Agenda

- **Background: Intelligent Transportation System (ITS) Operations Plan**
- **What is an Adaptive Signal System?**
- **City Evaluation & Results**
- **Recommendation**

ITS Operations Plan (2014)

- **ITS Goal: Enhance mobility through technology by increasing efficiency**
- **ITS Plan: Identifies series of improvements within City**
- **Last Updated in 2014 (3rd Update)**
- **4-year CIP established based on Plan**

ITS Operations Plan Projects

FY15

- Signal Optimization
- School Beacon Upgrades
- ITS Website improvements (Phase 1)
- *POD Detection Upgrades (Phase 1)*
- *Adaptive Study (Evaluate Solutions)*

FY16

- *POD Detection Upgrades (Phase 2)*
- *ATC Controller Upgrades*
- Adaptive Signal Project Approved for SH 6

FY17

- Signal Optimization
- Two Awards for POD Detection Work(ITS Texas & APWA)
- Connected Vehicle Module
- *DMS Sign Project*
- *Adaptive Signal Evaluation on SH 6 (SynchroGreen)*

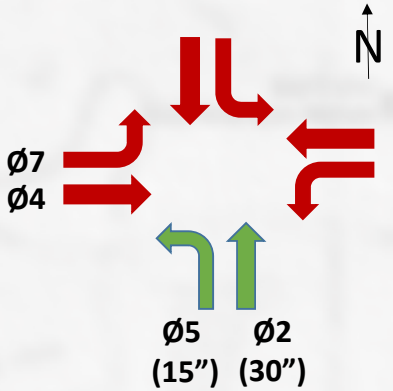
FY18

(Programmed)

- Expand Adaptive Traffic Signal Control
- POD Detection Upgrades (Final Phase)
- GPS Emergency Vehicle Priority System
- ITS Website Improvement

What is Adaptive?

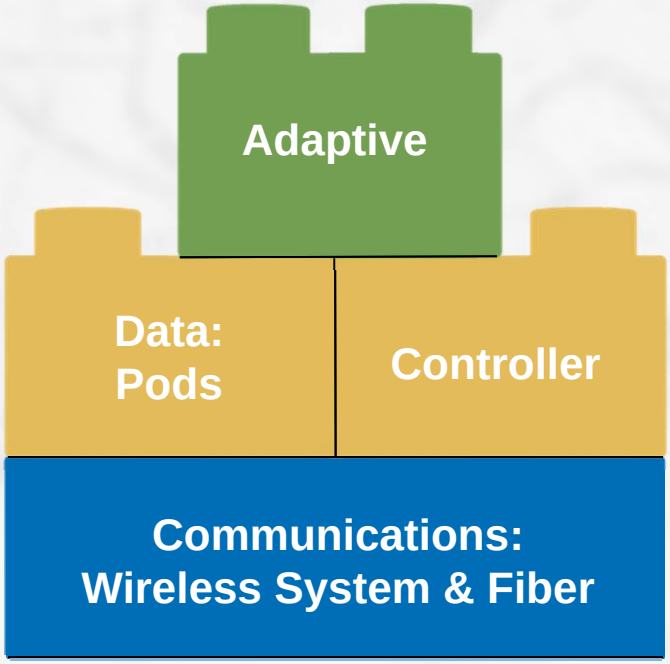
- **Basic Traffic Parameters**
  - Phases, Splits, Cycle, Offsets



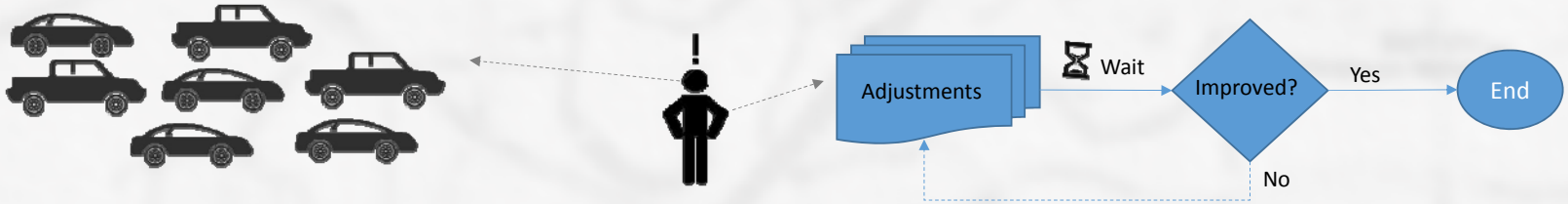
- **Time Based Coordination (TBC):**
  - Typical Operation
  - Scheduled Preset parameters

- **Adaptive:**
  - Changes/adapts signal timings (Cycle Length, Splits, and Offset) based on actual demand which may fluctuate along the day, week, and even the year. (Optimization Algorithm)

Adaptive Components



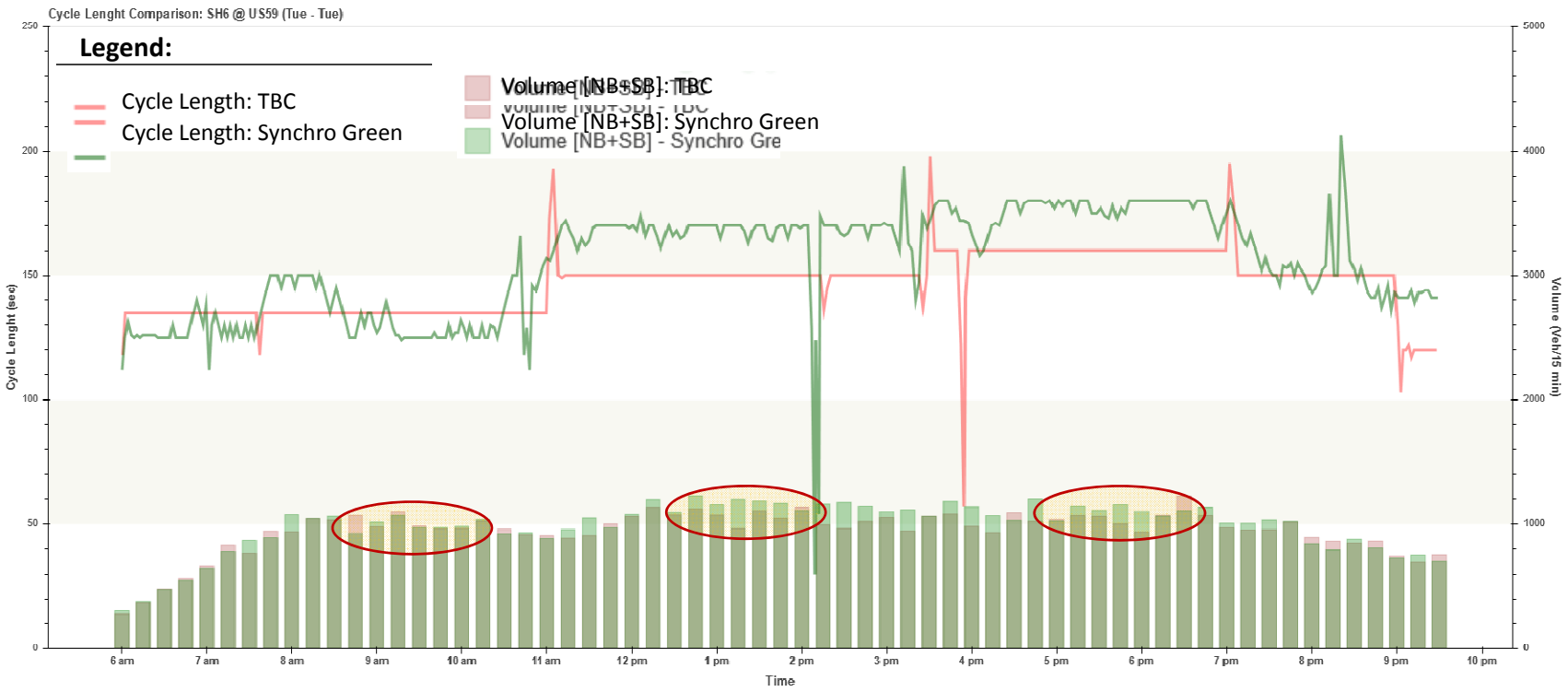
Adaptive Goals



- **Adaptive algorithm optimizes corridor (cycle by cycle)**

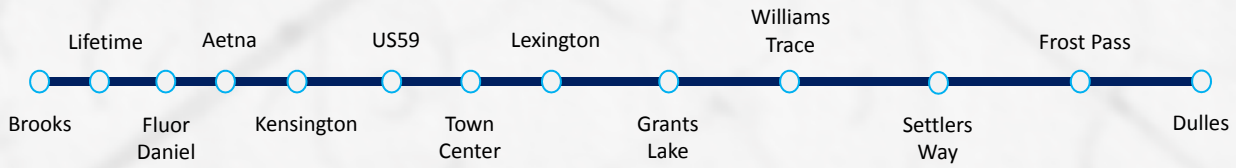
- **Expected Results:**
  - Minimize Overall Delay, reduce Stops & Travel Times, Increase Traffic Flow(reduce congestion)
  - Responsiveness: adjustments based on demand
  - Maximize Efficiency of current infrastructure

Adaptive vs TBC Comparison



Adaptive Evaluation

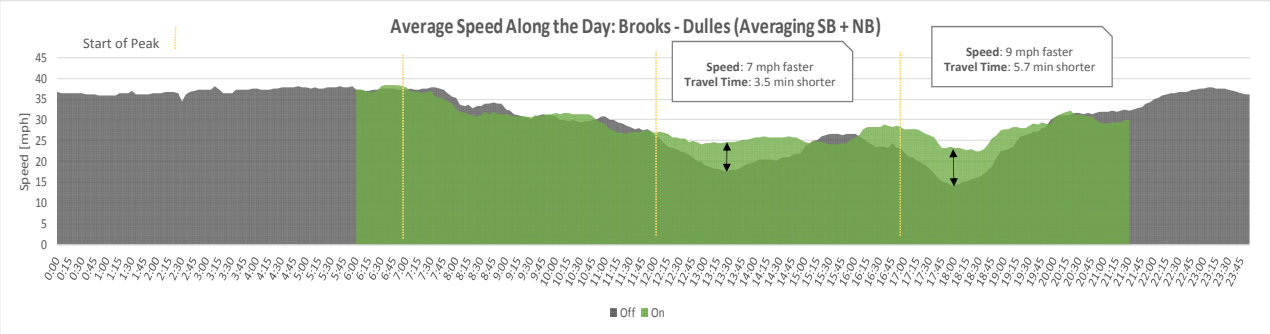
- **Trafficware's SynchroGreen Adaptive System Evaluation approved by Council April 2016**
- **SH 6 (Brooks to Dulles)**
- **Focus on AM, Noon, and PM Peaks**



Adaptive Evaluation

- **Qualitative and Quantitative Results**
  - New Tools and Visualizations to measure results
- **Travel Time Data & Volume Data Primary Source**
  - Field Runs & Bluetooth Data
  - SynchroGreen On: June 27 -29th
  - SynchroGreen Off: July 18 -20th
- **Metrics:**
  - Travel Time/Speed
  - Travel Time Delay
  - # of Stops
  - Google Congestions Maps
  - Traffic Flow (Reduce Saturation Times)

Travel Time/Speed Analysis



	Speed [mph]			Segment Distance [mi] 3.53		
	On	Off	*Dif*	Travel Time [min]		
Max	38.45	38.20	*0.25*	On	Off	*Dif*
Min	22.43	14.40	*8.03*			
1:25 PM	24.65	17.48	*7.18*	8.6	12.1	*-3.5*
5:55 PM	23.53	14.40	*9.13*	9.0	14.7	*-5.7*

Results – General Overview

- **Considering PM Peak:**
  - ✓ **Travel Time:** Decreased 38% (TT reduced 214 Seconds!)
  - ✓ **Stops:** Decreased on Avg from 5 to 3.1 stops
  - ✓ **Travel Time Delay:** Decreased 55% (avg 535 sec. to 240 sec.)
  - ✓ **Corridor LOS:** Improved 2 Levels (From E to C)
  - ✓ **Flow:** Increase of 450 veh/hr on avg.

Results – Traffic Flow Condition Movie

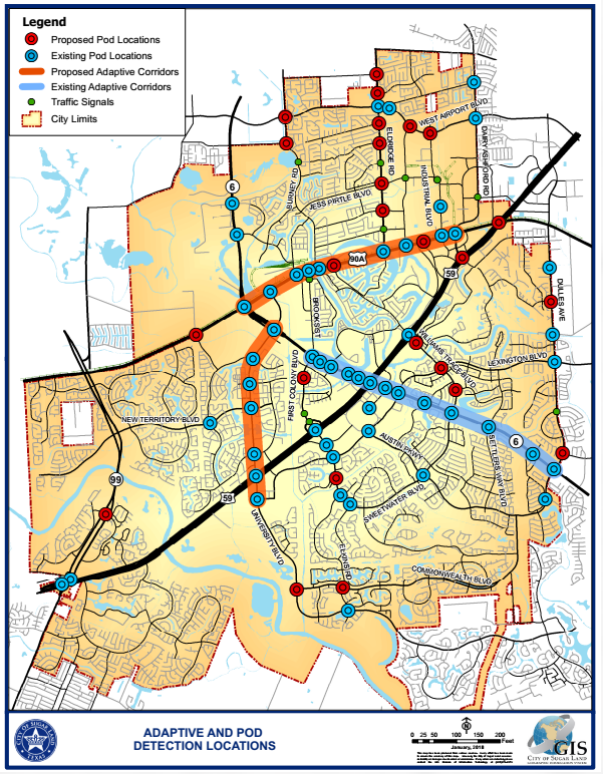
- **Tuesday PM Peaks Qualitative Comparison:**
  - June 27 (Synchro ON) vs July 18 (Synchro OFF)

Adaptive & Pod Expansion

- **Conclusion:**
  - SynchroGreen showed promising results

- **Expand Pods:**
  - 25 more intersections
  - $522,998.45

- **Expand SynchroGreen:**
  - US 90 (Dairy Ashford to SH 6)
  - University Blvd (SH 6 to Lexington)
  - $324,000



Recommendation

- **Authorize the purchase of Trafficware Group, Inc's SynchroGreen Adaptive System and Pod Wireless Detection System in a maximum amount of $846,998.45 as part of the TR1503 – Intelligent Transportation System (ITS) CIP.**

Questions?