



Houston-Galveston Area Council

TIP Call for Projects Application Draft Review

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This is a draft copy of a TIP Call for Projects application. This application is not an official submission.

If you have any questions regarding your application, please contact us at tip@h-gac.com.

Project Information

Project Title

Wireless Traffic Signal Communication System

Primary Agency

Fort Bend County

Date Submitted

Project Narrative

Describe the primary problems to be addressed by the project (Project Need).***1000 characters max***

Fort Bend County (the "County") has experienced rapid growth and this growth is projected to continue. This growth leads to traffic congestion, creating a greater need to actively monitor and control the roadway and traffic signals. A County wide communication system will be established to allow County personnel to actively manage the roadway system. Phase I of the system will be located in the northern part of Fort Bend County, which contains ninety percent (90%) of the County controlled traffic signals. This part of the County is more urbanized and experiences higher levels of congestion. Therefore, the County needs to have access to the traffic signals under County control to provide improved mobility in the area. Future expansion of the communication system will occur with growth. Major expansions of the system to other parts of the County (i.e. Phase II) will be included in future TIP call for projects.

Describe the primary outcome to be achieved by the project (Project Purpose).

1000 characters max

The proposed Wireless Traffic Signal Communication System (the "Project") would provide monitoring and control for 90% of the County controlled traffic signals. Future expansion phases would bring the remaining outlying signals into the system. Video cameras would be used to monitor traffic congestion and make signal timing modifications as needed. This would reduce traffic congestion and delays.

Describe the proposed improvement (Facility/Limits/Description).**1000 characters max**

The proposed improvements include upgrading/replacing the traffic signal controllers, installing Pan/Tilt/Zoom (PTZ) cameras, wireless communication equipment, high site towers and Traffic Management Center (TMC) equipment. Wireless communication may use existing public bands (2.4 GHz, 5.8 GHz), WiMAX, licensed bands, technology still in development, or a combination of these communication options. Some short fiber optic connections may also be included in the project. Towers may be required to act as high sites for the communication backbone if existing towers or tall buildings are not available. The Precinct 3 building located at the northeast corner of SH 99 at FM 1093 will be the primary location where the wireless data is transferred to the County's communication network. A long range microwave transmission may also be used to transfer the wireless data directly to the County's TMC. The TMC will be located at the County's Public Transportation Administration building, which is funded through a separate project. Final site assessment for this building is in progress and it will be located near the University of Houston - Sugar Land campus or near the Fort Bend County Fairgrounds. The space for the TMC is included in the planning for the building.

Describe any alternatives to the proposed improvement which have been considered or will be evaluated.**2000 characters max**

Fiber optic communication has been considered but would result in a higher cost due to the broad area to be covered. Fiber optic connections may be added in the future to provide higher capacity and redundancy for the system. Short range wireless connection may also be considered for closely spaced intersections with cell modem or leased fiber optic connections but this would result in a monthly fee from the private communication companies.

Project Development/Readiness

Has a scoping meeting been conducted with TxDOT or FTA?

Note: A brief scoping meeting will be scheduled during the application review period for any "Major Investment" project which has not already had one.

No

Please attach a completed scoping checklist or meeting summary.**What level of environmental documentation is required for the proposed project?**

Categorical Exclusion (CE)

Which CE does the proposed project scope qualify for?

(c)(21) Deployment of electronics, photonics, communications, or information processing

(c)(2) Deployment of electronics, photonics, communications, or information processing

Will any permits from the Army Corps of Engineers, US Coast Guard, railroad, etc. be required before the project can be constructed?

No

Please describe the permits needed and the timeline anticipated to acquire them.

1000 characters max

Please provide an estimated completion date for the 30% Design/PS&E milestone.

01/02/2016

Will additional property, or interest in property (easement), be required to implement the project?

Yes

How many parcels or portions thereof remain to be acquired?

6

Please provide an estimated date for the completion of property acquisition necessary for construction activities to begin.

30/08/2016

Has a utility evaluation been completed for the project?

No

Please describe the process for utility adjustments/relocations (entity responsible, financial responsibility, etc.).

There should not be any utility relocation for this project.

Will the project improve or significantly affect infrastructure owned or operated by another agency?

No

Please describe the affect and supply evidence of support from the affected agency.

Evidence of Agency Support Attachment

Please describe previous and upcoming public involvement activities related to the proposed project.

No previous public involvement. Commissioners Court will approve the TIP submittal to show support for the Project. to A workshop will be held at Commissioners Court to provide information about the project during the design process.

Public Involvement Attachment

Please provide any additional project development/readiness information relevant to the proposed project.

N/A

Additional Project Development/Readiness Attachment

Map/Location

**Please provide a clear and concise GIS coverage or PDF map of the proposed project.
(* .mpk ESRI Map Package file preferred)**

Signals Revised.mpk

Project Budget

Please attach a completed project budget worksheet.

Templates are available on the 2015 TIP Call Website

***Uploaded files are limited to Word Documents, Excel Spreadsheets, PDFs, GIS files, and image files.
File size cannot exceed 30MB.***

Application ID 300495 (ITS) Project Budget.pdf

Is this application for a transit project, ITS project, or other project that would have a significant ongoing operating/maintenance cost?

Yes

Please attach a completed 5-year annual operating budget worksheet.

Templates are available on the 2015 TIP Call Website

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Application ID 300495 (ITS) O&M Budget.pdf

Are transportation development credits being requested?

No

Please attach a completed TDC application.

Templates are available on the 2015 TIP Call Website

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File size cannot exceed 30MB.***

Screening Questions

Will the project have a useful lifespan greater than five (5) years?

Yes

Please explain:

While some equipment will need to be changed or replaced due to failure, most of the equipment should have an operational life of ten years or more.

Evaluation Questions - ITS Projects

Benefit /Cost Methodology

H-GAC to conduct analysis based on the GIS/map project location and project scope information provided above.

Congestion Safety

Incident/Event Management

Will the system be an integral part to an incident management system?

Yes

Please explain:

The operator can use the PTZ cameras to quickly determine location and cause of delays, notify appropriate emergency personnel if needed, and adjust traffic signal timing from the Traffic Management Center (TMC). This will allow for faster response to clear roadway blockages and provide signal adjustments to clear residual traffic queues.

Is the system on the National Highway System or other component of H-GAC's Congestion Mitigation Process (CMP) network?

Yes

Please explain:

The traffic signals along SH 99 from US 59 to FM 1093 would be included in the system. Cameras would also be added north of FM 1093 and access provided to TxDOT. Communication to the traffic signals could also be provided through the communication system through an interlocal agreement. SH 99 is on the CMP.

Will the system provide notification of a potential problem to facility users (e.g. dynamic message signs, mobile device alerts, etc.)?

Yes

Please explain:

Alerts could be sent out to the public related to blocked lanes or extensive delays through text messages or mobile applications. Bluetooth or other data could be collected to develop a Houston TranStar type map for the thoroughfares included in the system. While locations for dynamic message signs are not currently identified, they may be added during design. Possible locations include along SH 99 and FM 1093/Westpark Toll Road.

Will the system give priority to emergency vehicles?

Yes

Please explain:

Emergency pre-emption is already included on most County traffic signals and would be added to any without it.

Will the system give priority to transit or high-occupancy vehicles?

Yes

Please explain:

County Public Transportation vehicles will be given priority as needed to maintain schedules. Cameras feeds and transit information from the proposed Westpark Park & Ride site located on FM 1093 between Grand Mission Boulevard and Mason Road would also be provided on a webpage or mobile application.

Will the system utilize dynamic management of the facility to enhance travel time reliability (e.g. ramp metering, variable speed limits, variable pricing, etc.)?

Yes

Please explain:

Staff will monitor cameras, report incidents, and adjust traffic signal timing to address travel time delays. Example: the SH 99 (northbound) to IH-10 (eastbound) direct connector is closed due to a vehicle crash. Alerts would be sent out to the mobile devices and traffic signal timing on the Westheimer Parkway, Fry Road, Peek Road, and Mason Road would be adjusted to accommodate additional traffic.

Coordination

System Migration/Expandability

Can the system expand the regional communications network?

Yes

Please explain:

Since much of the area covered by the Project is within the City of Houston Extra-Territorial Jurisdiction (ETJ), consideration will be given to extending the current WiMax system. However, other options will be evaluated as this area is unlikely to be annexed during the life of the equipment. The video from the cameras will be shared with other agencies (TxDOT, cities, etc.).

Will the system NOT utilize proprietary systems that will not integrate with other systems in the region?

Yes

Please explain:

PTZ camera control and point to point communication will be open architecture. Replacement of all traffic signal controllers and cabinets to an open architecture (2070 platform) would result in substantially higher project cost.

Integration and Information Sharing

Will the system provide the following integration capabilities?

AND, System allows for control by another agency in the event of a primary agency loss of system control

Please explain:

Intent would be to provide access and control to TxDOT if desired by TxDOT. Control would also be shared with the City of Sugar Land in their ETJ. Other agencies can be added at their request.

Will the system collect and provide data available for traveler information access?

Yes

Please explain:

Bluetooth travel time information will be collected and displayed on a webpage. Mobile apps may also be developed.

Will the system allow for collection of data to address performance measures?

Yes

Please explain:

Travel times between strategic points will be collected and a running average calculated. Each day can then be tracked against the average. Also, most traffic signal controllers can provide counts from the vehicle detection. With the ability to access that data over the Wireless Network, counts can be collected, stored, and analyzed to determine trends.

Asset Mgmt/Efficient Operations

Continuity Operations

Will the proposed system enhance continuity of operations in the event of a disruption?

Yes

Please explain:

The Project will allow for faster identification of disruptions by sending alerts if the average travel times exceed normal by a certain percentage. Staff can then dispatch appropriate responders and equipment, and providing the information to the traveling public.

Will the system allow for interagency redundancy?

Yes

Please explain

Camera feeds will be provided to TxDOT and other agencies. This information can be especially useful during an evacuation or other major event.

Will the project increase system reliability?

Yes

Please explain:

Incidents will be identified quicker and steps can be taken to reduce delays and speed recovery. Alerts can be sent directly to signal technicians rather than relying on drivers to call in any signal issues.

System Lifecycle/Maintenance Issues

Is the projected lifespan of the system being installed five (5) years or greater?

Yes

Please explain:

Most of the equipment should last ten years. Some maintenance will be required to replaced failed equipment within that time frame.

Do you have a funded operations and routine maintenance program in place (please provide a 5-year budget as described in the financial plan worksheet)?

Yes

Please explain and complete "Operating Budget" tab within the financial plan worksheet template.

Existing Engineering Department personnel would monitor the system. Existing Road and Bridge Department personnel would be able to repair/replace signal level equipment. Contractors would be placed under contract to repair/replace any backbone/high site level equipment. Existing IT Department personnel would repair/replace any equipment at the TMC.

Does the project improve the efficiency of operations/maintenance expenses? (e.g. real-time system health/equipment condition, malfunction detection/diagnosis, etc.)

Yes

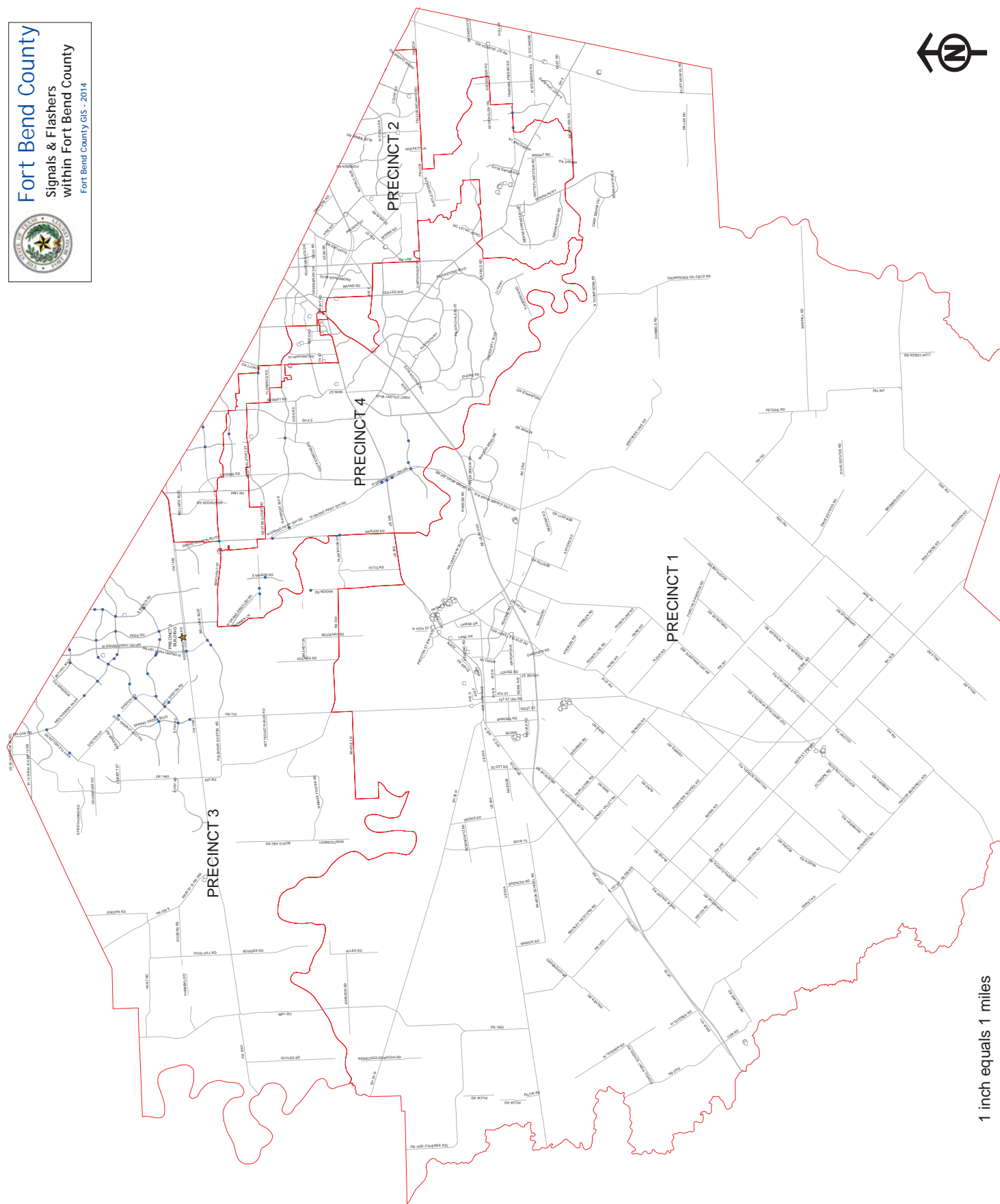
Please explain:

Alerts from the traffic signals can be sent directly to signal technicians. This will allow improved response times in correcting malfunctions.

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- Legend**
- PRECINCT 3 BLDG
 - County Facilities
 - County Traffic Signals

1 inch equals 1 miles

Project Expenditures ('000s)	Project Total
Planning/Environmental	50
Design	550
Property/ROW Acquisition	---
Utility Relocation	---
Construction	5,400
Other	---
Total Expenditures	6,000
Project Funding ('000s)	
Local - Bond	1,200
Local - General Revenue	
Local - Private Contributions	
TxDOT - Other	4,800
Other	
<i>REQUESTED (H-GAC/TxDOT)</i>	
Total Funding	6,000

1st Year of
Operations

Operating/Maintenance Expenditures ('000s)	Fiscal Year (Sept 1 - Aug 31)					Project Total
	2018	2019	2020	2021	2022	
Personnel (Existing)	150	150	150	150	150	750
Maintenance and repairs	10	10	20	20	20	80

Total Expenditures	160	160	170	170	170	830
	830					
Revenues ('000s)						
General Revenue	160	160	170	170	170	830

REQUESTED (H-GAC/TxDOT)	---	---	---	---	---	---
Total Revenues	160	160	170	170	170	830
	830					