



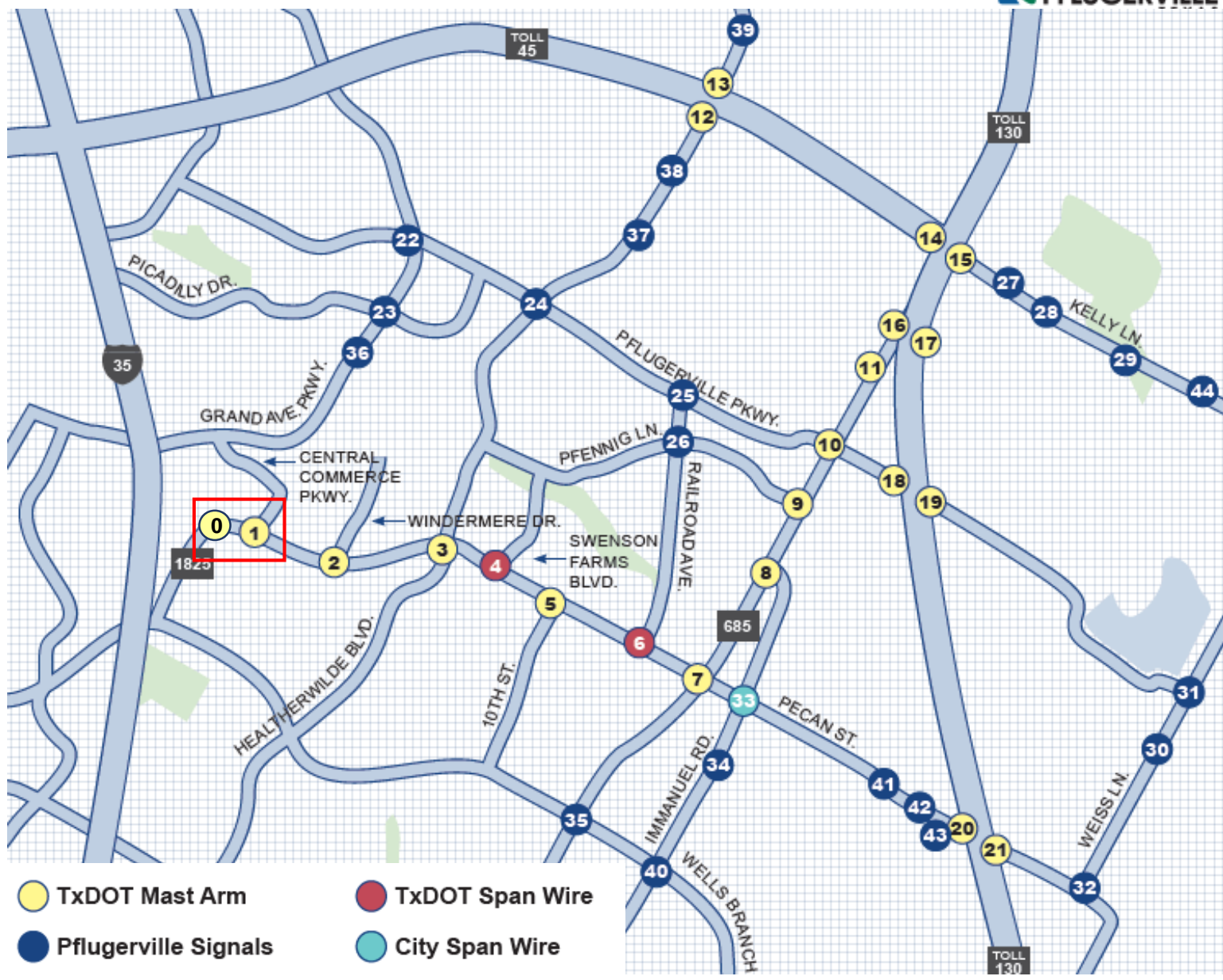
PFLUGERVILLE SIGNAL SYSTEM ASSESSMENT & IMPROVEMENTS PLAN DISCUSSION

Agenda

1. Background
2. TxDOT Signal System Takeover
3. City Signal System Improvements
4. Project Prioritization & Capital Improvements
5. Next Steps
6. Questions & Discussion

Traffic Signal Network

- Total Signals (City Limits) - 43
- TxDOT – 20
 - Toll - 10
- City Signals – 23*
- Variety of Signal Controllers
- No Communication



TxDOT Signal System Takeover

- Texas Admin Code, Title 43, Chapter 25, Subchapter A, Rule Section 25.5: “Incorporated cities of 50,000 or more population are responsible for the maintenance and operation of traffic signals and flashers at locations on the State Highway System.”
- FM 1825/Vision Dr and FM 1825/Central Commerce Pkwy
- TxDOT Signals to transfer to the City – 10 (or 12)
- Total Future City maintained signals – 33 (or 35)

Field Inventory & Assessment

- Field Inventory
- Equipment Assessment
- Photo Log
- Summary List of Repairs & Improvements

Intersection ID: **3** PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: **Pflugerville Pkwy @ Heatherwide** Key Map: **[Blank]**

E-W Street: **Pflugerville Parkway** Date: **29-Mar** **29-Mar**

N-S Street: **Heatherwide Blvd** Signal Controller: **[Blank]**

DETECTION/COMMUNICATION

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	PRESENCE & SETBACK, ITS PLUS CAMERA
WB	VIVDS	1	N	N	PRESENCE & SETBACK, ITS PLUS CAMERA
NB	VIVDS	1	N	N	PRESENCE & SETBACK, ITS PLUS CAMERA
SB	VIVDS	1	N	N	PRESENCE & SETBACK, ITS PLUS CAMERA

SIGNS

APPROACH	TYPE	CONDITION / REMARKS
EB	LEFT TURN YIELD ON GREEN	FAIR
WB	LEFT TURN ON YIELD ON GREEN	FAIR
NB	LEFT TURN YIELD ON GREEN	FAIR
SB	LEFT TURN YIELD ON GREEN	FAIR

ADA RAMPS / PED SIGNALS

CORNER	SDWK (Y/N) RAMP (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB*/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMP - Y	1	FAIR	Y	FAIR	NO VISUAL OR APS COUNTDOWN
NE	SDWK - Y RAMP - Y	1	FAIR	Y	FAIR	NO VISUAL OR APS COUNTDOWN; PUSH BUTTON TOO QUIET
SE	SDWK - Y RAMP - Y	1	FAIR	Y	FAIR	NO VISUAL OR APS COUNTDOWN; PED BUTTON TOO FAR FROM RAMP
SW	SDWK - Y RAMP - Y	1	FAIR	Y	FAIR	NO VISUAL OR APS COUNTDOWN

*1 - LED; 2 - Count Down; 3 - Audible; 4 - Incandescent; 5 - Other (describe)

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/18	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS
NW	B	16	3x3", 3x2"		Y	
CONDITION / REMARKS						
MODEL	TYPE (T&1, T&2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION	
EAGLE EPAC 300	TS2	N	N	N	EBL	5 WBL 1
SOFTWARE	SIEMENS ITS				EBT	2 WBT 6
VERSION	3.32P				NBL	3 SBL 7
MISC.					NBT	8 SBT 4
CONDITION / REMARKS						
CLOCK TIME OFF; NO DLS						

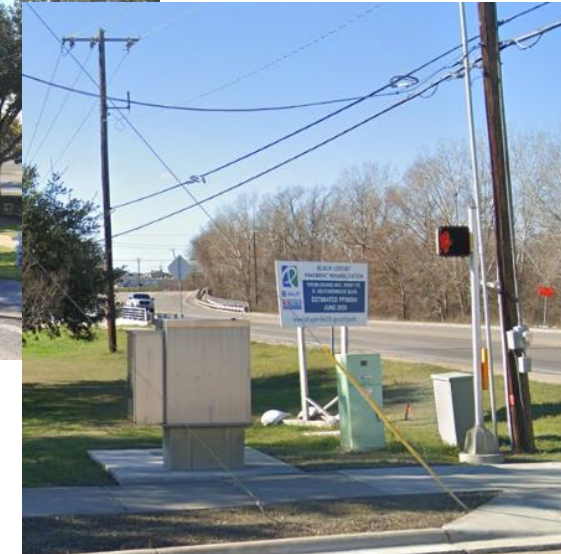
CONFLICT ELECTRONICS

Kimley»Horn



TxDOT Coordination

- Quarterly Meetings
- Design & Construct Span Wire to Mast Arm Signal
 - Pecan St/Swenson Farms
 - Pecan St/Railroad (Partial)
- 5-Sec Displays to Flashing Yellow Arrow
- Replace Malfunction Management Unit
- Battery Back-Up Units at Select Intersections
- Replace street light lamps with LED fixtures
- Consistent Video Detection
- Replace Video Monitors with LED (inside Cabinet)
- Develop & Implement Coordinated Signal Timings: FM 1825 and FM 685



CITY OF PFLUGERVILLE TXDOT SIGNALS UPGRADE SUMMARY

● TxDOT Mast Arm
 ● TxDOT Span Wire
 ● Pflugerville Signals

Upgrades

Key

A. Upgrade Existing Span Wire signal to Mast-Arm Signal

B. New Span-Wire Signal

C. Convert EB-WB Left-Turns to Flashing Yellow Arrow Display

D. Convert NB-SB Left-Turns to Flashing Yellow Arrow Display

E. Change MMU to be Compatible with FYA Operations

F. Provide Battery Back-Up Unit (Pending Justification Report)

G. Provide Working Wireless Comm. Radio (OR GPS Clock)

H. Change High Pressure Sodium lights to LED Luminaires

I. Replace ITS+ Video Detection Camera with ITERIS Camera

J. Add No-Ped Crossing Sign

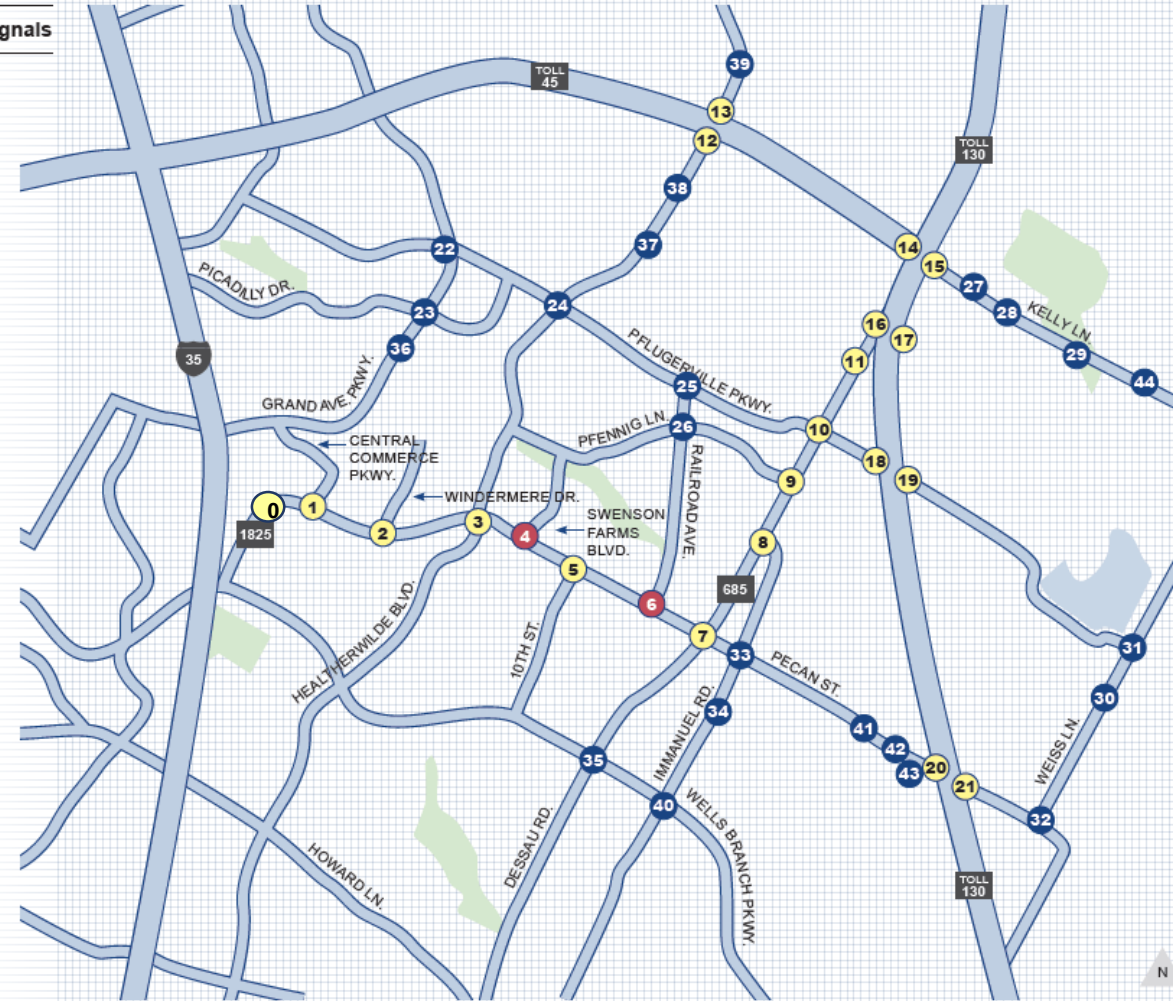
K. Replace TV Monitor inside Cabinet with LCD Monitor

L. Repair Ped Equipment (Displays, Push-Buttons, Signs)

M. Corridor Signal Re-timing

Note: Operations and Maintenance at existing signals along toll roads SH 45 and SH 130 (#12-21) shall remain with TxDOT

- 1 C|F|G|H|K|L|M
FM 1825 & Central Commercial
- 2 C|E|G|H|K|L|M
FM 1825 & Windermere Drive
- 3 C|F|G|H|I|L|M
FM 1825 & Heatherwilde Blvd
- 4 A|F|G|H|M
FM 1825 & Swenson Farms Blvd
- 5 C|E|G|H|L|M
FM 1825 & Meadows Lane
- 6 B|F|G|H|M
FM 1825 & Railroad Ave
- 7 C|D|F|G|H|M
FM 1825 & FM 685 Dessau
- 8 G|H|J|M
FM 685 & Old Austin Hutto Road
- 9 C|D|E|F|G|H|M
FM 685 & Pfennig Lane
- 10 D|E|F|G|H|K|M
FM 685 & Pflugerville Parkway
- 11 E|G|H|M
FM 685 & Town Center Drive
- 12 SH45 EBFR & Heatherwilde Blvd
- 13 SH45 WBFR & Heatherwilde Blvd
- 14 SH130 SBFR & Kelly Lane/45
- 15 SH130 NBFR & Kelly Lane/45
- 16 SH 130 SBFR & 685
- 17 SH 130 NBFR & 685
- 18 SH 130 SBFR & Pflugerville Parkway
- 19 SH 130 NBFR & Pflugerville Parkway
- 20 FM 1825 & SH 130 SBFR
- 21 FM 1825 & SH 130 NBFR



TxDOT Signals Repairs & Improvements Summary

TxDOT Schedule

- Swenson Farms/FM 1825 Mast-Arm Upgrade – Under Design
- Repairs & Upgrades by TxDOT Summer-Fall 2020
- Final Walk-thru – Sign off
- Execute Agreements between TxDOT & the City
- Anticipated Beginning of City Operations & Maintenance – **March 2021**



PFLUGERVILLE SIGNAL ACQUISITION INVENTORY WORKSHEET

City of Pflugerville Signal Acquisition from the Texas Department of Transportation
Final Walkthrough

Intersection	
Date	TxDOT Representative
City of Pflugerville Representative	Kimley-Horn Representative

The following items have been inspected for functionality and are of acceptable quality, including repair items and upgrade items addressed by TxDOT, or are otherwise not applicable to this intersection:

KEY	UPGRADE	YES	NO	N/A
A	Existing span wire signal upgraded to mast arm signal			
B	New span wire signal installed			
C	EB and WB left turns converted to FYA display			
D	NB and SB left turns converted to FYA display			
E	MMU converted to one compatible with FYA operations			
F	Battery back-up unit provided			
G	Working wireless radio or GPS clock provided			
H	LED luminaires provided (replacing high-pressure sodium luminaries)			
I	ITERIS video detection camera provided (replacing ITS+ cameras)			
J	No Ped Crossing sign provided			
K	LCD monitor provided in cabinet (replacing TV monitors)			
L	Pedestrian equipment repaired (displays, push-buttons, signs)			
M	Corridor signals have been retimed			
	Additional intersection-specific repairs as agreed with TxDOT			

NOTES

SIGNATURE

TxDOT Representative

Date

City of Pflugerville Representative

Date

Kimley-Horn Representative

Date

City Signals Field Inventory & Assessment

- Span-Wire Signal: Pecan St / Immanuel Rd
- 5-Section Displays to Flashing Yellow Arrow
- Pedestrian Infrastructure
- Variety of Signal Controllers



CITY OF PFLUGERVILLE CITY SIGNALS UPGRADE SUMMARY

- TxDOT Mast Arm
- TxDOT Span Wire
- City Signals
- City Span Wire

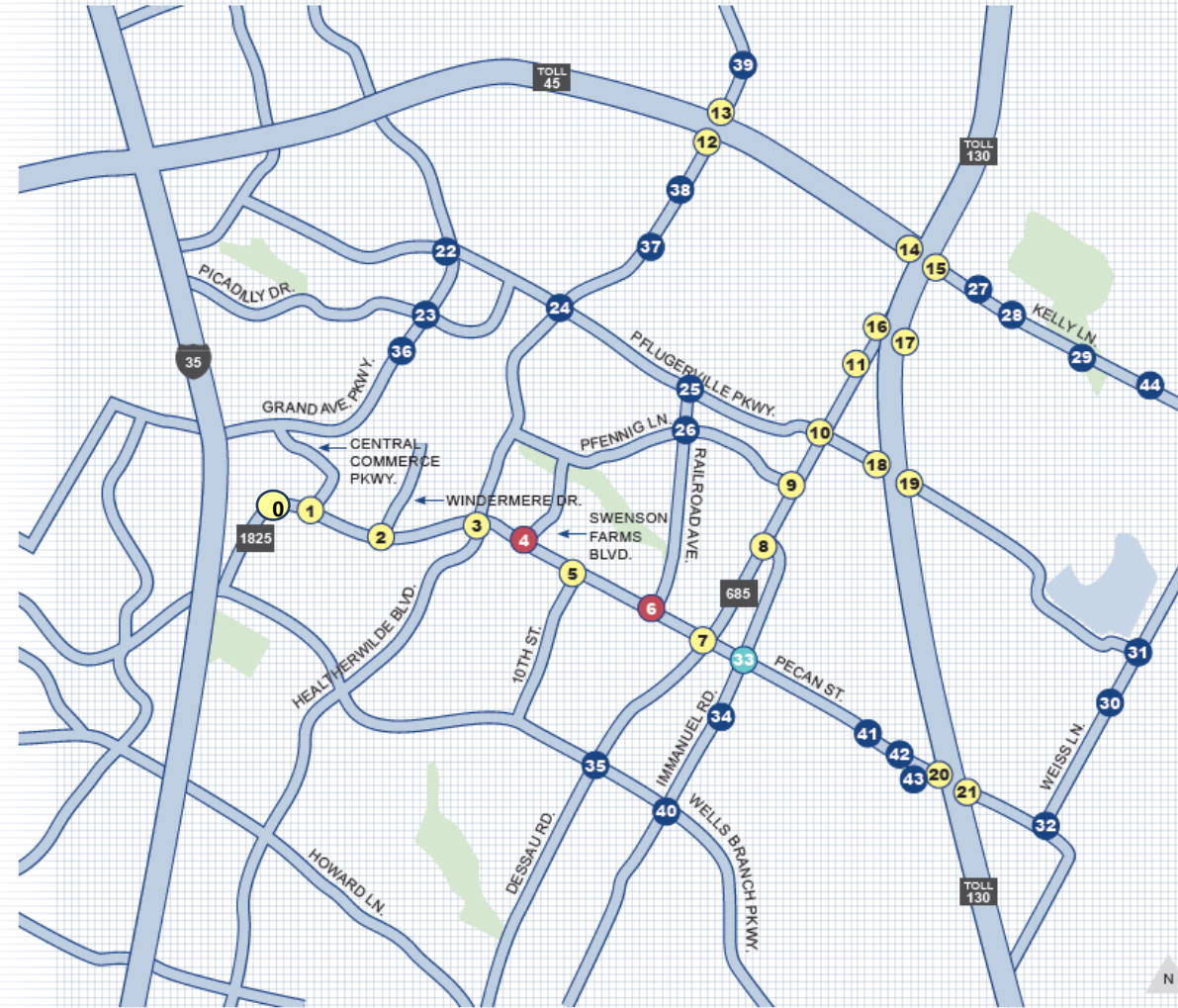
Upgrades

Key

- A.** Upgrade Existing Span Wire signal to Mast-Arm Signal
- B.** New Span-Wire Signal
- C.** Convert EB-WB Left-Turns to Flashing Yellow Arrow Display
- D.** Convert NB-SB Left-Turns to Flashing Yellow Arrow Display
- E.** Change MMU to be Compatible with FYA Operations
- F.** Provide Battery Back-Up Unit (Pending Justification Report)
- G.** Provide Working Wireless Comm. Radio (OR GPS Clock)
- H.** Change High Pressure Sodium lights to LED Luminaires
- I.** Add APS Pedestrian Units with Countdown Heads
- J.** Update Pedestrian ramps & Pole access to be ADA Compliant
- K.** Replace TV Monitor inside Cabinet with LCD Monitor (Displays, Push-Buttons, Signs)
- L.** Repair Ped Equipment (Displays, Push-Buttons, Signs)
- M.** Corridor/Intersection Signal Re-timing
- N.** Repair Cabinet Components
- O.** Add ILSN Signs

Note: B is not used on this map.

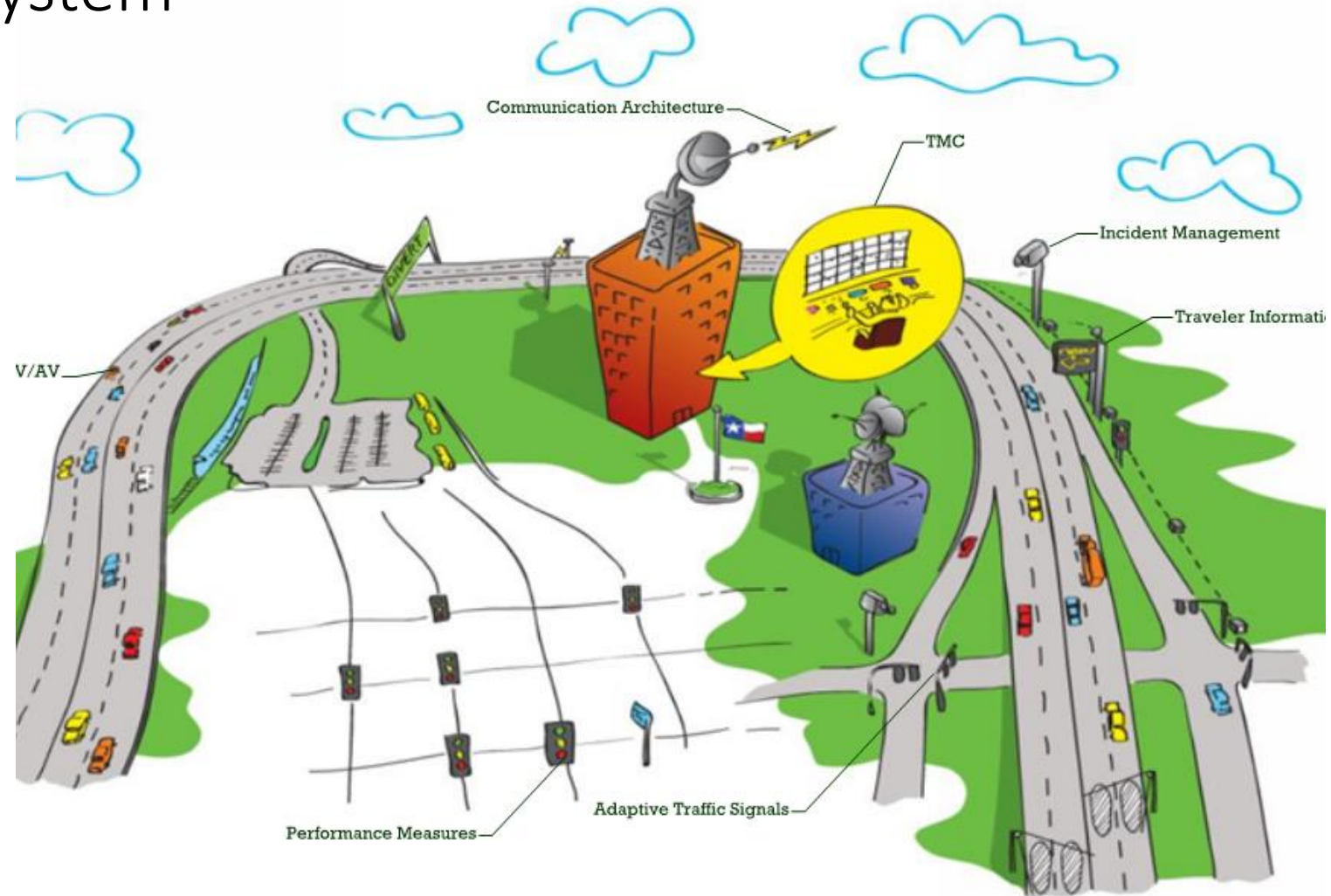
- 22** C | D | E | F | G | I | J | K | L | M | O
Pflugerville Pkwy & Grand Avenue Pkwy
- 23** C | D | E | F | G | I | J | M | O
Picadilly Drive & Grand Avenue Pkwy
- 24** C | D | E | F | G | I | L | M | N | O
Pflugerville Pkwy & Heatherwilde Blvd
- 25** C | E | G | I | J | K | L | M | N | O
Pflugerville Pkwy & Railroad Avenue
- 26** F | G | L | M | N | O
Pfennig Lane & Railroad Avenue
- 27** E | F | L | M | O
Kelly Lane & Colorado Sands Drive
- 28** F | J | L | M | N | O
Kelly Lane & Kennemer Drive
- 29** F | J | M | O
Kelly Lane & Falcon Pointe Blvd
- 30** F | G | M | O
Weiss Lane & Wolf Pack Drive
- 31** F | G | J | M | O
Pflugerville Pkwy & Weiss Lane
- 32** C | F | G | I | J | M | O
Pecan Street & Weiss Lane
- 33** A | C | D | E | F | G | H | I | J | K | M | O
Pecan Street & Old Austin-Hutto Immanuel Rd
- 34** D | E | F | G | I | J | M | N | O
Immanuel Road & Oxford Drive
- 35** C | E | F | G | I | J | K | L | M | O
Wells Branch & Dessau Lane
- 36** M
Grand Ave Pkwy at Black Locust Dr
- 37** M | O
Heatherwilde Blvd at Kingston Lacy Blvd
- 38** M
Heatherwilde Blvd at New Meister Lane
- 39** M
Heatherwilde Blvd at Cheyenne Valley Dr
- 40** Wells Branch at Immanuel Road
- 41** Pecan Street at Pfennig Lane
- 42** Pecan Street at Project Charm Dwy
- 43** Pecan Street at Biltmore Ave
- 44** Kelly Lane at Hidden Lake Dr-Jakes Hill Rd



City Signals Repairs & Improvements Summary

Intelligent Transportation System

- Intelligent Transportation System (ITS) = **Smart Mobility**
- Technology that is leveraged to :
 - collect important information
 - convey important information
 - share information
- **ITS** helps make informed decisions
- **ITS** improves transportation safety and mobility
- **ITS** enhances productivity



Project Prioritization & Implementation

- Priority 1: Repairs and Upgrades to meet Standards
- Priority 2: Set-up Communication System & Advanced Transportation Management System (ATMS) for Remote Monitoring & Control
- Priority 3: Intelligent Transportation System (ITS) Improvements
- Implementation over 3 Phases

Capital Improvements Preliminary Budget Summary

Phase 1 - \$1,388,955.63

Phase 2 – \$1,063,369.35

Phase 3 - \$890,042.50

Total Phases - \$3,342,367.48

Project Initiative	Project Priority	Phase 1	Phase 2	Phase 3
		Item Cost	Item Cost	Item Cost
Signal Repairs	1	\$ 593,000.00	\$ -	\$ -
Signal Upgrades	2	\$ -	\$ 270,000.00	\$ -
ITS Communication Infrastructure	1	\$ 247,250.00	\$ -	\$ -
CCTV Network		\$ -	\$ 163,860.00	\$ -
ILSN Signs	3	\$ -	\$ -	\$ 200,000.00
Traffic Signal Controller Upgrades	2	\$ -	\$ 70,200.00	\$ -
Emergency Vehicle Preemption	3	\$ -	\$ -	\$ 345,000.00
Advanced Traffic Management System	1	\$ 210,000.00	\$ 100,000.00	\$ 56,000.00
Detection Systems	3	\$ -	\$ 200,000.00	\$ -
TMC and Video Management System	3	\$ -	\$ -	\$ 72,000.00
	Subtotal:	\$ 1,050,250.00	\$ 804,060.00	\$ 673,000.00
	Contingency: (%)	\$ 157,537.50	\$ 120,609.00	\$ 100,950.00
	Construction Total:	\$ 1,207,787.50	\$ 924,669.00	\$ 773,950.00
	Engineering Costs	\$ 181,168.13	\$ 138,700.35	\$ 116,092.50
	Project Costs	\$ 1,388,955.63	\$ 1,063,369.35	\$ 890,042.50
	TOTAL PHASES 1+2+3	\$ 3,342,367.48		



Traffic Signal Improvements

Why Should the City Develop a Traffic Signal Management Plan?

Do you operate or maintain traffic signals?

Is the traffic signal system beyond its effective life cycle and in need of significant upgrades that are difficult to justify?

Is the effectiveness of traffic signal design, operation or maintenance dependent on one key individual?

Do you have trouble garnering support and funding for traffic signal operations program?

Have you recently taken over a traffic signal program that lacks documentation?

Do you perform more reactive and emergency maintenance than preventive maintenance?

Do you struggle with justifying your staffing and resources to management?

Do you find it difficult to demonstrate the need to retime your signals?

Has your budget and/or staff diminished but you are expected to effectively operate and maintain the same **(MORE)** number of signals?

Do you use outside help to design, operate or maintain your signal system?

Has the traffic signal system expanded over time without relative increases in the resources to adequately operate and maintain the system?



Phase 1 Traffic Signal Capital Improvement Projects

Signal Repairs	Span-Wire to /Mast-Arm Upgrade	Priority 1	\$450,000.00
	Replace 5-Sec P+P to 4-Sec FYA (Intersection)	Priority 1	\$48,000.00
	Repair & Upgrade PED PBs to APS Units (Intersection	Priority 1	\$60,000.00
	MISC Repair Items (Inside Cabinet Equipment)	Priority 1	\$35,000.00
ITS Communication Infrastructure	Dual Band Wireless Ethernet Radio (Off-System)	Priority 1	\$103,500.00
	Dual Band Wireless Ethernet Radio (Off-System)	Priority 1	\$54,000.00
	Hardened Ethernet Switch (Field)	Priority 1	\$61,250.00
	Ethernet Switch (Layer 3) (TMC/BTMC)	Priority 1	\$14,000.00
	Network Firewall	Priority 1	\$2,500.00
	Wireless Backhaul Link	Priority 1	\$12,000.00
ATMS	Advanced Traffic Management System (CENTRACS or Equipment)	Priority 1	\$190,000.00
	CCTV Module	Priority 1	\$20,000.00

Subtotal Costs* **\$1,050,250.00**

* Add Contingency % + Engineering = \$1,388,955.63



Next Steps

- Finalize Traffic Signal Assessment & Implementation Plan
- Initiate Planning Phase 1 Design Projects
- Return to Council July 14th
- Design Phase 1 Projects in FY2020 and FY2021
- Kick off Phase 1 Projects in FY21/FY22



Questions and Discussion