project Benefits – The elimination of the pedestrian crossing on the north leg will reduce the possibility of westbound right turning vehicles getting stuck on the railroad tracks while waiting for pedestrians to cross. Increasing the advance warning time for approaching trains from the east will allow for the train preemption cycle to accommodate pedestrians. Currently, the pedestrian indication heads go dark when the signal goes into railroad preemption.

Jobs Created – Jobs created for this project will involve labor to remove the painted crosswalk and install the necessary pedestrian prohibition signs. Removal of the pedestrian signal heads will also require electricians to remove the heads and to modify the traffic controller. Conduit and wire will need to be installed for the increased advance train warning time and railroad control equipment will need to be updated.

Project Cost – The estimated cost to complete this project is \$1.1 million as detailed in Table 9 below.

TABLE 8. Rail Safety Enhancement Cost at Rose Avenue and Fifth Street

Task	Cost
Construction (capital and support)	
Crosswalk removal	50,000
Train detection zone increase and conduit installation	600,000
Railroad crossing equipment upgrades, including \$250K for concrete panels and \$200K to reset the tracks	450,000
Subtotal	\$1,100,000
TOTAL	\$1,100,000

Rice Avenue and Fifth Street – This is a major north-south arterial with access to the 101 Freeway. Improvements to this intersection include the removal of the pedestrian crossing on the north leg of Rice Avenue and increasing the advance warning time for trains approaching from the east. This will involve removal of the striped crosswalk and pedestrian indication heads and installation of pedestrian crossing signs. Increasing advance warning time will entail moving the train detection zone east by several hundred yards and running conduit along the tracks.

Project Summary:

- Install pre-signal with advance preemption to improve traffic flow on Fifth Street;
- Eliminate pedestrian crosswalk west of railroad crossing and install additional signs to guide pedestrians away from railroad tracks;
- Install detectable warning devices for the handicapped;
- Add additional signing and striping to reduce conflict points and improve traffic flow.

Project Benefits – The elimination of the pedestrian crossing on the north leg will reduce the possibility of westbound right turning vehicles getting stuck on the railroad tracks while waiting for pedestrians crossing in the crosswalk. Increasing the advance warning time for approaching trains from the east will allow for the train preemption cycle to accommodate pedestrians. Currently the pedestrian indication heads go dark when the signal goes into railroad preemption.

Jobs Created – Jobs created for this project will include workers to remove the painted crosswalk and sign posters to install the necessary pedestrian prohibition signs. Removal of the pedestrian signal heads will also require

electricians to remove the heads and to modify the traffic controller. Conduit and wire will need to be installed for the increased advance train warning time and railroad control equipment will have to be updated.

Project Cost – The estimated cost to complete this project is \$1 million as detailed in Table 10 below.

TABLE 9. Rail Safety Enhancement Cost at Rice Avenue and Fifth Street

Task	Cost
Construction (capital and support)	
Installation of interconnect conduit along UPRR	1,000,000
Subtotal	\$1,000,000
TOTAL	\$1,000,000

Total Project Cost – Rail Safety Enhancements

The total estimated cost to complete the rail safety enhancements is \$9,850,000 as detailed in Table 11 below.

TABLE 10. Total Rail Safety Enhancement Cost

Task	Estimated Cost
Total Project Approval/Environmental Document	-0-
Total Plans, Specifications & Estimate	320,000
Total Right of Way	300,000
Total Construction	9,230,000
GRAND TOTAL:	\$9,850,000

GRANT FUNDS

The City of Oxnard is requesting a total of \$20 million in TIGER Discretionary Grants Funding for the BRITE Project, as detailed in Table 12 below.

Table 11: Grant Funds

	TIGER funds (requested)	State Funds (source)	State Funds (source)	Federal Funds (source)	Federal Funds (source)	Federal Funds (source)	Local Funds (source)	Local Funds (source)	Total Funds
Project Approval/Environmental Document	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Plans, Specifications & Estimate	1,379,200	-0-	-0-	-0-	-0-	-0-	-0-	-0-	1,379,200
Right of Way (capital and support)	300,000	-0-	-0-	-0-	-0-	-0-	-0-	-0-	300,000
Construction (capital and support)	18,320,800	-0-	-0-	-0-	-0-	-0-	-0-	-0-	18,320,800
TOTALS:	\$20,000,000	-0-	-0-	-0-	-0-	-0-	-0-	-0-	\$20,000,000

PRIMARY SELECTION CRITERIA

ITS – The City of Oxnard currently maintains a traffic signal system that provides minimal capability to the City and public in terms of traffic management and coordinated transportation operations. The City's traffic signal system employs twisted pair cable that was installed in the 1990s and simply does not have the communication bandwidth to support the ITS deployments detailed in the ITS Master Plan. These deployments are necessary for the City to achieve its transportation management goals. Additionally, the existing twisted pair cable supports less than half of the City's signalized intersections. Below is a discussion of the ITS primary selection criteria.

Rail Safety Enhancement – A UPRR Mainline runs through the heart of the City. Almost all of the City's railroad crossings are at-grade and the railroad safety equipment at these intersections is old. The aging equipment causes supply and maintenance issues with the UPRR and a significant potential for equipment failure leading to traffic delays. The City has engaged in dialogue with the UPRR to determine what improvements can be completed to improve safety and traffic flow. Below is a discussion of the Rail Safety Enhancement primary selection criteria.

1.1. Long Term Outcomes

ITS – The deployment of the City's ITS will represent an exponential improvement in the City's traffic management operations. As is typical with IT projects, the deployment of a high-bandwidth communications network represents the costliest component of the City's ITS. The ITS Master Plan details the deployment of a fiber optic communications network that will be shared with other City departments as a cost savings measure in terms of both the capital costs and operations and maintenance costs of the communications network. Fiber optic industry studies and existing deployments demonstrate a minimum 20-year lifespan for a fiber network. In fact, advancements in the fiber optic communications hardware are continuously improving both the bandwidth limits and lifespan of fiber optic networks. The communications network will support the deployment of new traffic signal controllers, CCTV cameras, and transit signal priority and detection systems that will aid in the City's deployment of traffic management solutions to all of the City's signalized intersections. This network will also allow City departments (e.g., police, fire, dispatch) to share traffic data internally, with adjacent agencies (e.g., Caltrans, County of Ventura, City of Port Hueneme), and with the public via traveler information systems. The City understands that the No-Build option is not an option. The current system, which was deployed in the 1990s, does not have the ability to support the City's current transportation management needs. Knowing this fact, the No-Build option will result in more traffic congestion, reduced air quality, and more accidents, and has the potential to adversely impact the City's growth and prosperity in the years to come.

Rail Safety Enhancement – The upgrade of the UPRR at-grade crossings with City streets will deliver improved reliability and performance of rail crossing safety equipment. Part of this upgrade includes the replacement of older rail crossing controllers with more advanced state of the art 170 controllers. Existing controllers are not to the Institute of Electronics and Electrical Engineers (IEEE) 1570 standard and so are not compatible with advanced signal preemption equipment. Advanced signal preemption allows for greater warning time prior to a train's approach. Knowing this fact, the No-Build option will result in more traffic congestion, reduced air quality and more accidents, and has the potential to adversely impact the City's growth and prosperity in the years to come. The advance traffic signal controller 170 equipment and advance railroad signal equipment will use IEEE 1570 to communicate directly to the railroad prior to the trains' approach to the crossing. Advance preemption will clear the crossing and intersection prior to the trains' arrival and will provide for adjacent traffic to operate safely and efficiently. It also provides for the activation of a blank out sign to prohibit turning toward the crossing using LED lighting. The railroad mast arm and flasher will use state-of-the-art equipment and LED flashers to save energy.

1.1.1. State of Good Repair

ITS – The City's ITS will greatly improve the existing traffic management capabilities, primarily by upgrading the twisted pair communications with a high-bandwidth communications network. The existing network supports less than half of the City's signalized intersections and uses unreliable serial-based hardware from the 1990s. Replacement parts are in limited supply, resulting in a highly unreliable network with high operating and maintenance costs. The high-bandwidth replacement network is primarily fiber optic cable to support Ethernet-

based communications and will have the capability to support all of the City's signalized intersections. The City's ITS will be an all Ethernet-based network, the standard for ITS, offering a vast array of vendors and hardware.

Rail Safety Enhancement – The Rail Safety Enhancement Project will expand the existing control capabilities by upgrading controller equipment. The upgraded controller equipment will be installed with the latest in advance traffic signal preemption, which will allow for greater advance warning of approaching trains. Existing equipment only affords 20 seconds of advance warning, hardly sufficient time to clear vehicles off the track and stop vehicles in conflict with train movement. The timing does not allow for the pedestrians to be serviced. With the new equipment and more advance warning, pedestrians can be serviced and faster trains can be supported.

1.1.1.1. *Is the project part of or consistent with efforts to maintain transportation facilities or systems in a state of good repair?*

ITS – In 2006, the City initiated this project to develop the Oxnard ITS Master Plan, which adheres to the FHWA Systems Engineering Guidebook for ITS. Accordingly, the City employed these systems engineering principles to develop a comprehensive ITS Master Plan that leveraged the existing infrastructure to the extent possible; developed comprehensive, logical recommended improvements; and developed corresponding operations and maintenance costs. The City's overall goal is to deploy a traffic management system that allows the City to not only maintain, but to greatly improve the City's transportation facilities and systems.

Rail Safety Enhancement – In the past, the City has partnered with the railroad companies operating within the City boundaries. The goal of these partnerships has been the improvement of at-grade crossings. Projects have included funding the replacement of rubberized mats with concrete pads or upgrading rail crossing equipment. There are numerous rail crossings in the City and partner projects occur at a rate of approximately two per year. These improvements benefit the motoring public and those living in the vicinity.

1.1.1.2. *Is a goal of the project to rehabilitate, reconstruct or upgrade surface transportation projects that threaten future economic growth and stability due to poor condition?*

ITS – The City's current transportation management system is greatly lacking the ability to manage the increasing demand. Since the existing system was deployed in the 1990's, the City has seen traffic congestion increase and level of service decrease. During this time, the City has invested in a downtown rehabilitation project that includes a new mall, parking structure and City-sponsored public events. ITS is necessary to increase the operational capacity of the City's existing street network, which will allow the City to continue its efforts to implement rehabilitation projects.

Rail Safety Enhancement – Rail safety is crucial not only for drivers and pedestrians, but to the region as a whole. As the City continues to grow, so too does the volume of freight being transported by rail. An incident on a main rail line has the potential of obstructing traffic for several hours. Even more critical is an increase in the rail transport of hazardous material. A mishap while transporting these materials can result in the evacuation of entire communities. The City's rail safety improvements are necessary to minimize any potential impacts between trains and vehicles and to prevent any delay of material necessary for the continuation of commerce both regionally and nationally.

1.1.1.3. *Is the project capitalized up front and using asset management approaches that optimizes its long-term cost structure?*

ITS – The City's ITS will deploy an Ethernet-based network that is shared with other City departments, including Information Technology (IT). This shared network will deploy communications to all of the City's signalized intersections and support network connections to City facilities, including police and fire stations. Maintaining a reliable network is essential to ensuring these vital communications remain on-line. The costs of maintenance and operations will be shared with other City departments to provide a long-term cost structure.

Rail Safety Enhancement – The City is planning to contribute to the necessary upgrades and modifications as requested by the UPRR and the California Public Utilities Commission (CPUC). The City will purchase the equipment and the UPRR will fund the installation and maintenance of the railroad safety equipment.

1.1.1.4. *Is there a sustainable source of revenue available for long-term operations and maintenance?*

ITS – The City has an annual operations and maintenance budget to support the ITS field devices, including traffic signal controllers, CCTV cameras and systems detection. This budget is allocated annually through the Public Works Department. The City also has an annual budget for IT. Other City departments, including Public Works, Police and Fire, will collectively be used to support the operations and maintenance of the communications network. This is a significant benefit of deploying a shared network, whereby the cost can be distributed amongst several City departments to ensure the City's ITS is sustainable.

Rail Safety Enhancement – Per CPUC General Order 72-B, the maintenance and operation of the equipment will be the responsibility of the UPRR.

1.1.2. *Economic Competitiveness*

The combined improvements of the ITS and Rail Safety Enhancement projects will increase the competitiveness of the region by speeding up the delivery of goods and services. This will also benefit the nation by providing a safe, reliable mode of delivery for goods and services.

1.1.2.1. *How does the project improve long-term efficiency, reliability or cost-competitiveness in the movement of workers or goods?*

ITS – ITS will greatly improve the City's ability to improve the movement of workers and goods. One notable improvement will be the operations of the adjacent Port of Hueneme. More than \$7 billion in cargo value moves through the Port of Hueneme each year. The Port of Hueneme is one of the nation's busiest banana importing ports and included in the nation's top ten automobile importing ports. Port-related activity generates more than \$650 million annually for Ventura County's economy at no cost to the taxpayer. Additionally, 4,500 jobs in Ventura County are directly or indirectly related to the Port of Hueneme's activities. Currently, all truck cargo from the Port travels through a portion of Oxnard with little to no traffic management capability. Implementation of the City's ITS, in conjunction with other surface street improvements, will facilitate improved commercial vehicle operations to and from the Port, resulting in improved Port operations that could directly result in more goods movement and, consequently, more employment opportunities.

Rail Safety Enhancement – The Rail Safety Enhancement Project can improve long-term efficiency, reliability and cost-competitiveness by providing an alternate port of operation to the Port of Los Angeles or the Port of San Francisco. As those cities continue to expand, space will become a constraint. Ventura County and the City of Oxnard still have open space and land to develop. Expansion of quality companies will improve the overall quality of goods, thus improving the reputation of products produced in the region.

1.1.2.2. *How does the project make improvements that allow for expansion, hiring, or other growth of private sector production, particularly in EDAs?*

These projects will promote productivity through the safe and reliable transport of materials and people. Increased productivity can result in greater profit for private industry. In turn, private industry can invest in research and expansion. Both investments will yield increased demand for workers and thereby increase employment.

1.1.3. *Livability*

ITS – ITS will allow the City to implement improved signal coordination to all of the City's signalized intersections through the deployment of a new communications network, upgraded traffic signal controllers and a new TMC. This will greatly improve daily travel through the City. The City's ITS will also provide the tools necessary to more effectively respond to incidents. The impact of ITS will be greatest felt by the 194,905 people that call the City home, plus the thousands more that travel to or through Oxnard for employment. The City also serves as the gateway from southern California to Central California Wine County, Santa Barbara and other coastal destinations. Vacation travel will also benefit from the City's ITS through the sharing of traffic data with Caltrans and the County of Ventura for dissemination to the traveling public.

Rail Safety Enhancement – The Rail Safety Enhancement Project will have a regional impact, because the Port of Hueneme services cargo ships throughout most of the Pacific Rim. In turn, the UPRR services the nation through an extensive railroad network system. Linking together products that are imported and exported from different parts of the world with commerce markets in the region and nation provides for healthy competition and reduced consumer prices. Overall passenger rail safety will help to avoid disruptions caused by train collisions and/or delays due to goods left on-loaded from container ships.

1.1.3.1. *How does the project enhance user mobility through the creation of more convenient transportation options?*

ITS – ITS is multimodal in nature, and includes transportation management improvements that aid to promote bus transit and rail transit use. In 2007, the City completed a new transit center that serves Metrolink, Amtrak, Gold Coast Transit, and other bus transit services. The City's ITS will implement transit signal priority along key corridors aimed to reduce bus travel time through the City limits and the transit center. ITS will also support the deployment of Next Bus travel time message boards at key bus stops and the transit center, which is planned for deployment by Gold Coast Transit as part of a separate Bus Rapid Transit project that will use the Transit Signal Priority system deployed by the Oxnard ITS.

Rail Safety Enhancement – Safe, reliable and economical rail transportation will inspire more people to opt for commuter rail service. This increase in commuter rail service will provide commuters with an alternative to vehicle traffic. A decrease in vehicles on City streets can reduce wear and tear to the street, prolonging the asphalt's life.

1.1.3.2. *Does the project enhance points of modal connectivity or reduce congestion on existing modal assets?*

ITS – The transit signal priority system deployed as part of the City's ITS will improve bus transit operations in the City. This will be done by providing favorable signal timing to transit buses along key corridors, resulting in reduced bus travel times and a greater appeal for public bus transit. At a minimum, the reduced stops will reduce congestion along the transit corridors. If the travel time savings are significant, it can result in the need for fewer buses to support a transit route, which further reduces congestion.

Rail Safety Enhancement – The Rail Safety Enhancement Project does enhance ship-to-rail-to-surface transport modes of connectivity. The improvements will also give the UPRR the option of adding a second parallel rail line to provide greater capability for rail activity while reducing conflicts in rail scheduling. The reduction of conflict will give Amtrak and Metrolink the capability to expand commuter service and increase overall ridership of the passenger rail system, thereby giving commuters the flexibility to work farther from home.

1.1.3.3. *Does the project improve accessibility and transportation services for economically disadvantaged populations, non-drivers, senior citizens, and the disabled or make goods, commodities and services more available to these groups?*

ITS – The transit signal priority system deployed as part of the City's ITS will improve bus transit operations throughout the City. Transit trip times will be reduced and bus shelters equipped with Next Bus signage will promote bus use. Transit signal priority, along with bus signal priority, can actually increase the capacity of a transit route, allowing more flexibility and ease of use of the transit system.

Rail Safety Enhancement – By expanding rail operation, the Rail Safety Enhancement Project will promote a lower cost of goods through an increased supply of product from the Port of Hueneme. Improved rail safety will reduce delays on City streets, providing commuters with a safer and more reliable circulation network around the City.

1.1.3.4. *Was a planning process used that coordinated transportation and land-use planning decisions and encouraged community participation in the process?*

ITS – Development of the City's ITS Master Plan promoted the participation of all City departments, adjacent municipalities, Caltrans and transit agencies. One focus of the project was to coordinate activities with land use and land development (i.e., capital improvement projects). Parallel activities to improve surface streets (e.g., roadway widening, resurfacing) has been incorporated into the ITS Master Plan to ensure proper coordination with other improvement activities.

Rail Safety Enhancement – The Rail Safety Enhancement Project began with meetings between the City, UPRR and the CPUC to discuss needed improvements and modifications to existing rail crossings in the City. These meetings helped prioritize intersections and identify specific mitigations necessary to achieve an increased safety and efficiency in rail transportation.

1.1.4. Sustainability

ITS – ITS will make great strides in the reduction of energy consumption in the Oxnard region. Currently, less than half of the City's signalized intersections operate optimized signal timing plans and signal coordination along key arterials is limited. Deployment of ITS, will allow the City to implement and maintain optimized signal timing to all of the City's signalized intersections, as well as to implement signal coordination along key arterial corridors. This should allow the City to easily exceed the documented 12% or more improved operational efficiencies realized by agencies that have implemented coordinated signal timing along corridors, such as the City of Los Angeles.

Rail Safety Enhancement – The Rail Safety Enhancement Project will reduce delays in the delivery of goods and services by ship, rail and surface transportation. Because the Port of Hueneme also services the Naval Base Ventura County, there is an element of national security associated with these improvements.

1.1.4.1. Does the project improve energy efficiency, reduce dependence on oil and/or reduce greenhouse gas emissions?

ITS – ITS will result in a dramatic decrease in fuel consumption and greenhouse gases in the Oxnard area. According to the City of Los Angeles, signal timing improvements have resulted in a 12% reduction in delays, which directly correlates to a reduction in fuel consumption and greenhouse gases. The improvements realized by City of Los Angeles are for signals that are already supported by a communications network and central traffic signal system, and simply involve updating the signal timing based on current volumes and traffic patterns. More than half of the City of Oxnard's signals are not currently supported by a communications network or a central traffic signal system. As such, the reduction in delay once ITS is implemented is envisioned to far exceed 12%.

Rail Safety Enhancement – The Rail Safety Enhancement Project will reduce overall dependency on oil and greenhouse gas emissions due to the superior efficiency and decreased cost of rail transport over truck transport. Increased commerce will utilize rail service, commerce that would have otherwise used truck transport services.

1.1.4.2. Does the project maintain, protect or enhance the environment, avoid adverse environmental impacts, and/or create environmental benefits?

The BRITE Project will enable a more efficient management of traffic on City streets. Through better management, the City can avoid having to construct wider streets or expand the circulation network. These road widening and/or expansion projects may involve open space and agricultural land. Road widening can also involve condemnation of land that currently benefits the community by other than transportation needs.

1.1.5. Safety

ITS – ITS will implement traffic management solutions along local surface streets. Stopped vehicles due to congestion or red traffic lights are a leading cause of accidents on local surface streets. One goal of ITS is to implement coordinated signal timing plans along key arterial corridors, which will improve vehicle progression and reduce the number of vehicle stops, a direct correlation to the reduction of accidents on local surface streets.

Rail Safety Enhancement – The Rail Safety Enhancement Project will eliminate some potential conflicts due to roadway geometry and configuration. This project will also result in more warning time of approaching trains, thereby increasing safety by allowing more time to clear the rail road tracks and servicing the pedestrian calls. Currently, during railroad preemption, the pedestrian indicators go dark and pedestrians are left unsure how to proceed.

1.2. Evaluation of Expected Project Costs and Benefits – Not applicable. Total project cost does not exceed \$20 million.

1.3. Evaluation of Project Performance – Effectiveness of these projects can best be monitored in the following ways: 1) By recording and categorizing complaints and comments received from the public. The City currently has a Call Center where public calls are recorded and tract for data purposes. 2) By reviewing traffic collision reports completed by the Oxnard Police Department. This is something that is already being done by City staff. 3) By measuring travel times along arterials before and after implementation of the BRITE Project. The after measurement can be monitored by CCTV cameras connected to the TMC.

1.4. Job Creation & Economic Stimulus

1.4.1. Does the project promote the creation of job opportunities for low-income workers?

Low wage workers will be needed to prepare for the installation of high tech equipment, including digging of trenches or foundations, demolition of existing facilities, clearing of debris, or clerical support.

1.4.2. Will the project provide maximum practicable opportunities for small business and disadvantaged business enterprises, including veteran-owned small businesses?

The City adheres to Disadvantaged Business Enterprise requirements and the results of the completed projects will benefit a majority of businesses both large and small.

1.4.3. Will the project use community based organizations in connecting disadvantaged workers with economic opportunities?

No.

1.4.4. Will the project support entities that have a sound track record on labor practices and compliance ensuring that workers are safe and treated fairly?

The City's purchasing guidelines state that only qualified and insured contractors can perform work for the City.

1.4.5. Does the project implement best practices consistent with civil rights and equal opportunity laws to ensure that all individuals benefit from the Recovery Act?

The City adheres to all standards set forth by the Americans with Disabilities Act and anti-discrimination legislation.

1.5. Quick Start Activities

1.5.1. Project Schedule

ITS – The City's ITS Master Plan, completed in 2006, clearly defines the project elements. Additionally, the City has a consultant specializing in ITS design and integration on board and committed to finalizing the design of the ITS within four months of receipt of funding. Incorporating a bidding process, the City envisions starting construction of the ITS within five months of receipt of funding.

Rail Safety Enhancement – All work within UPRR right-of-way can only be done by UPRR crews or contractors.

1.5.2. Environmental Approvals

ITS – In accordance with the California Environmental Quality Act (CEQA) Guidelines Section 15303, projects involving new construction of small facilities and equipment such as those included in the ITS are exempt from the requirements of CEQA. Therefore, staff has determined that there is no substantial evidence that the project may have a significant effect on the environment.

Rail Safety Enhancement – Per the National Environmental Policy Act (NEPA), an Environmental Impact Statement (EIS) is required for the closure of Colonia Road at Oxnard Boulevard. An EIS is required if the proposed action has the potential to "...significantly affect the quality of the human environment". For an action to "affect" the environment, it must have a causal relationship with the environment: direct, indirect, or cumulative. An EIS is

required to provide a full and fair discussion of environmental impacts of proposed alternatives. The EIS contains a full description of the proposed action, reasonable alternatives, and the probable environmental impacts that would avoid or minimize the adverse impacts of the proposed action.

The NEPA process for an EIS begins with publishing a Notice of Intent (NOI) in the Federal Register. The NOI is the official agency public announcement that a proposed planning effort is starting. During this part of the planning process, the agency solicits public input to identify major resource issues to be addressed in the proposed plan. At this point, the public will have at least 30 days to provide comments pertaining to the area to be addressed in the plan.

The City will prepare an EIS for the rail safety enhancement portion of the BRITE Project.

1.5.3. Legislative Approvals

Not applicable.

1.5.4. State and Local Planning

ITS – As an ITS Master Plan, the City's ITS is a local planning initiative included in citywide planning activities. Additionally, the VCTC, the regional Metropolitan Planning Organization responsible for maintaining the Regional ITS Architecture, was a stakeholder in the City's ITS Master Plan project. Once updated, the City's ITS will be incorporated into the Regional ITS Architecture.

Rail Safety Enhancement – The Rail Safety Enhancement Project is identified in UPRR documentation for improvement projects in need of funding.

1.5.5. Technically Feasible

ITS – The ITS Master Plan project adhered to the FHWA Systems Engineering Guidebook for ITS and all recommendations presented in the Master Plan are based upon proven technology, and will employ commercially off the shelf hardware and software. Currently, customized software or system development is required. As part of the ITS Master Plan project, a comprehensive inventory of existing conditions was completed to serve as a basis for the recommended improvements. Accordingly, the preliminary engineering activities have already been completed, including project definition, existing conditions assessment and preliminary cost estimates.

Rail Safety Enhancement – This project has been studied by the UPRR and a consultant JL Patterson.

1.5.6. Financially Feasible

The City has managed several multimillion dollar projects. Two recent projects have exceeded more than \$100 million. Grant funding for the ITS Master Plan can be supplemented by the City's Circulation System Improvement Fund. Funding for the Rail Safety Enhancement Project is solely dependent on contributions from the UPRR and grant funding.

1.5.7. Demonstrate that the project will be able to obligate funds prior to September 30, 2011. US DOT will give priority for projects expected to be complete by February 17, 2012.

ITS – Based on the envisioned date of February 17, 2010, for receipt of TIGER funds, the City anticipates the following schedule: finalize design in 4 months, by June 17, 2010; advertise and award project in 1 month, by July 17, 2010; complete construction within 6 months, by January 17, 2011. Based on this schedule, the City estimates completion of the project by January 17, 2011.

Rail Safety Enhancement – Scheduling to minimize disruption to rail traffic service and coordinating work crews and delivery of necessary equipment will be handled by the UPRR.

SECONDARY SELECTION CRITERIA

1.1. *Innovation*

ITS – The ITS project consists almost entirely of implementing innovative strategies with very little pure civil engineering or traffic engineering. ITS will implement new traffic signal controllers, CCTV cameras, system detection, and transit signal priority, all supported by a high-bandwidth Ethernet-based communications network. These improvements will allow the City to pursue long-term goals to improve traffic management, safety, and mobility, and to reduced emissions and greenhouse gases. ITS has proven to achieve these goals while also providing very positive benefits to cost ratios.

Rail Safety Enhancement – The advance traffic signal controller 170 and advance railroad signal equipment will use IEEE 1570 to communicate directly to the railroad. Advance preemption will clear the crossing and intersection prior to the train's arrival and will provide for adjacent traffic to operate safely and efficiently. It also provides for activation of blank out signs to prohibit turning toward the crossing through the use of LED lighting. The railroad mast arm and flasher will use state of the art equipment and LED to save energy.

1.2. *Partnership*

ITS – The ITS Master Plan project involved an extensive amount of partnerships, outreach and consensus building, both within the various departments (e.g., police, fire, dispatch, IT, capital projects management) at the City of Oxnard and also with Caltrans, the County of Ventura, City of Port Hueneme, and Gold Coast Transit. A key goal of the ITS Master Plan project was to develop a Master Plan for the City's ITS that is both multijurisdictional and multimodal. Deployment of the City's ITS as detailed in the Master Plan achieves these goals.

Rail Safety Enhancement – Rail Safety Enhancement demonstrates a partnership between the City and the UPRR.

1.2.1. *Jurisdictional & Stakeholder Collaboration*

The UPRR is a private entity that is regulated by the CPUC in California.

1.2.2. *Disciplinary Integration*

The BRITE Project is supported in principle by several public and semi-public agencies, including the Oxnard Housing Authority, Gold Coast Transit, Amtrak, Ventura County Regional Energy Alliance (VCREA), Caltrans, VCTC, Air Pollution Control District (APCD) and the Department of Homeland Security (DHS).

Providing a safer, more efficient transportation network in the City promotes alternate modes of transportation including bus transit, bicycling and walking. By allowing the transit agency to operate more efficiently, the City is able to minimize the cost of operation and pass these savings onto the riders. Lower transit costs benefit the working class and that benefit is inline with the policies of the Housing Authority and Gold Coast Transit.

Increased efficiency translates into reduced congestion, thereby supporting the policy of the APCD by reducing particulate emissions. Improvements within the rail projects involve upgrading existing lights from incandescent light bulbs to LED, resulting in a two-thirds reduction in energy consumption, a stated goal of the VCREA.

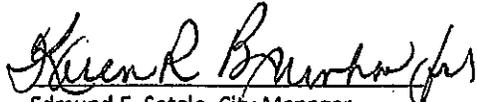
A reduction in congestion is a policy goal of the VCTC and benefits the Caltrans system of highways and freeways. Reducing conflict on the rail system helps avoid delay, thus benefitting Amtrak, and ensuring port access is a matter of national security and DHS.

INDEX OF WEBSITES FOR SUPPORTING INFORMATION

- www.publicworks.cityofoxnard.org
- www.venturacountystar.com/news/2009/aug/27/no-headline---nxxfctrain28/
- www.venturacountystar.com/news/2008/mar/04/metrolink-train-hits-truck-oxnard/
- <http://www.cbsnews.com/video/watch/?id=674663n&tag=related;photovideo>

Federal Wage Rate Certification

"The City of Oxnard will comply with the requirements of Subchapter IV of Chapter 31 of Title 40 of the United States Code, as required by the Recovery Act."


Edmund F. Sotelo, City Manager

APPENDIX I: RAIL SAFETY ENHANCEMENT PROJECT MAPS

FIGURE 1: CAMINO DEL SOL & OXNARD BOULEVARD – RAIL SAFETY ENHANCEMENT PROJECT

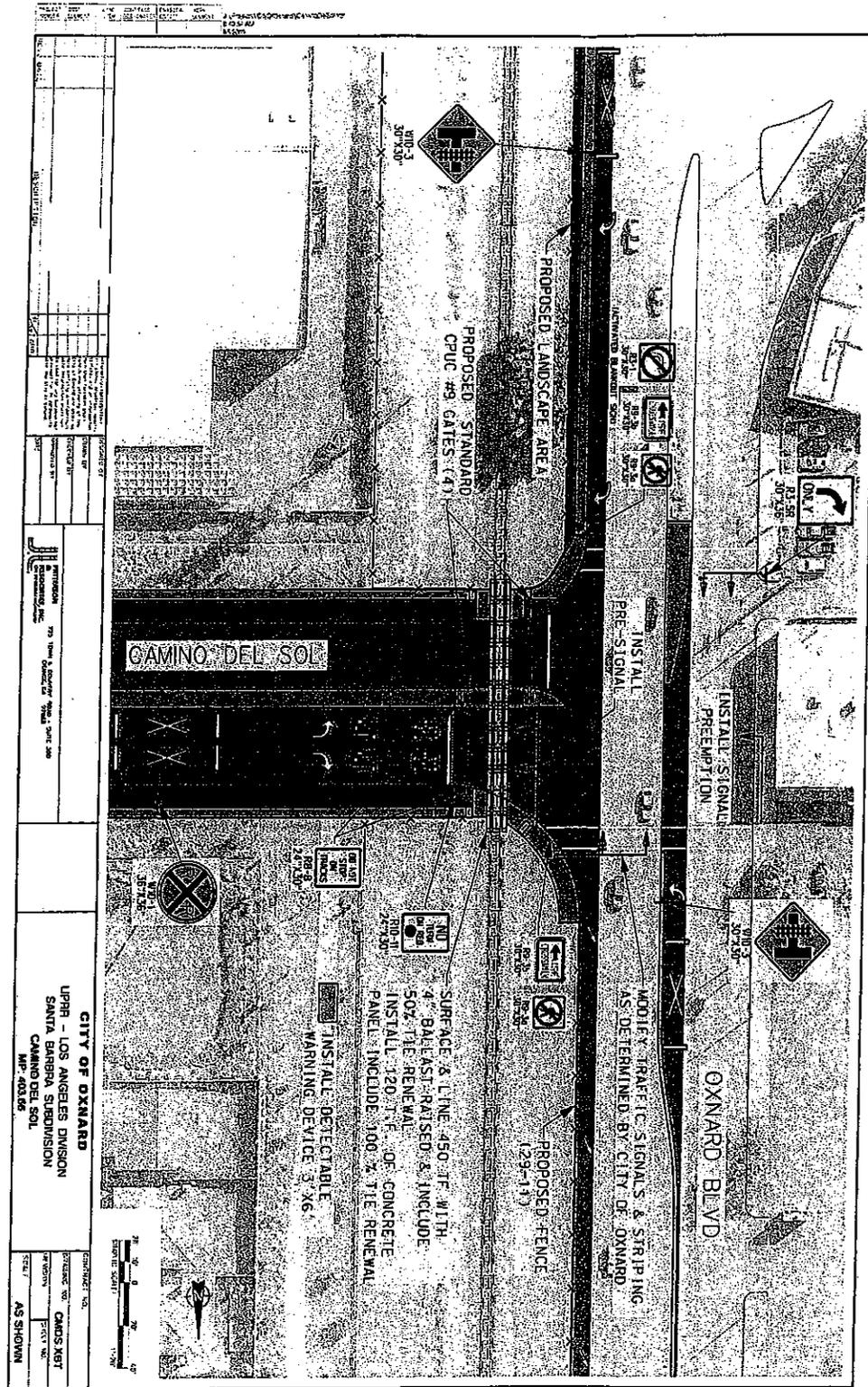


FIGURE 2: VINEYARD & SAINT MARY'S DRIVE - RAIL SAFETY ENHANCEMENT PROJECT

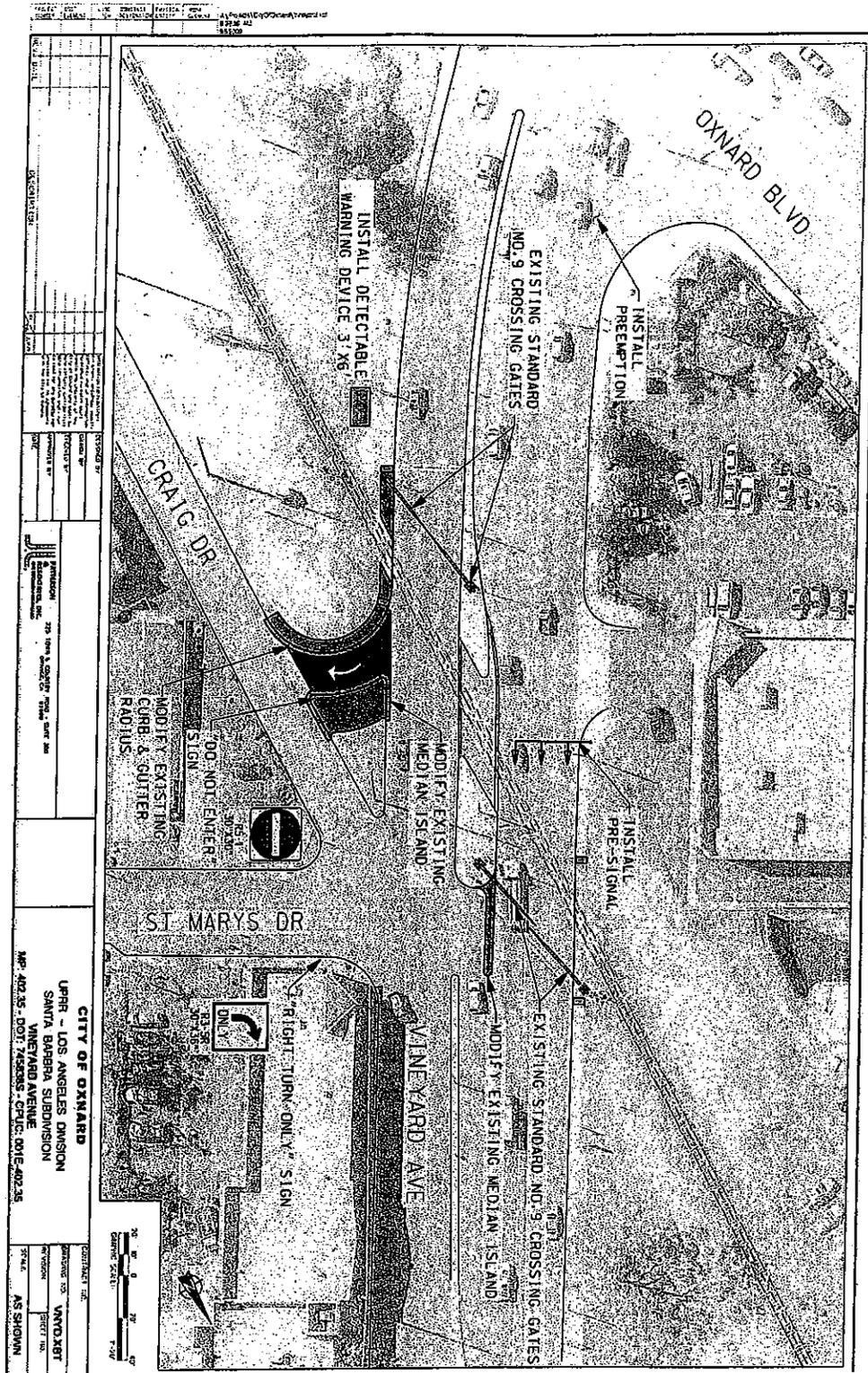


FIGURE 6: ROSE AVENUE & FIFTH STREET - RAIL SAFETY ENHANCEMENT PROJECT

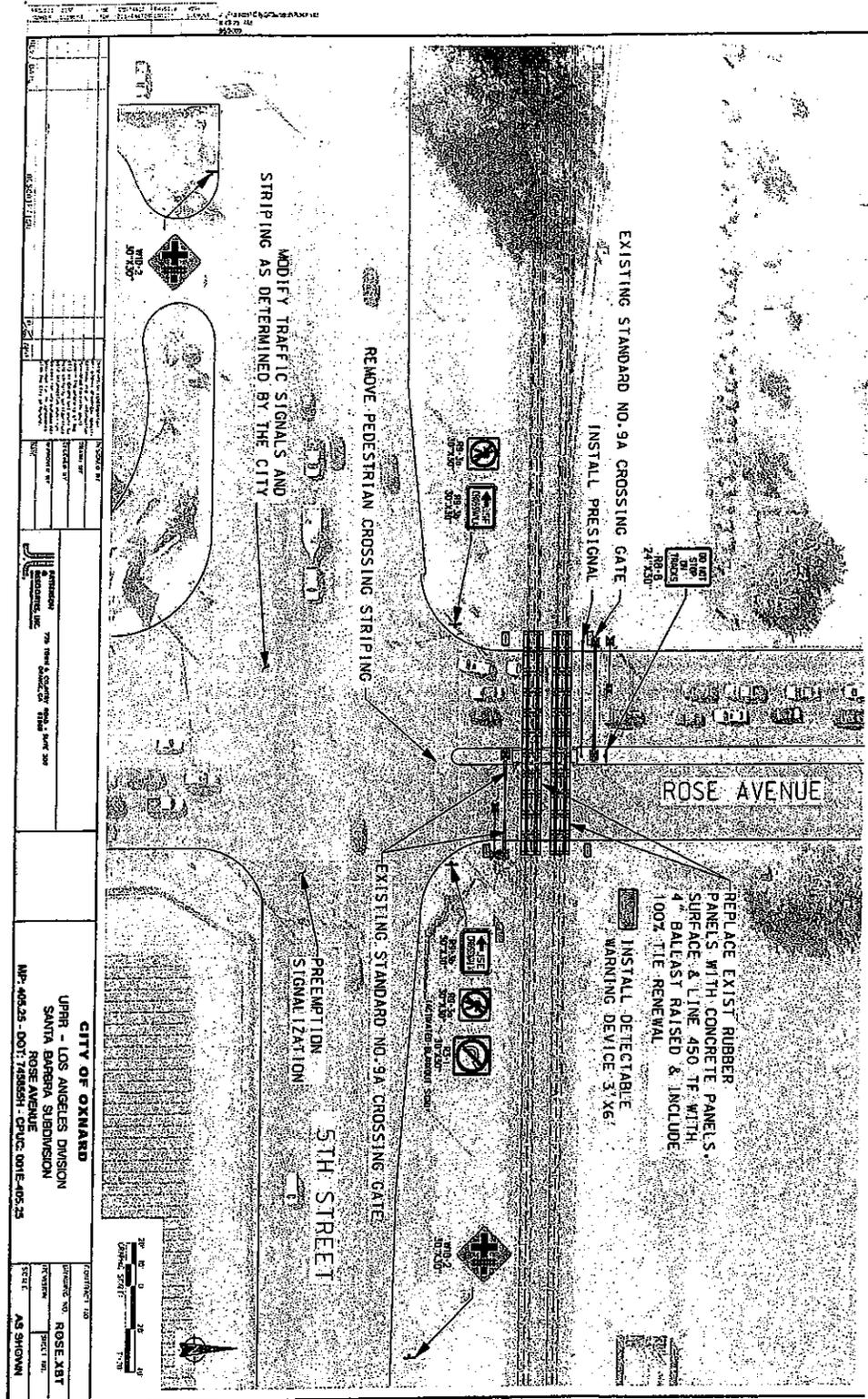


FIGURE 7: RICE AVENUE & FIFTH STREET - RAIL SAFETY ENHANCEMENT PROJECT

