

Memorandum



CITY OF DALLAS

DATE 5 September 2013

TO Honorable Members of the Transportation and Trinity River Project Committee:
Vonciel Jones Hill (Chair), Lee Kleinman (Vice Chair), Deputy Mayor Pro Tem Monica
Alonzo, Mayor Pro Tem Tennell Atkins, Sandy Greyson, Sheffie Kadane

SUBJECT **Advanced Traffic Management System Upgrade Project**

On Monday, 9 September 2013, the Transportation and Trinity River Project Committee will be briefed on the Advanced Traffic Management System Upgrade Project. The material attached is for your review.

Please contact me for any additional information.

A handwritten signature in black ink, appearing to read 'Forest E. Turner'.

Forest E. Turner
Assistant City Manager

Attachment

Cc: Honorable Mayor and Members of the City Council
A.C. Gonzalez, Interim City Manager
Warren M. S. Ernst, Interim City Attorney
Judge Daniel F. Solis, Administrative Judge
Rosa A. Rios, City Secretary
Craig D. Kinton, City Auditor
Ryan S. Evans, Interim First Assistant City Manager
Jill A. Jordan, P.E., Assistant City Manager
Joey Zapata, Assistant City Manager
Charles M. Cato, Interim Assistant City Manager
Theresa O'Donnell, Interim Assistant City Manager
Jeanne Chipperfield, Chief Financial Officer
Frank Libro, Public Information Officer
Elsa Cantu, Assistant to the City Manager – Mayor and Council



Advanced Traffic Management System Upgrade Project

Presented to the Transportation and Trinity
River Project Committee
9 September 2013



Briefing Purpose

- Introduce the six (6) components of the City's Traffic Signal System
- Introduce the three (3) components of the Advanced Traffic Management System ["ATMS"]
- Provide an update on the ATMS Upgrade project

Traffic Signal System Components



Traffic Signal



Vehicle Detectors



Controller Cabinet



Central Computer System



Communication Link



Traffic Signal Controller

Traffic Signal System

Part 1 - Traffic Signals

- Traffic lights
- Pedestrian lights
- Poles and mast arms
- Underground conduit and cables



Traffic Signal System

Part 2 - Vehicle Detectors

- Senses vehicles and provides vehicular data to controller
- If properly configured, can provide vehicle counts, vehicle classification and vehicle speeds
- Can be configured to identify traffic congestions on approaches



Traffic Signal System

Part 3 - Controller Cabinet

- Houses the traffic signal controller and other electronic components for a signal
- Keeps the controller and electronic components protected and maintains safe working temperature



Traffic Signal System

Part 4 - Traffic Signal Controller

- Computer that controls the traffic signal
- Analyzes data from vehicle detectors and other components of the traffic signal
- Communicates with and reports problems to the traffic management center



Traffic Signal System

Part 5 - Communication

- Connects traffic signal to central computer system



Traffic Signal System

Part 6 - Central Computer System

- Controls signal timing for the over 1400 signals in the system
- Can remotely change signal timing
- Collects traffic data from individual signals
- Aids in traffic signal maintenance and equipment tracking
- Manages traffic monitoring video cameras



Traffic Signal System Six Components

Traffic Signal



Vehicle Detectors



Controller Cabinet



Central Computer System



Communication Link



Traffic Signal Controller



ATMS Upgrade Project - Three Components

Benefits of a Traffic Management System

- Synchronizes traffic signals
 - Maintains green-to-green vehicle progression
 - Reduces congestion, stops, pollution, fuel consumption and red light running
- Notifies staff about traffic signal problems
 - Reduce traffic signal maintenance response time
 - Allows staff to address certain traffic signal issues remotely
- Adjusts timing for special events and incidents
 - Benefits over 100 events annually at the American Airlines Center [“AAC”] and Fair Park

Need for Upgrade

- Central computer system
 - The 1980's computer system is not supported by the manufacturer and cannot be repaired
- Communication
 - Analog communication over Time Warner television cable
- Traffic signal controllers
 - Installed in the early 1990's and is near end of life cycle

Replacing the System Now is Critical

- Central computer system is at risk of failure
 - Will result in rapid degradation of green-to-green vehicle progression between traffic signals
 - Will increase maintenance calls and response times
 - Will require manual adjustments to the traffic signals for special events and incidents
- Traffic signal control equipment is at end of life cycle
 - Does not meet the needs of the system users
 - Traffic signal software is no longer supported by the manufacturer

Need for Simultaneous Upgrades



- **All parts of the system must be upgraded simultaneously**
 - If only one part is upgraded, it will not be compatible with the other parts
 - No part of the existing system will be compatible with the replacement system

Traffic Management System

Basic 1980's Features

1. Synchronizes traffic signals
 - Maintains green-to-green vehicle progression
2. Notifies staff about basic traffic signal problems
 - Reduce traffic signal maintenance response time
 - Dark and all-red flashing traffic signals
3. Adjusts timing manually for special events and incidents
 - Benefits over 100 events annually at the AAC and Fair Park

New Traffic Management System Features

- Maintains traffic signal synchronization. In addition, can transmit traffic data real time. Staff can use this data to adjust signal timing
- Will allow staff to coordinate with neighboring cities to synchronize signals along streets crossing jurisdictional boundaries
- Enhanced diagnostic capabilities – in addition to notifying staff about a traffic signal malfunction, the new system will be able to identify the problem and issue electronic job tickets. This will reduce maintenance response time and allow staff to address certain traffic signal issues remotely

New Traffic Management System Features- contd.

- Capable of proactively monitoring traffic congestion. Capable of alerting the Traffic Management Center if traffic frequently backs up or if time to drive down an arterial increases significantly – which will allow staff to react rapidly to developing situations
- Capable of incorporating new traffic management applications as they are developed in the future without requiring wholesale system replacement
- Will provide for inter-jurisdictional compatibility; and regional cooperation through data sharing and emergency management

Advanced Traffic Management System Upgrade Project

- Completely replaces three (3) components of the Traffic Signal System
 - Traffic signal controller
 - Communication
 - Central computer system

Final Products

- Advanced Central Computer system
- Digital Communication
 - All traffic signals with digital communication equipment
- Advanced field equipment
 - Advanced traffic signal controllers
 - Advanced safety monitors

Traffic Management System Replacement Schedule

- December 2013
 - Start testing controller software. Installation of new controllers will begin after software tests are successfully completed
- March 2014
 - Begin communication system replacement
- January 2015
 - Begin central computer system replacement
- September 2016
 - Complete traffic signal controller replacement
 - Complete communication system replacement
 - Complete central computer system replacement

ATMS Project Costs



Source of Funds

- \$6.1 M – 2003, 2006 Bond Funds
- \$5.1 M – Federal/Regional Grant Funds
- \$1.3 M – General Fund *

* *Required in FY 2014 - 2015*

QUESTIONS?