

Memorandum



CITY OF DALLAS

DATE November 15, 2013
TO Honorable Mayor and Members of the City Council
SUBJECT **Traffic Signal System Upgrade Needs**

On Wednesday, November 20, 2013, the City Council will be briefed on the Traffic Signal System Upgrade Needs. The briefing material is attached for your review.

Please let me know if you have any questions or need additional information.

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

Forest E. Turner
Assistant City Manager

Attachment

Cc: A.C. Gonzalez, Interim City Manager
Warren M.S. Ernst, 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
Dennis Ware, (I) Director, Street Services



Traffic Signal System Upgrade Needs

Presented to: Dallas City Council
November 20, 2013

DEPARTMENT OF STREET SERVICES



Purpose

- The City of Dallas has a program to achieve and maintain street pavement condition satisfaction ratings at 87% or higher
- It is time to undertake a similar program for Traffic Signals
- This briefing:
 - Describes the current condition of the City's traffic signals
 - Outlines a possible program to upgrade and maintain the signals

Streets System

- City of Dallas' Streets System is composed of several components

- Pavement System

- Street/Pavement
- Striping and Signs
- Sidewalks
- Medians
- Rights-of-way

- Traffic Signal System

- Storm Drainage System

- Water/Wastewater Systems



Street Pavement Improvement Program

- In 1995, the Dallas City Council adopted a goal-oriented program entitled the “Streets 2015” to address the effects of deferred maintenance on the roadway system throughout the city.
 - Goal: achieve a 75% Satisfaction Rating by the year 2015
- A similar program is needed for the Traffic Signal System
- This briefing explores this idea

Function of Traffic Signal System

In Dallas, traffic signals are found at intersections associated with freeway ramps, major thoroughfares, and some residential streets. They:

- Reduce accidents by allocating right-of-way through intersections
- Provide for safe crossings for pedestrians across busy intersections
- Increase mobility through signal coordination along corridors

Benefits of a Good System

- Accident Reduction
 - Helps reduce red light running by providing for demand generated signal phasing
 - Facilitates protected left turn phasing where required
 - Reduces confusion due to signal failures related to weather events
- Reduced travel time and enhanced mobility
 - Better progression along corridors
 - More timing options for efficient operations
 - Ability to respond rapidly to incidents remotely from the Traffic Management Center due to availability of real time traffic data
- Economic benefits to citizens of Dallas due to congestion and accident reductions

City of Dallas Traffic Signals - History

- The City of Dallas witnessed sustained growth from 1940 through 1990
- During this period of growth, over 200 traffic signals were built every decade, then the growth slowed significantly
- The City has 1,493 Traffic signals today

Aging Traffic Signal System

- Industry standard for useful life of traffic signal is 20-25 years
- Almost 80% of our traffic signals are more than 25 years old
- 70% of our signalized intersections have broken detectors
 - Increases congestion and eliminates “intelligent” timing
- Signals lose structural integrity due to prolonged exposure to the elements
 - Increases likelihood for pole or mast-arm failure
- Old electrical hardware often short during weather events creating signal outages

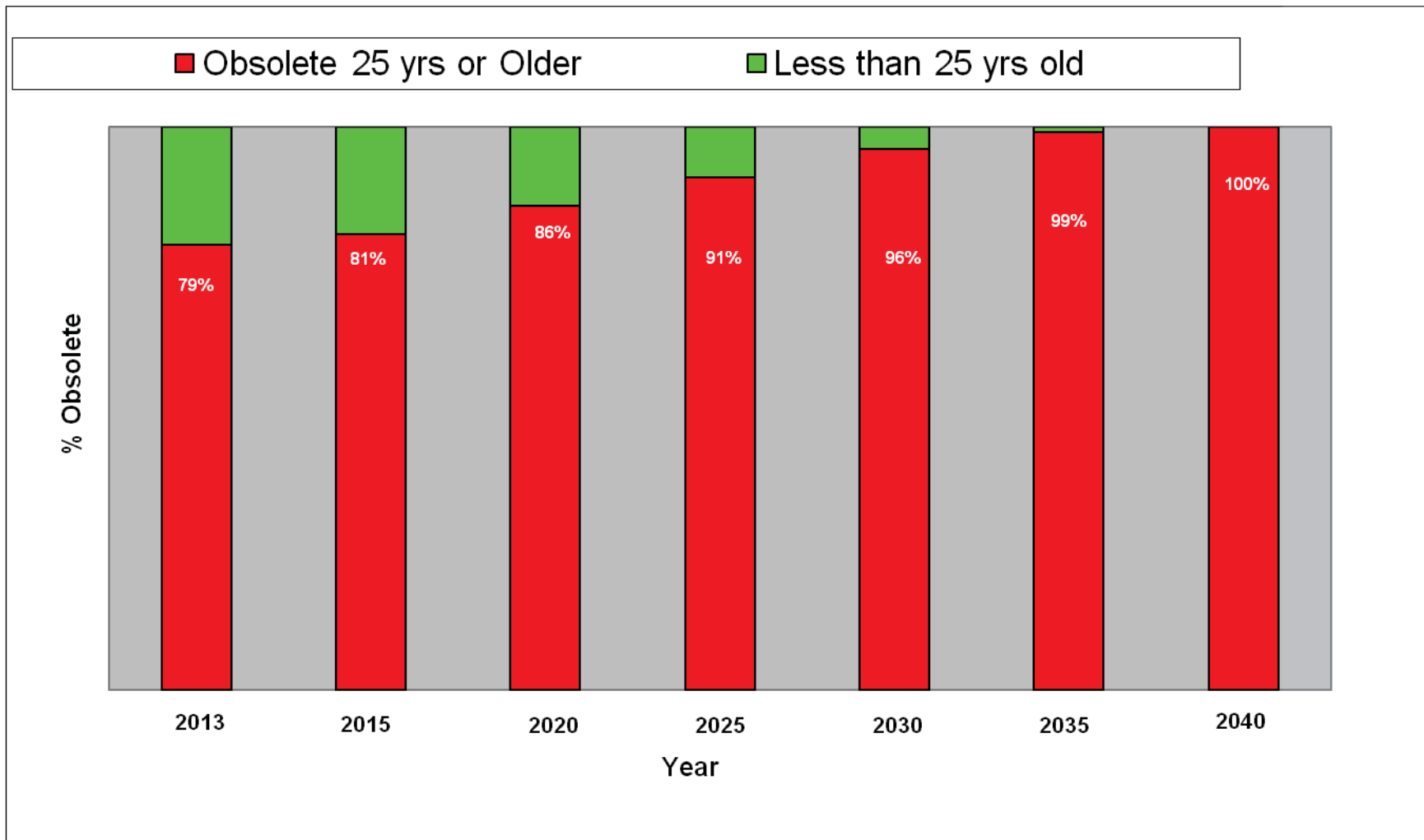
Aging Traffic Signal System Contd..

- In addition to the structural deficiencies, older traffic signals do not meet:
 - Current Federal operational standards
 - Current Federal structural standards
 - Current Federal wind-loading standards
- Many older signals do not meet current standards of the Americans with Disabilities Act (ADA)
- Due to broken detectors and old controllers, staff presently has limited capability to provide progression through corridors
- Due to hardware constraints, left turn signals cannot be provided

History of Maintenance

- Never had a replacement program – individual components are only replaced if they fail or are knocked down
- Periodic projects to upgrade individual components of the system (usually with grant or bond funds):
 - Upgrade of signal indicators from incandescent bulbs to Light Emitting Diode (LED)
 - Signal controller upgrades in the 1990's
 - Advanced Traffic Management System (ATMS) Upgrade project – currently underway
- **No program to comprehensively upgrade obsolete signals on an on-going basis**

Current and future state of City of Dallas Traffic Signals without a Maintenance Program



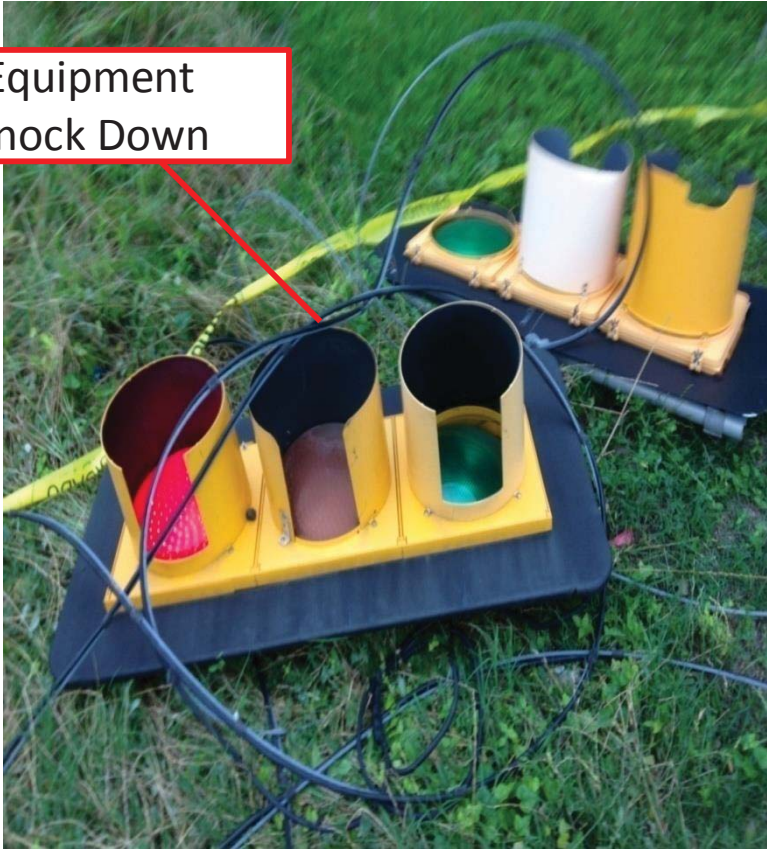
Structural Failure, Inwood @ LBJ - May 21, 2013



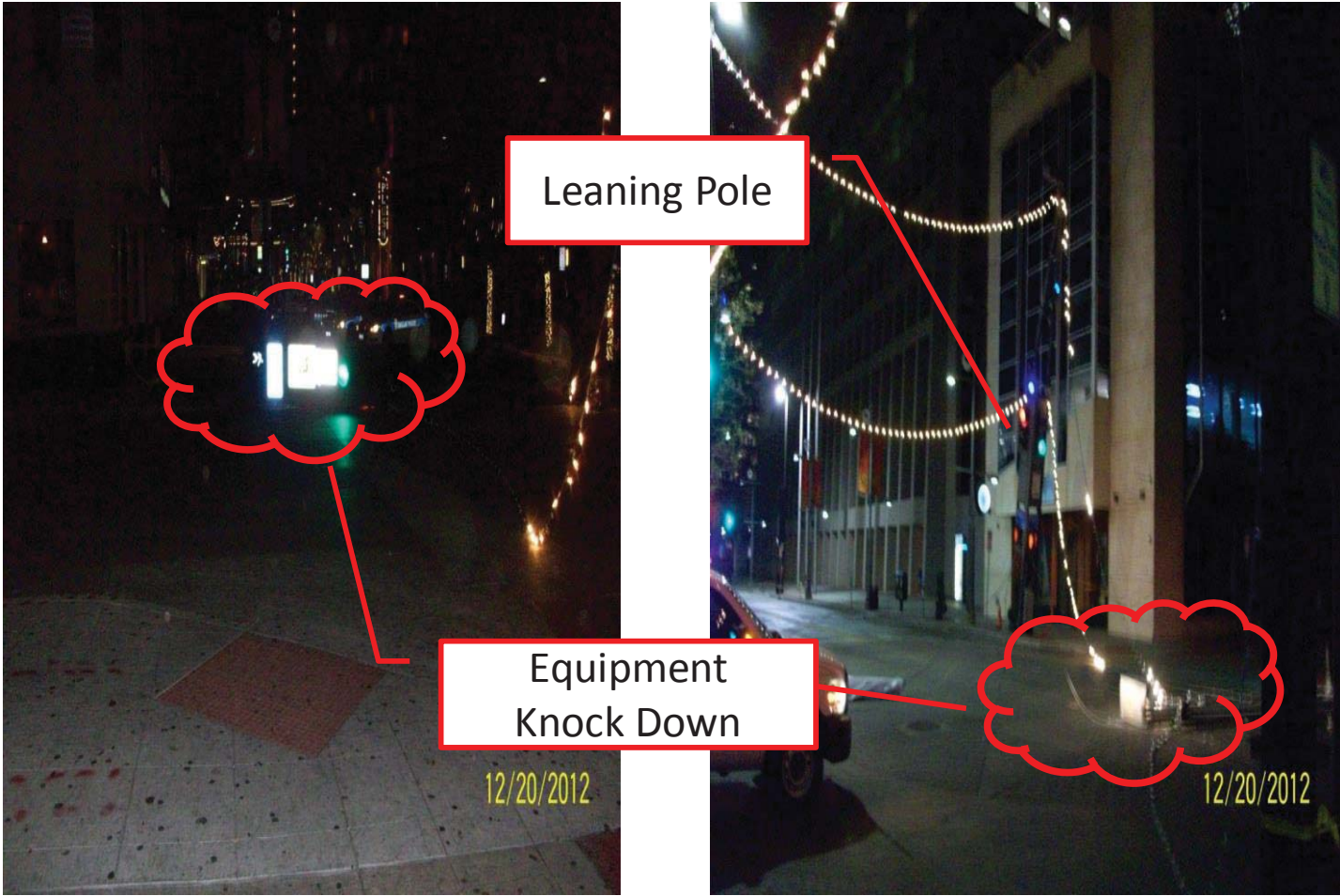
Beckley at IH 30 – May 29, 2013



Equipment
Knock Down



Field/Main – Downed Pole– Dec 2012



ADA Compliance Issues

Pole mounted cabinets don't extend to ground



Ped button placement not ADA compliant

Moving Forward in Two Parts



Central Computer System



Communication Link



Traffic Signal Controller

Part 1: Computer and Communications System



Traffic Signal



Vehicle Detectors



Controller cabinet

Part 2: Signal System Field Infrastructure

Underway Part 1: Computer and Communications System Upgrade



- The on-going Advanced Traffic Management System (ATMS) Upgrade project will completely replace the Computer and Communications System components by the end of 2016
- Estimated cost - \$12.5 Million
 - \$6.1 M Bond Funds
 - \$5.1 M Grant Funds
 - \$1.3 M in FY 2014-2015

Still Needed Part 2: Upgraded Traffic Signal Field Infrastructure System



Signal



Vehicle Detectors



Controller Cabinet

- Traffic Signal Field Infrastructure include:
 - Signal heads, poles, mast arms, electrical conduit etc.
 - Vehicle detectors
 - Controller cabinets
- Currently there is no program to upgrade field infrastructure
- Our field infrastructure system is old – this briefing will focus on the need to upgrade and maintain this system

Upgraded Traffic Signal Field Infrastructure System



Signal



Radar Vehicle Detectors



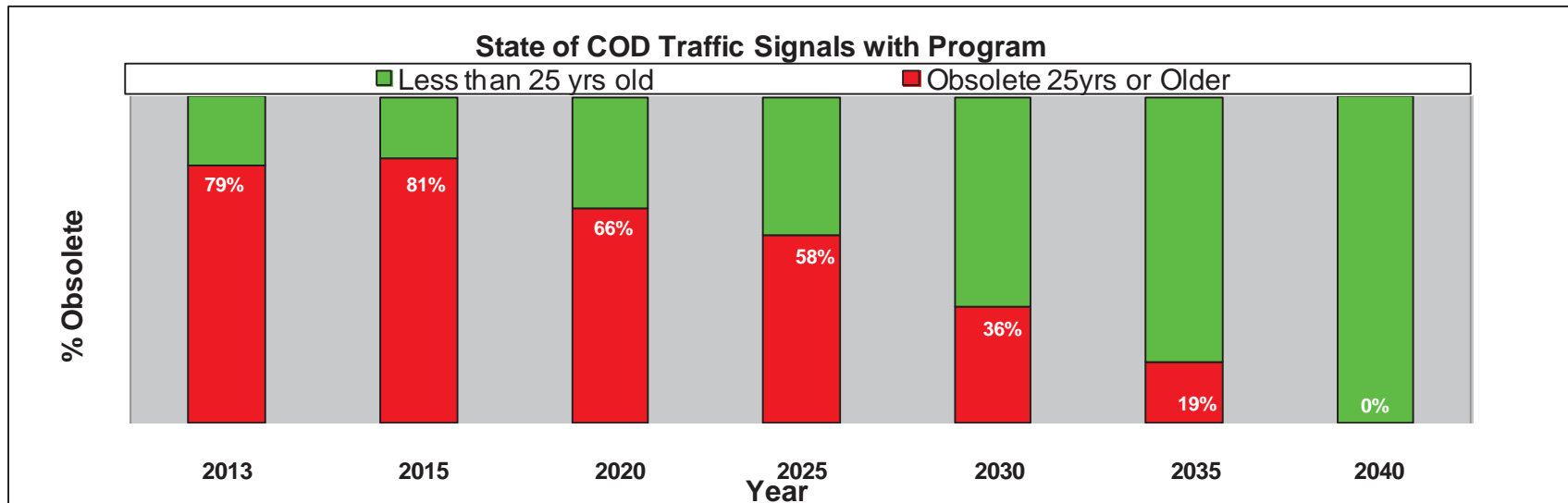
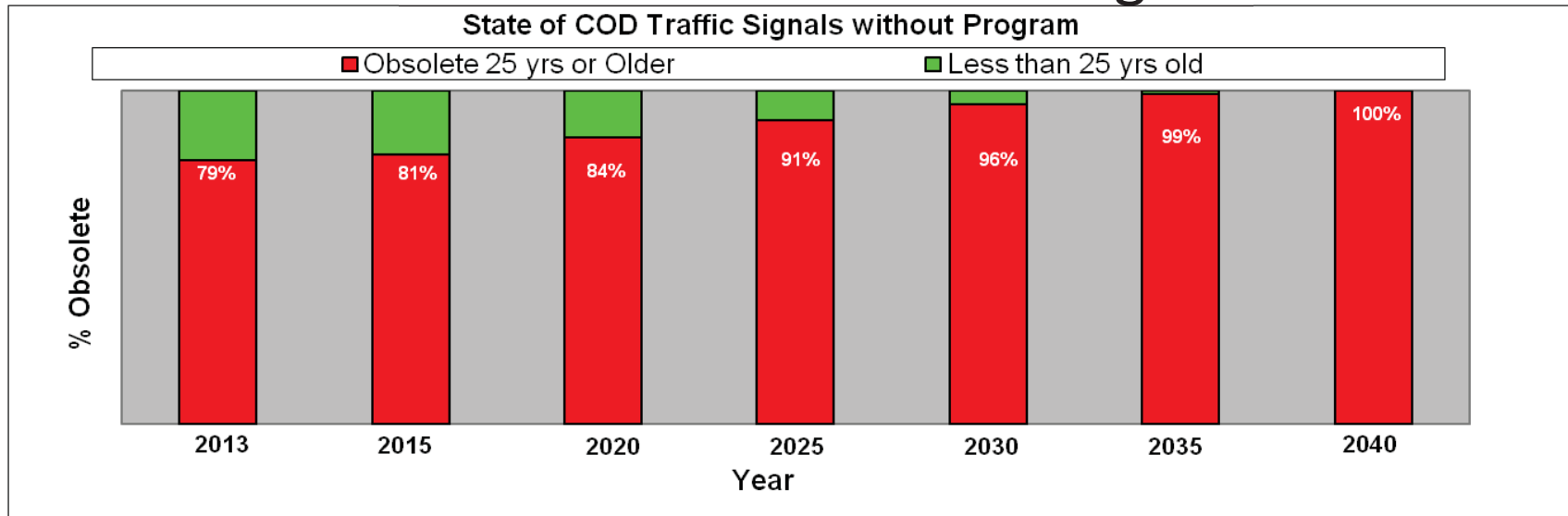
Controller Cabinet

- Upgraded Traffic Signal Field Infrastructure will include:
 - Signals that meet current state and federal structural and operational standards
 - Radar Detectors - Capable of detecting both automobiles and bicycles
 - Newer Controller Cabinets

Part 2 - Moving Forward

- Consider a program to replace 60 traffic signals annually
- This would:
 - Replace our Traffic Signal System every 25 years on an on-going basis
 - Prevent signals from being in service past their useful lives
 - Bring all signals to acceptable condition by 2040
 - Maintain the Traffic Signal System in acceptable condition after 2040

Comparison of State of COD Traffic Signals with and without Maintenance Program



Cost of Replacement Program

- Estimated cost to replace traffic signals that are currently 25 years or older (and past their useful life) is: \$196 Million
- Estimated Cost of a 60 signal light program is \$10 Million annually, **\$250 Million over 25 years** and includes O&M costs

Why Upgrade?

- Our current traffic signal system is aging and lack of an upgrade program will result in:
 - Increased number of service requests
 - Signal related service calls are trending significantly higher, soon current staff cannot keep up – level of service will suffer
 - Potential increase in accidents
 - More signal failures resulting driver confusion and frustration
 - Failure of detectors force drivers to make unsafe turns
 - Cannot provide protected left-turn phase due to broken detectors and/or short mast arms
 - Impaired mobility, increased congestion

Summary

- Dallas has an aging Traffic Signal Infrastructure
- Almost 80% of the Traffic System Field Infrastructure is past the industry standard for useful life
- A robust Traffic Signal System can reduce accidents, enhance mobility and improve the quality of life for Dallas citizens
- A Traffic Signal Infrastructure Maintenance Program is needed to address these needs

QUESTIONS?