

Intelligent Transportation System (ITS) Update

CITY COUNCIL

JUNE 17, 2024

Public Works & Engineering







Brief Back	kground
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- ITS Technology
- ITS Strategic Plan

ITS Project Overview

- Scope
- Procurement
- Funding

Signal and System Maintenance

- Maintenance Responsibility
- Voluntary Signal Maintenance Agreement
- Additional Capital, O&M Resources to Support ITS

Background



Intelligent Transportation System (ITS): Combination of various technologies that, when managed, improves the operating efficiency of the overall transportation system

- Burleson ITS project includes design and installation of:
 - Advanced Traffic Management System (software and hardware)
 - Vehicle detection, new video cameras
 - Emergency response vehicle preemption
 - Traffic Management Center build-out including video wall
- System design primarily focuses on connecting 44 traffic signals (16 existing City signals, 27 TxDOT signals, and the proposed Hidden Creek / Gardens signal) then monitoring and managing them in the proposed *Traffic Management Center*

Background: What is ITS?



Advanced Traffic Management System (ATMS) may include:

- Traffic Signals
 - Vehicular Detection
 - Signal Controllers
 - Communications
 - Updated Coordinated Timing
- Digital Message Signs
- Weather Sensors
- Video Cameras

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- Emergency Response Vehicle Preemption

Background: What is ITS?



A Traffic Management Center (TMC) is typically at the heart of an ATMS

Key functions of the TMC include:

- Monitoring the overall system (including video)
- Compiling and analyzing system data such as:
 - Signal performance measures
 - Origin & destination
 - Traffic counts
- Incident Management
- Centralized signal control



TMCs receive and process a tremendous amount of data

ITS Strategic Plan

- Adopted by Council December 2019
- Focuses on Traffic Management aspects of Smart Mobility
- Includes three-phased implementation recommended over 5 – 10 year period



ITS Strategic Plan – Phase I (High Priority)



Phase I recommends establishing six components:

- 1. Communications system connecting each intersection
- 2. Cellular-based School Zone System
- 3. Advanced Traffic Management System Software
- 4. Traffic Management Center
- 5. CCTV Cameras
- 6. Preemption Detection



ITS Strategic Plan – Phase II (Medium Priority)

Phase II recommends establishing additional ITS components and software modules to make SH 174 a smart corridor:

- 1. Radar detection system at 15 intersections
- 2. Third-party data application for determining travel time
- 3. Integration of travel time module into the Advanced Traffic Management System (ATMS)
- 4. Integration of performance measures module into ATMS
- 5. Development and integration of dedicated website dashboard





ITS Strategic Plan – *Phase III (Low Priority)*



Phase III recommends further expanding the system with:

- 1. Additional CCTV cameras (locations to be determined)
- 2. Two Dynamic Message Signs to support wayfinding, incident management, etc.
- 3. Two weather stations
- 4. Two road weather sensors
- 5. Integration of the Dynamic Message Signs module into the ATMS



Project Overview (Strategic Plan Phases I & II)



- Burleson ITS project includes design and installation of:
 - Advanced Traffic Management System (software and hardware)
 - o Vehicle detection, new video cameras
 - Emergency response vehicle preemption
 - Traffic Management Center (TMC) build-out including video wall
- System design focuses on connecting and managing (through the TMC) 44 traffic signals
 - o 16 existing City traffic signals
 - o 27 TxDOT signals (voluntary maintenance agreement required)
 - o New Hidden Creek / Gardens signal beginning construction this summer
- Original Project Budget: \$2,630,550 (2022 General Obligation Bond Program (\$2,161,123) and previous street bond funds (\$469,426))

Initial Project Procurement

Project bid April, 2023

- Single bid received (general contractor)
- \$4.9m including both bid alternates (did not include the dedicated website dashboard component)
- Single bid rejected by Council September 5, 2023

Council allocated additional \$1.5m in FY23-24 budget for total project construction budget of \$3.46m





Rendering for illustrative purposes only

Current Procurement: Cooperative Purchasing-based

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Procurement strategy revised November 2023:

- Assign experienced staff to role of integrator instead of general contractor
- Seek competitive pricing directly from software / hardware distributors through use of cooperative contracting
- Collaborate with Burleson Information Technology Department for procurement of network switches, firewall, camera mounts, and workstations at favorable pricing

Local Government Code authorizes cooperative purchasing as a means of increasing the purchasing power of government entities while also satisfying public procurement requirements



Traditional vs Cooperative Procurement

- Publicly advertised and bid using standard City process
- Multiple specialty software packages and hardware
- One bid received (General Contractor)
- State cooperative procurement contracts used
- City's consultant and city staff worked directly with distributors
- Vendor and City risk mitigated

Additional \$200,000 allocated for dedicated website dashboard beyond estimated costs to the right



Project Implementation Schedule



Phase I primary implementation anticipated completion in approximately nine months



Phase II (including signal analytics and adaptive signal timing for SH 174 corridor) will follow and take an anticipated additional nine months

Signal Maintenance Along TxDOT Roadways

- Cities with 50K population (as determined by census) are required to enter into Municipal Maintenance Agreement with TxDOT
 - Typically includes city assuming signal maintenance responsibility
 - Some level of TxDOT reimbursement for expenses may be negotiated
- Cities with less than 50K in population (as determined by census) may request to voluntarily assume signal maintenance responsibility subject to TxDOT approval
- 2020 Census recorded Burleson population of 47,991
- TxDOT approved the City's request to assume maintenance of traffic signals on state highways within Burleson city limits in 2023 and agreed to continue funding electricity costs





Signal Maintenance Agreement with TxDOT City Responsibilities



- Maintain
 - \circ Traffic signals at 27 intersections (cabinets, poles, and other equipment)
 - \odot Eight school flasher locations
 - \odot Five advanced flashers locations
- Implement traffic signal timing (including coordination with TxDOT and NCTCOG on regionally significant corridors)
- Provide traffic control (including providing temporary / replacement infrastructure when damaged by accidents, storms, etc.)
- Document inspections, maintenance, and repairs for each intersection
- Troubleshoot and respond to requests and complaints

Resources to Support Voluntary Signal Maintenance Agreement



In order to assume maintenance responsibility for 27 TxDOT traffic signals, maintain 44 total signals, and operate the Traffic Management Center, additional annual funding needed for:

- One Traffic Signal Technician / Traffic Management Center Operator \$100k (Provides a second FTE to assist with coverage of morning and evening peak periods)
- Inventory (signal cabinet, controller, detection, poles, etc.) and services \$75k

(Provides supplies for quickly responding to intersections damaged by traffic accidents and storms and normal equipment failures)

Resources to Support Voluntary Signal Maintenance Agreement (continued)

- Additional bucket truck necessary to access taller signal heads on multi-lane corridors – \$200k (Onetime costs plus \$20k annually recurring)
- Traffic control equipment for lane closures and safe work zones – \$50k (One-time costs and \$5k annually recurring)
- Ongoing IT costs \$100k annually recurring

Total: \$250k one-time, \$300k annually recurring

Based on cost reductions, one-time costs may be covered by project construction budget





Primary Project Benefits

- Enhanced Mobility More efficient traffic operations, Increased traffic safety (reduced accidents, less red light running, reduced signal outages, etc.)
- Decreased response times for emergency response project includes traffic signal preemption for BFD response vehicles
- Improved air quality (less congestion = less delay = lower fuel consumption and emissions)
- Enhanced response to traffic signal malfunctions with additional ability to remotely assess and in some cases resolve issues
- Improved public perception of traffic and congestion





Common Project Misconceptions



Project will not:

- Allow signal timing to be changed on-demand (temporary adjustments for special events / incidents will be possible)
- Eliminate TxDOT or NCTCOG coordination (partnership with both is critical and will remain in place)
- Generate reimbursement from TxDOT for assuming maintenance responsibility (TxDOT will direct-fund electricity until the 50,000 population threshold is met, but will not reimburse the City for maintenance or repairs)
- Provide around the clock TMC operation (two FTE (one current and one additional requested) anticipated to provide peak period coverage Monday – Friday and some special event coverage
- Immediately eliminate traffic congestion within Burleson

Next Steps





Council Feedback Sought Today

- Support for voluntarily assuming maintenance responsibility for traffic signals at 27 TxDOT intersections, school zones and flashers
- Support for one-time equipment costs (approximately \$250k with funding from cost reductions in construction budget)
- Support for additional operating costs (approximately \$300k annually)
- Support for preparing future action items for implementation of the ITS Project
- Support for funding and implementing the dedicated website dashboard







Additional Questions / Discussion

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