

# PFLUGERVILLE SIGNAL SYSTEM ASSESSMENT & IMPROVEMENTS PLAN

JUNE 2020



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## Executive Summary

The City of Pflugerville is one of the fastest growing communities in the nation with a population of approximately 71,000 in 2019 per City's estimates. When the 2020 Census results show the population over 50,000, the City will be required to take over signal operations and maintenance of all signals and flashers within their jurisdiction that are currently maintained by TxDOT. In preparation for this transition of responsibility, Kimley-Horn conducted the Pflugerville Signal System Assessment and Improvements project. The main objectives of this project are:

- Develop plan for takeover of operations and maintenance of existing TxDOT signals within the City limits.
- Inventory and assessment of existing City signals.
- Evaluate & establish City's preferences for traffic signal equipment and technology.
- Evaluate signal communication alternatives.
- Prioritization of City's Advanced Transportation Management System build-out.

Kimley-Horn conducted an inventory of all 21 TxDOT 'On-System' signals and 18 'Off-System' City signals within City of Pflugerville's limits, evaluated state of the equipment, and compliance with current Texas Manual for Uniform Control Devices (TxMUTCD) and other applicable standards. Out of 21 signalized TxDOT locations, operations and maintenance at 10 locations that are based off SH 45 and SH 130 toll roads will remain with TxDOT and not transfer to the City.

Based on coordination between the City and TxDOT staff, a summary of repairs and improvements at 11 locations was developed. Repairs include replacing malfunctioning equipment such as pedestrian push-buttons, signal displays, and vehicle detection units. Improvements to the signals include replacing 5-section displays for left-turn movements with 4-section displays with flashing yellow arrows (FYAs), furnishing Malfunction Management Unit (MMU) in the signal cabinet compatible with FYA operations, replacing old luminaires with LED lamps, and providing Battery Back-up Units (BBU) at select locations. Additionally, TxDOT will upgrade existing span-wire signal at FM 1825 and Swenson Farms Blvd to a mast-arm signal with all new equipment. At the other span-wire signal FM 1825 and Railroad Ave, TxDOT will install all new equipment but maintain span-wires due to lack of right-of-way for new mast-arm poles and pedestrian ramps

During field inventory it was found that City's 18 existing signals included a variety of different signal controllers. After evaluating different types of the signal controllers, the City has decided to use Econolite Cobalt signal controllers for all future deployments. All existing signal controllers will be planned to be replaced over a period of time.

Existing TxDOT signals have a wireless radio and an antenna installed at the intersection. However, none of the communication equipment is currently operational. None of City's signals include any communication. Two different alternatives were discussed in this

project. City's preferred alternative is to install fixed wireless communication system using ethernet radios. The second alternative is to use cellular modems at all locations.

For the City to transition to an Advanced Transportation Management System (ATMS), several Intelligent Transportation System related projects will need to be completed. A preliminary prioritization plan was developed to split the projects in to three main phases.

- Priority 1 – Repair or Replace malfunctioning equipment; upgrade equipment to comply with TxMUTCD standards and City guidelines.
- Priority 2 – Set-up system to allow remote monitoring and control of traffic signals.
- Priority 3 – Intelligent Transportation System (ITS) Improvements

Using above criteria, all projects were divided into three (3) implementation phases. Phase 1 is proposed to be all projects under Priority 1 and Priority 2 which consist of repairs, upgrades need to get in compliance with standards, and setting up wireless communication network. Phase 1 will need to be completed before Phases 2 & 3 may be implemented as vast majority of all the improvements in the latter phases will require a communication network. Projects under Phase 2 and Phase 3 may be combined and implemented simultaneously as a single phase per City's discretion.

Preliminary cost of design and construction of all improvements is anticipated to be approximately \$3.34 Million. Phase 1 is anticipated to be approx. \$1.4 Million, Phase 2 is anticipated to be approx. \$1 Million, and Phase 3 is anticipated to be approx. \$900,000.

## 1.0 Introduction

The City of Pflugerville is one of the fastest growing communities in the nation and is located approximately 20 miles north of Austin. The City has witnessed significant increase in population from approximately 19,500 in 2000 to approximately 48,500 in 2010 per the Census Bureau. The population will exceed 60,000 in the 2020 Census. The TxDOT roads and highways SH 45, SH 130, FM 685, and FM 1825 form part of the City's primary roadway network for this region. All traffic control devices along these TxDOT roadways are currently maintained and operated by TxDOT. Per Title 43 of the Texas Administrative Code, operations and maintenance of traffic signal infrastructure and other related traffic control devices will be transferred to the City after the population crosses 50,000 in 2020 Census. Prior to this signal takeover from TxDOT, City officials proactively decided to complete a Traffic Signal Inventory, Assessment, and Improvements Plan for existing TxDOT signals that are considered "on-system". The City currently operates and maintains signals that are on city roads and are considered "off-system" signals.

The main objectives of this project are as follows:

- Develop plan for takeover of operations and maintenance of existing TxDOT signals within the City limits.
- Inventory and assessment of existing City signals.
- Evaluate & establish City's preferences for traffic signal equipment and technology.
- Evaluate signal communication alternatives.
- Prioritization of City's Advanced Transportation Management System build-out.

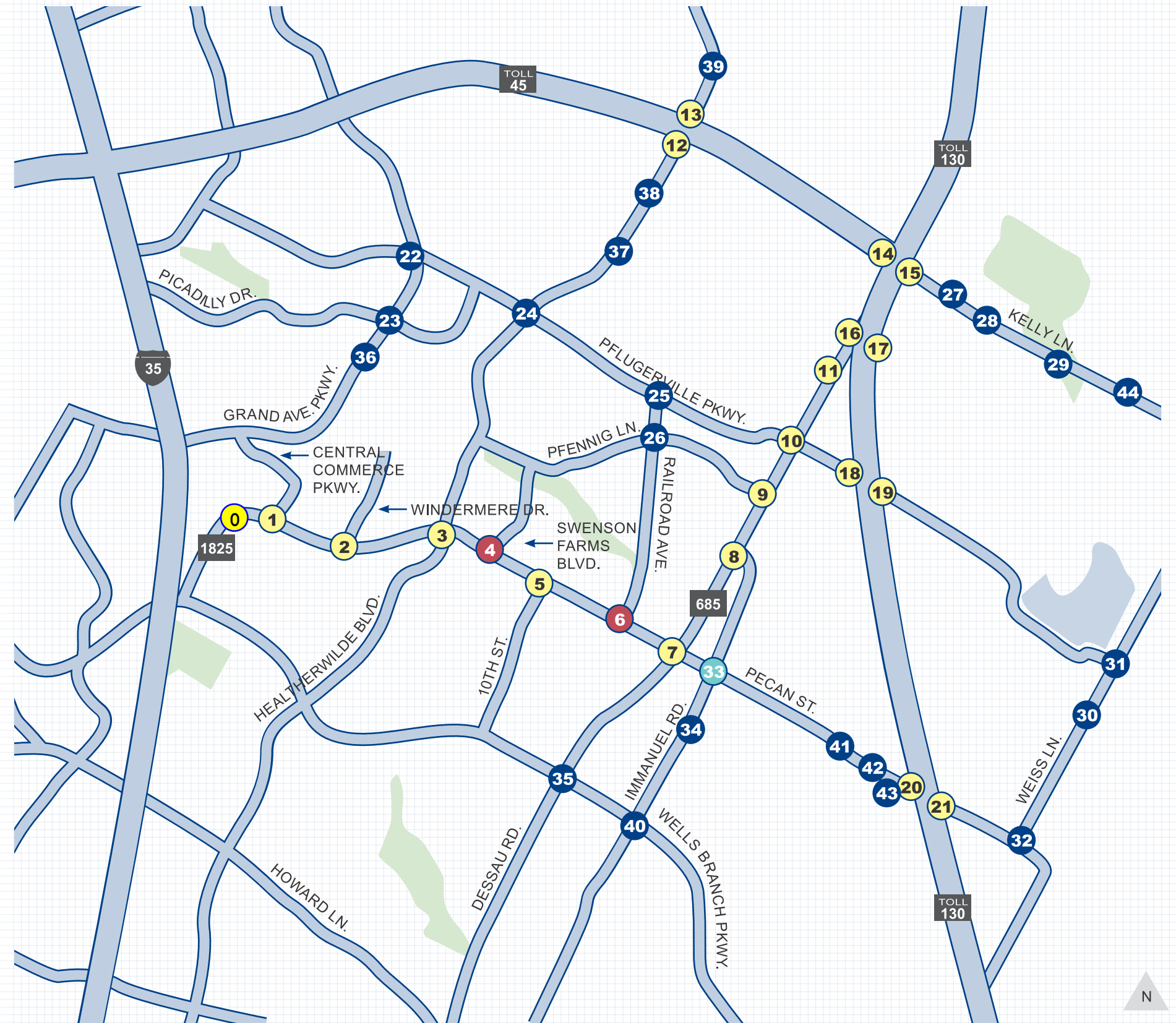
### The project

**Exhibit 1** shows all the signals within the City limits and identifies who owns and operates each signal.

# CITY OF PFLUGERVILLE TRAFFIC SIGNALS NETWORK

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

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li><span style="color: yellow;">●</span> 1 FM 1825 &amp; Central Commercial</li> <li><span style="color: yellow;">●</span> 2 FM 1825 &amp; Windermere Drive</li> <li><span style="color: yellow;">●</span> 3 FM 1825 &amp; Heatherwilde Blvd</li> <li><span style="color: red;">●</span> 4 FM 1825 &amp; Swenson Farms Blvd</li> <li><span style="color: yellow;">●</span> 5 FM 1825 &amp; Meadows Lane</li> <li><span style="color: red;">●</span> 6 FM 1825 &amp; Railroad Ave</li> <li><span style="color: yellow;">●</span> 7 FM 1825 &amp; FM 685 Dessau</li> <li><span style="color: yellow;">●</span> 8 FM 685 &amp; Old Austin Hutto Road</li> <li><span style="color: yellow;">●</span> 9 FM 685 &amp; Pfennig Lane</li> <li><span style="color: yellow;">●</span> 10 FM 685 &amp; Pflugerville Parkway</li> <li><span style="color: yellow;">●</span> 11 FM 685 &amp; Town Center Drive</li> <li><span style="color: yellow;">●</span> 12 SH45 EBFR &amp; Heatherwilde Blvd</li> <li><span style="color: yellow;">●</span> 13 SH45 WBFR &amp; Heatherwilde Blvd</li> <li><span style="color: yellow;">●</span> 14 SH130 SBFR &amp; Kelly Lane/45</li> <li><span style="color: yellow;">●</span> 15 SH130 NBFR &amp; Kelly Lane/45</li> <li><span style="color: yellow;">●</span> 16 SH 130 SBFR &amp; 685</li> <li><span style="color: yellow;">●</span> 17 SH 130 NBFR &amp; 685</li> <li><span style="color: yellow;">●</span> 18 SH 130 SBFR &amp; Pflugerville Parkway</li> <li><span style="color: yellow;">●</span> 19 SH 130 NBFR &amp; Pflugerville Parkway</li> <li><span style="color: yellow;">●</span> 20 FM 1825 &amp; SH 130 SBFR</li> <li><span style="color: yellow;">●</span> 21 FM 1825 &amp; SH 130 NBFR</li> <li><span style="color: yellow;">●</span> 0 FM 1825 &amp; Vision Dr</li> </ul> | <ul style="list-style-type: none"> <li><span style="color: blue;">●</span> 22 Pflugerville Pkwy &amp; Grand Avenue Pkwy</li> <li><span style="color: blue;">●</span> 23 Picadilly Drive &amp; Grand Avenue Pkwy</li> <li><span style="color: blue;">●</span> 24 Pflugerville Pkwy &amp; Heatherwilde Blvd</li> <li><span style="color: blue;">●</span> 25 Pflugerville Pkwy &amp; Railroad Avenue</li> <li><span style="color: blue;">●</span> 26 Pfennig Lane &amp; Railroad Avenue</li> <li><span style="color: blue;">●</span> 27 Kelly Lane &amp; Colorado Sands Drive</li> <li><span style="color: blue;">●</span> 28 Kelly Lane &amp; Kennemer Drive</li> <li><span style="color: blue;">●</span> 29 Kelly Lane &amp; Falcon Pointe Blvd</li> <li><span style="color: blue;">●</span> 30 Weiss Lane &amp; Wolf Pack Drive</li> <li><span style="color: blue;">●</span> 31 Pflugerville Pkwy &amp; Weiss Lane</li> <li><span style="color: blue;">●</span> 32 Pecan Street &amp; Weiss Lane</li> <li><span style="color: cyan;">●</span> 33 Pecan Street &amp; Old Austin-Hutto Immanuel Rd</li> <li><span style="color: blue;">●</span> 34 Immanuel Road &amp; Oxford Drive</li> <li><span style="color: blue;">●</span> 35 Wells Branch &amp; Dessau Lane</li> <li><span style="color: blue;">●</span> 36 Grand Ave Pkwy at Black Locust Dr</li> <li><span style="color: blue;">●</span> 37 Heatherwilde Blvd at Kingston Lacy Blvd</li> <li><span style="color: blue;">●</span> 38 Heatherwilde Blvd at New Meister Ln</li> <li><span style="color: blue;">●</span> 39 Heatherwilde Blvd at Cheyenne Valley Dr</li> <li><span style="color: blue;">●</span> 40 Wells Branch at Immanuel Road</li> <li><span style="color: blue;">●</span> 41 Pecan Street at Pfennig Lane</li> <li><span style="color: blue;">●</span> 42 Pecan Street at Project Charm Dwy</li> <li><span style="color: blue;">●</span> 43 Pecan Street at Biltmore Ave</li> <li><span style="color: blue;">●</span> 44 Kelly Lane at Hidden Lake Dr-Jakes Hill Rd</li> </ul> |
|---|--|



## 2.0 Methodology

At the beginning of the project a kickoff meeting was scheduled with the City and TxDOT to make introductions and initiate dialogue with TxDOT about all items related to takeover of signal operations and maintenance. After the kick-off meeting, field inventory process was initiated; above-ground traffic signal infrastructure and traffic signal cabinets and controllers were assessed. This was all documented in an excel database with data fields for the inventory of all major traffic signal equipment at each intersection. Photographs were taken at all signalized intersections to pictorially document each intersection and capture any deficiencies in existing signal components and/or traffic signal infrastructure. The traffic signal inventory considered the following major signal items.

### 2.1 *Above-ground Traffic Signal Infrastructure Inventory*

This included the working and physical condition of traffic signal poles, signal heads, traffic signs, vehicle detection, pedestrian facilities, communication equipment, electrical services, and ground boxes.

#### 2.1a *Signal Poles*

Since signal poles are the framework of the traffic signal infrastructure, any major damages to the traffic signal poles either due to weathering or due to vehicular accidents were noted. The inventory also checked the poles for any minor deficiencies such as missing pole caps and exposed handholes.

#### 2.1b *Vehicular Signal Heads*

Proper alignment and visibility of vehicular signal heads are essential for the proper functioning of traffic signals and driver communication. Signal heads were checked for misalignments and burnouts. For LED indications, those with significant number of LED's out were also noted.

#### 2.1c *Pedestrian Facilities*

Pedestrian signal heads were checked for proper alignment and functioning "Walk/Don't Walk" indications. Integrity of pushbuttons and whether it called the associated pedestrian phase were also checked. Pedestrian countdown heads were also checked. The timing of the countdown heads based on number of lanes and average walking speed was also assessed. Existing pedestrian ramps were evaluated to assess compliance with TxMUTCD guidelines for ADA accessibility.

#### 2.1d *Vehicle Detection*

Functional vehicle detection allows for more efficient traffic signal timings and operations. The inventory identified the type of vehicle detection, if any,



that was being used at each intersection. If inductive loops were used, the pavement and the loop condition was assessed based on visual inspection. Verification of detector operation was performed during the signal cabinet/controller inventory.

### **2.1e Signage**

Missing signs, those in poor condition or improperly used, were noted.

### **2.1f Illumination**

Existing illumination on top of signal poles was evaluated to check if they were the older technology using High-Pressure Sodium (HPS) lamps or the newer LED lamps.

## **2.2 Traffic Signal Cabinet and Controller Inventory**

The inventory of traffic signal cabinets, traffic controllers, and electrical service at each intersection was done.

### **2.2a Signal Cabinet, Controller and Other Hardware**

The inventory included signal cabinet, traffic controller, detector rack, conflict monitor, load switches, video monitor, power source, existing conduit sizes inside the cabinet, and general field wiring. During the inventory, the type and condition of electrical hardware units were verified, and the proper functioning of each component was also checked.

### **2.2b Electrical Service and other items**

The inventory identified the location and condition of electrical services, and those services without proper locks or labeling were noted. Other signal related electrical hardware at these locations was also inventoried.

After the field inventory of each intersection, all the field notes and pictures were compiled into a database and analyzed used to complete the traffic signal assessment.

## 3.0 Inventory of Signals

### 3.1 TxDOT On-System Traffic Signals

Upon transfer of the TxDOT on-system signals, the City of Pflugerville will be responsible for operating and maintaining 11 'on-system' traffic signals. The remaining five (5) diamond interchange signals are all along SH 45 and SH 130 Toll Roads. Operations and maintenance at these signals will remain with TxDOT or their contractor. Existing TxDOT 'on-system' signals within the City limits include:

- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| 0. FM 1825 @ Vision Drive         | 11. FM 685 @ Town Center Drive    |
| 1. FM 1825 @ Central Commerce     | 12. SH 45 EB @ Heatherwilde Blvd  |
| 2. FM 1825 @ Windermere Drive     | 13. SH 45 WB @ Heatherwilde Blvd  |
| 3. FM 1825 @ Heatherwilde Blvd    | 14. SH 130 SB @ Kelly Lane        |
| 4. FM 1825 @ Swenson Farms        | 15. SH 130 NB @ Kelly Lane        |
| 5. FM 1825 @ Meadows Lane         | 16. SH 130 SB @ FM 685            |
| 6. FM 1825 @ Railroad Avenue      | 17. SH 130 NB @ FM 685            |
| 7. FM 1825 @ Dessau Road          | 18. SH 130 SB @ Pflugerville Pkwy |
| 8. Old Austin Hutto Road @ FM 685 | 19. SH 130 NB @ Pflugerville Pkwy |
| 9. FM 685 @ Pfennig Lane          | 20. SH 130 SB @ Pecan Street      |
| 10. FM 685 @ Pflugerville Pkwy    | 21. SH 130 NB @ Pecan Street      |

Traffic signals at FM 1825/Vision Drive and FM 1825/Central Commerce Pkwy are not within City boundaries. However, these signals form the gateway to the City. Due to proximity to other signals along FM 1825 (Pecan Street), it is critical to maintain signal timings at these two intersections coordinated with rest of the corridor. If operations and maintenance at these locations were to remain with TxDOT, signal timings are anticipated to vary which may cause unnecessary disruption to traffic flow along the corridor. As a result, it is recommended that the City take over operations and maintenance at these signals to increase efficiency of traffic flow through the corridor.

A field inventory was conducted at each of the above locations to understand state of existing equipment and to identify damaged or malfunctioning equipment. The table and inventory data sheets are included in [Appendix A](#).

### 3.2 City of Pflugerville Off-System Traffic Signals

City of Pflugerville currently maintains and operates 23 isolated traffic signals. These signals include:

- |  |  |
|--|--|
| 22. Pflugerville Pkwy at Grand Avenue Pkwy         | 34. Immanuel Road at Oxford Drive              |
| 23. Grand Avenue Pkwy at Picadilly Drive           | 35. Dessau Lane at Wells Branch Pkwy           |
| 24. Pflugerville Pkwy at Heatherwilde Blvd         | 36. Grand Avenue Pkwy at Black Locust Drive    |
| 25. Pflugerville Pkwy at Railroad Avenue           | 37. Heatherwilde Blvd at Kingston Lacy Blvd    |
| 26. Pfennig Lane at Railroad Avenue                | 38. Heatherwilde Blvd at Meister Lane          |
| 27. Kelly Lane at Colorado Sands Drive             | 39. Heatherwilde Blvd at Cheyenne Valley Drive |
| 28. Kelly Lane at Kennemer Drive                   | 40. Wells Branch at Immanuel Road              |
| 29. Kelly Lane at Falcon Pointe Blvd               | 41. Pecan Street at Pfennig Lane*              |
| 30. Weiss Lane at Wolf Pack Drive                  | 42. Pecan Street at Project Charm Driveway*    |
| 31. Pflugerville Pkwy at Weiss Lane                | 43. Pecan Street at Biltmore Avenue*           |
| 32. Weiss Lane at Pecan Street                     | 44. Kelly Lane at Hidden Lake Drive*           |
| 33. Pecan Street at Old Austin-Hutto/Immanuel Road |  |

Traffic signals listed on 41 through 44 are in various stages of design and construction, but they are included to reflect the most current status of City signal ownership.

A field inventory was conducted at each of the above locations to understand state of existing equipment and to identify damaged or malfunctioning equipment. The table and inventory data sheets are included in [Appendix B](#).

## 4.0 TxDOT Coordination

After the field inventory of signals was completed a list of repairs and improvements at all the TxDOT signals was developed. A meeting was scheduled with TxDOT and City staff to go over all the improvements. Below is a summary of the discussion with TxDOT regarding the different items on the upgrade list:

- Push Button Repairs – As part of their annual maintenance program, TxDOT will check, repair, and replace any malfunctioning pedestrian push-button and pedestrian signal count down head displays.
- Upgrade Span-Wire Signals to Mast-Arm Design – there are two intersections that fall in this category: Pecan St at Swenson Farms Blvd. and Pecan St at Railroad Ave. As part of a previous project, TxDOT tried to upgrade the span-wire signal at Railroad Ave to a mast-arm, however, due to right-of-way and existing utility constraints, it is not likely to install new mast-arm signal poles and provide pedestrian accessibility. At this location, TxDOT will maintain span-wire signal but replace all other signal infrastructure (except signal cabinet which is new) with new equipment. After the City takes over operations and maintenance of signals, they can plan for installing new mast-arm poles and re-use all other equipment. At Swenson Farms Blvd signal, TxDOT will upgrade the span-wire signal to mast-arm design. The timeline on this upgrade may be approx. 12-18 months.
- Signal Controller – The City has decided to adopt Econolite Cobalt signal controller as the new standard for all new deployments and replacement of existing non-compliant controllers. Based on discussion with TxDOT, they will not provide new Econolite Cobalt controllers if existing signal controllers are working normally.
- Vehicle Detection – the City has adopted Radar detection as the preferred technology for vehicle detection at signalized intersections. TxDOT will not be able to provide Radar detection at all existing locations which mostly have video detection. However, TxDOT will make sure that all locations are consistent in their use of type and manufacture of the video detection camera.
- Flashing Yellow Arrow Deployment – there are multiple signals along FM 685 and FM 1825 that currently use a 5-section head display for left-turn movements. Since a 5-Section display is no longer supported in the 2011 TxMUTCD, TxDOT will upgrade all such locations with 4-Section displays with Flashing Yellow Arrows (FYA).
- APS units with Countdown heads – TxDOT will ensure all push-buttons and pedestrian displays are working. However, TxDOT will be unable to provide Audible Ped Signal (APS) units at all locations.

- Malfunction Management Unit (MMU) Upgrade – To support FYA operations as part of left-turn improvements, TxDOT will upgrade (where necessary) the MMUs to be compatible with FYA operations.
- Battery back-up units (BBU) – TxDOT is open to considering BBUs at traffic signals, however, any such decision will be based on a ‘Justification memo’ for each location. Based on this direction, a Battery Back-up Unit Justification memo was developed for TxDOT. The memo was based on guidelines issues by the NYSDOT for prioritizing intersections for installing BBUs. The memo has been included in [Appendix C](#).
- LED luminaires – TxDOT will replace all existing High-Pressure Sodium (HPS) lamps on traffic signal poles with LED luminaires.
- Wireless radio – Multiple signal locations have existing Wireless Radio installed on a pole and a communication Switch inside the signal cabinet. TxDOT will check all locations with a wireless radio and replace any malfunctioning units with functional radios. TxDOT will not point the radio antennas at any specific direction. Alternatively, TxDOT will check internally if the Wireless Radios may be replaced by a GPS clock which will help the signal controllers maintain time and remain in step with adjacent signals.

Following up to the meeting with TxDOT and the City, a field meeting was scheduled with TxDOT to conduct a walk-through at each signal. Based on all the discussions, the final improvements to be provided by TxDOT are summarized in the next section.

## 5.0 Summary of Assessment

After receiving TxDOT feedback on ‘on-system’ signal improvements, City of Pflugerville staff was consulted to develop City’s preferences for equipment and technology for all signals in the future. Below criteria was used to complete signals assessment:

- Signal installation – Mast-Arm poles
- Signal heads – LED Displays with backplates
- Pedestrian infrastructure:
  - ADA compliant pedestrian ramps
  - Audible Pedestrian Signal (APS) units with countdown signal head displays.
- Left-turn “Protected+Permitted” phasing signal head – 4-section head with flashing yellow arrow (FYA)
- Functional presence/stop bar vehicle detection
- Malfunction Management Unit (MMU) compatible with FYA operations
- Signal cabinet – NEMA TS-2; 16 position load switch
- Econolite Cobalt signal controller
- Battery back-up unit (BBU)
- LED intersection lighting on signal poles
- Internally lit street name signs (ILSN)

Based on above criteria, a traffic signal assessment was performed, and the results for the TxDOT on-system and City of Pflugerville off-system signals are included in [Appendix A](#) and [Appendix B](#) respectively. Evaluation of major traffic signal items was done during inventory and the subsequent assessment provides information to repair and/or upgrade these signals to current standards. In some instances, repairs or upgrades are required to comply with NEC, Texas MUTCD or ADA guidelines. [Appendix D](#) and [Appendix E](#) include a photo log for all the TxDOT on-system and City of Pflugerville off-system signals respectively. **Exhibit 2** and **Exhibit 3** summarize the traffic signals assessment and classify the repairs and improvements needed at each signalized intersection for TxDOT ‘on-system’ and City of Pflugerville ‘off-system’ respectively. These are also tabulated in **Table 1** and **Table 2**. The issues/items that need to be addressed urgently either due to non-compliance, safety or major deficiencies are listed under “Repair Work”. The items that need to be dealt with in the long-term and is in the best interest of the City to either upgrade or repair are listed under “Upgrade Work”.

# CITY OF PFLUGERVILLE TXDOT SIGNALS UPGRADE SUMMARY



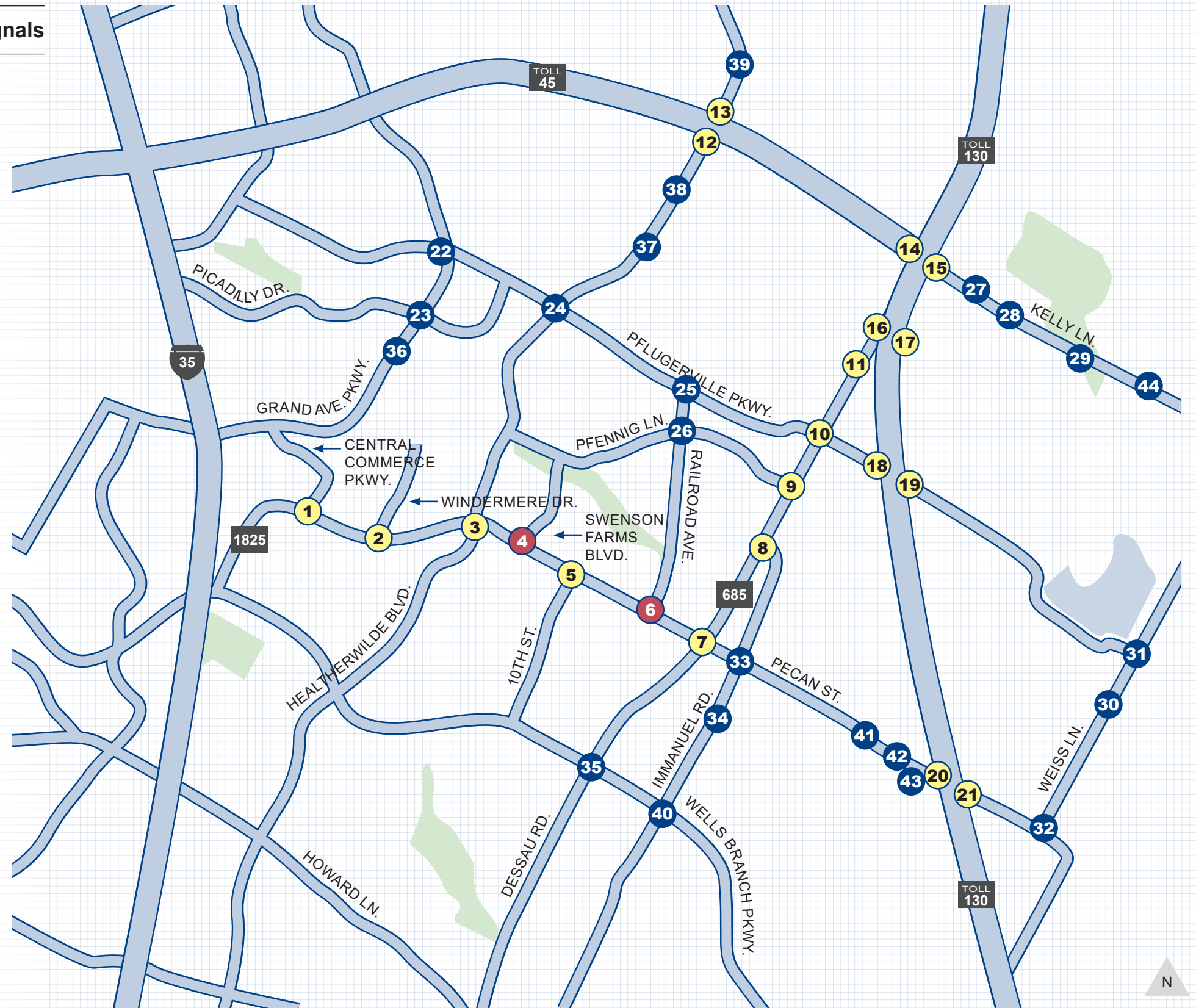
● TxDOT Mast Arm    
 ● TxDOT Span Wire    
 ● Pflugerville Signals

## 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

- 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



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

Table 1: Field Assessment Summary – TxDOT On-System Signals

														
TXDOT "ON-SYSTEM" TRAFFIC SIGNALS														
FIELD ASSESSMENT SUMMARY														
	LOCATION	A	B	C	D	E	F	G	H	I	J	K	L	M
Int. ID	Intersection	Upgrade Existing Span Wire signal to Mast-Arm Signal	New Span-Wire Signal	Convert EB-WB Left-Turns to Flashing Yellow Arrow Display	Convert NB-SB Left-Turns to Flashing Yellow Arrow Display	Change MMU to be Compatible with FYA Operations	Provide Battery Back-Up Unit (Pending Justification Memo)	Provide Working Wireless Comm. Radio (OR GPS Clock)	Change High Pressure Sodium lights to LED Luminaires	Replace ITS+ Video Detection Camera with ITERS Camera	Add No-Ped Crossing Sign	Replace TV Monitor inside Cabinet with LCD Monitor	Repair Ped Equipment (Displays, Push-Buttons, Signs)	Corridor Signal Re-timing
1	FM 1825 & Central Commercial			2			1	1	4			1	1	1
2	FM 1825 & Windermere Drive			2		1		1	4			1	1	1
3	FM 1825 & Heatherwide Blvd			2			1	1	4	4			1	1
4	FM 1825 & Swenson Farms Blvd	1					1	1	4					1
5	FM 1825 & Meadows Lane			2		1		1	4				1	1
6	FM 1825 & Railroad Ave		1				1	1	4					1
7	FM 1825 & FM 685 Dessau			2	2		1	1	4					1
8	FM 685 & Old Austin Hutto Road/Split Oak Drive							1	4		4			1
9	FM 685 & Pfennig Lane			2	2	1	1	1	4					1
10	FM 685 & Pflugerville Parkway				2	1	1	1	4			1		1
11	FM 685 & Town Center Drive					1		1	4					1
12	SH 45 EBFR & Heatherwide Blvd												1	
13	SH 45 WBFR & Heatherwide Blvd													
14	SH 130 SBFR & Kelly Lane/45			1		1							1	1
15	SH 130 NBFR & Kelly Lane/45			1										1
16	SH 130 SBFR & 685			1		1							1	
17	SH130 NBFR & 685			1										
18	SH 130 SBFR & Pflugerville Parkway													
19	SH 130 NBFR & Pflugerville Parkway													
20	FM 1825 & SH 130 SBFR													
21	FM 1825 & SH 130 NBFR												1	
	<b>TOTAL</b>	<b>1</b>	<b>1</b>	<b>16</b>	<b>6</b>	<b>7</b>	<b>7</b>	<b>11</b>	<b>44</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>8</b>	<b>13</b>

**NOTES**

- SIGNALS ALONG SH 45 & SH 130 WILL CONTINUE TO BE OPERATED & MAINTAINED BY TXDOT. IMPROVEMENTS IDENTIFIED ABOVE ARE FOR INFORMATION PURPOSES ONLY.
- THE TOTAL QUANTITIES LISTED AT THE BOTTOM ARE APPROXIMATE AND SUBJECT TO CHANGE.
- COLUMN L IDENTIFIES LOCATIONS WHERE AT LEAST ONE MALFUNCTIONING PEDESTRIAN ITEM WAS IDENTIFIED. TXDOT WILL REPLACE ALL MALFUNCTIONING ITEMS AT THE INTERSECTION.



# 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
- 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

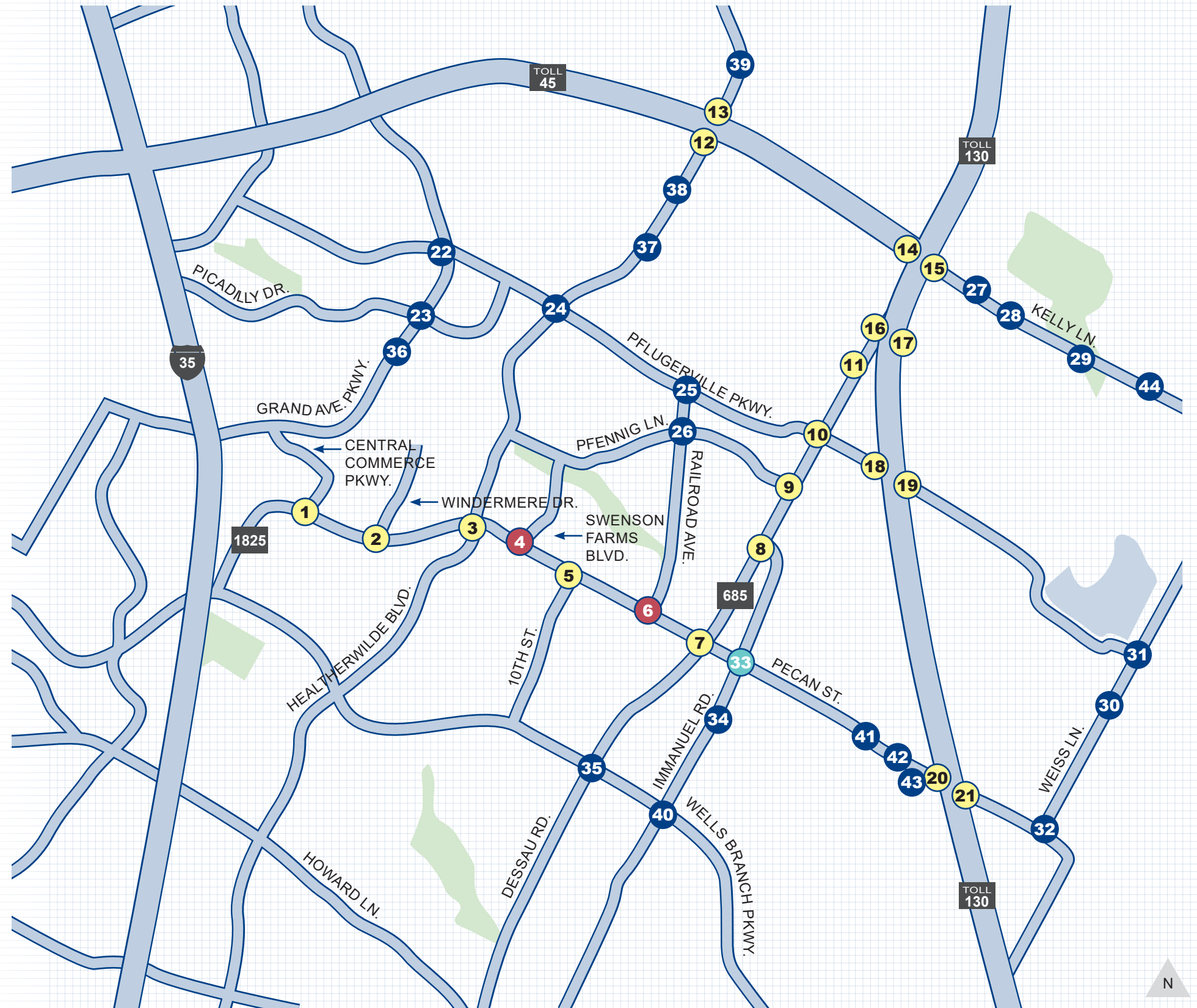


Table 2: Field Assessment Summary - City of Pflugerville Off-System Signals

CITY OF PFLUGERVILLE 'OFF-SYSTEM' TRAFFIC SIGNALS															
FIELD ASSESSMENT SUMMARY															
Int. ID	LOCATION Intersection	A Upgrade Existing Span Wire signal to Mast-Arm 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	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	L Repair Ped Equipment (Displays, Push-Buttons, Signs)	M Corridor/Intersection Signal Re-timing	N Repair Cabinet Components	O Add ILSN Signs
22	Pflugerville Pkwy & Grand Avenue Pkwy		2	2	1	1	1		8	4	1	1	1		4
23	Picadilly Drive & Grand Avenue Pkwy		2	2	1	1	1		8	2			1		4
24	Pflugerville Pkwy & Heatherwilde Blvd		2	2	1	1	1		8			1	1		4
25	Pflugerville Pkwy & Railroad Avenue		2		1		1		4	1	1	1	1	1	4
26	Pfennig Lane & Railroad Avenue					1	1					1	1	1	4
27	Kelly Lane & Colorado Sands Drive				1	1						2	1		3
28	Kelly Lane & Kennemer Drive					1				2		1	1	1	3
29	Kelly Lane & Falcon Pointe Blvd					1				1			1		3
30	Weiss Lane & Wolf Pack Drive					1	1						1		3
31	Pflugerville Pkwy & Weiss Lane					1	1			1			1		3
32	Pecan Street & Weiss Lane		1			1	1		4	4			1		2
33	Pecan Street & Old Austin-Hutto Immanuel Rd	1	2	2	1	1	1	4	8	4	1		1		4
34	Immanuel Road & Oxford Drive			2	1	1	1		8	8			1	1	4
35	Wells Branch & Dessau Lane		2		1	1	1		6	8	1	1	1		4
36	Grand Ave Pkwy at Black Locust Dr												1		
37	Heatherwilde Blvd at Kingston Lacy Blvd												1		3
38	Heatherwilde Blvd at New Meister Ln												1		
39	Heatherwilde Blvd at Cheyenne Valley Dr												1		
	<b>TOTAL</b>	<b>1</b>	<b>13</b>	<b>10</b>	<b>8</b>	<b>13</b>	<b>11</b>	<b>4</b>	<b>54</b>	<b>35</b>	<b>4</b>	<b>8</b>	<b>18</b>	<b>4</b>	<b>52</b>

**NOTES**

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## 6.0 Recommended Technology

This section identifies the recommended technologies that should be deployed, enhanced, or constructed in the future by the City of Pflugerville for the creation of an Advanced Transportation Management System (ATMS). This section includes technology recommendations in the following areas, which have already been coordinated to be included in the City's Specifications Update:

- Traffic Signal Controllers;
- Conflict monitors;
- CCTV Cameras;
- Central System Software;
- Integration Needs; and
- Traffic Operations Center.

### 6.1 Traffic Signal Controllers

There are two aspects to the traffic signal controller; hardware and software (firmware). Historically, the NEMA traffic signal controller was considered as one unit because the firmware was embedded onto a PROMM chip. The firmware came from the factory installed on the hardware. The single unit traffic signal controller is still common practice with many controller manufacturers. For the discussion below, we separate the two elements.

#### 6.1.1 Controller Hardware

For the hardware, it is recommended that the City procure hardware that meets, at a minimum, the standards of the Advanced Transportation Controller, or ATC. This approach provides the greatest flexibility, interoperability, interchangeability possible. The ATC provides a solid framework for procurement in an open competitive environment.

The ATC hardware should be compatible with the traffic signal control cabinet. The City currently has all TS2 cabinets. The discussion below identifies the TS2 standard. For traffic signal controllers to be installed into existing traffic control cabinets, the City should procure TS2, Type II controllers. This provides the A, B, C connectors found on TS1 style controllers, providing an easy migration path for the City, and keeps costs to a minimum. As identified in the next section, the City should install TS2, Type I cabinets for new installations and replacements. In this case, the ATC should be compatible with TS2, Type I connectors, which is essentially the HDLC ports. There are two ways of achieving this functionality. First, the TS2, Type II controller can be 'converted' to work in a TS2, Type I cabinet with the addition of a simple dongle for Connector "A" that provides power. Second, future cabinets can have a dual connector installed as a part of the specification. Either type of controller form factor (Type I or Type II) can be installed in the dual connector cabinet. The signal technician makes the determination which cable to use. The redundant, un-used, cable will remain inactive and coiled in the cabinet.

### 6.1.2 Controller Software

The City should only procure software that is completely compliant with National Transportation Communications for Intelligent Transportation Systems (ITS) Protocol for all Mandatory objects as a minimum, and it is recommended to support Optional objects too. The City must explicitly specify the controller software be NTCIP-compliant. Failure to specify NTCIP compliance could lead to disagreements between the City and manufacturer when it comes to using that communication protocol. The controller software can be procured with the controller hardware, or separately. With the ATC controller the City has options.

All the TxDOT 'on-system' signals in the City use Econolite Econolite ASC/2 and ASC/3 class controllers. These controllers may not have the required processor and memory capacity to support high-resolution data and other third-party controller software applications. City's 'off-system' signals include a variety of Econolite Cobalt, Siemens M60, Intelight, and McCain controllers.



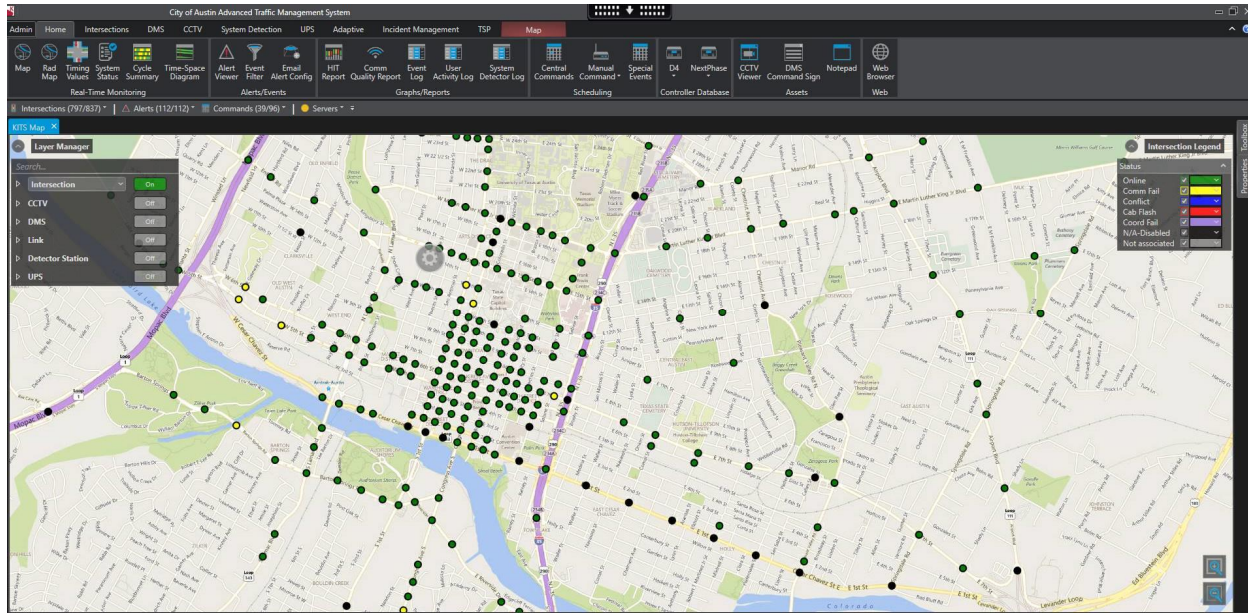
In an effort to standardize the type of signal controllers for all City signals, the City shortlisted Econolite and Intelight controllers. Kimley-Horn coordinated with Texas Highway Products and scheduled a demonstration for the Intelight controller for the City staff and with Paradigm Traffic Systems to schedule a demonstration for the City of the Econolite Cobalt controller. After review and discussion, the City selected the Econolite Cobalt controller as the preferred choice for all their signals in the City.

### 6.1.3 Central System Software

The central system software shall allow TMC operators to create, store, compare, and edit signal controller databases from designated workstations. It shall also provide the capability for TMC operators to remotely access the signal controllers using IP protocols and upload and download signal timing plans selected from the database. The remote uploads and downloads shall be able to be accomplished either manually or automatically by the time of day. TMC operators and system administrators shall be able to monitor signal performance and identify faulty signals and communications problems by receiving alerts generated by the system.

The central software should have additional loosely integrated packages or modules for the traffic management functions such as managing pan-tilt-zoom CCTV and video detection camera images; operating DMS messages; monitoring and accessing conflict monitors, video detectors, and emergency vehicle preemption (EVP) equipment; and utilizing traffic detection devices for performance metrics.

The central system software shall allow TMC managers to configure different levels of access privileges to various authorized user classes.



A central system software for managing controller databases (Image source: City of Austin KITS)

## 6.2 Traffic Surveillance and Incident Management

Closed-circuit television (CCTV) is used for monitoring traffic flow or other events from a remote location. The benefits are immediate information on roadway conditions, monitoring traffic flow during special events, and incident identification and management. It is recommended that full motion capable CCTV cameras are deployed at the following locations:

- Half-mile spacing along major arterials;
- High accident locations; and
- On centralized elevated storage tank.

### 6.2.1 Full Motion CCTV Cameras

It is recommended that the future procurement of CCTV cameras consist of digital IP cameras. This fundamental capability will ease in deployment, video routing, video management, and the sharing of a video stream the local area partners. There are many manufacturers and suppliers of CCTV Cameras, including such manufactures as Axis, Cohu, Pelco, and Advidia. The make and model should be evaluated by the City considering cost, maintenance, support, and functionality. The make and model should also be consistent with the capabilities of the recommended video management system integrated with the AMTS at the TMC. When choosing a CCTV camera, the City needs to pay close attention to the video format and control.

### 6.2.2 Video Format

MPEG stands for the Moving Picture Experts Group. MPEG is an ISO/IEC working group, established in 1988 to develop standards for digital audio and video formats. There are five MPEG standards being used or in development, but only three are commonly used

in the traffic/transportation industry. Each compression standard was designed with a specific application and bit rate in mind, although MPEG compression scales well with increased bit rates.

The four relevant MPEG video compression standards are:

MPEG-4 – a standard for multimedia and Web compression - MPEG-4 is an object-based compression, similar in nature to the Virtual Reality Modeling Language (VRML). Individual objects within a scene are tracked separately and compressed together to create an MPEG4 file. The files are sent as data packages and assembled at the viewer end. The result is a high-quality motion picture. The algorithm is object oriented and its compression efficiency is very high. One of the design goals was to implement high interactive functionality and applications for 5-64 kbit/s for mobile and POTS (plain old telephone service) services. MPEG-4 highest bit rate has been set to 4Mbit/s for TV/film applications. MPEG-4 is based on very complex coding algorithms. It needs very high processing power, but its compression-efficiency is very high. It is one of the most promising encoding schemes for the future in low and medium bit-rate applications. MPEG-4 is a new compression algorithm and the available chipsets today have limited performance.

Motion-JPEG - Unlike the previous algorithm, M-JPEG uses frame-by-frame compression and transmission. This ensures a constant bit rate and more important low latency. It also provides fast recovery after connection loss. M-JPEG has limited compression efficiency and needs at least 16 Mbit/s at 15 fps for CCIR 601 picture quality. Like MPEG, it introduces blocking effects at lower bit rates.

H.264 - Formerly known as H.26L, is current standard compression scheme. It is an enhanced version of H.263, with even better compression ratios. Even MPEG4 has adopted this scheme and is known as 'MPEG4-10'. Like H.263 this algorithm provides good quality at low bit rates, but it can also be adapted for higher bit rates. At 1 Mb/s the H.264 offers a very good picture quality. Typically, H.264 has better video quality compared to MPEG2 but only requires one-half the bandwidth. The quality of video is comparable to that of Blu-Ray DVD. It is recommended that the City of Pflugerville to specify the use of the H.264 compression protocol, because it is supported by most all major manufactures and is very efficient in terms of video compression.

H.265 – Also known as High Efficiency Video Coding (HEVC), H.265 is the next evolution of video compression schemes. The compression ratio of H.265 is approximately double that of H.264. Improved compression allows for the same picture quality of H.264 at half the data rate, or much better video quality (up to 8K resolution) at the same transmission rate. If equipment is available, H.265 support should be considered.

### **6.2.3 Video Control**

CCTV camera control is the manner in which the operator interfaces with the unit, including pan, tilt, and zoom (PTZ). The recommended protocols that should be supported are: Coahu, Axis, Pelco D, Pelco P, NTCIP 1205 v1.08, and ONVIF. It should

be noted here that the Cisco Video Management system may not recognize the NTCIP open standard.

#### **6.2.4 Camera Housing**

There are two different physical types of cameras: 1) Barrel; 2) Dome

Barrel type cameras have been deployed on many freeways and arterials around the world. The design of this camera is basically a high-definition (color or black and white) camera mounted inside of a barrel housing. These cameras can be mounted in a fixed position or mounted atop or to the side of a mechanical device that provides the pan and tilt control. The current trend in design is commonly referred to as external positioning. These articulating mechanical drives provide 360 degrees in horizontal and vertical movement. Typically, the cameras marketed to the transportation industry are internally pressurized with nitrogen gas, making it less prone to condensation and freezing. The internal pressure also keeps dust and other environmental elements out of the housing. There are many manufactures of barrel type cameras including Bosch, Cohu, MOOG, Pelco, and WTI.

The dome style camera is simply that, dome shaped. These camera units provide 360 degrees in horizontal movement; vertical movement (view) is typically +40 degrees (up) and -90 degrees (down). The dome construction means that the camera unit assembly is one unit. Typical mounting is in a hanging placement; some type of arm or extension bracket is needed. Some dome cameras are pressurized, but typically they are not. Heating units provide protection against freezing temperatures.

There are many manufactures, including Axis, Bosch, Interlogix, Ikegami, MOOG, Panasonic, and Siqura. There is no specific recommendation to the City of Pflugerville whether they procure a barrel or dome style camera. Either unit style will accommodate the needs of the City. The ease of installation will probably dictate the style of choice.



### 6.2.5 Other CCTV Camera Functionality to be Considered

The chosen CCTV camera should support the following requirements:

- Frame rate of 30 frames per second minimum;
- Focal zoom of 30X, plus 10X digital zoom minimum;
- Support automatic and manual control of focus and iris control;
- Support wind rating of 80 mph under all weather conditions;
- Build in ID generator;
- Support 1080p resolution;
- Support both uni-cast and multi-cast connection types;
- Support IEEE 802.3 standard for 10/100 Ethernet connections in half-duplex and full-duplex;
- Support RTP, RTSP, UDP/IP, TCP/IP, IPv4, HTTP, IGMP v2, SNMP, DHCP, DNS, IEEE 802.1x, Ethernet 802.3u, and Telnet; and
- Support a minimum of 30 presets.

### 6.3 Conflict Monitors

Upgrading the traffic signal controllers to ATC requires updating from conflict monitors to malfunction management units (MMU). The conflict monitors are hardwired circuit boards that define compatible phases. MMU's provide the same functionality, along with additional monitoring, display, and troubleshooting functions.

It is recommended that the City procure MMU's that meet or exceed the requirements of NEMA Standard TS2-2003, Part 4. The hardware procured by the City of Pflugerville should include status, signal voltage monitoring, event logs, Ethernet compatibility, and Flashing Yellow Arrow (FYA) functionality.

Approximately, half of the intersections have MMU2-16LEip model, which is Ethernet-based, allowing for remote monitoring. For intersection that currently do not have this model of MMU, it is recommended that the City replace and standardize over time as need and budget are identified.





## 7.0 Communication Architecture

This project should consider the following two categorical options for communications:

- Direct-connect
- Wireless

Direct-connect communication is a physical link between two devices, whereas wireless communications sends data across the airwaves.

### 7.1 *Direct Connect*

Direct-connect communications require a physical connection between a transmitter and a receiver, using fiber optic cable, twisted-wire pair, coaxial cable, or leased lines. Direct-connect media is generally preferred for ITS applications due to the ease of expansion, its relatively high level of security, and its dedicated transport characteristics (interference and environmental impacts are not a significant consideration). Installing and maintaining underground conduit, cable, and/or aerial equipment can be costly.

The cost to install any of the available direct-connect media can be broken into three main components: the physical media cost, installation cost, and the end equipment cost. The installation cost is similar for each type of direct-connect media. The cost of the equipment required for each type of the direct-connect media varies considerably and is more expensive for fiber optic cable than for copper cable. Among the direct connect media types; fiber optic cable is the most expensive (when considering both cable cost and end equipment) even though the cost of fiber optic cable has been decreasing over time.

#### 7.1.1 *Fiber Optic Cable*

##### 7.1.1.1 *Traditional Fiber Optic Cable*

Fiber optic cable has become the standard media type for most the new ITS deployments around the world. The characteristics of fiber include nearly unlimited bandwidth capacity and protection from electromagnetic and radio frequency interference, lightning, and other power surges.

In a fiber optic link, a coherent light source feeds into one end of a fiber and a light-sensing device is attached to the other end of the fiber, providing unidirectional operation. Two fibers are typically employed for a bi-directional communications link, although advanced multiplexing techniques are available that allow two-way communications on a single fiber.

In the past, the cost of installing fiber optic cable was much higher than twisted-pair copper wire. Over the years, as demand for fiber optic cable has increased, the cost differential between fiber optic cable and twisted-pair copper wire has become negligible.

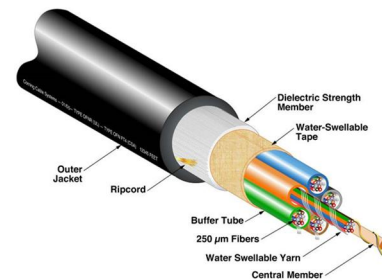
For systems where, new communications media needs to be installed, the cost of deploying fiber optic cable or copper wire can be considered comparable. The cost for end equipment is higher for fiber optic cable installations than for other types of installations.

The chief characteristics of fiber optic communications are the wavelength of the source (the mode) and the diameter of the core that carries the light signal. The propagation of the signal results from internal refraction caused by the difference in refractive indices of the core glass and the surrounding glass. There is a relationship between the size of the core and the mode transported.

There are two types of optical fiber: single-mode and multi-mode. Multi-mode fiber has standard core diameters of 50  $\mu\text{m}$  and 62.5  $\mu\text{m}$ ; single-mode fiber has a core diameter of only 8  $\mu\text{m}$ . The larger core of the multi-mode fiber allows many modes or different wavelengths of light to propagate down the core. The multiple wavelengths effectively “spread out” the signal at the receiving end. If the spread is too much, information at the receiving end will be lost. Because of this, multi-mode fiber is typically used for short communications runs typically less than 2 miles.

Single-mode fiber, on the other hand, has a relatively small core for light transmission, so only one mode is supported. This results in more bandwidth and higher data rates being possible over longer distances. It is not uncommon to be able to send a single-mode signal over 40 miles without the need for repeaters.

As the cost of deploying fiber optic cable decreases, it is becoming an ever more widely used communications media for transportation communications systems. With virtually unlimited bandwidth, limited only by the end equipment, fiber optic cable is used for all types of ITS applications. It can be used for traffic controller communications and video transmissions of up to 20 miles without regenerators or optical amplifiers (with the right transceiver pair, video signals can be transmitted up to 70 miles). Fiber optic cable is capable of reaching long distances and can be manipulated in many different network configurations. A beneficial characteristic of all fiber optic cables is their immunity to Electromagnetic Interference (EMI) and Radio Frequency Interference (RFI) because there is no electrical signal present in the cable. As a result, fiber optic cable is highly suitable for harsh electrical-prone environments (e.g. on utility poles) and has a very high transmission capacity.



Some advantages of fiber optic cable include:

- A pair of light tubes can support many more circuits than a metallic path;
- Immunity from electromagnetic interference (EMI) and radio-frequency interference (RFI);
- High integrity for data transmission;
- Emits no radiation and it is difficult to tap a fiber tube without detection of the resulting signal loss, thus represents a highly secure means of communication;
- Use of small cable diameters and low-weight cable; and
- Extremely flexible - can be installed to support a low-capacity (low-bit-rate) system and, as the system's requirements expand, can use the broadband capabilities of optical fibers and convert to a high-capacity (high-bit-rate) system simply by changing the terminal electronics.

Some disadvantages of optical fiber include:

- Designing a fiber optic network tends to require substantial engineering efforts because of the complexity of networks, light distribution characteristics and medium, as well as other factors;
- Fiber optic installations are highly sensitive to the quality of installation and the cost of installation is typically high;
- Splicing requires elaborate equipment and expertise;
- Maintenance of fiber optic systems is more complex and costly; periodic re-equalization of the fiber network is required; and
- Slightly higher cost than twisted-pair copper wire or coaxial cable.

#### *7.1.1.2 Pre-connectorized Cable Systems*

A relatively new product on the market is a pre-connectorized cable produced by Corning. A cable end is pre-connectorized, allowing the cable to simply screw together and lock in a mechanical splice for a variety of design configurations. These cables can be configured with a pinned or non-pinned connector on one end and a raw cable on the opposite end, allowing this cable to be spliced to traditional fiber optic cable. On the connectorized end, a pre-terminated fiber distribution housing with a matching connector on the cable end can be mechanically connected. The pre-connectorized fiber distribution housing can be rack mountable shelf mountable for easy cabinet installation. This makes

installation much easier because there is no additional equipment needed for cabinet splicing and training is minimal. **Figure 1** illustrates the concept of the system.

A key factor to consider before using the Corning product is that greater losses exist with mechanical splices than the losses resulting from traditional fusion splices.

*Figure 1. OptiTip System by Corning*



## 7.2 Wireless

Wireless media has the benefit of having relatively low installation costs and can provide better access capabilities to remote locations. With wireless media, however, the City will need to design the network around other external factors and, in some cases, seek FCC radio license approval prior to installation.

The chief advantage of wireless media is that no physical connection is required between the transmitter and receiver. This can translate into significant capital cost savings compared to direct connect networks and operating cost savings compared to leased facilities. Those potential savings can however be offset by the higher cost of the end equipment required for wireless communications. Additionally, if a wireless media that requires line-of-sight is selected, additional repeaters may be required resulting in increased system costs. Weather conditions like fog, heavy rain, or snow may affect the transmission links for higher bandwidth applications (i.e. video feeds).

### 7.2.1 Microwave

The use of microwave radio to provide communications links in a system is useful where a hard-wired link is not possible, not cost-effective, nor desirable. Microwave systems provide high bandwidth and can therefore transport voice, data, and video information to remote sites at speeds equivalent to gigabit fiber optic networks.

Microwave radio links, in conjunction with the corresponding support infrastructure, can be expensive. In a system with hundreds of ITS devices, this means a substantial up-front cost.

Each microwave radio link must be licensed with the Federal Communications Commission (FCC) before becoming operational. Each license petition requires a site survey, a detailed path analysis, frequency coordination with other local area users, and the petition must be certified by a licensed radio engineer. This process is time

consuming, costly, and not always successful. Licensed frequency ranges provide exclusive channels to broadcast data over, so there are fewer opportunities for interference. Manufacturers have built diverse radio products with diverse specifications. The averaged numbers below give a good indication of what can be expected from a wireless solution in each specific frequency.

Performance and effective data speed rates are distance and frequency driven. For example, as the frequency increases from 11 GHz to 18 GHz, the distance the link and successfully operate reduces. The higher the frequency, the shorter the distance. When operating frequencies are limited, external parabolic antenna dishes are recommended to boost data speeds and maximize performance.

Common licensed frequencies utilized for microwave links for ITS applications include 11 GHz, 18 GHz, and 23 GHz.

### **7.2.2 Broadband Radio**

Broadband radio is widely deployed for ITS applications and is used in many cities throughout the country. The wireless network currently serving the City's ATMS is a broadband system. Broadband radio has been an attractive solution due to its relatively low cost, availability in unlicensed frequency spectrums (902-928 MHz, 2.4 GHz, and 5.2 - 5.8 GHz), high tolerance for line-of-sight obstructions, and flexible network configurations. Using repeaters, a wireless broadband network can be expanded with relative ease. This type of encoding/decoding allows it to work well in areas with a high number of other users are broadcasting within these bands. Unfortunately, this wireless technology is somewhat wasteful of bandwidth with complex encoding and decoding of data which can limit the available bandwidth for data transfer.

Broadband radio has an uncertain transmission range, and typically requires line-of-sight (higher frequencies require line-of-sight). Because it uses low power, no FCC license is required. Since broadband transmission occurs in the noise level, spread spectrum works well in a high noise environment.

Broadband radio can use the entire band (902-928 MHz, 2.4 GHz, and 5.2 - 5.8GHz) designated by the FCC and is available for use by all. Instead of subdividing the band the FCC mandated that each device operating in this range not exceed 1 watt in output power and that it be able to tolerate any interference generated in the band. Spread-spectrum radios are type-certified by the FCC; that is the FCC approves the design of the radio, rather than requiring individual licenses for each site. Unlicensed wireless technologies have greater opportunities for interference with other users because the nature of unlicensed solutions allows the technology to be used by anyone. Generally, these frequencies are used for Wi-Fi communications for WLANs within residences, buildings and sometimes dense urban outdoor areas. However, there is a cost savings benefit realized by not having to register for the user license, and there are ways to mitigate the potential for interference. Intruder/attacker interference is typically deterred by encryption of data and digital certificates that authenticate the transmitting system and receiving system.

### **900 MHz**

The 900 MHz frequency band (902-928MHz) can bridge 20 miles in line of sight applications. 900MHz wireless technology can also be used in near line of sight applications over a reduced range. Throughput can reach up to 10Mbps, but only for the shortest of ranges. More commonly this frequency band achieves throughput closer to 1Mbps. This band is suitable for distribution to ITS data devices with low bandwidth requirements such as detectors, traffic signals, environmental stations (without video or limited still frames), and dynamic message signs.

### **2.4 GHz**

The 2.4 GHz frequency band is dedicated for industrial, scientific, and medical (ISM) equipment. The most common example is the microwave oven. Low power wireless communications applications are allowed to use this band but must be tolerant of and not interfere with ISM devices. For low power wireless communications, up to 20 miles of line of sight coverage can be achieved; but to realize up to 50 Mbps, the range must be reduced to a few miles. This band is suitable for distribution to ITS data devices with low bandwidth requirements such as detectors, traffic signals, environmental stations (without video or limited still frames), and dynamic message signs. CCTV and Video Detection units may also be viable for use with this band in very limited numbers for transmission back to a higher bandwidth network (fiber or high-speed wireless backhaul).

### **5.0 GHz**

The 5.0 GHz frequency band (5.2 – 5.8 GHz) is utilized by both WLAN point to point technologies and WiMAX technologies. Generally, WiMAX technologies perform poorly at this frequency due to high levels of interference from other WLAN deployments. WLAN point to point communications can provide a better alternative for a single link and can cover a distance up to a couple miles in line of sight applications. Throughput can typically reach 300 Mbps and can be configured to operate at a variety of channel size widths from 20 MHz all the way to 80 MHz. This band is suitable for short range backhaul as an aggregation for other wireless devices and/or fiber/twisted-pair distribution systems, as well as for serving high-bandwidth devices such as CCTV cameras.

There are a couple licensed broadband frequencies available for ITS applications. Performance and data speeds can be equivalent to unlicensed frequencies but have additional coordination and design considerations to take into account.

### **3.65 GHz**

This frequency band (3.65-3.7GHz) is loosely/minimally licensed. The license is inexpensive and easy to obtain. For a municipality to deploy a system involves applying for the specific antenna locations and paths for frequency coordination with others who may have systems within the same geographic area. Generally, manufacturers can provide wireless links with a range up to 10 miles in line of sight applications. Throughput can reach 200 – 300 Mbps at a channel size of 10 MHz.

This band is suitable for backhaul (within range limitations) as an aggregation for other wireless devices and/or fiber/twisted-pair distribution systems, as well as for serving high-bandwidth devices such as CCTV cameras.

#### **4.9 GHz**

This frequency band (4.94-4.99MHz) is primarily designated for public safety use. It can achieve ranges up to 5 miles in line of sight conditions. Throughput can reach 150 Mbps. When evaluating the use of this frequency, cities must coordinate with their Police and Fire Departments to ensure deploying additional radios under this frequency does not impact existing systems in operation. Providing communication to ITS and ATMS device is considered public safety initiatives.

This band is also suitable for short range backhaul as an aggregation for other wireless devices and/or fiber/twisted-pair distribution systems, as well as for serving high-bandwidth devices such as CCTV cameras. This frequency band can have a bandwidth limitation due to the maximum channel width allowed is capped at 20 MHz. Effective throughput can reach 150 Mbps.

Historically, agencies choose to work with frequencies in the unlicensed spectrum due to ease of deployment and less license coordination involved. By far the most popular frequencies are the unlicensed 900 MHz, 2.4 GHz and 5.8 GHz. However, highly populated and commercialized areas experience high rates of interference for these frequencies, resulting in lower data rates and shorter deployment distances. For this reason, deployment of systems operating in the 3.65 GHz and 4.9 GHz are gaining popularity.

Generally, point-to-point deployments are much more common for last mile ITS communication applications. However, wireless mesh technologies are improving and will most likely provide the platform for vehicle to infrastructure communications in emerging technologies. WiMAX is the least used platform because hardware pricing, application requirements, and unlicensed spectrum limitations.

Broadband radio can be utilized to transmit video but only on higher frequencies (2.4 GHz and 5.2 -5.8 GHz). The higher frequencies can carry more bandwidth than the 900 MHz band but because they travel through the air on a wider wavelength they are more susceptible to interference. The possibility for interference limits the range at which broadband radios can operate.

Some advantages of broadband radio include:

- Flexible installation.
- Does not require cable installation and maintenance.
- Does not require FCC channel use approval.
- Works well in a high-noise environment.
- Currently in use for many industrial process control applications.
- Uses low transmitter power.

- Can be used in a mixed system of wired or radio interconnected controllers.
- No land-line interconnect required.
- Relatively low equipment cost.

Some disadvantages of broadband radio include:

- Requires external antenna, radios, and cable.
- Limited range for transmitting high bandwidth signals.
- May require additional equipment including risers, towers, and/or repeaters.
- Unprotected frequency channel space.
- Requires line-of-sight, especially for the higher-frequencies.
- Interference from pine tree needles can obstruct radio transmissions.
- Inability to transmit high bandwidth signals (i.e. video) on lower frequencies.

Error! Reference source not found. provides a comparison summary of wireless technology for ITS applications.

**Table 3: Wireless Technology Comparison**

	900MHz	2.4GHz	5.8GHz	3.65GHz	4.9GHz
<b>Range</b>	10-20 miles	<20 miles	<=5 miles	<=10 miles	<=5 miles
<b>Throughput</b>	<=10Mbps	<=50Mbps	<=300Mbps	<=300Mbps	<=150Mbps
<b>Bandwidth</b>	26MHz	20/40MHz	80MHz	10MHz	20MHz
<b>PoE Support</b>	Yes	Yes	Yes	Yes	Yes
<b>Licensed</b>	No	No	No	Yes	Yes
<b>Price*</b>	<=\$2,000	~\$4,000	<=\$7,000	<=\$10,000	<=\$10,000

\*Price per link includes wireless bridge/antenna and installation. Poles, cabinets, repeaters, cabling, and conduit are not included in the price.



### 7.2.3 Contention Based System vs Frequency Reuse

In contention-based protocol, any device can communicate with the base station at any time. To avoid conflicts, which create transmission errors, devices “listen” to the network to determine when the channel is available. The protocol is analogous to a busy signal on a telephone land line, or two people trying not to interrupt each other. Other analogies include the trading floor at Wall Street, with devices as stockbrokers shouting out orders randomly, waiting to be heard, or a press conference with the president, where reporters all shout their questions at once.

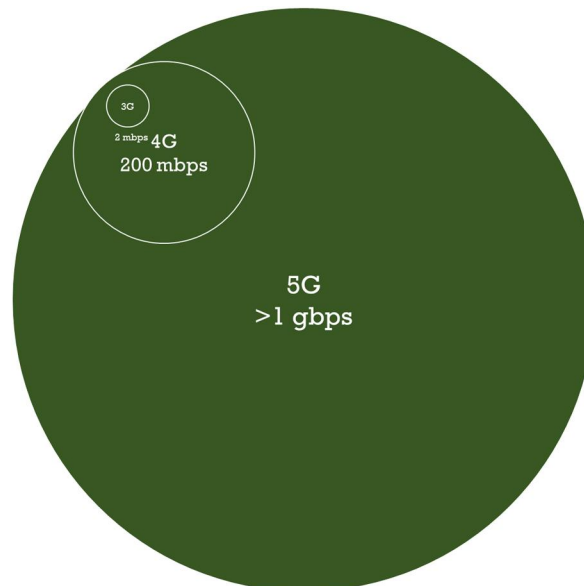
Frequency reuse protocols, which are typical of cellular networks, allow devices to use the same frequency, provided the devices are sufficiently far apart. This allows for less interference and transmission errors, improving coverage and capacity.

The performance of the contention base systems will degrade as more users (access points) join the network. More devices trying to communicate at once results in fewer opportunities for an open channel, reducing available bandwidth. The frequency reuse protocols are more scalable and will not experience the same level of network degradation.

### 7.2.4 5G Cellular Wireless Communications

The 5G wireless technology operates in the 6 GHz radio frequency band; higher frequencies provide higher bandwidth but shorter range. Because of this, 5G will likely require more multiple input and output antennas (MIMOs) to boost signals.

Figure 2. Illustration of Cellular Bandwidths (Source: Kimley-Horn)



Current 4G LTE networks provide a theoretical bandwidth of 200 mbps. The coming 5G standard will vastly improve the speed and bandwidth available to mobile connections, providing the speed needed for applications such as Vehicle-to-Infrastructure (V2I).

**Table 4: Wireless Cellular Technologies**

Technology	3G	4G LTE	5G
<b>Deployment</b>	circa 2004	circa 2008	circa 2020
<b>Bandwidth</b>	2 m1bps	200 mbps	>1 gbps
<b>Applications</b>	Phone calls, text messages, internet	3G + streaming video, transfer of large files	4G LTE + real-time V2I, IoT

Sources: <https://www.raconteur.net/technology/4g-vs-5g-mobile-technology>  
<https://gizmodo.com/what-is-5g-and-how-will-it-make-my-life-better-1760847799>

### 7.3 Recommended Communications Networks

As part of this project, two (2) communication network preliminary alternatives have been developed based on the project requirements, meetings and discussions with City staff, and prior knowledge and experience with available communications networks. The recommended network architectures are: **Alternative 1** – Fixed Wireless System, and **Alternative 2** – Cellular system.

#### 7.3.1 Ethernet-based communications Architecture

Today, most modern networks use the Ethernet, Internet Protocol (IP), and Transmission Control Protocol (TCP) to transmit data packets between any two locations within a network. As part of the proposed Pflugerville ATMS, the proposed traffic signal controllers and other ITS devices will support Ethernet communication interfaces.

While the City's future procurement of ITS and communications network equipment will utilize the TCP/IP protocol, there are some devices, such as radar detectors that communicate using the RS-232 serial communications protocol. For these devices, software (serial port emulator) and hardware (terminal servers) will be required to provide the transport mechanism to support transmission over the Ethernet network within TCP/IP Ethernet packets. Required terminal servers or media converters are generally provided with the ITS device and considered subsidiary.

Recommended communication architectures are described in more detail in next section.

**Exhibit 4** illustrates the traffic signal cabinet network schematic and a Layer 2 field hardened Ethernet switch. Each traffic signal cabinet or field ITS cabinet should be standardized from an Ethernet port and IP configuration perspective. A minimum of 12

IP addresses are recommended to be assigned to each cabinet. Each device inside the cabinet is assigned a specific port on the switch and should be labeled. This figure is intended to standardize how individual equipment in the signal cabinet is integrated with the Ethernet switch and network.

### **7.3.2 Network Architecture Alternatives**

**Alternative 1- Exhibits 5 and 5A** show a conceptual layout for a fixed wireless communication system. This alternative consists of setting up a new wireless system by installing new radios. This alternative consists of redundant backhaul ring architecture for the communication nodes connecting Pflugerville Public Works Department building to project water towers A- Pecan St/Central Commerce Pkwy, B-Pflugerville Pkwy/Heatherwilde Blvd, and C-Hendrickson High School. With this approach if you lose a tower you can still have communication within your system. A licensed 18 GHz microwave ring is recommended between Nodes A, B, C, and Public Works Department and shall serve as the primary backhaul. Also, includes installing Access Point (AP) radios mounted on top of three elevated water storage tanks, serving as a communication hub or node. On the top of each tower a cluster of access point radios will be installed that will communicate to specific signalized intersections or ITS device cabinets in the field. Each signalized intersection or ITS device will have a subscriber unit (SU) radio that will be aligned to a corresponding AP. Each AP will have a specific coverage area, for example a 90-degree coverage area, resulting in four AP radios to cover 360 degrees. The system architecture will connect from Public Works Traffic Management Center to City service center via the City WAN, where the service center will serve as the back-up. The school zone system will be a cellular network that connects to the system via the City WAN.

**Alternative 2- Exhibits 6 and 6A** details a cellular wireless system architecture. A cellular modem will be installed inside each traffic signal cabinet, which will talk to the cloud and the cloud will talk to the TMC. Similar to Alternative 1 and 2, the school zone system will connect to the system via the City WAN.

### **7.3.3 Preferred Network Architecture**

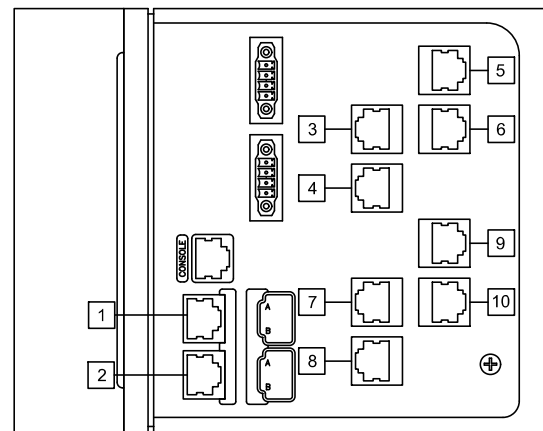
Based on discussions with City staff, the preferred network alternative is **Alternative 1** comprising of a fixed wireless communication system. A preliminary concept is shown in Exhibit 5. However, a detailed analysis will be needed to confirm network paths, signal strength, appropriate node to point to, and other details. Based on discussions with City staff, the Alternative 1 assumes a new tower at the Public Works facilities. Preliminary analysis showed that the Public Works facilities are at a low point with the elevation lower than surrounding traffic signals and node points A, B, and C. The proposed tower will need to be designed to reach an appropriate elevation to allow wireless communication links from other nodes.

KEY NOTES:

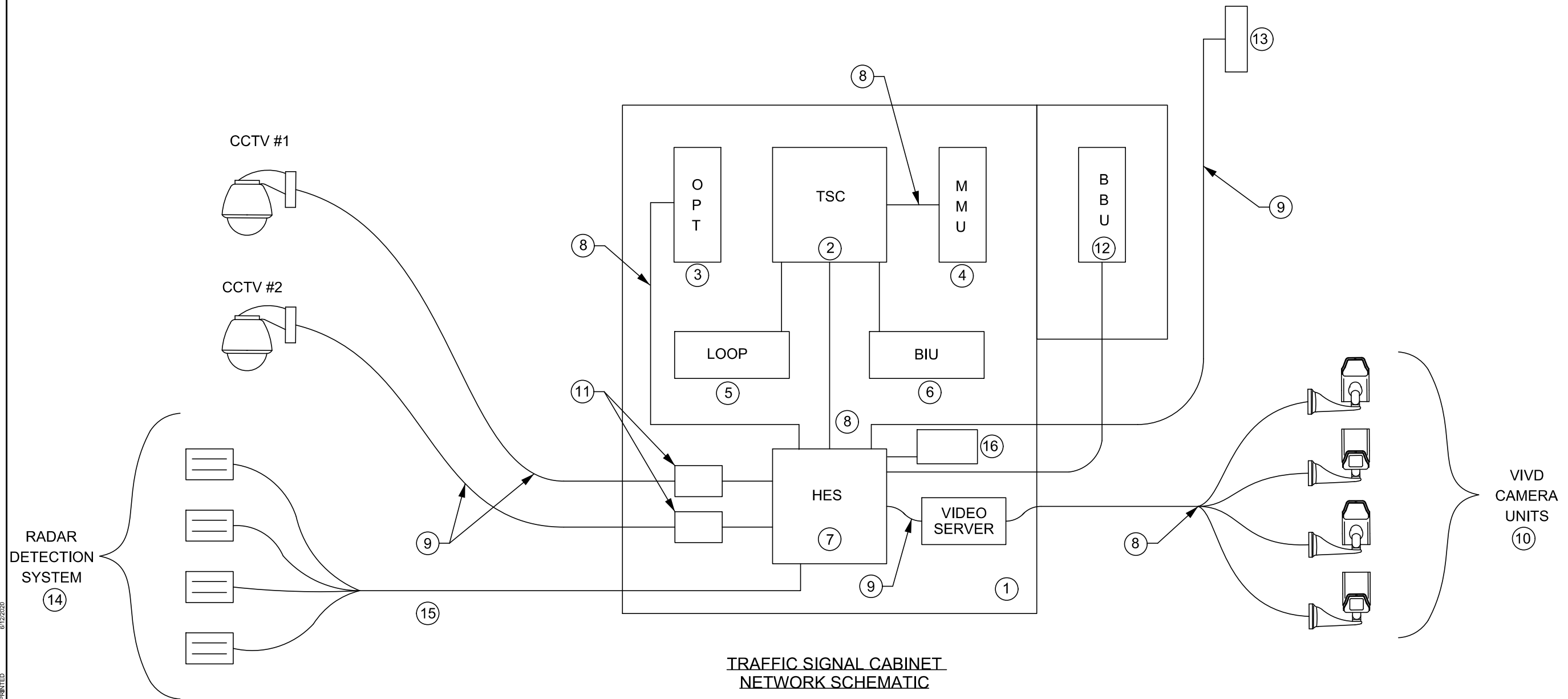
- ① TS-2 TYPE 1 NEMA CABINET
- ② TRAFFIC SIGNAL CONTROLLER TS2-TYPE 1 WITH LINUX OPERATING SYSTEM
- ③ OPTICOM - ETHERNET READY
- ④ MMU - MALFUNCTION MANAGEMENT UNIT
- ⑤ LOOP DETECTOR CARD(S)
- ⑥ BIU
- ⑦ HARDENED ETHERNET SWITCH (LAYER 2)
- ⑧ COAXIAL VIVD CABLE(S)
- ⑨ CAT 6 ETHERNET CABLE
- ⑩ VIVD CAMERA UNITS VARIES BY INTERSECTION.
- ⑪ CCTV POWER INJECTOR
- ⑫ BATTERY BACKUP UNIT
- ⑬ WIRELESS ETHERNET RADIO SUBSCRIBER UNIT
- ⑭ RADAR DETECTION SYSTEM
- ⑮ DETECTOR CABLE
- ⑯ CELLULAR ROUTER

RESERVED PORT CONFIGURATION:

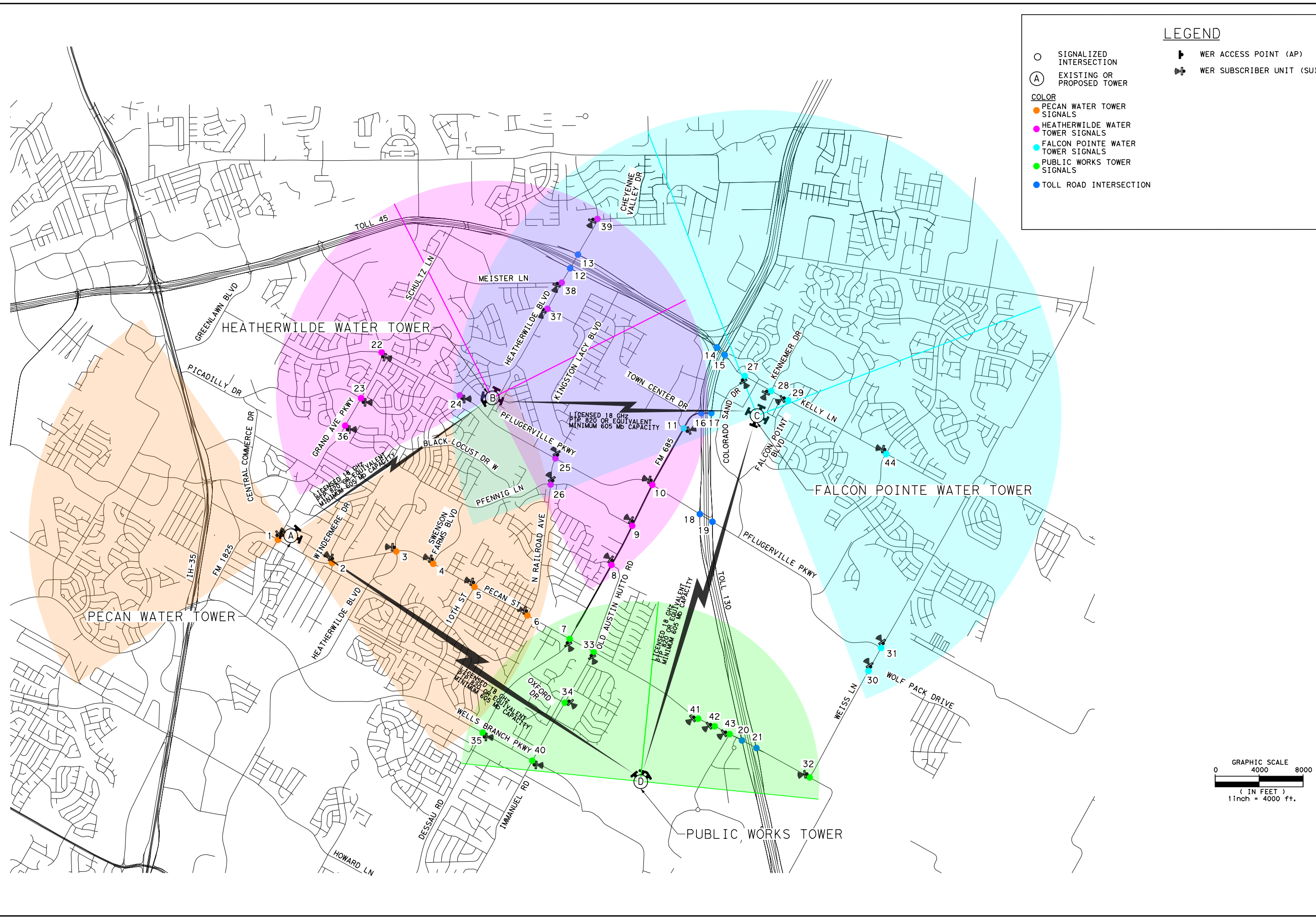
- ① WIRELESS RADIO TX/RX
- ② SPARE TX/RX
- ③ TRAFFIC SIGNAL CONTROLLER
- ④ CONFLICT MONITOR
- ⑤ AXIS 6055E CCTV
- ⑥ AXIS Q7404 VIDEO SERVER
- ⑦ BATTERY BACKUP UNIT (IF PRESENT)
- ⑧ OPTICOM (IF PRESENT)
- ⑨ RADAR DETECTION SYSTEM (IF PRESENT)
- ⑩ VIVDS CONTROLLER (IF IP BASED)



FIELD ETHERNET  
LAYER 2



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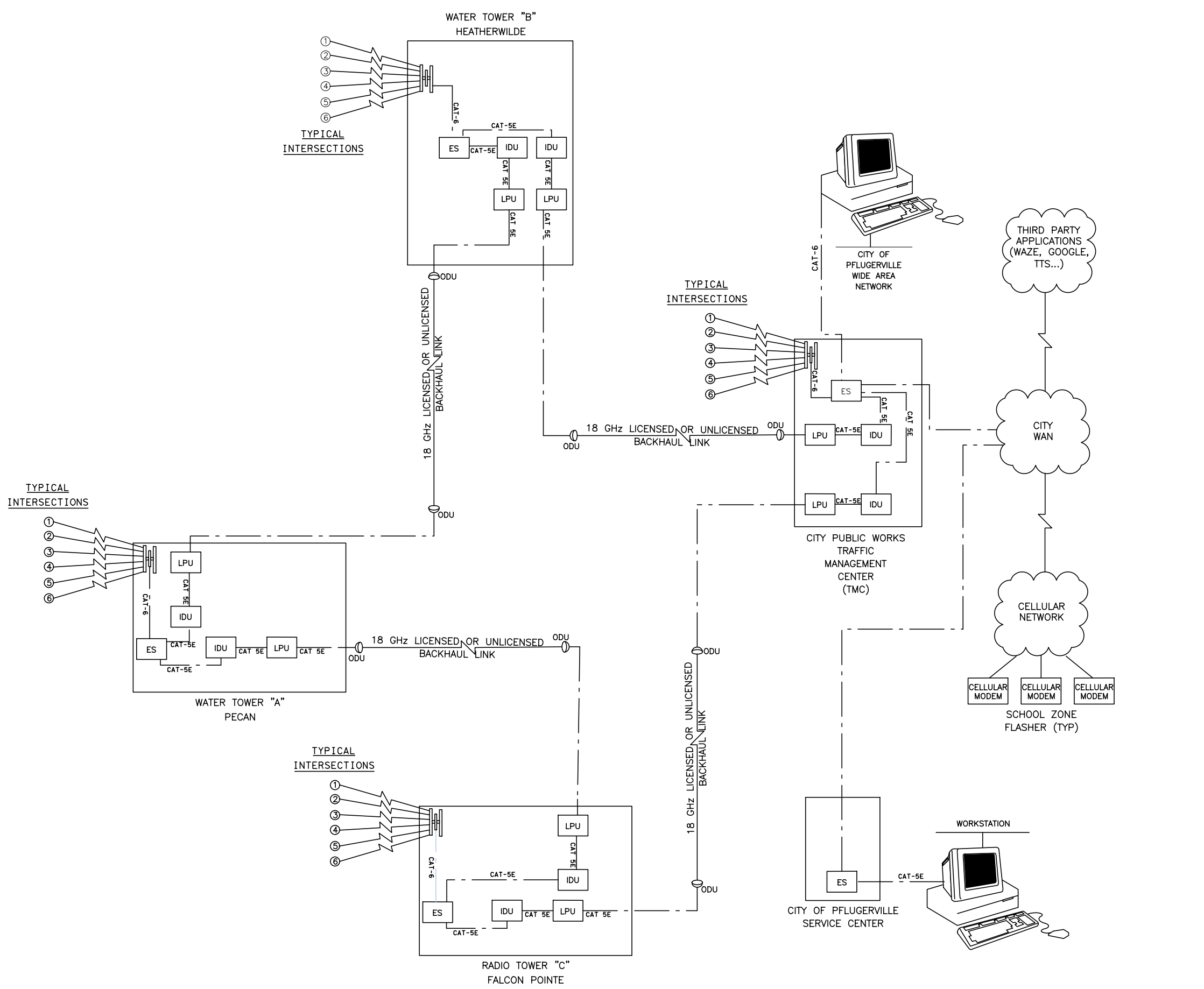
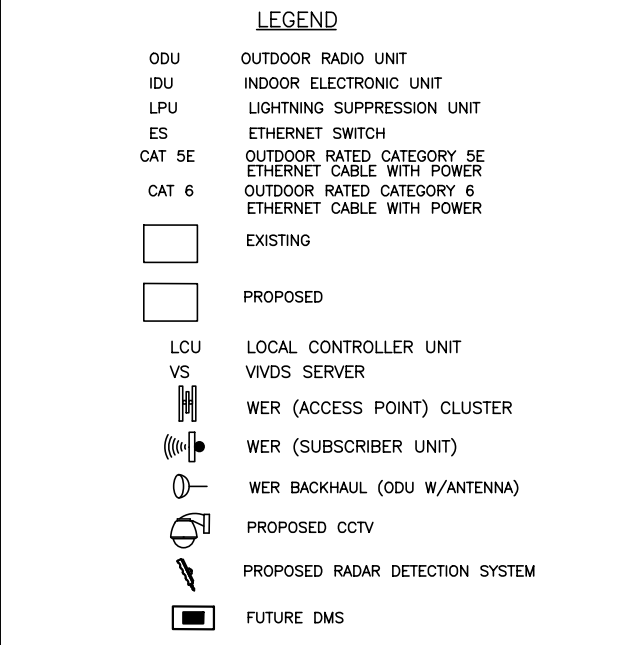
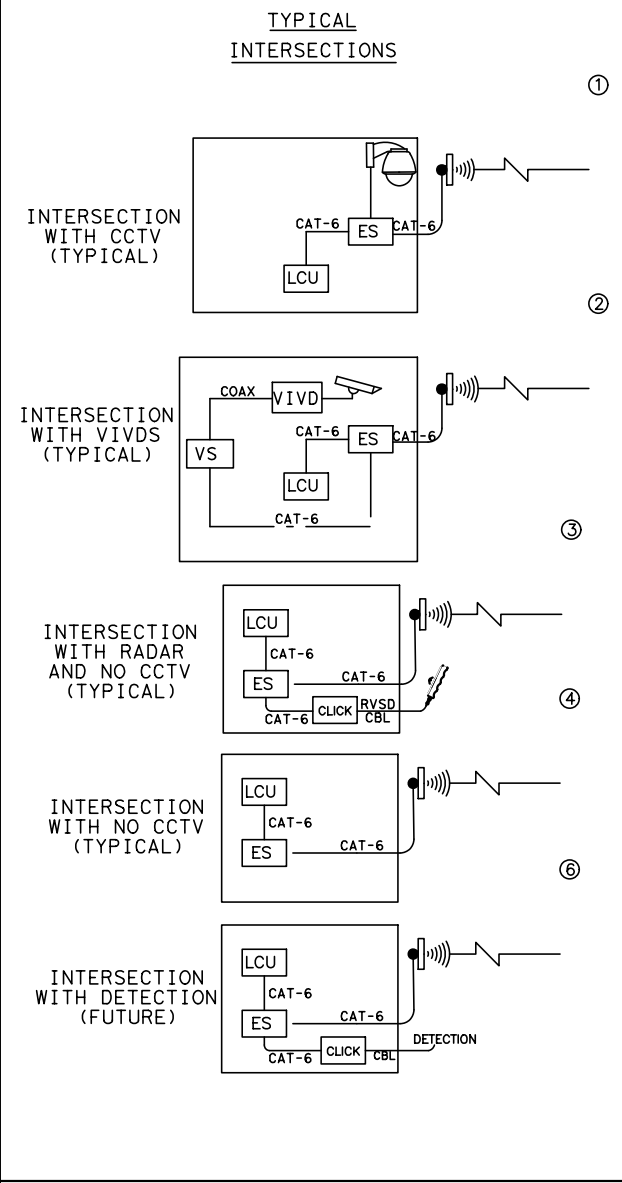


**LEGEND**

- SIGNALIZED INTERSECTION
- Ⓐ EXISTING OR PROPOSED TOWER
- PECAN WATER TOWER SIGNALS
- HEATHERWILDE WATER TOWER SIGNALS
- FALCON POINTE WATER TOWER SIGNALS
- PUBLIC WORKS TOWER SIGNALS
- TOLL ROAD INTERSECTION
- ▶ WER ACCESS POINT (AP)
- ▶ WER SUBSCRIBER UNIT (SU)

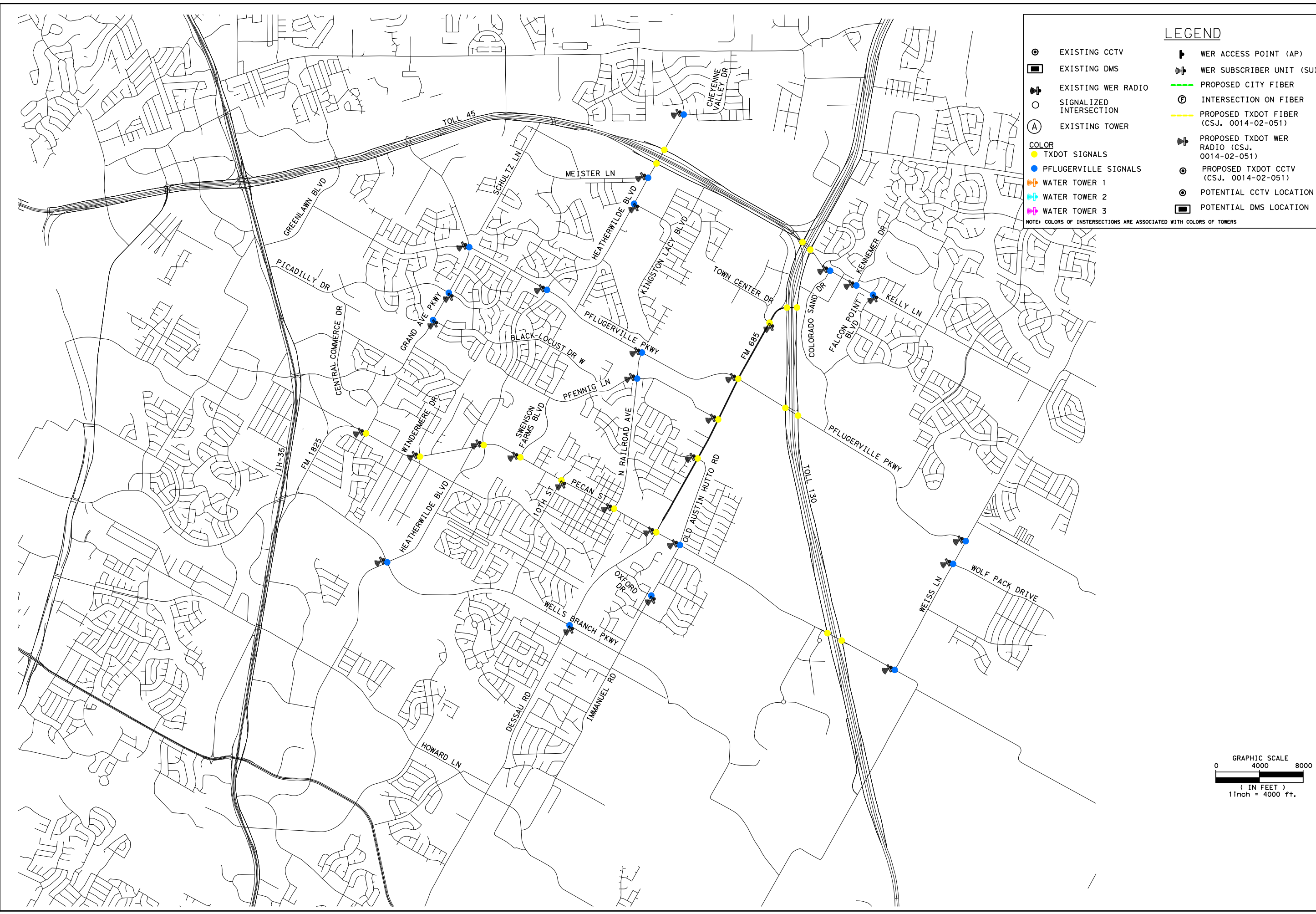
**PFLUGERVILLE RADIO COMMUNICATION SYSTEM LAYOUT ALTERNATIVE 1**

Scale:	N.T.S.
Designed by:	KH
Drawn by:	KH
Checked by:	KH
Date:	6/12/2020
Project No.:	069228906



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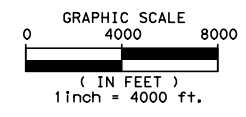
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 6/12/2020



**LEGEND**

- EXISTING CCTV
- EXISTING DMS
- EXISTING WER RADIO
- SIGNALIZED INTERSECTION
- EXISTING TOWER
- TXDOT SIGNALS
- PFLUGERVILLE SIGNALS
- WATER TOWER 1
- WATER TOWER 2
- WATER TOWER 3
- WER ACCESS POINT (AP)
- WER SUBSCRIBER UNIT (SU)
- PROPOSED CITY FIBER
- INTERSECTION ON FIBER
- PROPOSED TXDOT FIBER (CSJ. 0014-02-051)
- PROPOSED TXDOT WER RADIO (CSJ. 0014-02-051)
- PROPOSED TXDOT CCTV (CSJ. 0014-02-051)
- POTENTIAL CCTV LOCATION
- POTENTIAL DMS LOCATION

NOTE: COLORS OF INTERSECTIONS ARE ASSOCIATED WITH COLORS OF TOWERS

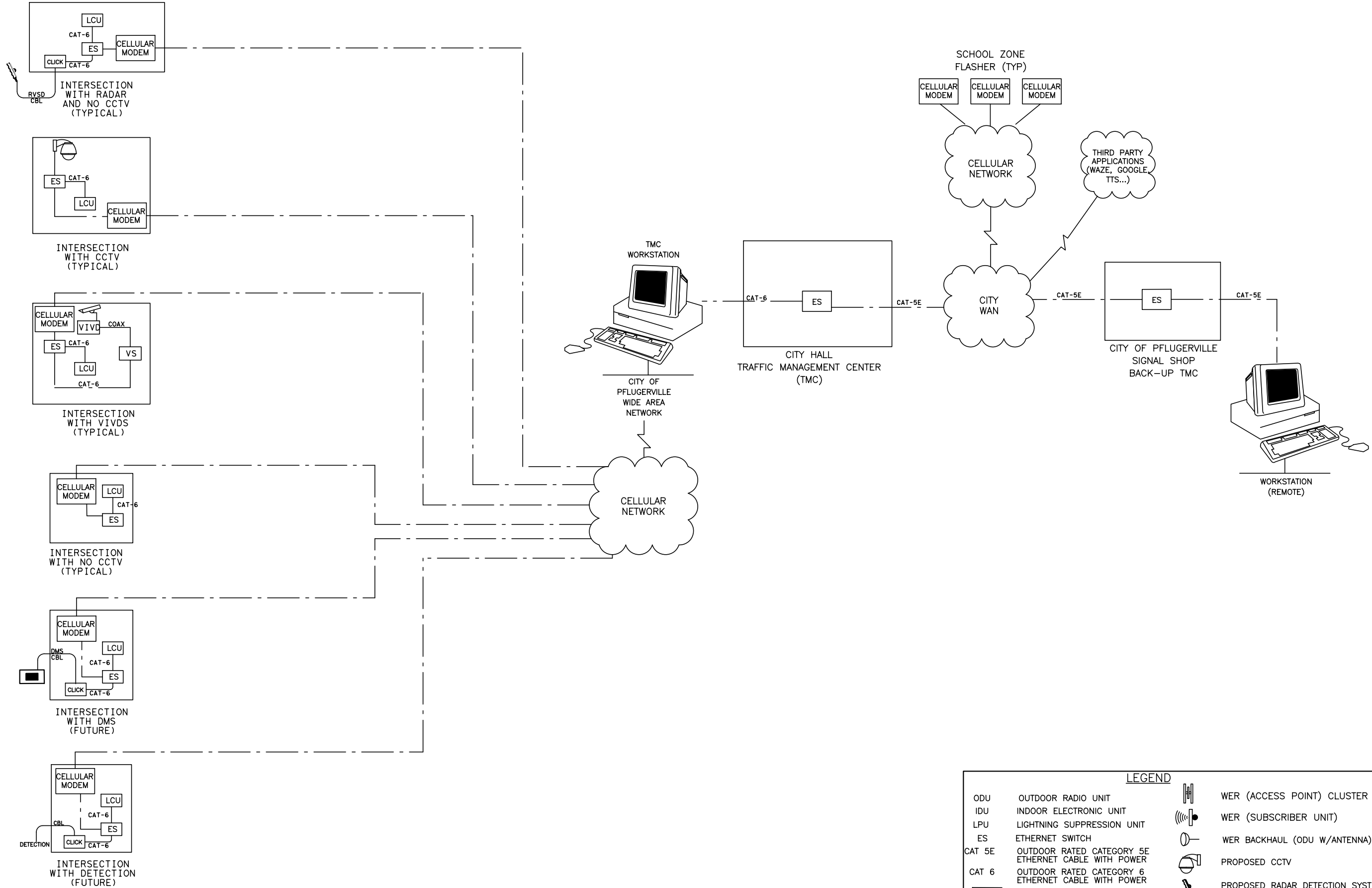


**Kimley»Horn**  
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PFLUGERVILLE RADIO COMMUNICATION  
 SYSTEM LAYOUT  
 ALTERNATIVE 2

Scale:	Designed by:
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Date:	Project No.:

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 DWG NAME: 6/12/2020  
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LEGEND			
ODU	OUTDOOR RADIO UNIT		WER (ACCESS POINT) CLUSTER
IDU	INDOOR ELECTRONIC UNIT		WER (SUBSCRIBER UNIT)
LPU	LIGHTNING SUPPRESSION UNIT		WER BACKHAUL (ODU W/ANTENNA)
ES	ETHERNET SWITCH		PROPOSED CCTV
CAT 5E	OUTDOOR RATED CATEGORY 5E ETHERNET CABLE WITH POWER		PROPOSED RADAR DETECTION SYSTEM
CAT 6	OUTDOOR RATED CATEGORY 6 ETHERNET CABLE WITH POWER		FUTURE DMS
	PROPOSED		
LCU	LOCAL CONTROLLER UNIT		
VS	VIVDS SERVER		

Scale:	Designed by:	Drawn by:	Checked by:	Date:	Project No.



## 8.0 Prioritizing, Deployment, and Budget Requirements

The entire signal system upgrade for the City of Pflugerville will require a number of discrete projects. Some of these projects have a higher priority than others and need to be completed before subsequent improvement projects can start. The criteria used to prioritize different projects is as follows:

- Priority 1 – Repair or Replace malfunctioning equipment; upgrade equipment to comply with TxMUTCD standards and City guidelines.
- Priority 2 – Set-up system to allow remote monitoring and control of traffic signals.
- Priority 3 – Intelligent Transportation System (ITS) Improvements

After projects were prioritized using above criteria, they were divided into different phases. Phase 1 is proposed to be all projects under Priority 1 and Priority 2 which consist of repairs, upgrades need to get in compliance with standards, and setting up wireless communication network. Phase 1 will need to be completed before Phases 2 & 3 may be implemented as vast majority of all the improvements in the latter phases will require a communication network. Projects under Phase 2 and Phase 3 may be combined and implemented simultaneously as a single phase per City's discretion. However, since the projects are discrete, they have been separated in two phases to allow gradual system build-out. The ATMS is shown as Priority 1, however, some of the associated modules are shown as implemented in Phase 2 and 3 Planning level budget estimates are presented in Section 8.1.

### 8.1 Budget Estimates

**Table 5** summaries planning level budget estimates for projects under Phases 1-2-3. The table represents only capital and engineering cost for the phased projects. Cost estimates have been prepared for each traffic signal intersection and projections for cost increases should be adjusted annually based on updates for technology and unit pricing during the anticipated year of construction.

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Table 5. Capital Improvement Summary

Project Initiative	Item Description	Project Priority	Unit	Phase 1			Phase 2			Phase 3		
				Unit Price	Quantity	Item Cost	Unit Price	Quantity	Item Cost	Unit Price	Quantity	Item Cost
Signal Repairs	SPAN-WIRE TO MAST-ARM UPGRADE	1	EA	\$ 300,000.00	1.5	\$ 450,000.00	\$ 300,000.00		\$ -	\$ 300,000.00		\$ -
	REPLACE 5-SEC P+P TO 4-SEC FYA (INTERSECTION)		EA	\$ 6,000.00	8	\$ 48,000.00	\$ 6,000.00		\$ -	\$ 6,000.00		\$ -
	REPAIR & UPGRADE PED PBs TO APS UNITS (INTERSECTION)		EA	\$ 10,000.00	6	\$ 60,000.00	\$ 9,800.00		\$ -	\$ 9,800.00		\$ -
	MSC REPAIR ITEMS (INSIDE CABINET EQUIPMENT)		EA	\$ 5,000.00	7	\$ 35,000.00	\$ 5,000.00		\$ -	\$ 5,000.00		\$ -
	<b>SUBTOTAL</b>						\$ 593,000.00			\$ -		
Signal Upgrades	UPGRADE PUSH-BUTTONS TO APS UNITS (INTERSECTION)	2	EA	\$ 10,000.00		\$ -	\$ 10,000.00	13.00	\$ 130,000.00	\$ 10,000.00		\$ -
	BATTERY BACK-UP UNITS		EA	\$ 7,000.00		\$ -	\$ 7,000.00	20	\$ 140,000.00	\$ 7,000.00		\$ -
	<b>SUBTOTAL</b>					\$ -			\$ 270,000.00			\$ -
ITS Communication Infrastructure	DUAL BAND WIRELESS ETHERNET RADIO (OFF-SYSTEM)	1	EA	\$ 4,500.00	23.00	\$ 103,500.00	\$ 1,200.00		\$ -	\$ 1,200.00		\$ -
	DUAL BAND WIRELESS ETHERNET RADIO (ON-SYSTEM)		EA	\$ 4,500.00	12.00	\$ 54,000.00	\$ 1,200.00		\$ -	\$ 1,200.00		\$ -
	HARDENED ETHERNET SWITCH (FIELD)		EA	\$ 1,750.00	35.00	\$ 61,250.00	\$ 1,750.00		\$ -	\$ 1,750.00		\$ -
	ETHERNET SWITCH (LAYER 3) (TMC/BTMC)		EA	\$ 3,500.00	4.00	\$ 14,000.00	\$ 3,500.00		\$ -	\$ 3,500.00		\$ -
	NETWORK FIREWALL		EA	\$ 2,500.00	1.00	\$ 2,500.00	\$ 2,500.00		\$ -	\$ 2,500.00		\$ -
	WIRELESS BACKHAUL LINK		EA	\$ 12,000.00	1.00	\$ 12,000.00	\$ 12,000.00		\$ -	\$ 12,000.00		\$ -
<b>SUBTOTAL</b>					\$ 247,250.00			\$ -			\$ -	
CCTV Network	CCTV FIELD EQUIPMENT	2	EA	\$ 2,750.00		\$ -	\$ 2,750.00	35.00	\$ 96,250.00	\$ 2,750.00		\$ -
	CATEGORY 6 ETHERNET CABLE		LF	\$ 1.25		\$ -	\$ 1.25	26000.00	\$ 32,500.00	\$ 1.25		\$ -
	MOUNTING BRACKET		EA	\$ 80.00		\$ -	\$ 80.00	35.00	\$ 2,800.00	\$ 80.00		\$ -
	POLE EXTENSION		EA	\$ 50.00		\$ -	\$ 50.00	35.00	\$ 1,750.00	\$ 50.00		\$ -
	FLASH MEMORY CARD		EA	\$ 56.00		\$ -	\$ 56.00	35.00	\$ 1,960.00	\$ 56.00		\$ -
	2 YR EXTENDED WARRANTY		EA	\$ 200.00		\$ -	\$ 200.00	35.00	\$ 7,000.00	\$ 200.00		\$ -
	CCTV FIELD EQUIPMENT (AT WATER TOWER)		EA	\$ 7,200.00		\$ -	\$ 7,200.00	3.00	\$ 21,600.00	\$ 2,700.00		\$ -
<b>SUBTOTAL</b>					\$ -		\$ 163,860.00				\$ -	
ILSN Signs	INTERNALLY LIT ILLUMINATION STREETNAME SIGNS	3	EA			\$ -	\$ 8,000.00		\$ -	\$ 8,000.00	25.00	\$ 200,000.00
	<b>SUBTOTAL</b>					\$ -			\$ -			\$ 200,000.00
Traffic Signal Controller Upgrades	TRAFFIC SIGNAL CONTROLLER ASSEMBLY (COBALT OR EQUIVALENT)	2	EA	\$ 2,600.00		\$ -	\$ 2,600.00	27.00	\$ 70,200.00	\$ 2,600.00		\$ -
	<b>SUBTOTAL</b>					\$ -			\$ 70,200.00			\$ -
Emergency Vehicle Preemption	OPTICOM DETECTORS	3	EA			\$ -	\$ 1,500.00		\$ -	\$ 1,500.00	60.00	\$ 90,000.00
	OPTICOM PHASE SELECTOR		EA			\$ -	\$ 5,000.00		\$ -	\$ 5,000.00	30.00	\$ 150,000.00
	OPTICOM RACK		EA			\$ -	\$ 1,000.00		\$ -	\$ 1,000.00	30.00	\$ 30,000.00
	OPTICOM CABLE		LF			\$ -	\$ 5.00		\$ -	\$ 5.00	15000.00	\$ 75,000.00
<b>SUBTOTAL</b>					\$ -			\$ -			\$ 345,000.00	
Advanced Traffic Management System	ADVANCED TRAFFIC MANAGEMENT SYSTEM (CENTRACS OR EQUIVALENT)	1	LS	\$ 190,000.00	1.00	\$ 190,000.00	\$ 190,000.00		\$ -	\$ 190,000.00		\$ -
	CCTV MODULE		LS	\$ 20,000.00	1.00	\$ 20,000.00	\$ 20,000.00		\$ -	\$ 20,000.00		\$ -
	DMS MODULE		LS	\$ 20,000.00		\$ -	\$ 20,000.00		\$ -	\$ 20,000.00		\$ -
	ADAPTIVE SIGNAL CONTROL MODULE		LS	\$ 100,000.00		\$ -	\$ 100,000.00	1.00	\$ 100,000.00	\$ 100,000.00		\$ -
	TRAVEL TIME MODULE		LS	\$ 36,000.00		\$ -	\$ 36,000.00		\$ -	\$ 36,000.00	1.00	\$ 36,000.00
	PERFORMANCE METRICS MODULE		LS	\$ 20,000.00		\$ -	\$ 20,000.00		\$ -	\$ 20,000.00	1.00	\$ 20,000.00
<b>SUBTOTAL</b>					\$ 210,000.00			\$ 100,000.00			\$ 56,000.00	
Detection Systems	RADAR DETECTION SYSTEM (4 LEG APPROACH)	3	EA	\$ 20,000.00		\$ -	\$ 20,000.00	10.00	\$ 200,000.00	\$ 22,000.00		\$ -
	VIDEO DETECTION SYSTEM (4 LEG APPROACH)		EA	\$ 15,000.00		\$ -	\$ 15,000.00		\$ -	\$ 15,000.00		\$ -
	<b>SUBTOTAL</b>					\$ -			\$ 200,000.00			\$ -
TMC and Video Management System	TMC LED MONITORS (4K 50-55")	3	EA	\$ 2,500.00		\$ -	\$ 2,500.00		\$ -	\$ 2,500.00	4.00	\$ 10,000.00
	MISC. UPGRADES TO TMC FURNITURE		LS	\$ 2,000.00		\$ -	\$ 2,000.00		\$ -	\$ 2,000.00	1.00	\$ 2,000.00
	VIDEO MANAGEMENT SYSTEM (SOFTWARE)		EA	\$ 10,000.00		\$ -	\$ 10,000.00		\$ -	\$ 10,000.00	1.00	\$ 10,000.00
	VIDEO MANAGEMENT SYSTEM (HARDWARE)		EA			\$ -			\$ -	\$ 65,000.00		\$ -
	TMC REMODEL		LS	\$ 50,000.00		\$ -	\$ 50,000.00		\$ -	\$ 50,000.00	1.00	\$ 50,000.00
<b>SUBTOTAL</b>					\$ -			\$ -			\$ 72,000.00	
		Subtotal:				\$ 1,050,250.00			\$ 804,060.00			\$ 673,000.00
		Contingency: (%)		15	\$ 157,537.50			15	\$ 120,609.00		15	\$ 100,950.00
		<b>Construction Total:</b>				<b>\$ 1,207,787.50</b>			<b>\$ 924,669.00</b>			<b>\$ 773,950.00</b>
		<b>Engineering Costs</b>				<b>\$ 181,168.13</b>			<b>\$ 138,700.35</b>			<b>\$ 116,092.50</b>
		<b>Initial Project Cost</b>				<b>\$ 1,388,955.63</b>			<b>\$ 1,063,369.35</b>			<b>\$ 890,042.50</b>
		<b>TOTAL PHASES 1+2+3</b>				<b>\$ 3,342,367.48</b>						

## APPENDICES

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**INTERSECTION 1 – FM 1825 AT CENTRAL COMMERCE**

Intersection ID :

1

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION:

FM 1825 @ Central Commerce

Key Map:

E-W Street:

FM 1825

Date:

9-Jan

6-Feb

N-S Street:

Central Commerce

Signal

Controller

SIGNAL POLES

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM/PED POLE	Y	FAIR	
NE	MAST ARM/PED POLE	Y	FAIR	
SE	MAST ARM/PED POLE	Y	FAIR	
SW	MAST ARM/PED POLE	Y	FAIR	
N Median		N	S Median	Y
E Median		N	W Median	N

SIGNAL HEADS

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	5	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL	5	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H		FAIR
NBL	4	12"	LED	Y	H	4	FAIR
NBT	3	12"	LED	Y	H		FAIR
SBL	4	12"	LED	Y	H	4	FAIR
SBT	3	12"	LED	Y	H		FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

DETECTION/COMMUNICATION

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	2	N	N	PRESENCE & SETBACK
WB	VIVDS	2	N	N	PRESENCE & SETBACK
NB	LOOPS/VIVDS	1	N	N	
SB	VIVDS	1	N	Y	

Intersection ID :

1

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION:

FM 1825 @ Central Commerce

Key Map:

E-W Street:

FM 1825

Date:

9-Jan

6-Feb

N-S Street:

Central Commerce

Signal

Controller

SIGNS

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

ADA RAMPS / PED SIGNALS

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	RAMPS	2	SEE REMARKS	Y	FAIR	APS COUNTDOWN NO WORKING
NE	RAMPS	2	SEE REMARKS	Y	FAIR	PEDESTRIAN POLE IT TOO CLOSE TO EDGE - TIRE TRACKS PRESENT
SE	RAMPS	2	SEE REMARKS	Y	FAIR	
SW	RAMPS	2	SEE REMARKS	Y	FAIR	

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOO K	MISC. ITEMS		
SE	B	16	5 x 3", 2 x 2"	N	Y	Spare - 1 x 2", 3 x 3"		
CONDITION / REMARKS		FAIR						
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION			
ASC 3 - 100	TS2	COORD	N	N	EBL	5	WBL	1
SOFTWARE	Econolite				EBT	2	WBT	6
VERSION	2.5.1				NBL	3	SBL	4
MISC.	N3000				NBT		SBT	
CONDITION / REMARKS		GRID						

CONFLICT ELECTRONICS

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - 16 Leip	FAIR



Intersection ID :

1

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION:

FM 1825 @ Central Commerce

Key Map:

E-W Street:

FM 1825

Date:

9-Jan

6-Feb

N-S Street:

Central Commerce

Signal

Controller

COMMUNICATION

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
Wireless Radio	known manufactur	- EtherWAN switch		PRESENT BUT NOT INTEGRATED WITH CENTRAL SYSTEM

ELECTRICAL SERVICE

LOCATION
NW

LOOPS/VIVDS/RADAR

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris	Vantage Edge 2		

DETECTOR CARDS

VEH. PH	1	2	3	4	5	6	7	8
WORKING		Y - SETBACK				Y - SETBACK		
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

ADDITIONAL INFORMATION:

- EtherWAN Switch - EX 71620
- Power Source - EDI
- Advance Not Working
- Presence - Grid
- Manual on side of door
- Light above door is working
- Clock is reset

**INTERSECTION 2 - FM 1825 AT WINDERMERE DR**

**Intersection ID :**

**2**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **FM 1825 @ Windermere Drive**

Key Map:

E-W Street:

**FM 1825**

Date:

9-Jan

6-Feb

N-S Street:

**Windermere Drive**

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM	Y	FAIR	
NE	MAST ARM	Y	FAIR	
SE	MAST ARM	Y	FAIR	
SW	MAST ARM	Y	FAIR	
N Median	Y	S Median	N	
E Median	N	W Median	N	

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	5	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL	5	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H		FAIR
NBL	4	12"	LED	Y	H	4	FAIR
NBT	3	12"	LED	Y	H		FAIR
SBL	4	12"	LED	Y	H	4	FAIR
SBT	3	12"	LED	Y	H		FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**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
WB	VIVDS	1	N	N	PRESENCE & SETBACK
NB	LOOPS/VIVDS	1	N	Y	FAIR
SB	LOOPS/VIVDS	1	N	N	FAIR

Intersection ID :

2

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: FM 1825 @ Windermere Drive

Key Map:

E-W Street:

FM 1825

Date:

9-Jan

6-Feb

N-S Street:

Windermere Drive

Signal

Controller

SIGNS

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

APPROACH	TYPE	CONDITION / REMARKS
NB	LANE ASSIGNMENT	FAIR
SB	LANE ASSIGNMENT	FAIR

ADA RAMPS / PED SIGNALS

CORNER	SDWK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMPS - Y	2/3	SEE REMARKS	Y	FAIR	APS ON NW CORNER NOT WORKING
NE	SDWK - Y RAMPS - Y	2/3	SEE REMARKS	Y	FAIR	AUDIO TONE NOT WORKING
SE	RAMPS - Y	2/3	SEE REMARKS	Y	FAIR	APS ON SE CORNER NOT WORKING
SW	RAMPS - Y	2/3	SEE REMARKS	Y	FAIR	AUDIO TONE NOT WORKING

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS		
NW	B	16	2 x 5", 2 x 2"	N	Y	Spare - 3 x 3", 1 x 2"		
CONDITION / REMARKS								
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION			
		COORD	N	N	EBL	5	WBL	1
SOFTWARE	Econolite ASC/ 3-1000				EBT	2	WBT	6
VERSION	2.51.00				NBL	3	SBL	4
MISC.					NBT		SBT	
CONDITION / REMARKS		GRID						

**Intersection ID :**

**2**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **FM 1825 @ Windermere Drive**

Key Map:

E-W Street:

**FM 1825**

Date:

**9-Jan**

**6-Feb**

N-S Street:

**Windermere Drive**

Signal

Controller

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU - 16 E	Not Compatible w/ FYAs

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
EtherWAN		EX71620		Radio Unknown / Radio has POE

**ELECTRICAL SERVICE**

LOCATION
NW

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris			Some cameras dirty, some zones not

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING	Y	Y	Y	Y	Y	Y		
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER	BULL DOG WITH CHIRP							

**ADDITIONAL INFORMATION:**

Power source - EDI PS 250

VIVDS - Not set-up correctly - too zoomed out, potential sun glare issues

Re-built - May 2011

Clock Checked

Manual

**INTERSECTION 3 - FM 1825 AT HEATHERWILDE BLVD**

**Intersection ID :**

**3**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **FM 1825 @ Heatherwilde Blvd**

Key Map:

E-W Street:

**FM 1825**

Date:

9-Jan

6-Feb

N-S Street:

**Heatherwilde blvd**

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM	Y	FAIR	
NE	MAST ARM	Y	FAIR	
SE	MAST ARM	Y	FAIR	
SW	MAST ARM	Y	FAIR	
N Median	Y	S Median	Y	
E Median	N	W Median	N	

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	5	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL	5	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H		FAIR
NBL	4	12"	LED	Y	H	4	FAIR
NBT	3	12"	LED	Y	H		FAIR
SBL	4	12"	LED	Y	H	4	FAIR
SBT	3	12"	LED	Y	H		FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**DETECTION/COMMUNICATION**

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	2	N	N	PRESENCE & SETBACK, ITS PLUS CAMERA
WB	VIVDS	2	N	N	PRESENCE & SETBACK, ITS PLUS CAMERA
NB	VIVDS	1	N	N	FAIR
SB	VIVDS	1	N	Y	FAIR

Intersection ID :

3

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** FM 1825 @ Heatherwilde Blvd

Key Map:

E-W Street:

FM 1825

Date:

9-Jan

6-Feb

N-S Street:

Heatherwilde blvd

Signal

Controller

**SIGNS**

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

APPROACH	TYPE	CONDITION / REMARKS
NB		
SB		

**ADA RAMPS / PED SIGNALS**

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	RAMPS - Y	2	FAIR	Y	FAIR	
NE	RAMPS - Y	2	FAIR	Y	FAIR	
SE	SDWK - Y RAMPS - Y	2	FAIR	Y	FAIR	
SW	RAMPS - Y	2	FAIR	Y	FAIR	

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

**CABINET/CONTROLLER DETAILS**

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS		
SE	B	16	5 x 3", 2 x 2"	N	Y	Spare - 3 x 3", 1 x 2"		
CONDITION / REMARKS								
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION			
					EBL	5	WBL	1
SOFTWARE	ASC / 3-1000				EBT	2	WBT	6
VERSION	2.51.00				NBL	3	SBL	4
MISC.					NBT		SBT	
CONDITION / REMARKS								

**CONFLICT ELECTRONICS**



**Intersection ID :**

**3**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **FM 1825 @ Heatherwilde Blvd**

Key Map:

E-W Street: **FM 1825**

Date:

**9-Jan**

**6-Feb**

N-S Street: **Heatherwilde blvd**

Signal

Controller

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - 16 Lei	- FYA Compliant

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
EtherWAN		EX71800		Radio - Unknown - POE

**ELECTRICAL SERVICE**

LOCATION
SE

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
ITS +		Color Wide LCD Monitor	

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS	ITSP - V200E							
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER	Dogs with Chirps							

**ADDITIONAL INFORMATION:**

Clock checked

Power source - EDI PS250

Manual

**INTERSECTION 4 - FM 1825 AT SWENSON FARMS BVLD**

**Intersection ID :**

**4**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **FM 1825 & Swenson Farms**

Key Map:

E-W Street:

**FM 1825**

Date:

**9-Jan**

**6-Feb**

N-S Street:

**Swenson Farms**

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	SPAN WIRE / PED POLE	Y	FAIR	
NE	SPAN WIRE / PED POLE	Y	FAIR	
SE	SPAN WIRE / PED POLE	Y	FAIR	
SW	SPAN WIRE / PED POLE	Y	FAIR	
N Median	N		S Median	N
E Median	N		W Median	N

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	5	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL	5	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H		FAIR
NBL	4	12"	LED	Y	H	4	FAIR
NBT	3	12"	LED	Y	H		FAIR
SBL	4	12"	LED	Y	H	4	FAIR
SBT	3	12"	LED	Y	H		FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**DETECTION/COMMUNICATION**

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	FAIR
WB	VIVDS	1	N	N	FAIR
NB	VIVDS	1	N	Y	FLAT PANEL ANTENNA
SB	VIVDS	1	N	N	FAIR

Intersection ID :

4

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: FM 1825 & Swenson Farms

Key Map:

E-W Street:

FM 1825

Date:

9-Jan

6-Feb

N-S Street:

Swenson Farms

Signal

Controller

SIGNS

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

APPROACH	TYPE	CONDITION / REMARKS
NB		
SB		

ADA RAMPS / PED SIGNALS

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMPS - Y	2	SEE REMARKS	Y	SEE REMARKS	PUSH BUTTON <b>NOT</b> WORKING IN E DIRECTION
NE	SDWK - Y RAMPS - Y	2	FAIR	Y	FAIR	
SE	SDWK - Y RAMPS - Y	2	FAIR	Y	FAIR	
SW	SDWK - Y RAMPS - Y	2	FAIR	Y	FAIR	

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS		
NE	B	16	3 x 3", 1 x 2"	N	Y	Spare - 1 x 2"		
CONDITION / REMARKS								
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION			
Econolite	TS2	Coord		N	EBL	1	WBL	5
SOFTWARE	ASC / 3-1000				EBT	6	WBT	2
VERSION	2.51.00				NBL	4	SBL	3
MISC.					NBT		SBT	
CONDITION / REMARKS								

CONFLICT ELECTRONICS

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - 16 LEip	- FYA Compliant

**Intersection ID :**

4

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** FM 1825 & Swenson Farms

Key Map:

E-W Street:

FM 1825

Date:

9-Jan

6-Feb

N-S Street:

Swenson Farms

Signal

Controller

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
EtherWAN		EX71620		Radio - Unknown

**ELECTRICAL SERVICE**

LOCATION
NW

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris	Vantage Edge 2	Color LCD	-SB Camera not working

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

Power - EAGLE - CPS 102

Old OMNI Antenna for SSR - Abandoned

Manual

**INTERSECTION 5 - FM 1825 AT MEADOWS LN**

**Intersection ID :**

**5**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** FM 1825 @ Meadows Lane

Key Map:

E-W Street: FM 1825

Date:

10-Jan

6-Feb

N-S Street: Meadows Lane

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM	Y	FAIR	
NE	MAST ARM	Y	FAIR	
SE	MAST ARM	Y	FAIR	
SW	MAST ARM	Y	FAIR	
N Median	N		S Median	N
E Median	N		W Median	N

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	5	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL	5	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H		FAIR
NBL	3	12"	LED	Y	H	3	FAIR
NBT	3	12"	LED	Y	H		FAIR
SBL	3	12"	LED	Y	H	3	FAIR
SBT	3	12"	LED	Y	H		FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**DETECTION/COMMUNICATION**

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS/RADAR	2	N	N	PRESENCE & SETBACK
WB	VIVDS	2	N	N	PRESENCE & SETBACK
NB	VIVDS	1	N	N	FAIR
SB	VIVDS	1	N	Y	FAIR

Intersection ID :

5

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: FM 1825 @ Meadows Lane

Key Map:

E-W Street: FM 1825

Date:

10-Jan

6-Feb

N-S Street: Meadows Lane

Signal

Controller

SIGNS

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

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

ADA RAMPS / PED SIGNALS

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	RAMPS - Y	2/3	FAIR	Y	FAIR	
NE	SDWK - Y RAMPS - Y	2/3	FAIR	SEE REMARKS	SEE REMARKS	SIGN FADED
SE	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
SW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS		
SE	B	16	5 x 3", 2 x 2"	N	Y	spare - 2 x 3", 2 x 2"		
CONDITION / REMARKS								
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION			
Econolite	TS2	Coord	N	N	EBL	5	WBL	1
SOFTWARE	ASC / 3-1000				EBT	2	WBT	6
VERSION	2.51.00				NBL	8	SBL	4
MISC.					NBT		SBT	
CONDITION / REMARKS								

CONFLICT ELECTRONICS



**Intersection ID :**

**5**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** FM 1825 @ Meadows Lane

Key Map:

E-W Street:

FM 1825

Date:

10-Jan

6-Feb

N-S Street:

Meadows Lane

Signal

Controller

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU - 16E	- FYA Not Compliant

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
EtherWAN		EX71620		Radio - Unknown

**ELECTRICAL SERVICE**

LOCATION
SW

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris	Lelleput LED		

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS	Iteris Vantage Edge 2							
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

Radio pointing down (flat pannel antenna)

Extra channel for EB setback

Power - EDI - PS250

**INTERSECTION 6 - FM 1825 AT RAILROAD AVE**

**Intersection ID :**

**6**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **FM 1825 & Railroad Avenue**

Key Map:

E-W Street:

**1825**

Date:

**10-Jan**

**6-Feb**

N-S Street:

**Railroad Avenue**

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	SPAN WIRE	Y	FAIR	
NE	SPAN WIRE	Y	FAIR	
SE	SPAN WIRE	Y	FAIR	
SW	SPAN WIRE	Y	FAIR	
N Median	N		S Median	N
E Median	N		W Median	N

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	5	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL	5	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H		FAIR
NBL	4	12"	LED	Y	H	3	FAIR
NBT	3	12"	LED	Y	H		FAIR
SBL	3	12"	LED	Y	H	3	FAIR
SBT	3	12"	LED	Y	H		FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**DETECTION/COMMUNICATION**

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	FAIR
WB	VIVDS	1	N	N	FAIR
NB	VIVDS	1	N	Y	FAIR
SB	VIVDS	1	N	N	FAIR

**Intersection ID :**

6

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** FM 1825 & Railroad Avenue

Key Map:

E-W Street:

1825

Date:

10-Jan

6-Feb

N-S Street:

Railroad Avenue

Signal

Controller

**SIGNS**

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

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

**ADA RAMPS / PED SIGNALS**

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SKWK - Y RAMPS - Y	1	FAIR	Y	FAIR	
NE	SKWK - Y RAMPS - Y	1	FAIR	Y	FAIR	
SE	SKWK - Y RAMPS - Y	1	FAIR	Y	FAIR	
SW	SKWK - Y RAMPS - Y	1	FAIR	Y	FAIR	

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

**CABINET/CONTROLLER DETAILS**

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS		
NE	B	16	2x 4 "	N	Y			
CONDITION / REMARKS								
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION			
Econolite	TS2	Coord	N	N	EBL	5	WBL	1
SOFTWARE	ASC / 3-1000				EBT	2	WBT	6
VERSION	2.42.10				NBL	8	SBL	4
MISC.					NBT		SBT	
CONDITION / REMARKS								

**CONFLICT ELECTRONICS**

**Intersection ID :**

6

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** FM 1825 & Railroad Avenue

Key Map:

E-W Street:

1825

Date:

10-Jan

6-Feb

N-S Street:

Railroad Avenue

Signal

Controller

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU - 16E	- FYA Not Compliant

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
EtherWAN		EX71620		Radio - Unknown

**ELECTRICAL SERVICE**

LOCATION
NE

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris	Ultrak		

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS	Iteris Vantage Edge 2							
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

Span Wire

Issues w/ ROW and ADA for mast arm upgrade

Power - Eagle CPS 105

**INTERSECTION 7 - FM 1825 AT FM 685**

Intersection ID :

7

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: FM 1825 @ Dessau Road

Key Map:

E-W Street: FM 1825

Date:

10-Jan

6-Feb

N-S Street: Dessau Road

Signal

Controller

SIGNAL POLES

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM/ PED POLE	Y	FAIR	
NE	MAST ARM/ PED POLE	Y	FAIR	
SE	MAST ARM / PED POLE	Y	FAIR	
SW	MAST ARM / PED POLE	Y	FAIR	
N Median	N		S Median	N
E Median	Y		W Median	N

SIGNAL HEADS

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	5	12"	LED	Y	H	2	OFF CENTER
EBT	3	12"	LED	Y	H	2	OFF CENTER
WBL	5	12"	LED	Y	H	2	OFF CENTER
WBT	3	12"	LED	Y	H	2	OFF CENTER
NBL	5	12"	LED	Y	H	2	OFF CENTER
NBT	3	12"	LED	Y	H	2	OFF CENTER
SBL	5	12"	LED	Y	H	2	OFF CENTER
SBT	3	12"	LED	Y	H	2	OFF CENTER

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

DETECTION/COMMUNICATION

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS/RAD AR	1	N	N	FAIR
WB	VIVDS/RAD AR	1	N	N	FAIR
NB	VIVDS/RAD AR	1	N	Y	FAIR
SB	VIVDS/RAD AR	1	N	N	FAIR

Intersection ID :

7

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: FM 1825 @ Dessau Road

Key Map:

E-W Street: FM 1825

Date:

10-Jan

6-Feb

N-S Street: Dessau Road

Signal

Controller

SIGNS

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

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

ADA RAMPS / PED SIGNALS

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SKWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
NE	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
SE	SKWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
SW	RAMPS - Y	2/3	FAIR	Y	FAIR	

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS		
NE	B	16	4 x 3", 2 x 2"	N	Y	Spare - 1 x 3", 1 x 2"		
CONDITION / REMARKS								
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION			
Econolite	TS2	Coord		N	EBL	5	WBL	1
SOFTWARE	ASC / 3-1000				EBT	2	WBT	6
VERSION	2.63.00				NBL	3	SBL	7
MISC.					NBT	8	SBT	4
CONDITION / REMARKS								

CONFLICT ELECTRONICS



**Intersection ID :**

**7**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **FM 1825 @ Dessau Road**

Key Map:

E-W Street: **FM 1825**

Date:

**10-Jan**

**6-Feb**

N-S Street: **Dessau Road**

Signal

Controller

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - Leip	

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
EtherWAN		EX71620		Radio - Unknown

**ELECTRICAL SERVICE**

LOCATION
NE

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
	RADAR		

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS	Wavetronics - Click 650							
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

Power - EDI PS 250

APS Controller - Polara Nonako V4.06

**INTERSECTION 8 - FM 685 AT OLD AUSTIN HUTTON RD**

Intersection ID :

8

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: OLD AUSTIN HUTTO RD & FM 685

Key Map:

E-W Street: Old Austin Hutto Road

Date:

11-Jan

6-Feb

N-S Street: FM 685

Signal

Controller

SIGNAL POLES

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM	Y	FAIR	
NE	MAST ARM	Y	FAIR	
SE	MAST ARM	Y	FAIR	
SW	MAST ARM	Y	FAIR	
N Median	Y	S Median	Y	
E Median	N	W Median	N	

SIGNAL HEADS

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H/ VERT(V))	PHASING*	CONDITION / REMARKS
EBL	4	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H	2	FAIR
WBL	4	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H	2	FAIR
NBL	4	12"	LED	Y	H	2	FAIR
NBT	3	12"	LED	Y	H	2	FAIR
SBL	4	12"	LED	Y	H	2	FAIR
SBT	3	12"	LED	Y	H	2	FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

DETECTION/COMMUNICATION

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	FAIR
WB	VIVDS	1	N	N	FAIR
NB	VIVDS/RADAR	1	N	N	FAIR
SB	VIVDS/RADAR	1	N	Y	FAIR

**Intersection ID :**

**8**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

**OLD AUSTIN HUTTO RD & FM 685**

Key Map:

E-W Street:

Old Austin Hutto Road

Date:

11-Jan

6-Feb

N-S Street:

FM 685

Signal

Controller

**SIGNS**

APPROACH	TYPE	CONDITION / REMARKS
EB	LEFT TURN YIELD ON FLASHING YELLOW ARROW	FAIR
WB	LEFT TURN YIELD ON FLASHING YELLOW ARROW	FAIR

APPROACH	TYPE	CONDITION / REMARKS
NB	LEFT TURN YIELD ON FLASHING YELLOW ARROW	FAIR
SB	LEFT TURN YIELD ON FLASHING YELLOW ARROW	FAIR

**ADA RAMPS / PED SIGNALS**

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	N	NONE	N/A	N/A	N/A	
NE	N	NONE	N/A	N/A	N/A	
SE	N	NONE	N/A	N/A	N/A	
SW	N	NONE	N/A	N/A	N/A	

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

**CABINET/CONTROLLER DETAILS**

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS		
SW	B	16		N	Y			
<b>CONDITION / REMARKS</b>								
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION			
Econolite	TS2	Coord		N	EBL	7	WBL	3
SOFTWARE	ASC / 3-2100				EBT	4	WBT	8
VERSION	2.49.00				NBL	5	SBL	1
MISC.					NBT	2	SBT	6
<b>CONDITION / REMARKS</b>								

**Intersection ID :**

**8**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** OLD AUSTIN HUTTO RD & FM 685

Key Map:

E-W Street: **Old Austin Hutto Road**

Date:

**11-Jan**

**6-Feb**

N-S Street: **FM 685**

Signal

Controller

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - 16LEip	FYAs x 4

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
Radio	EtherWAN	EX71620		Radio - Unknown

**ELECTRICAL SERVICE**

LOCATION
SW

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS	Iteris Vantage Edge 2							
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

Ped Heads lying inside the cabinet

Wavetronix - setback detector - NB & SB

-Check 112 (model) - peteclor card

-Controller - Check 600

Power - EDT PS 250

**INTERSECTION 9 - FM 685 AT PFENNIG LANE**

Intersection ID :

9

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: FM 685 @ Pfennig Lane

Key Map: 

E-W Street: Pfennig Lane

Date: 11-Jan 6-Feb

N-S Street: FM 685

Signal Controller

SIGNAL POLES

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM	Y	FAIR	
NE	MAST ARM	Y	FAIR	
SE	MAST ARM / PED POLE	Y	FAIR	
SW	MAST ARM / PED POLE	Y	FAIR	
N Median	N		S Median	N
E Median	N		W Median	N

SIGNAL HEADS

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	5	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL	5	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H		FAIR
NBL	5	12"	LED	Y	H	2	FAIR
NBT	3	12"	LED	Y	H		FAIR
SBL	5	12"	LED	Y	H	2	FAIR
SBT	3	12"	LED	Y	H		FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

DETECTION/COMMUNICATION

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	FAIR
WB	VIVDS	1	N	N	FAIR
NB	VIVDS	1	N	Y	FAIR
SB	VIVDS	1	N	N	FAIR

**Intersection ID :**

**9**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** FM 685 @ Pfennig Lane

Key Map:  

E-W Street: Pfennig Lane

Date: 11-Jan 6-Feb

N-S Street: FM 685

Signal   Controller  

**SIGNS**

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

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

**ADA RAMPS / PED SIGNALS**

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMPS - Y	1/3	FAIR	Y	FAIR	
NE	SDWK - Y RAMPS - Y	1/3	FAIR	Y	FAIR	
SE	SDWK - Y RAMPS - Y	1/3	FAIR	Y	FAIR	
SW	RAMPS - Y	1/3	FAIR	N/A	FAIR	

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

**CABINET/CONTROLLER DETAILS**

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS		
NE	B	16	2 x 4", 4 x 2"	N	N	3 x 2" Spare		
CONDITION / REMARKS								
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION			
Econolite	TS2	Coord	N	N	EBL	7	WBL	3
SOFTWARE	ASC / 3-2100				EBT	4	WBT	8
VERSION	2.51.00				NBL	5	SBL	1
MISC.					NBT	2	SBT	6
CONDITION / REMARKS								



**Intersection ID :**

9

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

FM 685 @ Pfennig Lane

Key Map:

E-W Street:

Pfennig Lane

Date:

11-Jan

6-Feb

N-S Street:

FM 685

Signal

Controller

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - 16E	FYA Not Compliant - All 5 seconds

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
Radio	EtherWAN	EX71620		Radio - Unknown

**ELECTRICAL SERVICE**

LOCATION
NE

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris		LCD	Set back 2 x 6

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS	Iteris Vantage Edge 2							
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

Power - CPS 105

**INTERSECTION 10 - FM 685 AT PFLUGERVILLE PKWY**

**Intersection ID :**

**10**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **FM 685 @ Pflugerville Parkway**

Key Map:

E-W Street: **Pflugerville Pkwy**

Date:

11-Jan

6-Feb

N-S Street: **FM 685**

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM / PED POLE	Y	FAIR	
NE	MAST ARM	Y	FAIR	
SE	MAST ARM / PED POLE	Y	FAIR	
SW	MAST ARM	Y	FAIR	
N Median	N		S Median	N
E Median	N		W Median	N

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	3	12"	LED	Y	H	3	FAIR
EBT	4	12"	LED	Y	H		FAIR
WBL	3	12"	LED	Y	H	3	FAIR
WBT	4	12"	LED	Y	H		FAIR
NBL	5	12"	LED	Y	H	2	FAIR
NBT	3	12"	LED	Y	H		FAIR
SBL	5	12"	LED	Y	H	2	FAIR
SBT	3	12"	LED	Y	H		FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**DETECTION/COMMUNICATION**

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	FAIR
WB	VIVDS	1	N	N	FAIR
NB	VIVDS/ RADAR	1	N	Y	UNIT DIRECTIONAL AENTENA ON NE CORNER, FLAT PANEL ON NW CORNER
SB	VIVDS	1	N	N	FAIR

**Intersection ID :**

**10**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** FM 685 @ Pflugerville Parkway

Key Map:

E-W Street: Pflugerville Pkwy

Date:

11-Jan

6-Feb

N-S Street: FM 685

Signal

Controller

**SIGNS**

APPROACH	TYPE	CONDITION / REMARKS
EB		
WB		

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

**ADA RAMPS / PED SIGNALS**

CORNER	SDWK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
NE	SDWK - Y RAMPS - Y	2/3	FAIR	Y	SEE REMARKS	PEDESTRIAN BUTTON NOT WORKING
SE	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
SW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	

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

**CABINET/CONTROLLER DETAILS**

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS		
NE	B	16	5 x 2", 2 x 3"		N	2 x 3", 1 x 2" - Spare		
CONDITION / REMARKS		EPAC 300 x 2						
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION			
Econolite	TS2			N	EBL	4	WBL	3
SOFTWARE	ASC / 3-2100				EBT	5	WBT	8
VERSION	2.48.00				NBL	2	SBL	1
MISC.					NBT		SBT	6
CONDITION / REMARKS								

**Intersection ID :**

**10**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **FM 685 @ Pflugerville Parkway**

Key Map:

E-W Street: **Pflugerville Pkwy**

Date:

**11-Jan**

**6-Feb**

N-S Street: **FM 685**

Signal

Controller

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - 16E	NO FYA, MMU Not Compatible

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
	EtherWAN	EX71620		Radio - Unknown

**ELECTRICAL SERVICE**

<b>LOCATION</b>
NE

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris		Honeywell	

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS	Iteris Vantage Edge 2							
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

APS - Campbell Controller

Old YAGI antenna likely during SSR - not in use

Ground box and pole fdn exposed @ NE corner

**INTERSECTION 11 - FM 685 AT TOWNE CENTER DR**

**Intersection ID :**

**11**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **FM 685 & TOWN CENTER DRIVE**

Key Map:

E-W Street: **TOWN CENTER DRIV**

Date:

11-Jan

6-Feb

N-S Street: **FM 685**

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM / PED POLE	Y	FAIR	
NE	MAST ARM	Y	FAIR	
SE	MAST ARM / PED POLE	Y	FAIR	
SW	MAST ARM / PED POLE	Y	FAIR	
N Median	N		S Median	N
E Median	Y		W Median	Y

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	3	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL					H		
WBT							
NBL	3	12"	LED	Y	H	2	RED ARROW SIGNAL HEAD
NBT	3	12"	LED	Y	H		FAIR
SBL	3	12"	LED	Y	H/V	2	VERTICAL SIGNAL HEAD AND FLASHING RIGHT
SBT	3	12"	LED	Y	H		FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**DETECTION/COMMUNICATION**

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	FAIR
WB					
NB	VIVDS	1	N	N	FAIR
SB	VIVDS	1	N	Y	FAIR

Intersection ID :

11

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: FM 685 & TOWN CENTER DRIVE

Key Map:

E-W Street: TOWN CENTER DR

Date:

11-Jan

6-Feb

N-S Street: FM 685

Signal

Controller

SIGNS

APPROACH	TYPE	CONDITION / REMARKS
EB		
WB		

APPROACH	TYPE	CONDITION / REMARKS
NB	LEFT TURN YIELD ON FLASHING RED ARROW AFTER STOP	FAIR
SB		

ADA RAMPS / PED SIGNALS

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	RAMPS - Y	2/3	FAIR	Y	FAIR	
NE	N					
SE	N					
SW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS		
SW	B	16	5 x 3", 2 x 2"	N		2 x 3", 2 x 2" - Spare		
CONDITION / REMARKS								
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION			
Econolite					EBL	4	WBL	
SOFTWARE	ASC / 3-1000				EBT	5	WBT	
VERSION	2.63.00				NBL	2	SBL	6
MISC.					NBT		SBT	
CONDITION / REMARKS								



**Intersection ID :**

11

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** FM 685 & TOWN CENTER DRIVE

Key Map:

E-W Street: TOWN CENTER DRIV

Date:

11-Jan

6-Feb

N-S Street: FM 685

Signal

Controller

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - 16E	FYA Not Compatible

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
	EtherWAN	EX71620		Radio - Unknown

**ELECTRICAL SERVICE**

LOCATION
NE

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris		Lillipur	

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS	Iteris Vantage Edge 2							
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

Polara APS Controller

Power Source CPS 105

EBR & SBR - 3 sec - FYA - Right Assow

NBL - 3 sec - Flashing Red Arrow

**INTERSECTION 12 - SH45 EB FRONTAGE ROAD AT HEATHERWILDE BLVD**

Intersection ID :

12

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: SH 45 EBFR @ HEATHERWILDE BLVD

Key Map:

E-W Street: SH 45 EBFR

Date:

14-Jan

12-Feb

N-S Street: HEATHERWILDE BLVD

Signal

Controller

SIGNAL POLES

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM	Y		
NE	MAST ARM	Y		
SE	MAST ARM	Y		
SW	MAST ARM	Y		
N Median	N		S Median	Y
E Median	N		W Median	N

SIGNAL HEADS

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	3	12"	LED	Y	H	3	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL							
WBT							
NBL							
NBT	3	12"	LED	Y	H	3	FAIR
SBL	5	12"	LED	Y	H	2	FAIR
SBT	3	12"	LED	Y	H		FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

DETECTION/COMMUNICATION

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	FAIR
WB					
NB	VIVDS	1	N	Y	FAIR
SB	VIVDS	1	N	N	FAIR

Intersection ID :

12

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: SH 45 EBFR @ HEATHERWILDE BLVD

Key Map:

E-W Street: SH 45 EBFR

Date:

14-Jan

12-Feb

N-S Street: HEATHERWILDE BLVD

Signal

Controller

SIGNS

APPROACH	TYPE	CONDITION / REMARKS
EB		
WB		

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

ADA RAMPS / PED SIGNALS

CORNER	SDWK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMPS - Y					
NE	SDWK - Y RAMPS - Y	2	SEE REMARKS	Y	SEE REMARKS	PEDESTRIAN HEAD BROKEN, SIGN IS FADED
SE	SDWK - Y RAMPS - Y	2	FAIR	Y	FAIR	
SW	SDWK - Y RAMPS - Y	2	FAIR	Y	FAIR	

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS	
SE	B	16	2 x 4"	N	Y		
CONDITION / REMARKS							
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION		
Siemens M60	TS2	Act			EBL	WBL	
SOFTWARE					EBT	WBT	
VERSION	4.5.8.C				NBL	SBL	
MISC.					NBT	SBT	
CONDITION / REMARKS							

CONFLICT ELECTRONICS

MMU MAKE	MODEL	CONDITION / REMARKS

**Intersection ID :**

12

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** SH 45 EBFR @ HEATHERWILDE BLVD

Key Map:

E-W Street:

SH 45 EBFR

Date:

14-Jan

12-Feb

N-S Street:

HEATHERWILDE BLVD

Signal

Controller

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
EDI	MMU2 - 16 Lei			

**ELECTRICAL SERVICE**

LOCATION
SE

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris	Antage Edge 2		LCD Monitor

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

Power Source - CPS 105

**INTERSECTION 13 - SH45 WB FRONTAGE ROAD AT HEATHERWILDE BLVD**

**Intersection ID :**

**13**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** SH 45 WBFR @ HEATHERWILDE BLVD

Key Map: 

E-W Street: SH 45 WBFR  
N-S Street: HEATHERWILDE BLV

Date: 

14-Jan	12-Feb
Signal	Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM	Y	FAIR	
NE	MAST ARM	Y	FAIR	
SE	MAST ARM	Y	FAIR	
SW	MAST ARM	Y	FAIR	
N Median	Y	S Median	N	
E Median	N	W Median	N	

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL							
EBT							
WBL	3	12"	LED	Y	H	3	FAIR
WBT	3	12"	LED	Y	H		FAIR
NBL	5	12"	LED	Y	H	2	FAIR
NBT	3	12"	LED	Y	H		FAIR
SBL	3	12"	LED	Y	H	3	FAIR
SBT	3	12"	LED	Y	H		FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap  
Refer to Intersection Layout for additional signal head details

**DETECTION/COMMUNICATION**

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB					
WB	VIVDS	1	N	N	FAIR
NB	VIVDS	1	N	N	FAIR
SB	VIVDS	1	N	N	FAIR

**Intersection ID :**

**13**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** SH 45 WBFR @ HEATHERWILDE BLVD

Key Map:  

E-W Street: SH 45 WBFR  
 N-S Street: HEATHERWILDE BLVD

Date: 14-Jan 12-Feb  
Signal Controller

**SIGNS**

APPROACH	TYPE	CONDITION / REMARKS
EB		
WB		

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

**ADA RAMPS / PED SIGNALS**

CORNER	SDWK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
NE	SDWK - Y RAMPS - Y	2/3	SEE REMARKS	Y	SEE REMARKS	PEDESTRIAN BUTTON IS FADED ON NE CORNER, PEDESTRIAN HEAD NOT WORKING
SE	SDWK - Y RAMPS - Y	2/3	SEE REMARKS	Y	SEE REMARKS	BUTTON SOUND ON SE CORNER IS VERY FAINT, PEDESTRIAN HEAD NOT WORKING
SW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	

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

**CABINET/CONTROLLER DETAILS**

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS		
SE	B	16	2 x 4"	N	Y			
CONDITION / REMARKS								
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION			
Siemens M60	TS2	Act			EBL		WBL	
SOFTWARE					EBT		WBT	
VERSION	4.5.8.C				NBL		SBL	
MISC.					NBT		SBT	
CONDITION / REMARKS								



**Intersection ID :**

**13**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

**SH 45 WBFR @ HEATHERWILDE BLVD**

Key Map:

E-W Street:

**SH 45 WBFR**

Date:

**14-Jan**

**12-Feb**

N-S Street:

**HEATHERWILDE BLVD**

Signal

Controller

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
EDI	MMU2 - 16 Leip			

**ELECTRICAL SERVICE**

LOCATION
SE

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris	Vantage Edge 2		LCD Monitor

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

Power Source - CPS 105

**INTERSECTION 14 - SH130 SB FRONTAGE ROAD AT KELLY LANE**

**Intersection ID :**

**14**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** SH 130 SBFR @ Kelly Lane

Key Map:

E-W Street:

Kelly lane

Date:

11-Jan

12-Feb

N-S Street:

SH 130 SBFR

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW				
NE				
SE	MAST ARM	Y	FAIR	
SW	MAST ARM	Y	FAIR	
N Median	N		S Median	N
E Median	N		W Median	Y

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	3	12"	LED	Y	H	3	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL	5	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H		FAIR
NBL							
NBT							
SBL	3	12"	LED	Y	H	3	FAIR
SBT	3	12"	LED	Y	H		FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**DETECTION/COMMUNICATION**

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	FAIR
WB	VIVDS	1	N	N	FAIR
NB					
SB	VIVDS	1	N	Y	FAIR

Intersection ID :

14

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: SH 130 SBFR @ Kelly Lane

Key Map:

E-W Street:

Kelly lane

Date:

11-Jan

12-Feb

N-S Street:

SH 130 SBFR

Signal

Controller

SIGNS

APPROACH	TYPE	CONDITION / REMARKS
EB	NO LEFT TURN	FAIR
WB		

APPROACH	TYPE	CONDITION / REMARKS
NB		
SB	NO RIGHT TURN, LEFT TURN YIELD ON GREEN	FAIR

ADA RAMPS / PED SIGNALS

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW						
NE	SDWK - Y RAMPS - Y	1/2	FAIR	Y	FAIR	NO AUDIBLE PEDESTRIAN BUTTONS
SE						
SW	SDWK - Y RAMPS - Y	1/2	FAIR	Y	FAIR	NO AUDIBLE PEDESTRIAN BUTTONS

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS	
SOUTH	B	16	8 x 2", 2 x 3"	N	N		
CONDITION / REMARKS							
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION		
Econolite					EBL	WBL	
SOFTWARE	ASC / 3 - 1000				EBT	WBT	
VERSION	2.51.10				NBL	SBL	
MISC.					NBT	SBT	
CONDITION / REMARKS							

**Intersection ID :**

**14**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **SH 130 SBFR @ Kelly Lane**

Key Map:

E-W Street:

Kelly lane

Date:

11-Jan

12-Feb

N-S Street:

SH 130 SBFR

Signal

Controller

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - 16E	Not Compatible w/ FYA

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
Etherwan		EX71620		Not hooked up

**ELECTRICAL SERVICE**

POE - No surge protection

LOCATION
SOUTH

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris	Vantage Edge 2		LCD Monitor

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

Power Source - CPS 105

**INTERSECTION 15 - SH130 NB FRONTAGE ROAD AT KELLY LANE**

**Intersection ID :**

**15**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **SH 130 NBFR @ Kelly Lane**

Key Map:

E-W Street: **Kelly Lane**

Date:

11-Jan

12-Feb

N-S Street: **SH 130 NBFR**

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM	Y	FAIR	
NE	MAST ARM / PED POLE	Y	FAIR	
SE				
SW				
N Median		N	S Median	N
E Median		Y	W Median	N

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	5	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL	3	12"	LED	Y	H	3	FAIR
WBT	3	12"	LED	Y	H		FAIR
NBL	3	12"	LED	Y	H	3	FAIR
NBT	3	12"	LED	Y	H		FAIR
SBL							
SBT							

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**DETECTION/COMMUNICATION**

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	FAIR
WB	VIVDS	1	N	N	FAIR
NB	VIVDS	1	N	N	FAIR
SB					

Intersection ID :

15

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: SH 130 NBFR @ Kelly Lane

Key Map:

E-W Street: Kelly Lane

Date:

11-Jan

12-Feb

N-S Street: SH 130 NBFR

Signal

Controller

SIGNS

APPROACH	TYPE	CONDITION / REMARKS
EB	NO RIGHT TURN, LEFT TURN YIELD ON GREEN	FAIR
WB	NO LEFT TURN	FAIR

APPROACH	TYPE	CONDITION / REMARKS
NB		
SB		

ADA RAMPS / PED SIGNALS

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW						
NE						
SE	SDWK - Y RAMPS - Y	2	FAIR	Y	SEE REMARKS	PEDESTRIAN BUTTON NOT WORKING
SW	SDWK - Y RAMPS - Y	1	SEE REMARKS	Y	FAIR	NO PEDESTRIAN COUNTDOWN HEAD

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS	
SOUTH	B	16	8 x 2", 2 x 3"	N	N		
CONDITION / REMARKS							
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION		
Econolite					EBL		WBL
SOFTWARE	ASC / 3 - 1000				EBT		WBT
VERSION	2.51.10				NBL		SBL
MISC.					NBT		SBT
CONDITION / REMARKS							



**Intersection ID :**

**15**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **SH 130 NBFR @ Kelly Lane**

Key Map:

E-W Street: **Kelly Lane**

Date:

**11-Jan**

**12-Feb**

N-S Street: **SH 130 NBFR**

Signal

Controller

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - 16E	Not Compatible w/ FYA

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
Etherwan		EX71620		Not hooked up
				POE - No surge protection

**ELECTRICAL SERVICE**

LOCATION
SOUTH

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris	Antage Edge 2		LCD Monitor

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

Power Source - CPS 105

**INTERSECTION 16 - SH130 SB FRONTAGE ROAD ATA FM 685**

**Intersection ID :**

**16**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **SH 130 SBFR @ FM 685**

Key Map:

E-W Street:

**FM 685**

Date:

11-Jan

12-Feb

N-S Street:

**SH 130 SBFR**

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW				
NE				
SE	MAST ARM	Y	FAIR	
SW	MAST ARM	Y	FAIR	
N Median		N	S Median	N
E Median		N	W Median	Y

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	3	12"	LED	Y	H	3	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL	5	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H		FAIR
NBL							
NBT							
SBL	3	12"	LED	Y	H	3	FAIR
SBT	3	12"	LED	Y	H		FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**DETECTION/COMMUNICATION**

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N		FAIR
WB	VIVDS	1	N		FAIR
NB				Y	FAIR
SB	VIVDS	1	N		FAIR

Intersection ID :

16

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: SH 130 SBFR @ FM 685

Key Map:

E-W Street:

FM 685

Date:

11-Jan

12-Feb

N-S Street:

SH 130 SBFR

Signal

Controller

SIGNS

APPROACH	TYPE	CONDITION / REMARKS
EB	NO LEFT TURN	
WB	LEFT TURN YIELD ON GREEN	

APPROACH	TYPE	CONDITION / REMARKS
NB		
SB		

ADA RAMPS / PED SIGNALS

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW						
NE						
SE	SDWK - Y RAMPS - Y	2/3	FAIR	Y	SEE REMARKS	PUSH BUTTON SOUND IS NOT WORKING
SW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	SEE REMARKS	PUSH BUTTON SOUND IS NOT WORKING

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS	
SW	B	16					
CONDITION / REMARKS							
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION		
Econolite	TS2				EBL		WBL
SOFTWARE	ASC / 3 - 1000				EBT		WBT
VERSION	2.51.10				NBL		SBL
MISC.					NBT		SBT
CONDITION / REMARKS							

CONFLICT ELECTRONICS

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - 16E	FYA Not Compatible

**Intersection ID :**

**16**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **SH 130 SBFR @ FM 685**

Key Map:

E-W Street:

**FM 685**

Date:

**11-Jan**

**12-Feb**

N-S Street:

**SH 130 SBFR**

Signal

Controller

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
Etherwan		EX71620		Flat Panel Antenna

**ELECTRICAL SERVICE**

LOCATION

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris	antage Edge	Yes	

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

Video Card # 2 - NBFR - BAD

Polara Model - CCU2EN

Power Source - CPS 105

Ped PBS - SBFR Not Working

**INTERSECTION 17 - SH130 NB FRONTAGE ROAD ATA FM 685**

**Intersection ID :**

**17**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **SH 130 NBFR @ FM 685**

Key Map:

E-W Street:

**FM 685**

Date:

11-Jan

12-Feb

N-S Street:

**SH 130 NBFR**

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM	Y	FAIR	
NE	MAST ARM / PED POLE	Y	FAIR	
SE	PED POLE		FAIR	
SW	PED POLE		FAIR	
N Median		N	S Median	N
E Median		Y	W Median	N

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	5	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL	3	12"	LED	Y	H	3	FAIR
WBT	3	12"	LED	Y	H		FAIR
NBL	3	12"	LED	Y	H	3	FAIR
NBT	3	12"	LED	Y	H		FAIR
SBL							
SBT							

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**DETECTION/COMMUNICATION**

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	FAIR
WB	VIVDS	1	N	N	FAIR
NB	VIVDS	1	N	N	FAIR
SB					

Intersection ID :

17

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: SH 130 NBFR @ FM 685

Key Map:

E-W Street: FM 685

Date:

11-Jan

12-Feb

N-S Street: SH 130 NBFR

Signal

Controller

SIGNS

APPROACH	TYPE	CONDITION / REMARKS
EB	LEFT TURN YIELD ON GREEN, TURN LANES, NO RIGHT TURN	
WB	NO LEFT TURN	

APPROACH	TYPE	CONDITION / REMARKS
NB	LEFT TURN	
SB		

ADA RAMPS / PED SIGNALS

CORNER	SDWK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW						
NE	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
SE	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
SW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS	
SBFR	B	16					
CONDITION / REMARKS							
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION		
Econolite	TS2				EBL		WBL
SOFTWARE	ASC / 3 - 1000				EBT		WBT
VERSION	2.51.10				NBL		SBL
MISC.					NBT		SBT
CONDITION / REMARKS							



**Intersection ID :**

17

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** SH 130 NBFR @ FM 685

Key Map:

E-W Street: FM 685

Date:

11-Jan

12-Feb

N-S Street: SH 130 NBFR

Signal

Controller

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - 16E	FYA Not Compatable

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
Etherwan		EX71620		Flat Panel Antenna

**ELECTRICAL SERVICE**

LOCATION

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris	antage Edge	Yes	

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

Video Card # 2 - NBFR - BAD

Polara Model - CCU2EN

Power Source - CPS 105

Ped PBS - SBFR Not Working

**INTERSECTION 18 SH130 SB FRONTAGE ROAD AT PFLUGERVILLE PKWY**

Intersection ID :

18

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: SH 130 SBFR @ Pflugerville Parkway

Key Map:

E-W Street: Pflugerville Parkway

Date: 11-Jan 12-Feb

N-S Street: SH 130 SBFR

Signal Controller

SIGNAL POLES

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW				
NE				
SE	MAST ARM	Y	FAIR	
SW	MAST ARM	Y	FAIR	
N Median	N		S Median	N
E Median	N		W Median	Y

SIGNAL HEADS

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	3	12"	LED	Y	H	3	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL	4	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H		FAIR
NBL							
NBT							
SBL	3	12"	LED	Y	H	3	FAIR
SBT	3	12"	LED	Y	H		FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

DETECTION/COMMUNICATION

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	FAIR
WB	VIVDS	1	N	N	FAIR
NB				Y	
SB	VIVDS	1	N	N	FAIR

Intersection ID :

18

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: SH 130 SBFR @ Pflugerville Parkway

Key Map:

E-W Street: Pflugerville Parkway
N-S Street: SH 130 SBFR

Date: 11-Jan 12-Feb
Signal Controller

SIGNS

Table with 3 columns: APPROACH, TYPE, CONDITION / REMARKS. Rows for EB (NO LEFT TURN) and WB (NO RIGHT TURN).

Table with 3 columns: APPROACH, TYPE, CONDITION / REMARKS. Rows for NB and SB.

ADA RAMPS / PED SIGNALS

Table with 7 columns: CORNER, SD/WK (Y/N) RAMPS (Y/N), PED-HEAD TYPE\*, PED HEAD CONDITION, PB's/SIGN (Y/N,N/A, Access?), PUSHBTN CONDITION, CONDITION / REMARKS. Rows for NW, NE, SE, SW.

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

CABINET/CONTROLLER DETAILS

Table with 7 columns: LOCATION CORNER, TYPE B/P, LS 12/16, CONDUIT, GPS CLOCK, MANUAL/FIELDBOOK, MISC. ITEMS. Includes rows for MODEL, SOFTWARE, VERSION, MISC., and PHASING ORIENTATION.

CONFLICT ELECTRONICS

Table with 3 columns: MMU MAKE, MODEL, CONDITION / REMARKS. Row for EDI MMU2 - 16LEip.

**Intersection ID :**

**18**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** SH 130 SBFR @ Pflugerville Parkway

Key Map:

E-W Street: Pflugerville Parkway

Date: 11-Jan 12-Feb

N-S Street: SH 130 SBFR

Signal Controller

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
Etherwan				In the box but unused

**ELECTRICAL SERVICE**

LOCATION

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS	Wavetronix - radar - presence and set back click 112							
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

Wavetronix Controller - Click 600

Polara APS - CCU.2EN

Power - EDI PS250

Wavetronix

- |           |           |
|-----------|-----------|
| 1         | 2         |
| 1 Phase 2 | 1 Phase 4 |
| 2 Phase 6 | 2 Phase 8 |
| 3 A       | 3 Adv 4   |
| 4 B       | 4 Adv 8   |

**INTERSECTION 19 SH130 NB FRONTAGE ROAD AT PFLUGERVILLE PKWY**

**Intersection ID :**

**19**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** SH 130 NBFR @ PFLUGERVILLE PKWY

Key Map: 

E-W Street: Pflugeville Pwky

Date:

11-Jan

12-Feb

N-S Street: SH 130 NBFR

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM	Y	FAIR	
NE	MAST ARM	Y	FAIR	
SE				
SW				
N Median		N	S Median	N
E Median		Y	W Median	N

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	4	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL	3	12"	LED	Y	H	3	FAIR
WBT	3	12"	LED	Y	H		FAIR
NBL	3	12"	LED	Y	H	3	FAIR
NBT	3	12"	LED	Y	H		FAIR
SBL							
SBT							

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**DETECTION/COMMUNICATION**

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	
WB	VIVDS	1	N	N	
NB	VIVDS	1	N	N	
SB					

Intersection ID :

19

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: SH 130 NBFR @ PFLUGERVILLE PKWY

Key Map:

E-W Street: Pflugeville Pwky

Date: 11-Jan 12-Feb

N-S Street: SH 130 NBFR

Signal Controller

SIGNS

APPROACH	TYPE	CONDITION / REMARKS
EB	NO RIGHT TURN	FAIR
WB	NO LEFT TURN	FAIR

APPROACH	TYPE	CONDITION / REMARKS
NB		
SB		

ADA RAMPS / PED SIGNALS

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
NE	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
SE						
SW						

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS	
N	B	16	2 x 4"			spare - 1 x 3" , 2 x 2"	
CONDITION / REMARKS							
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION		
Econolite					EBL		WBL
SOFTWARE	ASC / 3 - 1000				EBT		WBT
VERSION	2.63.00				NBL		SBL
MISC.					NBT		SBT
CONDITION / REMARKS							

CONFLICT ELECTRONICS

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - 16LEi	



**Intersection ID :**

**19**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **SH 130 NBFR @ PFLUGERVILLE PKWY**

Key Map:

E-W Street: **Pflugeville Pwky**

Date:

**11-Jan**

**12-Feb**

N-S Street: **SH 130 NBFR**

Signal

Controller

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
Etherwan				In the box but unused

**ELECTRICAL SERVICE**

LOCATION

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS	Wavetronix - radar - presence and set back click 112							
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

Wavetronix Controller - Click 600

Polara APS - CCU.2EN

Power - EDI PS250

1

2

Wavetronix

1 Phase 2

1 Phase 4

2 Phase 6

2 Phase 8

3 A

3 Adv 4

4 B

4 Adv 8

**INTERSECTION 20 - SH130 SB FRONTAGE ROAD AT FM 1825**

**Intersection ID :**

**20**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

**SH 130 SBFR @ Pecan Street**

Key Map:  

E-W Street:

**1825**

Date:

10-Jan	12-Feb
Signal	Controller

N-S Street:

**SH 130 SBFR**

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW				
NE				
SE	MAST ARM / PED POLE	Y	FAIR	
SW	MAST ARM / PED POLE	Y	FAIR	
N Median		N	S Median	N
E Median		N	W Median	N

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	3	12"	LED	Y	H	3	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL	4	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H		FAIR
NBL							
NBT							
SBL	3	12"	LED	Y	H	3	FAIR
SBT	3	12"	LED	Y	H		FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**DETECTION/COMMUNICATION**

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS / RADAR	1	N		
WB	VIVDS / RADAR	1	N		
NB				Y	
SB	VIVDS	1	N		

Intersection ID :

20

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION:

SH 130 SBFR @ Pecan Street

Key Map:

E-W Street:

1825

Date:

10-Jan	12-Feb
Signal	Controller

N-S Street:

SH 130 SBFR

SIGNS

APPROACH	TYPE	CONDITION / REMARKS
EB	ONE WAY	
WB	LEFT TURN YIELD ON FLASHING YELLOW ARROW, ONE WAY	

APPROACH	TYPE	CONDITION / REMARKS
NB		
SB		

ADA RAMPS / PED SIGNALS

CORNER	SDWK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW						
NE						
SE	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
SW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	

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



CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS	
SW	B	16	3 x 4" . 1 x 2"			spare - 3x4"	
CONDITION / REMARKS							
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION		
Econolite	TS2				EBL		WBL
SOFTWARE	ASC / 3 - 1000				EBT		WBT
VERSION	2.63.00				NBL		SBL
MISC.					NBT		SBT
CONDITION / REMARKS							

**Intersection ID :**

**20**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

**SH 130 SBFR @ Pecan Street**

Key Map:  

E-W Street:

**1825**

Date:

<b>10-Jan</b>	<b>12-Feb</b>
Signal	Controller

N-S Street:

**SH 130 SBFR**

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - 16LEij	

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
Flat panel radio antenna				EtherWAN in the box

**ELECTRICAL SERVICE**

LOCATION
NW

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Wavetronix (setback) , VIVDS (presence)		Color	

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

Wavetronix - Click 650

VIVDS - Iteris Vantage Edge 2

Power Source - EDI PS 250

Polara - APS - Model CCU2EN

**INTERSECTION 21 - SH130 NB FRONTAGE ROAD AT FM 1825**

**Intersection ID :**

**21**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **SH 130 NBFR @ Pecan Street**

Key Map:

E-W Street: **Pecan Street**

Date:

10-Jan

12-Feb

N-S Street: **SH 130 NBFR**

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM	Y	WEST BOUND MAST ARM IS VERY FLIMSY IN WIND	
NE	MAST ARM	Y	FAIR	
SE				
SW				
N Median		N	S Median	N
E Median		N	W Median	N

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	4	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL	3	12"	LED	Y	H	3	FAIR
WBT	3	12"	LED	Y	H		FAIR
NBL	3	12"	LED	Y	H	3	FAIR
NBT	3	12"	LED	Y	H		FAIR
SBL							
SBT							

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**DETECTION/COMMUNICATION**

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	FAIR
WB	VIVDS	1	N	N	FAIR
NB	VIVDS	1	N	N	FAIR
SB					

Intersection ID :

21

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: SH 130 NBFR @ Pecan Street

Key Map:

E-W Street: Pecan Street

Date:

10-Jan

12-Feb

N-S Street: SH 130 NBFR

Signal

Controller

SIGNS

APPROACH	TYPE	CONDITION / REMARKS
EB	LEFT TURN YIELD ON FLASHING YELLOW, ONE WAY	FAIR
WB	ONE WAY	FAIR

APPROACH	TYPE	CONDITION / REMARKS
NB		
SB		

ADA RAMPS / PED SIGNALS

CORNER	SDWK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
NE	RAMPS - Y	2/3	FAIR	Y	SEE REMARKS	APS NOT WORKING, NO SIDEWALK CONNECTING CROSS WALKS
SE	SDWK - Y RAMPS - Y	2/3	FAIR	Y	SEE REMARKS	
SW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS	
SW	B	16	3 x 4" . 1 x 2"			spare - 3x4"	
CONDITION / REMARKS							
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION		
Econolite	TS2				EBL		WBL
SOFTWARE	ASC / 3 - 1000				EBT		WBT
VERSION	2.63.00				NBL		SBL
MISC.					NBT		SBT
CONDITION / REMARKS							



**Intersection ID :**

**21**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **SH 130 NBFR @ Pecan Street**

Key Map:

E-W Street: **Pecan Street**

Date:

**10-Jan**

**12-Feb**

N-S Street: **SH 130 NBFR**

Signal

Controller

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - 16LEi	

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
panel radio antenna				EtherWAN in the box

**ELECTRICAL SERVICE**

LOCATION
NW

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Wavetronix (setback)		Color	

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

Wavetronix - Click 650

VIVDS - Iteris Vantage Edge 2

Power Source - EDI PS 250

Polara - APS - Model CCU2EN

## 10.0 APPENDIX B: Traffic Signal Inventory and Assessment – City of Pflugerville Off-System Signals

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**INTERSECTION 1 – PFLUGERVILLE PARKWAY & GRAND AVENUE  
PARKWAY**

Intersection ID :

1

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION:

Pflugerville Pkwy @ Grand Avenue Pkwy

Key Map:

E-W Street:

Pflugerville Pkwy

Date:

29-May

29-May

N-S Street:

Grand Avenue Pkwy

Signal

Controller

SIGNAL POLES

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM/PED POLE	Y	FAIR	
NE	MAST ARM/PED POLE	Y	FAIR	
SE	MAST ARM/PED POLE	Y	FAIR	
SW	MAST ARM/PED POLE	Y	FAIR	
N Median		Y	S Median	Y
E Median		Y	W Median	N

SIGNAL HEADS

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	5	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H	2	FAIR
WBL	5	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H	2	FAIR
NBL	5	12"	LED	Y	H	2	FAIR
NBT	3	12"	LED	Y	H	2	FAIR
SBL	5	12"	LED	Y	H	2	FAIR
SBT	3	12"	LED	Y	H	2	FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

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
WB	VIVDS	1	N	N	PRESENCE & SETBACK
NB	VIVDS	1	N	N	PRESENCE & SETBACK
SB	VIVDS	1	N	N	PRESENCE & SETBACK

Intersection ID :

1

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: Pflugerville Pkwy @ Grand Avenue Pkwy

Key Map:

E-W Street: Pflugerville Pkwy  
 N-S Street: Grand Avenue Pkwy

Date: 29-May 29-May  
 Signal Controller

**SIGNS**

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

**ADA RAMPS / PED SIGNALS**

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMPS - Y	1	SEE REMARKS	Y	FAIR	PUSH BUTTON ON POLES TOO FAR FROM RAMPS
NE	SDWK - Y RAMPS - Y	1	SEE REMARKS	Y	FAIR	PUSH BUTTON ON POLES TOO FAR FROM RAMPS
SE	SDWK - Y RAMPS - Y	1	SEE REMARKS	Y	FAIR	EB PED HEAD RED HAND IS OUT; PUSH BUTTON ON POLES TOO FAR FROM RAMPS
SW	SDWK - Y RAMPS - Y	1	SEE REMARKS	Y	FAIR	RAMP SHORT. PED POLE FAR FROM RAMP. PUSH BUTTON ON POLES TOO FAR FROM RAMPS

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

**CABINET/CONTROLLER DETAILS**

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOO K	MISC. ITEMS		
NE	B	16	5x3", 2x2"	N	N	Spare - 2x3"		
CONDITION / REMARKS		FAIR						
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION			
EAGLE EPAC 300	TS2	COORD			EBL	5	WBL	1
SOFTWARE	SIEMENS ITS				EBT	2	WBT	6
VERSION	3.321				NBL	3	SBL	7
MISC.					NBT	8	SBT	4
CONDITION / REMARKS								

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - 16 E	NOT COMPATIBLE WITH FYA

Intersection ID :

1

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION:

Pflugerville Pkwy @ Grand Avenue Pkwy

Key Map:

E-W Street:

Pflugerville Pkwy

Date:

29-May

29-May

N-S Street:

Grand Avenue Pkwy

Signal

Controller

COMMUNICATION

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS

ELECTRICAL SERVICE

LOCATION
NE NEXT TO SIGNAL CABINET

LOOPS/VIVDS/RADAR

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris	Vantage Edge 2	COLOR WIDE MONITOR LCD NOT WORKING	

DETECTOR CARDS

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

ADDITIONAL INFORMATION:

COLOR LCD NOT WORKING

CTRRCR DISPLAY DISAPPEARS

POWER SRCE - EDI PS 250

**INTERSECTION 2 - PICADILLY DRIVE & GRAND AVENUE PARKWAY**



Intersection ID :

2

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION:

Picadilly Dr @ Grand Ave Pkwy

Key Map:

E-W Street:

Picadilly Dr

Date:

29-May

29-May

N-S Street:

Grand Avenue Pkwy

Signal

Controller

SIGNAL POLES

CORNER	MAST ARM/SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM/PED POLE	Y	FAIR	
NE	MAST ARM/PED POLE	Y	FAIR	
SE	MAST ARM/PED POLE	N	FAIR	
SW	MAST ARM/PED POLE	N	FAIR	
N Median	Y		S Median	Y
E Median	Y		W Median	Y

SIGNAL HEADS

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	5	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H	2	FAIR
WBL	5	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H	2	FAIR
NBL	5	12"	LED	Y	H	2	FAIR
NBT	3	12"	LED	Y	H	2	FAIR
SBL	5	12"	LED	Y	H	2	FAIR
SBT	3	12"	LED	Y	H	2	FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

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
WB	VIVDS	1	N	N	PRESENCE & SETBACK
NB	VIVDS	1	N	N	PRESENCE & SETBACK
SB	VIVDS	1	N	N	PRESENCE & SETBACK

Intersection ID :

2

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION:

Picadilly Dr @ Grand Ave Pkwy

Key Map:

E-W Street:

Picadilly Dr

Date:

29-May

29-May

N-S Street:

Grand Avenue Pkwy

Signal

Controller

SIGNS

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

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

ADA RAMPS / PED SIGNALS

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMPS - Y	1	SEE REMARKS	Y	FAIR	SMALL PED POLES UNSTABLE
NE	SDWK - Y RAMPS - Y	1	SEE REMARKS	Y	FAIR	SMALL PED POLES UNSTABLE
SE	SDWK - Y RAMPS - Y	1	SEE REMARKS	Y	FAIR	PED BUTTON TOO FAR AWAY FROM RAMP; SMALL PED POLES UNSTABLE
SW	SDWK - Y RAMPS - Y	1	SEE REMARKS	Y	FAIR	SMALL PED POLES UNSTABLE

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS				
NE	B	16	2 x 3", 1 x 2"		Y					
CONDITION / REMARKS										
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION					
EAGLE EPAC 300	TS2	N			EBL	2	WBL	1		
SOFTWARE	SIEMENS ITS				EBT	5	WBT	6		
VERSION	3.33E				NBL	3	SBL	7		
MISC.					NBT	8	SBT	4		
CONDITION / REMARKS										

Intersection ID :

2

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION:

Picadilly Dr @ Grand Ave Pkwy

Key Map:

E-W Street:

Picadilly Dr

Date:

29-May

29-May

N-S Street:

Grand Avenue Pkwy

Signal

Controller

CONFLICT ELECTRONICS

MMU MAKE	MODEL	CONDITION / REMARKS
MMU -16 E	EDI	

COMMUNICATION

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
N/A				

ELECTRICAL SERVICE

LOCATION
NE NEXT TO SIGNAL CABINET

LOOPS/VIVDS/RADAR

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris	VAN EDGE 2	COLOR WIDE LCD MONITOR	FAIR

DETECTOR CARDS

VEH. PH	1	2	3	4	5	6	7	8
WORKING	Y	Y	Y	Y	Y	Y		
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)		Y		Y		Y		Y
OTHER								

ADDITIONAL INFORMATION:

ADVANTAGE DET. FOR 4 AND 8

POWER SOURCE - CPS 105 AND EAGLE

**INTERSECTION 3 - PFLUGERVILLE PARKWAY & HEATHERWILDE  
BLVD**

**Intersection ID :**

**3**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

**Pflugerville Pkwy @ Heatherwilde**

Key Map:

E-W Street:

Pflugerville Parkway

Date:

29-May

29-May

N-S Street:

Heatherwilde Blvd

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM/PED POLE	Y	FAIR	
NE	MAST ARM/PED POLE	Y	FAIR	
SE	MAST ARM/PED POLE	Y	FAIR	
SW	MAST ARM/PED POLE	Y	FAIR	
N Median	Y	S Median	Y	
E Median	N	W Median	Y	

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	5	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H	2	FAIR
WBL	5	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H	2	FAIR
NBL	5	12"	LED	Y	H	2	FAIR
NBT	3	12"	LED	Y	H	2	FAIR
SBL	5	12"	LED	Y	H	2	FAIR
SBT	3	12"	LED	Y	H	2	FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

Intersection ID :

3

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION:

Pflugerville Pkwy @ Heatherwilde

Key Map:

E-W Street:

Pflugerville Parkway

Date:

29-May

29-May

N-S Street:

Heatherwilde Blvd

Signal

Controller

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

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

ADA RAMPS / PED SIGNALS

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMPS - Y	1	FAIR	Y	FAIR	NO VISUAL OR APS COUNTDOWN
NE	SDWK - Y RAMPS - Y	1	FAIR	Y	FAIR	NO VISUAL OR APS COUNTDOWN; PUSH BUTTON TOO QUIET
SE	SDWK - Y RAMPS - Y	1	FAIR	Y	FAIR	NO VISUAL OR APS COUNTDOWN; PED BUTTON TOO FAR FROM RAMP
SW	SDWK - Y RAMPS - 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 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS		
NW	B	16	3x3", 3x2"		Y			
CONDITION / REMARKS								
MODEL	TYPE (TS1, TS2)	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

**Intersection ID :**

**3**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

**Pflugerville Pkwy @ Heatherwilde**

Key Map:

E-W Street:

**Pflugerville Parkway**

Date:

**29-May**

**29-May**

N-S Street:

**Heatherwilde Blvd**

Signal

Controller

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - 16 E	

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS

**ELECTRICAL SERVICE**

LOCATION
NW

**LOOPS/IVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
ITERIS	VAN EDGE 300	Color Wide LCD Monitor	

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING	Y	Y	Y	Y	Y	Y	Y	Y
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)		Y		Y		Y		Y
OTHER								

**ADDITIONAL INFORMATION:**

POWER SOURCE - CPS 105, EAGLE

**INTERSECTION 4 - PFLUGERVILLE PARKWAY & RAILROAD  
AVENUE**



**Intersection ID :**

**4**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

**Pflugerville Pkwy @ Railroad Avenue**

Key Map:

E-W Street:

Pflugerville Pkwy

Date:

29-May

29-May

N-S Street:

Railroad Ave

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM / PED POLE	N	FAIR	
NE	MAST ARM / PED POLE	Y	FAIR	
SE	MAST ARM	Y	FAIR	
SW	MAST ARM/PED POLE	Y	FAIR	
N Median	Y	S Median	N	
E Median	Y	W Median	Y	

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	5	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H	2	FAIR
WBL	5	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H	2	FAIR
NBL	4	12"	LED	Y	H	4	FAIR
NBT	3	12"	LED	Y	H	4	FAIR
SBL	4	12"	LED	Y	H	4	FAIR
SBT	3	12"	LED	Y	H	4	FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**DETECTION/COMMUNICATION**

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	FAIR
WB	VIVDS	1	N	N	FAIR
NB	VIVDS	1	N	N	FAIR
SB	VIVDS	1	N	N	FAIR

Intersection ID :

4

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: Pflugerville Pkwy @ Railroad Avenue

Key Map:

E-W Street:

Pflugerville Pkwy

Date:

29-May

29-May

N-S Street:

Railroad Ave

Signal

Controller

SIGNS

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

APPROACH	TYPE	CONDITION / REMARKS
NB	LANE DIRECTION	
SB	LANE DIRECTION	

ADA RAMPS / PED SIGNALS

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMPS - Y	1	SEE REMARKS	Y	SEE REMARKS	NO APS OR COUNTDOWN
NE	SDWK - Y RAMPS - Y	1	SEE REMARKS	Y	SEE REMARKS	NO APS OR COUNTDOWN
SE	SDWK - N RAMPS - N					
SW	SDWK - Y RAMPS - Y	1	SEE REMARKS	Y	SEE REMARKS	NO APS OR COUNTDOWN; PED BUTTON DOESN'T WORK

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS		
NE	B	16	2x3", 2x2"			Spare - 1x2"		
CONDITION / REMARKS								
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION			
Eagle EPAC 300	TS2				EBL	5	WBL	1
SOFTWARE	SIEMENS 175				EBT	2	WBT	6
VERSION	3.33B				NBL	8	SBL	4
MISC.					NBT		SBT	
CONDITION / REMARKS		CLOCKTIME OFF						

CONFLICT ELECTRONICS

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - 16 LE	

**Intersection ID :**

4

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

**Pflugerville Pkwy @ Railroad Avenue**

Key Map:

E-W Street:

Pflugerville Pkwy

Date:

29-May

29-May

N-S Street:

Railroad Ave

Signal

Controller

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS

**ELECTRICAL SERVICE**

LOCATION
NW

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris	Vantage Edge 2	GVI VID Monitor	

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING	Y	Y			Y	Y		Y
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)		Y		Y				
OTHER								

**ADDITIONAL INFORMATION:**

LIGHT IN CABINET DOES NOT WORK

POWER SOURCE - EAGLE CPS105

**INTERSECTION 5 - PFENNIG LANE & RAILROAD AVENUE**

**Intersection ID :**

**5**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

**Pfennig Lane/ Railroad Avenue**

Key Map:

E-W Street:

**Pfennig Lane**

Date:

**29-May**

**29-May**

N-S Street:

**N Railroad Avenue**

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS
NW	MAST ARM/PED POLE	N	FAIR
NE	MAST ARM	N	FAIR
SE	MAST ARM/PED POLE	N	FAIR
SW	MAST ARM/PED POLE	N	FAIR
N Median	N	S Median	N
E Median	N	W Median	N

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	4	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H	2	FAIR
WBL	4	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H	2	FAIR
NBL	4	12"	LED	Y	H	2	FAIR
NBT	3	12"	LED	Y	H	2	FAIR
SBL	4	12"	LED	Y	H	2	FAIR
SBT	3	12"	LED	Y	H	2	FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**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
WB	VIVDS	1	N	N	PRESENCE & SETBACK
NB	VIVDS	1	N	N	PRESENCE & SETBACK
SB	VIVDS	1	N	Y	PRESENCE & SETBACK

Intersection ID :

5

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION:

Pfennig Lane/ Railroad Avenue

Key Map:

E-W Street:

Pfennig Lane

Date:

29-May

29-May

N-S Street:

N Railroad Avenue

Signal

Controller

SIGNS

APPROACH	TYPE	CONDITION / REMARKS
EB	LEFT TURN YIELD ON FLASHING YELLOW ARROW	FAIR
WB	LEFT TURN YIELD ON FLASHING YELLOW ARROW	FAIR

APPROACH	TYPE	CONDITION / REMARKS
NB	LEFT TURN YIELD ON FLASHING YELLOW ARROW	FAIR
SB	LEFT TURN YIELD ON FLASHING YELLOW ARROW	FAIR

ADA RAMPS / PED SIGNALS

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	SEE REMARKS	ped button too far from ramp
NE	SDWK - N RAMPS - N	2/3	FAIR	Y	FAIR	
SE	SDWK - Y RAMPS - Y	2/3	FAIR	Y	SEE REMARKS	ped button too far from ramp
SW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS		
NW	B	16	2 x 4"		Y			
CONDITION / REMARKS								
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION			
SIEMENS M60	TS2	N	N	N	EBL	7	WBL	3
SOFTWARE	SEPAC				EBT	4	WBT	8
VERSION	4.56C				NBL	1	SBL	6
MISC.					NBT	6	SBT	2
CONDITION / REMARKS		CLOCK TIME OFF						

CONFLICT ELECTRONICS

**Intersection ID :**

5

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** Pfennig Lane/ Railroad Avenue

Key Map:

E-W Street: Pfennig Lane

Date:

29-May

29-May

N-S Street: N Railroad Avenue

Signal

Controller

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU - 16LEip	RUNS FYA

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS

**ELECTRICAL SERVICE**

LOCATION
NW

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
		COLOR WIDE MONITOR	

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING	Y	Y	Y	Y	Y	Y	Y	Y
CONDITION / REMARKS	Iteris Vantage Edge 2							
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)		Y						Y
OTHER								

**ADDITIONAL INFORMATION:**

APS - POLARA CCU 2EN

POWER SOURCE - CPS 105, EAGLE

**INTERSECTION 6 - KELLY LANE & COLORADO SANDS DRIVE**



**Intersection ID :**

**6**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** Kelly Lane @ Colorado Sands Dr.

Key Map:

E-W Street: Kelly Lane

Date:

30-May

20-May

N-S Street: Colorado Sands Drive

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM	Y	FAIR	
NE	MAST ARM/PED POLE	N	FAIR	
SE	MAST ARM/PED POLE	Y	FAIR	
SW	PED POLE	N	FAIR	
N Median	N		S Median	Y
E Median	Y		W Median	Y

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL							
EBT	3	12"	LED	Y	H	N/A	FAIR
WBL	4	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H	2	FAIR
NBL	3	12"	LED	Y	H	1	FAIR
NBT	3	12"	LED	Y	H	1	FAIR
SBL							
SBT							

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**DETECTION/COMMUNICATION**

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	FAIR
WB	VIVDS	1	N	N	FAIR
NB	VIVDS	1	N	Y	FAIR
SB	VIVDS	1	N	N	FAIR

**Intersection ID :**

**6**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** Kelly Lane @ Colorado Sands Dr.

Key Map:

E-W Street: Kelly Lane

Date:

30-May

20-May

N-S Street: Colorado Sands Drive

Signal

Controller

**SIGNS**

APPROACH	TYPE	CONDITION / REMARKS
EB		
WB	LEFT TURN YIELD ON FLASHING YELLOW ARROW	FAIR

APPROACH	TYPE	CONDITION / REMARKS
NB	LANE DIRECTION	FAIR
SB		

**ADA RAMPS / PED SIGNALS**

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SKWK - Y	2/3	FAIR	Y	FAIR	
NE	SKWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
SE	SKWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
SW	SKWK - Y RAMPS - Y	2/3	FAIR	Y	SEE REMARKS	RAMP SHORT AND PED POLE TOO FAR FROM RAMP

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

**CABINET/CONTROLLER DETAILS**

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS		
NE	B	16	2x3", 3x2", 2x1"	Y	Y			
CONDITION / REMARKS								
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION			
Econolite	TS2	Coord	N	N	EBL		WBL	1
SOFTWARE	ASC / 3-2100				EBT	2	WBT	6
VERSION					NBL	8	SBL	
MISC.					NBT		SBT	
CONDITION / REMARKS								

**CONFLICT ELECTRONICS**

**Intersection ID :**

6

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** Kelly Lane @ Colorado Sands Dr.

Key Map:

E-W Street: Kelly Lane

Date:

30-May

20-May

N-S Street: Colorado Sands Drive

Signal

Controller

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU - 16LE	

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS

**ELECTRICAL SERVICE**

LOCATION

SE

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris	VAN EDGE 2	COLOR WIDE LCD MONITOR	

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING	Y	Y				Y		Y
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)		Y						Y
OTHER								

**ADDITIONAL INFORMATION:**

POWER SOURCE - EDI PS 250

APS: POLARA CCU2EN

**INTERSECTION 7 - KELLY LANE & KENNEMER DRIVE**

**Intersection ID :**

**7**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

**Kelly Lane @ Kennermer Dr.**

Key Map:

E-W Street:

Kelly Lane

Date:

30-May

30-May

N-S Street:

Kennermer Dr.

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM/ PED POLE	N	FAIR	
NE	MAST ARM/ PED POLE	N	FAIR	
SE	MAST ARM / PED POLE	Y	FAIR	
SW	MAST ARM / PED POLE	N	FAIR	
N Median		N	S Median	N
E Median		Y	W Median	N

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	4	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H	2	FAIR
WBL	4	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H	2	WESTBOUND RIGHT SEPARATE VERTICAL SIGNAL HEAD
NBL	4	12"	LED	Y	H	4	FAIR
NBT	3	12"	LED	Y	H	4	FAIR
SBL	4	12"	LED	Y	H	4	FAIR
SBT	3	12"	LED	Y	H/V	4	SOUTH BOUND RIGHT SEPARATE VERTICAL

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**DETECTION/COMMUNICATION**

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	Y	N	FAIR
WB	VIVDS	1	Y	N	FAIR
NB	VIVDS	1	Y	N	FAIR
SB	VIVDS	1	Y	N	FAIR

**Intersection ID :**

**7**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

**Kelly Lane @ Kennemer Dr.**

Key Map:

E-W Street:

Kelly Lane

Date:

30-May

30-May

N-S Street:

Kennemer Dr.

Signal

Controller

**SIGNS**

APPROACH	TYPE	CONDITION / REMARKS
EB	LEFT TURN YIELD ON FLASHING YELLOW ARROW	FAIR
WB	LEFT TURN YIELD ON FLASHING YELLOW ARROW	FAIR

APPROACH	TYPE	CONDITION / REMARKS
NB		
SB		

**ADA RAMPS / PED SIGNALS**

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SKWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	PED RUNS ONLY EXCLUSIVE PHASE
NE	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	PED RUNS ONLY EXCLUSIVE PHASE
SE	SKWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	SKIPPED PED CYCLE; PED RUNS ONLY EXCLUSIVE PHASE
SW	SKWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	PED RUNS ONLY EXCLUSIVE PHASE

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

**CABINET/CONTROLLER DETAILS**

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS				
NW	B	16	2x3", 2x2"	Y	Y					
CONDITION / REMARKS										
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION					
Econolite	TS2	Coord	N	Y	EBL	5	WBL	1		
SOFTWARE	ASC / 3-2100				EBT	2	WBT	6		
VERSION	2.63.00				NBL	3	SBL	4		
MISC.					NBT		SBT			
CONDITION / REMARKS										

**CONFLICT ELECTRONICS**

**Intersection ID :**

7

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

Kelly Lane @ Kennemer Dr.

Key Map:

E-W Street:

Kelly Lane

Date:

30-May

30-May

N-S Street:

Kennemer Dr.

Signal

Controller

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - LE	

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS
OPTICOM	762 PHASE SELECTOR	GTT	FIRE	

**ELECTRICAL SERVICE**

LOCATION
NW

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
ITERIS	VAN EDGE 2	COLOR WIDE LCD MONITOR	

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING	Y	Y	Y	Y	Y	Y	Y	Y
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)				Y		Y		N
OTHER								

**ADDITIONAL INFORMATION:**

OPTICOM: RTC MODEL 380 CARD RACK/ GTT OPTICOM SYSTEM 762 PHASE SELECTOR

APS POLARA CCU2EN

POWER SOURCE - EDI PS250

**INTERSECTION 8 - KELLY LANE & FALCON POINTE BLVD**



Intersection ID :

8

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: Kelly Lane @ Falcon Pointe Blvd

Key Map:

E-W Street: Kelly Lane

Date:

30-May

30-May

N-S Street: Falcon Pointe Blvd

Signal

Controller

SIGNAL POLES

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM	Y	FAIR	
NE	MAST ARM/PED POLE	N	FAIR	
SE	MAST ARM	Y	FAIR	
SW				
N Median			S Median	Y
E Median	Y		W Median	Y

SIGNAL HEADS

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	4	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H	2	FAIR
WBL	4	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H	2	FAIR
NBL	3	12"	LED	Y	H	1	FAIR
NBT	3	12"	LED	Y	H	1	FAIR
SBL							
SBT							

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

DETECTION/COMMUNICATION

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	FAIR
WB	VIVDS	1	N	N	FAIR
NB	VIVDS	1	N	N	FAIR
SB	VIVDS	1	N	N	FAIR

Intersection ID :

8

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: Kelly Lane @ Falcon Pointe Blvd

Key Map:

E-W Street: Kelly Lane

Date:

30-May

30-May

N-S Street: Falcon Pointe Blvd

Signal

Controller

SIGNS

APPROACH	TYPE	CONDITION / REMARKS
EB	LEFT TURN YIELD ON FLASHING YELLOW ARROW; U-TURN	FAIR
WB	LEFT TURN YIELD ON FLASHING YELLOW ARROW	FAIR

APPROACH	TYPE	CONDITION / REMARKS
NB		
SB		

ADA RAMPS / PED SIGNALS

CORNER	SDWK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
NE	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
SE	SDWK - Y	2/3	FAIR	Y	SEE REMARKS	PED BUTTON TOO FAR FROM RAMP
SW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS	
CONDITION / REMARKS							
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION		
					EBL		WBL
SOFTWARE					EBT		WBT
VERSION					NBL		SBL
MISC.					NBT		SBT
CONDITION / REMARKS							

**Intersection ID :**

**8**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** **Kelly Lane @ Falcon Pointe Blvd**

Key Map:

E-W Street: **Kelly Lane**

Date:

**30-May**

**30-May**

N-S Street: **Falcon Pointe Blvd**

Signal

Controller

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS

**ELECTRICAL SERVICE**

LOCATION

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

SIGNAL CABINET DOES NOT OPEN

**INTERSECTION 9 - WEISS LANE & WOLF PACK DRIVE**

Intersection ID :

9

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: Weiss Lane @ Wolf Pack Dr.

Key Map:

E-W Street: Wolf Pack Dr.

Date:

30-May

30-May

N-S Street: Weiss Lane

Signal

Controller

SIGNAL POLES

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM	Y	FAIR	
NE	MAST ARM	N	FAIR	
SE	MAST ARM / PED POLE	Y	FAIR	
SW	MAST ARM / PED POLE	N	FAIR	
N Median		Y	S Median	Y
E Median		N	W Median	N

SIGNAL HEADS

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL							
EBT							
WBL	3	12"	LED	Y	H	3	FAIR
WBT	3	12"	LED	Y	H	3	FAIR
NBL							
NBT	3	12"	LED	Y	H		FAIR
SBL	3	12"	LED	Y	H	1	FAIR
SBT	3	12"	LED	Y	H	1	FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

DETECTION/COMMUNICATION

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	FAIR
WB	VIVDS	1	N	N	FAIR
NB	VIVDS	1	N	N	FAIR
SB	VIVDS	1	N	N	FAIR

**Intersection ID :**

**9**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** Weiss Lane @ Wolf Pack Dr.

Key Map:

E-W Street: Wolf Pack Dr.

Date:

30-May

30-May

N-S Street: Weiss Lane

Signal

Controller

**SIGNS**

APPROACH	TYPE	CONDITION / REMARKS
EB		
WB		

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

**ADA RAMPS / PED SIGNALS**

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
NE	SDWK - N RAMPS - N					
SE	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
SW	SDWK - N RAMPS - N					

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

**CABINET/CONTROLLER DETAILS**

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS	
NE	B	16	2 x 4", 1 x 2'	N	Y		
CONDITION / REMARKS							
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION		
COBALT	TS2	N	N	N	EBL	WBL	8
SOFTWARE	ECONOLITE				EBT	4	WBT
VERSION					NBL	SBL	1
MISC.					NBT	2	SBT
CONDITION / REMARKS							

**Intersection ID :**

9

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** Weiss Lane @ Wolf Pack Dr.

Key Map:

E-W Street: Wolf Pack Dr.

Date:

30-May

30-May

N-S Street: Weiss Lane

Signal

Controller

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - 16LEi	

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS

**ELECTRICAL SERVICE**

LOCATION
NE

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris	Vantage Edge 2	Colorwide LCD Monitor	

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING	Y	Y		Y		Y		Y
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)		Y						
OTHER								

**ADDITIONAL INFORMATION:**

APS: Polara CCU2EN

Power: EDI, PS250

**INTERSECTION 10 - PFLUGERVILLE PARKWAY & WEISS LANE**



Intersection ID :

10

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: Pflugerville Parkway @ Weiss Lane

Key Map:

E-W Street: E Pflugerville Pkwy

Date:

30-May

30-May

N-S Street: Weiss Lane

Signal

Controller

SIGNAL POLES

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM / PED POLE	N	FAIR	
NE	MAST ARM / PED POLE	Y	FAIR	
SE	MAST ARM / PED POLE	Y	FAIR	
SW	MAST ARM	N	FAIR	
N Median		Y	S Median	Y
E Median		N	W Median	Y

SIGNAL HEADS

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	5	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H	2	FAIR
WBL	3	12"	LED	Y	H		FAIR
WBT							
NBL	3	12"	LED	Y	H	4	FAIR
NBT	3	12"	LED	Y	H	4	FAIR
SBL	3	12"	LED	Y	H	4	FAIR
SBT	3	12"	LED	Y	H	4	FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

DETECTION/COMMUNICATION

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	FAIR
WB	VIVDS	1	N	N	FAIR
NB	VIVDS	1	N	N	FAIR
SB	VIVDS	1	N	N	FAIR

Intersection ID :

10

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION: Pflugerville Parkway @ Weiss Lane

Key Map:

E-W Street: E Pflugerville Pkwy

Date:

30-May

30-May

N-S Street: Weiss Lane

Signal

Controller

SIGNS

APPROACH	TYPE	CONDITION / REMARKS
EB		
WB		

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

ADA RAMPS / PED SIGNALS

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
NE	SDWK - Y RAMPS - Y	2/3	FAIR	Y	SEE REMARKS	PEDESTRIAN BUTTON NOT WORKING
SE	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	
SW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS				
NE	B	16	2 x 4", 1 x 2"	N	Y	1 x 3", 3 x 2" - Spare				
CONDITION / REMARKS										
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION					
M60 SEIMENS	TS2		N	N	EBL	7	WBL	8		
SOFTWARE	SEPAC				EBR	4	WBT	8		
VERSION	3.56 F				NBL	5	SBL	1		
MISC.					NBT	2	SBT	6		
CONDITION / REMARKS		INCORRECT CONTROLLER								

**Intersection ID :**

**10**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

**Pflugerville Parkway @ Weiss Lane**

Key Map:

E-W Street:

E Pflugerville Pkwy

Date:

30-May

30-May

N-S Street:

Weiss Lane

Signal

Controller

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU2 - Leip	

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS

**ELECTRICAL SERVICE**

LOCATION
NE

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris	VAN-EDGE 2	COLOR WIDE	

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING	Y	Y		Y		Y	Y	Y
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

APS - POLARA CCU2 EN

POWER - EDI PS 250

**INTERSECTION 11 - PECAN STREET & WEISS LANE**

Intersection ID :

11

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION:

Pecan Street @ Weiss Lane

Key Map:

E-W Street:

Pecan Street

Date:

3-Jun

30-May

N-S Street:

Weiss Lane

Signal

Controller

SIGNAL POLES

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM	Y	FAIR	
NE				
SE	MAST ARM	Y	FAIR	
SW				
N Median	N		S Median	
E Median	N		W Median	N

SIGNAL HEADS

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	5	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL							
WBT	3	12"	LED	Y	H	1	FAIR
NBL							
NBT							
SBL	3	12"	LED	Y	H	1	FAIR
SBT							

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

DETECTION/COMMUNICATION

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	VIVDS	1	N	N	FAIR
WB	VIVDS	1	N	N	FAIR
NB					
SB	VIVDS	1	N	N	FAIR

**Intersection ID :**

11

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

**Pecan Street @ Weiss Lane**

Key Map:

E-W Street:

Pecan Street

Date:

3-Jun

30-May

N-S Street:

Weiss Lane

Signal

Controller

**SIGNS**

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

APPROACH	TYPE	CONDITION / REMARKS
NB		
SB		

**ADA RAMPS / PED SIGNALS**

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	N					
NE	N					
SE	N					
SW	N					

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

**CABINET/CONTROLLER DETAILS**

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS		
NE	B	16	2 x 4", 3 x 3", 1 x 2"	N		3 x 3", 1 x 2" - Spare		
CONDITION / REMARKS								
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION			
Cobalt Econolite	TS2	N	N	N	EBL	7	WBL	
SOFTWARE	ECONOLITE				EBT	4	WBT	8
VERSION					NBL		SBL	6
MISC.					NBT		SBT	
CONDITION / REMARKS								

**Intersection ID :**

11

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

**Pecan Street @ Weiss Lane**

Key Map:

E-W Street:

Pecan Street

Date:

3-Jun

30-May

N-S Street:

Weiss Lane

Signal

Controller

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS
EDI	MMU 2 - 16 Leip	

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS

**ELECTRICAL SERVICE**

LOCATION
NE

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS
Iteris	VANTAGE EDGE 2	COLOR WIDE	

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING				Y		Y	Y	Y
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

**INTERSECTION 12 - PECAN STREET & OLD AUSTIN-HUTTO IMMANUEL RD**



**Intersection ID :**

**12**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

**Pecan St @ Old Austin-Hutto Immanuel Rd**

Key Map:

E-W Street:

Pecan St

Date:

3-Jun

3-Jun

N-S Street:

Old Austin Hutto Rd/Immanuel Rd

Signal

Controller

**SIGNAL POLES**

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	Span Wire / Ped Pole	Y		
NE	Span Wire / Ped Pole	Y		
SE	Span Wire / Ped Pole	Y		
SW	Span Wire / Ped Pole	Y		
N Median	N		S Median	N
E Median	Y		W Median	Y

**SIGNAL HEADS**

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	5	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL	5	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H		FAIR
NBL	5	12"	LED	Y	H/V	2	FAIR
NBT	3	12"	LED	Y	H		FAIR
SBL	5	12"	LED	Y	H	2	FAIR
SBT	3	12"	LED	Y	H		FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

**DETECTION/COMMUNICATION**

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	NONE				
WB	NONE				
NB	NONE				
SB	NONE				

**Intersection ID :**

**12**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

**Pecan St @ Old Austin-Hutto Immanuel Rd**

Key Map:

E-W Street:

Pecan St

Date:

3-Jun

3-Jun

N-S Street:

Old Austin Hutto Rd/Immanuel Rd

Signal

Controller

**SIGNS**

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

APPROACH	TYPE	CONDITION / REMARKS
NB		
SB		

**ADA RAMPS / PED SIGNALS**

CORNER	SDWK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMPS - Y	1/2	FAIR	Y	SEE REMARKS	PUSH BUTTON TOO FAR FROM RAMP
NE	SDWK - Y RAMPS - Y	1/2	FAIR	Y	FAIR	
SE	SDWK - Y RAMPS - Y	1/2	FAIR	Y	FAIR	PUSH BUTTON TOO FAR FROM RAMP
SW	SDWK - Y RAMPS - Y	1/2	FAIR	Y	FAIR	PUSH BUTTON TOO FAR FROM RAMP

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



**Intersection ID :**

12

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:** Pecan St @ Old Austin-Hutto Immanuel Rd

Key Map:

E-W Street:

Pecan St

Date:

3-Jun

3-Jun

N-S Street:

Old Austin Hutto Rd/Immanuel Rd

Signal

Controller

**CABINET/CONTROLLER DETAILS**

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS		
CONDITION / REMARKS								
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION			
					EBL		WBL	
SOFTWARE					EBT		WBT	
VERSION					NBL		SBL	
MISC.					NBT		SBT	
CONDITION / REMARKS								

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS

**ELECTRICAL SERVICE**

LOCATION

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

**INTERSECTION 13 - IMMANUAL ROAD & OXFORD DRIVE**

Intersection ID :

13

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION:

Immanuel Rd @ Oxford Dr.

Key Map:

E-W Street:

Pflugerville Elementary School/ Oxford Dr

Date:

3-Jun

N-S Street:

Immanuel Road

Signal

Controller

SIGNAL POLES

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM / PED POLE	N	FAIR	
NE	MAST ARM / PED POLE	N	FAIR	
SE	MAST ARM / PED POLE	N	FAIR	
SW	MAST ARM / PED POLE	N	FAIR	
N Median	N	S Median	Y	
E Median	Y	W Median	Y	

SIGNAL HEADS

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	3	12"	LED	Y	H	3	FAIR
EBT	3	12"	LED	Y	H	3	FAIR
WBL	3	12"	LED	Y	H	3	FAIR
WBT	3	12"	LED	Y	H	3	FAIR
NBL	5	12"	LED	Y	H	2	FAIR
NBT	3	12"	LED	Y	H		FAIR
SBL	5	12"	LED	Y	H	2	FAIR
SBT	3	12"	LED	Y	H		FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

DETECTION/COMMUNICATION

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	NONE				
WB	NONE				
NB	NONE				
SB	NONE				

Intersection ID :

13

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION:

Immanuel Rd @ Oxford Dr.

Key Map:

E-W Street:

Pflugerville Elementary School/ Oxford Dr

Date:

3-Jun

N-S Street:

Immanuel Road

Signal

Controller

SIGNS

APPROACH	TYPE	CONDITION / REMARKS
EB		
WB		

APPROACH	TYPE	CONDITION / REMARKS
NB		
SB		

ADA RAMPS / PED SIGNALS

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITIO N	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - Y RAMPS - Y	1/2	FAIR	Y	FAIR	NO SIDEWALK ON SOUTH LEG
NE	SDWK - Y RAMPS - Y	1/2	FAIR	Y	FAIR	VISUAL COUNTDOWN; NO SIDEWALK ON EAST LEG
SE	SDWK - Y RAMPS - Y	1/2	FAIR	Y	FAIR	PED BUTTON WRONG SIDE OF POLE; NO SIDEWALK ON WEST LEG
SW	SDWK - Y RAMPS - Y	1/2	FAIR	Y	FAIR	NO CROSSWALK ON SOUTH LEG

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

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOO K	MISC. ITEMS	
CONDITION / REMARKS							
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION		
					EBL		WBL
SOFTWARE					EBT		WBT
VERSION					NBL		SBL
MISC.					NBT		SBT
CONDITION / REMARKS							

**Intersection ID :**

**13**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

**Immanuel Rd @ Oxford Dr.**

Key Map:

E-W Street:

Pflugerville  
Elementary School/  
Oxford Dr

Date:

3-Jun

N-S Street:

Immanuel Road

Signal

Controller

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS

**ELECTRICAL SERVICE**

LOCATION

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

**INTERSECTION 14 - WELLS BRANCH & DESSAU LANE**



Intersection ID :

14

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION:

Wells Branch @ Dessau Lane

Key Map:

E-W Street:

Wells Branch Pkwy

Date:

11-Jan

12-Feb

N-S Street:

Dessau Lane

Signal

Controller

SIGNAL POLES

CORNER	MAST ARM/ SPAN WIRE/ PED POLE	ILLUM (Y/N)	CONDITION / REMARKS	
NW	MAST ARM	Y	FAIR	
NE	MAST ARM / PED POLE	Y	FAIR	
SE	MAST ARM / PED POLE	Y	FAIR	
SW	MAST ARM / PED POLE	Y	FAIR	
N Median	Y	S Median	Y	
E Median	Y	W Median	Y	

SIGNAL HEADS

CORNER	# OF HEADS	8"/12"	LED / INCDST	BKPLT (Y/N)+	HORIZ(H)/ VERT(V)	PHASING*	CONDITION / REMARKS
EBL	5	12"	LED	Y	H	2	FAIR
EBT	3	12"	LED	Y	H		FAIR
WBL	5	12"	LED	Y	H	2	FAIR
WBT	3	12"	LED	Y	H		FAIR
NBL	3	12"	LED	Y	H	3	FAIR
NBT	3	12"	LED	Y	H	3	FAIR
SBL	3	12"	LED	Y	H	3	FAIR
SBT	3	12"	LED	Y	H	3	FAIR

\* 1=Protected; 2=Permitted+Protected; 3=Permitted; 4=Split; 5=Overlap

Refer to Intersection Layout for additional signal head details

DETECTION/COMMUNICATION

APPROACH	LOOPS/ VIVDS etc.	NO. OF VIVDS	OPTICOM (Y/N)	ANTENNA (Y/N/TYPE)	CONDITION / REMARKS
EB	NONE				
WB	NONE				
NB	NONE				
SB	NONE				

Intersection ID :

14

PFLUGERVILLE SIGNAL INVENTORY

INTERSECTION:

Wells Branch @ Dessau Lane

Key Map:

E-W Street:

Wells Branch Pkwy

Date:

11-Jan

12-Feb

N-S Street:

Dessau Lane

Signal

Controller

SIGNS

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

APPROACH	TYPE	CONDITION / REMARKS
NB	LEFT ON GREEN ARROW ONLY	FAIR
SB	LEFT ON GREEN ARROW ONLY	FAIR

ADA RAMPS / PED SIGNALS

CORNER	SD/WK (Y/N) RAMPS (Y/N)	PED-HEAD TYPE*	PED HEAD CONDITION	PB's/SIGN (Y/N,N/A, Access?)	PUSHBTN CONDITION	CONDITION / REMARKS
NW	SDWK - N RAMPS - N					NO CROSS WALK OR PED HEAD
NE	SDWK - N RAMPS - N	2/3	FAIR	Y	SEE REMARKS	PUSH BUTTON DOES NOT WORK; NO CROSSWALK
SE	SDWK - Y RAMPS - Y	2/3	FAIR	Y	SEE REMARKS	PED PUSH BUTTON FAR FROM RAMP
SW	SDWK - Y RAMPS - Y	2/3	FAIR	Y	FAIR	PED PUSH BUTTON FAR FROM RAMP

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

NO PED PHASE ACTIVATED

CABINET/CONTROLLER DETAILS

LOCATION CORNER	TYPE B/P	LS 12/16	CONDUIT	GPS CLOCK	MANUAL/ FIELDBOOK	MISC. ITEMS	
CONDITION / REMARKS							
MODEL	TYPE (TS1, TS2)	ACT / COORD	MASTER (Y/N)	PREEMPT (Y/N)	PHASING ORIENTATION		
					EBL		WBL
SOFTWARE					EBT		WBT
VERSION					NBL		SBL
MISC.					NBT		SBT
CONDITION / REMARKS							

**Intersection ID :**

**14**

**PFLUGERVILLE SIGNAL INVENTORY**

**INTERSECTION:**

**Wells Branch @ Dessau Lane**

Key Map:

E-W Street:

**Wells Branch Pkwy**

Date:

**11-Jan** **12-Feb**

N-S Street:

**Dessau Lane**

Signal Controller

**CONFLICT ELECTRONICS**

MMU MAKE	MODEL	CONDITION / REMARKS

**COMMUNICATION**

TYPE	MODEL	MAKE	FUNCTION	CONDITION / REMARKS

**ELECTRICAL SERVICE**

LOCATION

**LOOPS/VIVDS/RADAR**

MAKE	MODEL	MONITOR	CONDITION / REMARKS

**DETECTOR CARDS**

VEH. PH	1	2	3	4	5	6	7	8
WORKING								
CONDITION / REMARKS								
PED. PH	1	2	3	4	5	6	7	8
WORKING (Y/N)								
OTHER								

**ADDITIONAL INFORMATION:**

## 11.0 APPENDIX C: Battery Back-Up Unit Justification Memo

## Technical Memorandum

**To:** John Nevares, P.E.  
Assistant Director of Transportation Operations  
Texas Department of Transportation  
7901 N Interstate Hwy 35  
Austin, TX 78753

**From:** Vivek Deshpande, P.E., PTOE

**Re:** *Pflugerville Signal Takeover Battery Backup Justification Memorandum*

**Date:** May 12, 2020

### Overview

Kimley-Horn and Associates, Inc. (K-H) has completed an inventory of the existing TxDOT-owned signal system within the city of Pflugerville, Texas. Pflugerville is a fast-growing community expected to have a population in excess of 60,000 in the 2020 Census, and as a result, the traffic signal infrastructure and other related traffic control devices owned by TxDOT will be transferred to the City by summer 2021.

Prior to this signal takeover from TxDOT, City officials engaged K-H to complete a Traffic Signal Inventory and Assessment. As a part of the inventory and assessment, traffic signals were evaluated for functionality, condition, compatibility with Texas Manual on Uniform Traffic Control Devices (TxMUTCD), and necessary repairs. It is anticipated that TxDOT will complete necessary repairs and modifications to existing signals to be compatible with current standards before the City assumes maintenance and operations responsibility in summer 2021.

In discussions with TxDOT, battery back-up units (BBU) may be provided at some of the existing TxDOT traffic signal locations. A literature review was conducted to identify justification criteria used by other agencies. This technical memorandum uses the criteria established by the New York State Department of Transportation (NYSDOT), applies to existing TxDOT signal locations, summarizes conditions at the intersections, and provides justification for the installation of BBU systems at each intersection.

### Battery Backup Systems

Battery backup systems provide a secondary power source to traffic signals in the event that the primary power source is interrupted. The system ensures that the traffic signal and signal cabinet are provided a continuous source of power so that traffic operations can continue uninterrupted in the case of a utility power outage. Continuous signal operation is an important safety consideration for high-risk intersections, including those which carry significant traffic volumes, those located along truck or evacuation routes, those with high crash rates, or those considered a priority intersection to the City system, among other factors. Without a BBU, the signal head displays go dark when there is a power outage. During such a situation, traffic is supposed to stop at the intersection and treat it as an 'All-Way Stop'. Unfortunately, in most cases, traffic does not notice a dark signal and continue at normal speed which creates very unsafe conditions for both vehicular traffic and especially pedestrians at the intersection.

Per City of Pflugerville preference, all new City signals are designed with BBU systems. Consistent with this preference, the City prefers that signals acquired from TxDOT in summer 2021 have BBU systems installed. This technical memorandum serves to justify the installation of BBU systems at eight existing TxDOT intersections on the basis of safety and continuous traffic operations.

## Justification Factors

The New York State Department of Transportation (NYSDOT) published a report in 2009 titled *Guidelines for Traffic Signal Energy Back-Up Systems*. In it, NYSDOT defines a BBU ranking system based on weighted intersection priorities. This technical memorandum utilizes the NYSDOT ranking system, shown in **Table 1**, to determine BBU justification. Some of the prioritization factors listed in the NYSDOT report are not applicable to the City of Pflugerville and have been replaced with applicable factors. These factors are noted in the table below.

The NYSDOT report did not provide any guidance for a minimum score that warranted a BBU; the scores were used to prioritize locations where BBU was needed. For the purposes of this project, a weighted factor score of 75 – equal to half of the total available points – was assumed as the threshold where a BBU system is justified.

**Table 1 – Adopted Justification Factor System**

Prioritization Factor	Input Value	Weighting Factor
Priority Intersection Location*: How high of a priority is this intersection to the City system? (input value 0-3)		15
MUTCD Warrant: Does intersection meet MUTCD warrant #7 (crash experience) (input value 0 or 1)		15
Proximity to Major Facilities**: How high of a risk level are the facilities near this intersection (churches and major attractions input value 1, schools, hospitals, and emergency services input value 2)		10
Proximity to Grade Crossing: Intersection within less than 75' from a grade crossing input value 1, intersection between 75' and 200' from grade crossing input value 2		10
Speed: Is the posted speed of any approaching lane greater than 40 MPH OR part of a freeway exit ramp (input value 0 or 1)		10
Volume at Intersection: AADT of all approach lanes combined (weighted input value between 0 and 1)		5
Evacuation Route: Is this intersection part of an evacuation route (input value 0 or 1)		5
Truck Route: Is this intersection part of a designated truck route (input value 0 or 1)		5
Left turn bays present: (input value 0 or 1)		5
If turn bays are present are any multilane? (input value 0 or 1)		5
Proximity to other signalized intersections: Is this intersection within 2 miles of another traffic signal? (input value 0 or 1)		5
Total Score (maximum 150):		

\*In the NYSDOT report, this factor considered consecutive years that an intersection was considered a priority intersection by the state. As such a list does not exist for Pflugerville, this factor has been amended.

\*\*In the NYSDOT report, this factor considered frequency of intersection power outages. As this data is not available, the factor has been modified to include proximity to critical facilities as shown.

## Intersections Considered

The Texas Department of Transportation currently owns 15 signals within the City of Pflugerville. The City will take over ten (10) of these signals, listed below. The toll authority will maintain ownership of the remaining five interchanges along SH 45 and SH 130.

1. FM 1825 & Windermere Drive
2. FM 1825 & Heatherwilde Blvd
3. FM 1825 & Swenson Farms Blvd
4. FM 1825 & Meadows Lane
5. FM 1825 & Railroad Ave
6. FM 1825 & FM 685 Dessau
7. FM 685 & Old Austin Hutto Road/Split Oak Drive
8. FM 685 & Pfennig Lane
9. FM 685 & Pflugerville Parkway
10. FM 685 & Town Center Drive

**Table 2** below shows the justification factor scores derived from **Table 1** for each of these intersections. The complete justification factor tables for each intersection can be found in **Appendix A**.

**Table 2 – Justification Factor Scores**

Intersection Number	Name	Score (out of maximum 150)	Percent of max possible score	BBU Justified?
2	FM 1825 & Heatherwilde Blvd	100	67%	Y
6	FM 1825 & FM 685 Dessau	89	59%	Y
9	FM 685 & Pflugerville Parkway	89	59%	Y
8	FM 685 & Pfennig Lane	89	59%	Y
5	FM 1825 & Railroad Ave	83	55%	Y
3	FM 1825 & Swenson Farms Blvd	82	55%	Y
10	FM 685 & Town Center Drive	74	49%	N
1	FM 1825 & Windermere Drive	39	26%	N
4	FM 1825 & Meadows Lane	28	18%	N
7	FM 685 & Old Austin Hutto Road	18	12%	N

## Recommendation

As noted in **Table 2**, based on the ranking system developed, BBU systems are justified at six intersections. These recommendations are made on the basis of safety concerns and continuous traffic operations if the intersection were to lose power and not have a backup supply. The City of Pflugerville requests that TxDOT install BBU systems at these six intersections before the City takes over operations & maintenance in summer 2021.

TxDOT owns two additional intersections – FM 1825 @ Central Commercial Dr and FM 1825 @ Vision Dr – located just outside the City limits. The City is considering taking over these signals even though they are outside their limits to allow better signal coordination and flow for traffic entering the City. To assist in the acquisition of these two additional signals, the City is requesting if TxDOT would provide BBU systems for these signals prior to summer 2021 as well. The total list of eight intersections for which the City requests that TxDOT install BBU systems is below.

1. FM 1825 & Heatherwilde Blvd
2. FM 1825 & FM 685 Dessau
3. FM 685 & Pflugerville Parkway
4. FM 685 & Pfennig Lane
5. FM 1825 & Railroad Ave
6. FM 1825 & Swenson Farms Blvd
7. FM 1825 & Central Commercial Dr
8. FM 1825 & Vision Dr

# APPENDIX A: Weighted Recommendation Tables

DRAFT



### Intersection 1: FM 1825 & Windermere Drive

Prioritization Factor	Input Value	Weighting Factor	Total
Priority Intersection Location: How high of a priority is this intersection to the City system? (input value 0-3)	0	15	0
MUTCD Warrant: Does intersection meet MUTCD warrant #7 (crash experience) (input value 0 or 1)	1	15	15
Proximity to Major Facilities: How high of a risk level are the facilities near this intersection ( churches and major attractions input value 1, schools, hospitals, and emergency services input value 2)	0	10	0
Proximity to Grade Crossing: Intersection within less than 75' from a grade crossing input value 1, intersection between 75' and 200' from grade crossing input value 2	0	10	0
Speed: Is the posted speed of any approaching lane greater than 40 MPH OR part of a freeway exit ramp (input value 0 or 1)	1	10	10
Volume at Intersection: AADT of all approach lanes combined (weighted input value between 0 and 1)	0.818	5	4
Evacuation Route: Is this intersection part of an evacuation route (input value 0 or 1)	0	5	0
Truck Route: Is this intersection part of a designated truck route (input value 0 or 1)	0	5	0
Left turn bays present: (input value 0 or 1)	1	5	5
If turn bays are present are any multilane? (input value 0 or 1)	1	5	5
Proximity to other signalized intersections: Is this intersection within 2 miles of another traffic signal? (input value 0 or 1)	0	5	0
Total Score:			39

### Intersection 2: FM 1825 & Heatherwilde Blvd (Justified)

Prioritization Factor	Input Value	Weighting Factor	Total
Priority Intersection Location: How high of a priority is this intersection to the City system? (input value 0-3)	3	15	45
MUTCD Warrant: Does intersection meet MUTCD warrant #7 (crash experience) (input value 0 or 1)	1	15	15
Proximity to Major Facilities: How high of a risk level are the facilities near this intersection ( churches and major attractions input value 1, schools, hospitals, and emergency services input value 2)	2	10	20
Proximity to Grade Crossing: Intersection within less than 75' from a grade crossing input value 1, intersection between 75' and 200' from grade crossing input value 2	0	10	0
Speed: Is the posted speed of any approaching lane greater than 40 MPH OR part of a freeway exit ramp (input value 0 or 1)	1	10	10
Volume at Intersection: AADT of all approach lanes combined (weighted input value between 0 and 1)	1	5	5
Evacuation Route: Is this intersection part of an evacuation route (input value 0 or 1)	0	5	0
Truck Route: Is this intersection part of a designated truck route (input value 0 or 1)	0	5	0
Left turn bays present: (input value 0 or 1)	1	5	5
If turn bays are present are any multilane? (input value 0 or 1)	0	5	0
Proximity to other signalized intersections: Is this intersection within 2 miles of another traffic signal? (input value 0 or 1)	0	5	0
Total Score:			100

### Intersection 3: FM 1825 & Swenson Farms Blvd (Justified)

Prioritization Factor	Input Value	Weighting Factor	Total
Priority Intersection Location: How high of a priority is this intersection to the City system? (input value 0-3)	3	15	45
MUTCD Warrant: Does intersection meet MUTCD warrant #7 (crash experience) (input value 0 or 1)	0	15	0
Proximity to Major Facilities: How high of a risk level are the facilities near this intersection ( churches and major attractions input value 1, schools, hospitals, and emergency services input value 2)	2	10	20
Proximity to Grade Crossing: Intersection within less than 75' from a grade crossing input value 1, intersection between 75' and 200' from grade crossing input value 2	0	10	0
Speed: Is the posted speed of any approaching lane greater than 40 MPH OR part of a freeway exit ramp (input value 0 or 1)	1	10	10
Volume at Intersection: AADT of all approach lanes combined (weighted input value between 0 and 1)	0.433	5	2
Evacuation Route: Is this intersection part of an evacuation route (input value 0 or 1)	0	5	0
Truck Route: Is this intersection part of a designated truck route (input value 0 or 1)	0	5	0
Left turn bays present: (input value 0 or 1)	1	5	5
If turn bays are present are any multilane? (input value 0 or 1)	0	5	0
Proximity to other signalized intersections: Is this intersection within 2 miles of another traffic signal? (input value 0 or 1)	0	5	0
Total Score:			82

#### Intersection 4: FM 1825 & Meadows Lane

Prioritization Factor	Input Value	Weighting Factor	Total
Priority Intersection Location: How high of a priority is this intersection to the City system? (input value 0-3)	0	15	0
MUTCD Warrant: Does intersection meet MUTCD warrant #7 (crash experience) (input value 0 or 1)	0	15	0
Proximity to Major Facilities: How high of a risk level are the facilities near this intersection ( churches and major attractions input value 1, schools, hospitals, and emergency services input value 2)	1	10	10
Proximity to Grade Crossing: Intersection within less than 75' from a grade crossing input value 1, intersection between 75' and 200' from grade crossing input value 2	0	10	0
Speed: Is the posted speed of any approaching lane greater than 40 MPH OR part of a freeway exit ramp (input value 0 or 1)	1	10	10
Volume at Intersection: AADT of all approach lanes combined (weighted input value between 0 and 1)	0.545	5	3
Evacuation Route: Is this intersection part of an evacuation route (input value 0 or 1)	0	5	0
Truck Route: Is this intersection part of a designated truck route (input value 0 or 1)	0	5	0
Left turn bays present: (input value 0 or 1)	1	5	5
If turn bays are present are any multilane? (input value 0 or 1)	0	5	0
Proximity to other signalized intersections: Is this intersection within 2 miles of another traffic signal? (input value 0 or 1)	0	5	0
Total Score:			28

#### Intersection 5: FM 1825 & Railroad Ave (Justified)

Prioritization Factor	Input Value	Weighting Factor	Total
Priority Intersection Location: How high of a priority is this intersection to the City system? (input value 0-3)	3	15	45
MUTCD Warrant: Does intersection meet MUTCD warrant #7 (crash experience) (input value 0 or 1)	0	15	0
Proximity to Major Facilities: How high of a risk level are the facilities near this intersection ( churches and major attractions input value 1, schools, hospitals, and emergency services input value 2)	2	10	20
Proximity to Grade Crossing: Intersection within less than 75' from a grade crossing input value 1, intersection between 75' and 200' from grade crossing input value 2	0	10	0
Speed: Is the posted speed of any approaching lane greater than 40 MPH OR part of a freeway exit ramp (input value 0 or 1)	1	10	10
Volume at Intersection: AADT of all approach lanes combined (weighted input value between 0 and 1)	0.545	5	3
Evacuation Route: Is this intersection part of an evacuation route (input value 0 or 1)	0	5	0
Truck Route: Is this intersection part of a designated truck route (input value 0 or 1)	0	5	0
Left turn bays present: (input value 0 or 1)	1	5	5
If turn bays are present are any multilane? (input value 0 or 1)	0	5	0
Proximity to other signalized intersections: Is this intersection within 2 miles of another traffic signal? (input value 0 or 1)	0	5	0
Total Score:			83

#### Intersection 6: FM 1825 & FM 685 Dessau (Justified)

Prioritization Factor	Input Value	Weighting Factor	Total
Priority Intersection Location: How high of a priority is this intersection to the City system? (input value 0-3)	3	15	45
MUTCD Warrant: Does intersection meet MUTCD warrant #7 (crash experience) (input value 0 or 1)	1	15	15
Proximity to Major Facilities: How high of a risk level are the facilities near this intersection ( churches and major attractions input value 1, schools, hospitals, and emergency services input value 2)	1	10	10
Proximity to Grade Crossing: Intersection within less than 75' from a grade crossing input value 1, intersection between 75' and 200' from grade crossing input value 2	0	10	0
Speed: Is the posted speed of any approaching lane greater than 40 MPH OR part of a freeway exit ramp (input value 0 or 1)	1	10	10
Volume at Intersection: AADT of all approach lanes combined (weighted input value between 0 and 1)	0.818	5	4
Evacuation Route: Is this intersection part of an evacuation route (input value 0 or 1)	0	5	0
Truck Route: Is this intersection part of a designated truck route (input value 0 or 1)	0	5	0
Left turn bays present: (input value 0 or 1)	1	5	5
If turn bays are present are any multilane? (input value 0 or 1)	0	5	0
Proximity to other signalized intersections: Is this intersection within 2 miles of another traffic signal? (input value 0 or 1)	0	5	0
Total Score:			89

### Intersection 7: FM 685 & Old Austin Hutto Road/Split Oak Drive

Prioritization Factor	Input Value	Weighting Factor	Total
Priority Intersection Location: How high of a priority is this intersection to the City system? (input value 0-3)	0	15	0
MUTCD Warrant: Does intersection meet MUTCD warrant #7 (crash experience) (input value 0 or 1)	0	15	0
Proximity to Major Facilities: How high of a risk level are the facilities near this intersection ( churches and major attractions input value 1, schools, hospitals, and emergency services input value 2)	0	10	0
Proximity to Grade Crossing: Intersection within less than 75' from a grade crossing input value 1, intersection between 75' and 200' from grade crossing input value 2	0	10	0
Speed: Is the posted speed of any approaching lane greater than 40 MPH OR part of a freeway exit ramp (input value 0 or 1)	1	10	10
Volume at Intersection: AADT of all approach lanes combined (weighted input value between 0 and 1)	0.636	5	3
Evacuation Route: Is this intersection part of an evacuation route (input value 0 or 1)	0	5	0
Truck Route: Is this intersection part of a designated truck route (input value 0 or 1)	0	5	0
Left turn bays present: (input value 0 or 1)	1	5	5
If turn bays are present are any multilane? (input value 0 or 1)	0	5	0
Proximity to other signalized intersections: Is this intersection within 2 miles of another traffic signal? (input value 0 or 1)	0	5	0
Total Score:			18

### Intersection 8: FM 685 & Pfennig Lane (Justified)

Prioritization Factor	Input Value	Weighting Factor	Total
Priority Intersection Location: How high of a priority is this intersection to the City system? (input value 0-3)	3	15	45
MUTCD Warrant: Does intersection meet MUTCD warrant #7 (crash experience) (input value 0 or 1)	1	15	15
Proximity to Major Facilities: How high of a risk level are the facilities near this intersection ( churches and major attractions input value 1, schools, hospitals, and emergency services input value 2)	1	10	10
Proximity to Grade Crossing: Intersection within less than 75' from a grade crossing input value 1, intersection between 75' and 200' from grade crossing input value 2	0	10	0
Speed: Is the posted speed of any approaching lane greater than 40 MPH OR part of a freeway exit ramp (input value 0 or 1)	1	10	10
Volume at Intersection: AADT of all approach lanes combined (weighted input value between 0 and 1)	0.727	5	4
Evacuation Route: Is this intersection part of an evacuation route (input value 0 or 1)	0	5	0
Truck Route: Is this intersection part of a designated truck route (input value 0 or 1)	0	5	0
Left turn bays present: (input value 0 or 1)	1	5	5
If turn bays are present are any multilane? (input value 0 or 1)	0	5	0
Proximity to other signalized intersections: Is this intersection within 2 miles of another traffic signal? (input value 0 or 1)	0	5	0
Total Score:			89

### Intersection 9: FM 685 & Pflugerville Parkway (Justified)

Prioritization Factor	Input Value	Weighting Factor	Total
Priority Intersection Location: How high of a priority is this intersection to the City system? (input value 0-3)	3	15	45
MUTCD Warrant: Does intersection meet MUTCD warrant #7 (crash experience) (input value 0 or 1)	1	15	15
Proximity to Major Facilities: How high of a risk level are the facilities near this intersection ( churches and major attractions input value 1, schools, hospitals, and emergency services input value 2)	1	10	10
Proximity to Grade Crossing: Intersection within less than 75' from a grade crossing input value 1, intersection between 75' and 200' from grade crossing input value 2	0	10	0
Speed: Is the posted speed of any approaching lane greater than 40 MPH OR part of a freeway exit ramp (input value 0 or 1)	1	10	10
Volume at Intersection: AADT of all approach lanes combined (weighted input value between 0 and 1)	0.818	5	4
Evacuation Route: Is this intersection part of an evacuation route (input value 0 or 1)	0	5	0
Truck Route: Is this intersection part of a designated truck route (input value 0 or 1)	0	5	0
Left turn bays present: (input value 0 or 1)	1	5	5
If turn bays are present are any multilane? (input value 0 or 1)	0	5	0
Proximity to other signalized intersections: Is this intersection within 2 miles of another traffic signal? (input value 0 or 1)	0	5	0
Total Score:			89

**Intersection 10: FM 685 & Town Center Drive**

Prioritization Factor	Input Value	Weighting Factor	Total
Priority Intersection Location: How high of a priority is this intersection to the City system? (input value 0-3)	2	15	30
MUTCD Warrant: Does intersection meet MUTCD warrant #7 (crash experience) (input value 0 or 1)	1	15	15
Proximity to Major Facilities: How high of a risk level are the facilities near this intersection ( churches and major attractions input value 1, schools, hospitals, and emergency services input value 2)	1	10	10
Proximity to Grade Crossing: Intersection within less than 75' from a grade crossing input value 1, intersection between 75' and 200' from grade crossing input value 2	0	10	0
Speed: Is the posted speed of any approaching lane greater than 40 MPH OR part of a freeway exit ramp (input value 0 or 1)	1	10	10
Volume at Intersection: AADT of all approach lanes combined (weighted input value between 0 and 1)	0.636	5	3
Evacuation Route: Is this intersection part of an evacuation route (input value 0 or 1)	0	5	0
Truck Route: Is this intersection part of a designated truck route (input value 0 or 1)	0	5	0
Left turn bays present: (input value 0 or 1)	1	5	5
If turn bays are present are any multilane? (input value 0 or 1)	0	5	0
Proximity to other signalized intersections: Is this intersection within 2 miles of another traffic signal? (input value 0 or 1)	0	5	0
<b>Total Score:</b>			<b>73</b>

DRAFT

## 12.0 APPENDIX D: Intersection Photo Log - TxDOT On-System Signals

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INTERSECTION 18 SH130 SB FRONTAGE ROAD AT PFLUGERVILLE PKWY ..... 67

INTERSECTION 19 SH130 NB FRONTAGE ROAD AT PFLUGERVILLE PKWY..... 70

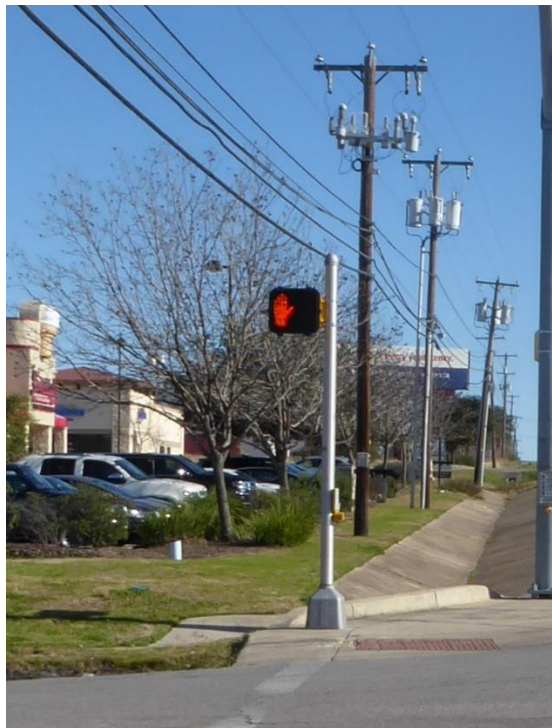
INTERSECTION 20 - SH130 SB FRONTAGE ROAD AT FM 1825..... 73

INTERSECTION 21 - SH130 NB FRONTAGE ROAD AT FM 1825 ..... 76

**INTERSECTION 1 – FM 1825 AT CENTRAL COMMERCE**

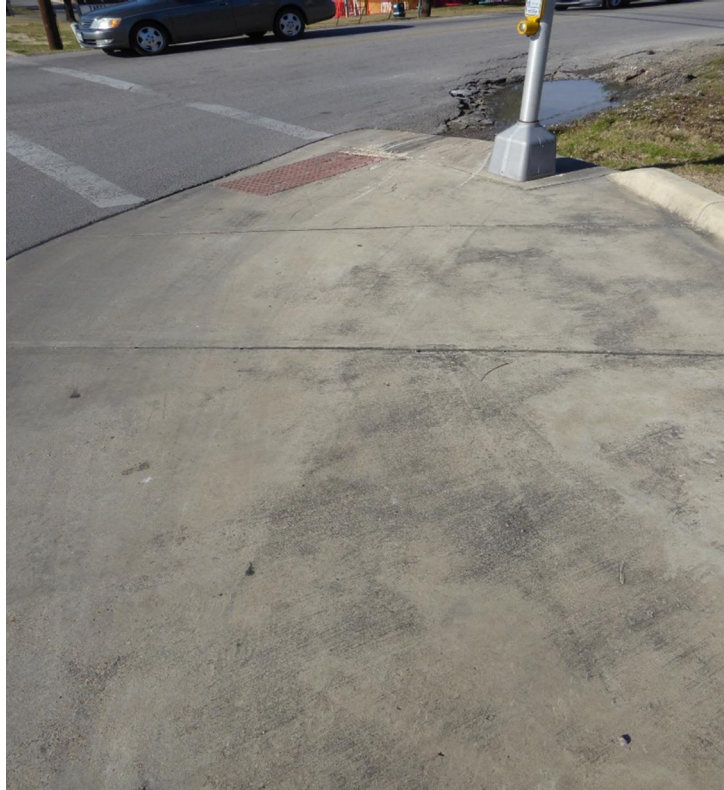


*EB approach on FM 1825. Need advanced detection.*



*Pedestrian count down head not working NW corner*

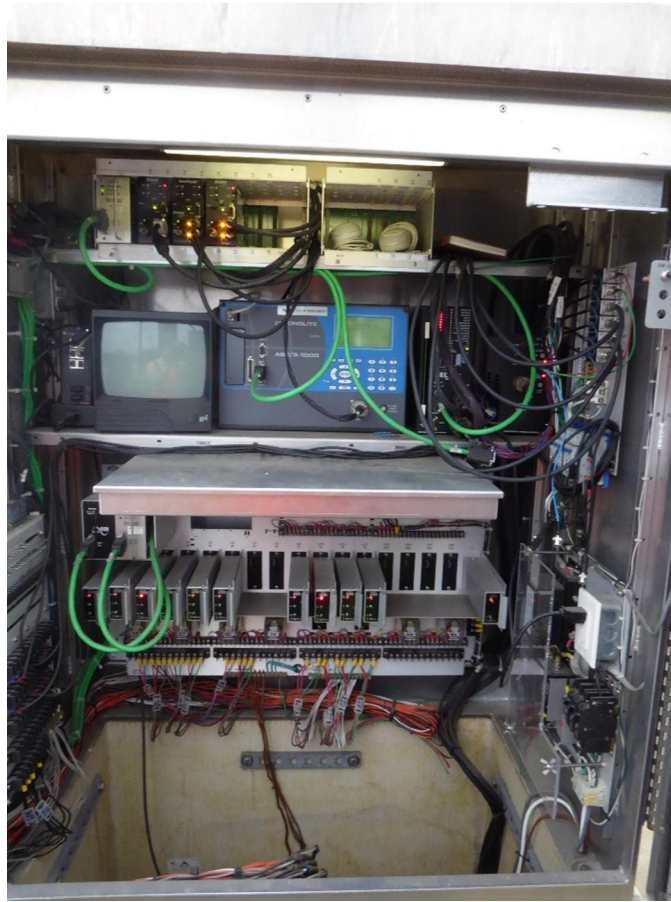




*Tire tracks on east side of Central Commerce NB curb*



*Loops located on NB approach on Central Commerce*



**INTERSECTION 2 - FM 1825 AT WINDERMERE DR**



*EB approach on FM 1825*



*SB approach on Windermere Drive*



*SE corner - faded pedestrian crossing sign and push button not working*



*NE corner – audio tone not working*



*NW corner – push button not working*





**INTERSECTION 3 - FM 1825 AT HEATHERWILDE BLVD**

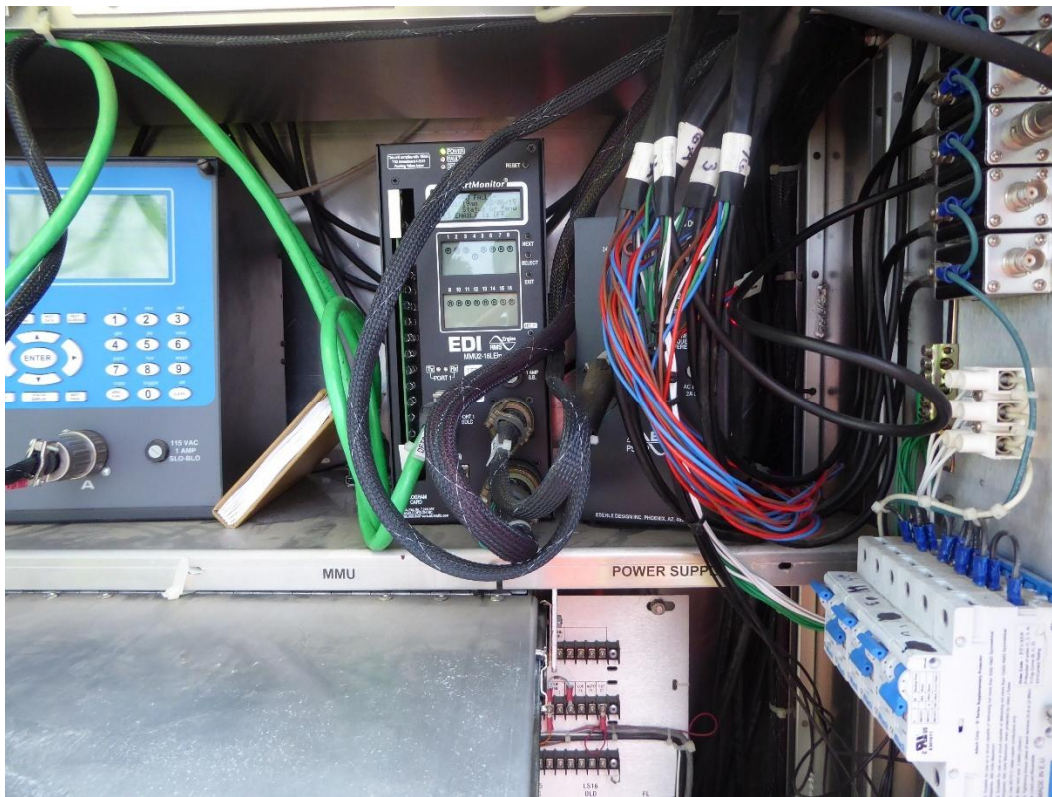


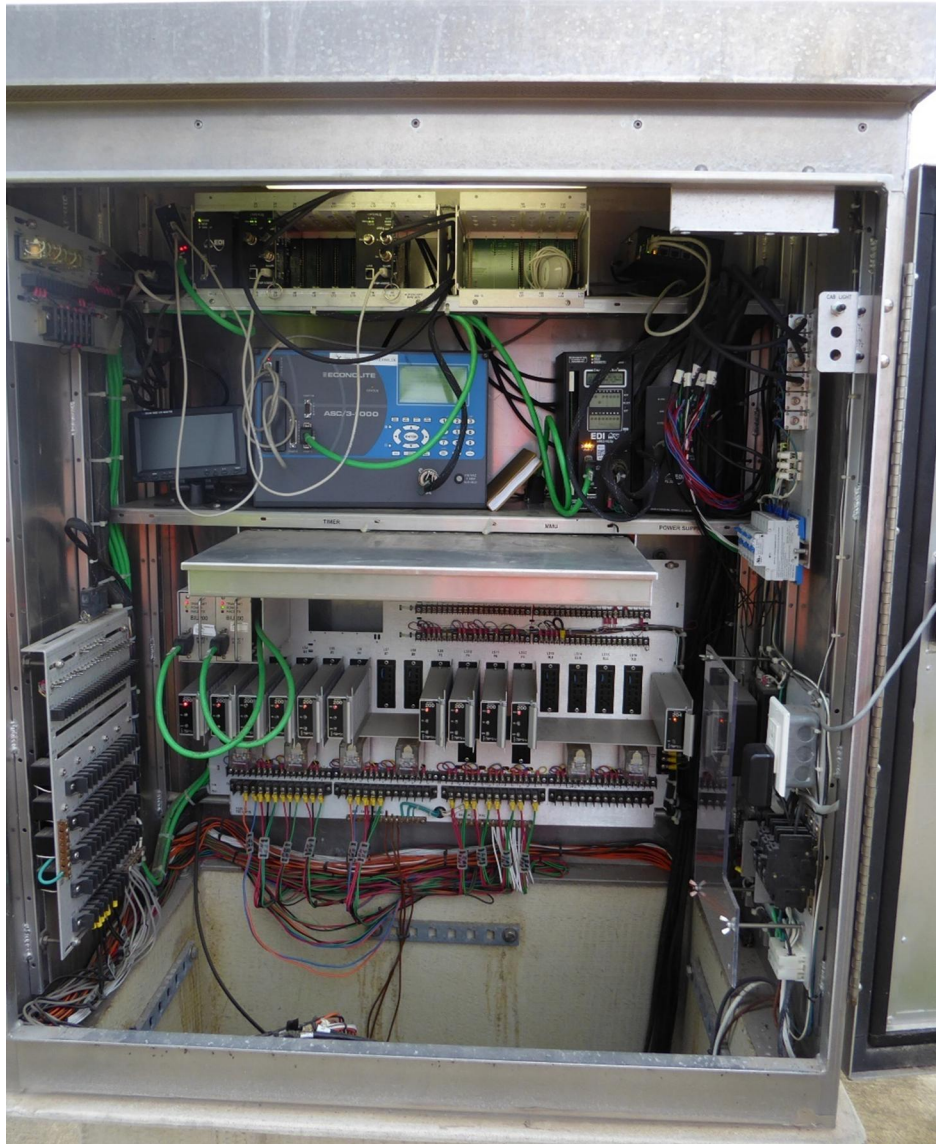


*EB approach on FM 1825*

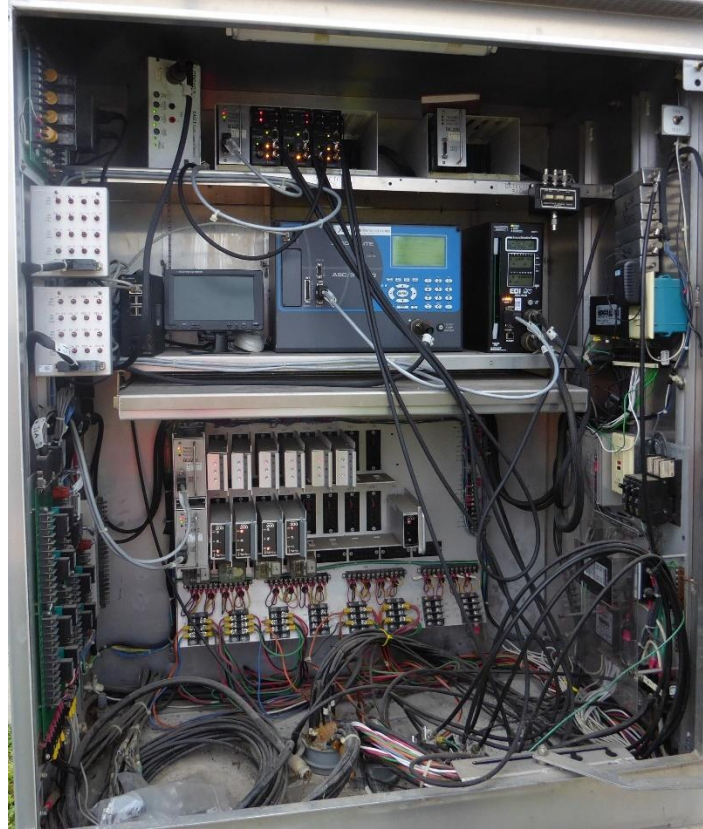


*Mast arm pole on NE corner – provide min. 8' center to center spacing between signal heads*





**INTERSECTION 4 - FM 1825 AT SWENSON FARMS BVLD**





**INTERSECTION 5 - FM 1825 AT MEADOWS LN**



*EB approach on FM 1825*



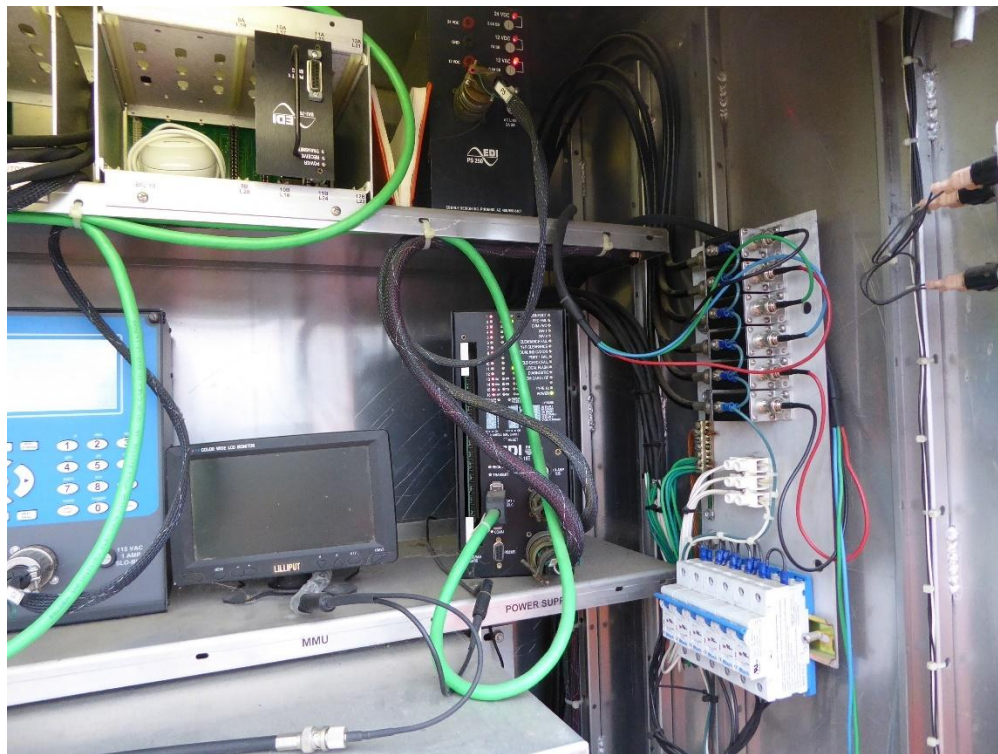
*SE Corner – relocate ped push-button to align with south crosswalk and accessible ramp*





*Split phase on NB approach on Meadow Ln*





**INTERSECTION 6 - FM 1825 AT RAILROAD AVE**



*SB approach on Railroad Avenue. Span Wire.*

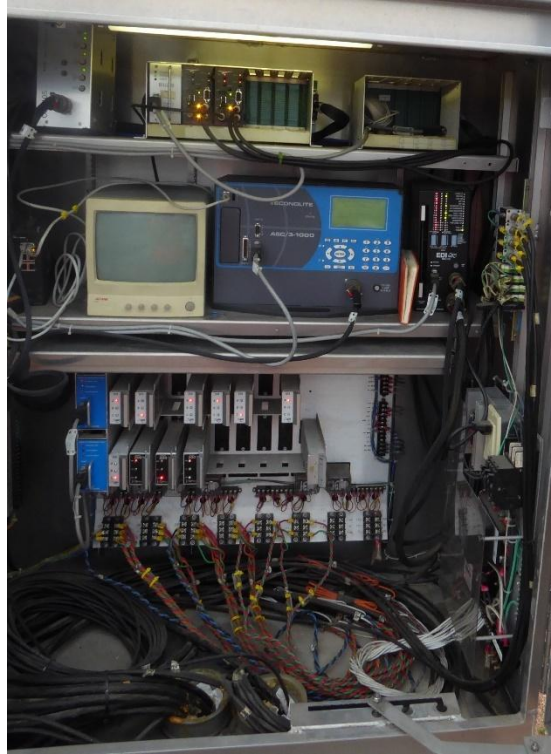


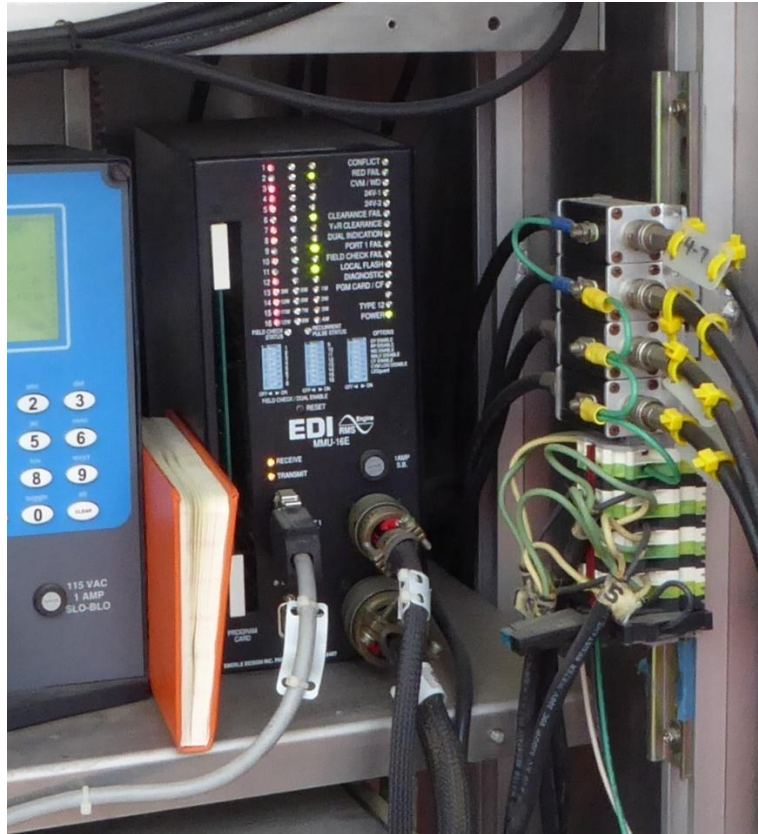


*Pedestrian push button on separate pole of pedestrian head*



*SB approach on Railroad Avenue*





**INTERSECTION 7 - FM 1825 AT FM 685**



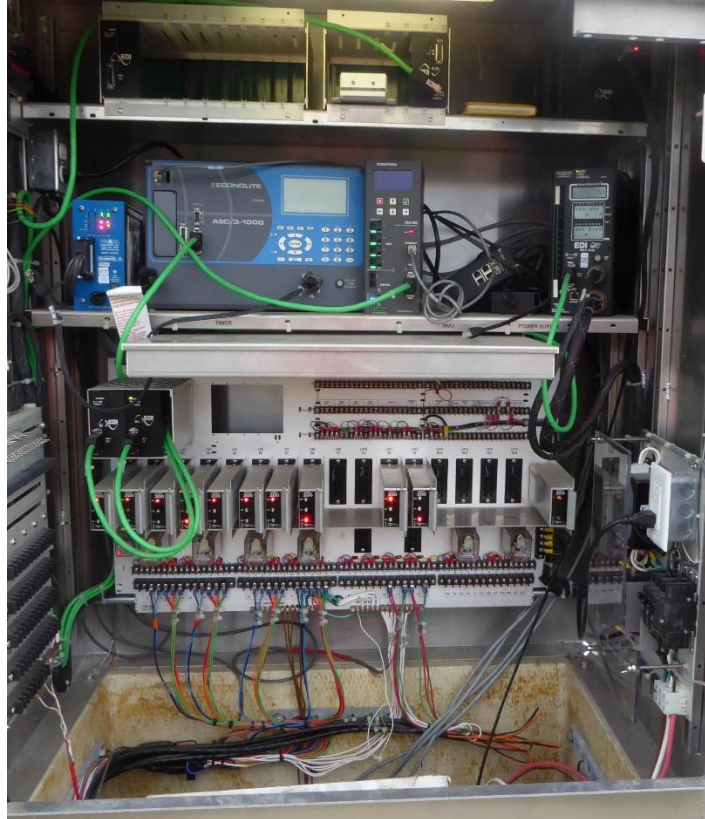


*WB approach*









**INTERSECTION 8 - FM 685 AT OLD AUSTIN HUTTON RD**



*SB approach*



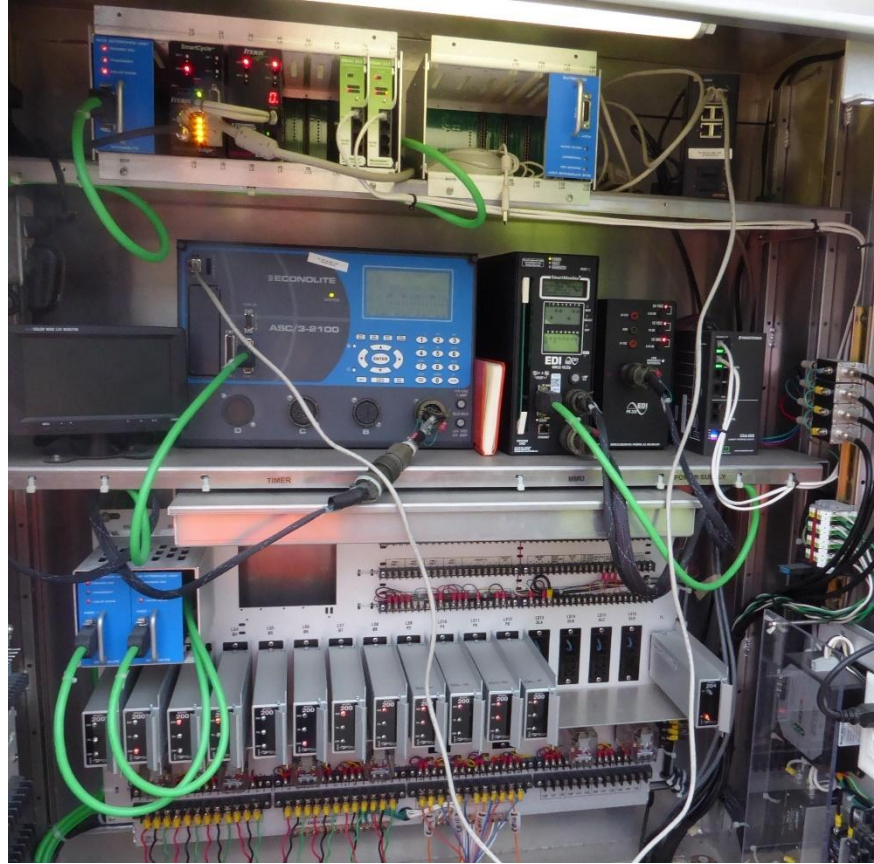
*EB approach*



*WB Leg*



*EB Approach*





**INTERSECTION 9 - FM 685 AT PFENNIG LANE**



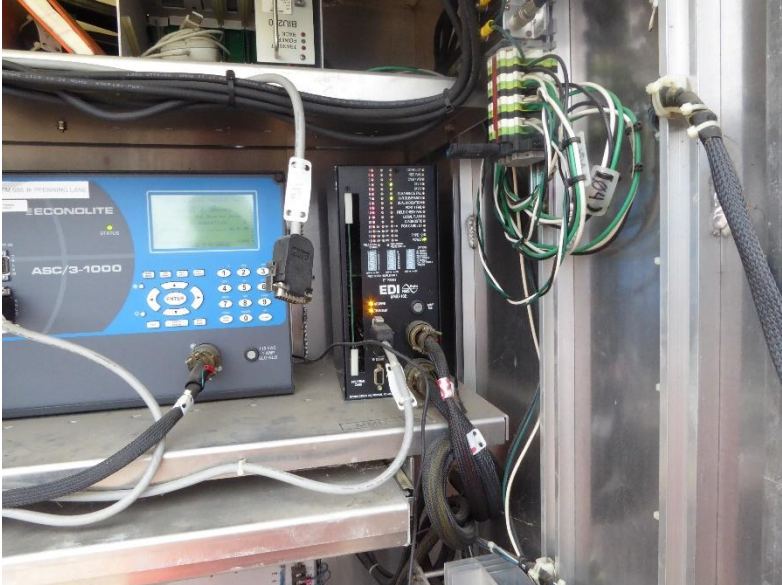
*WB Approach*





NB Approach





**INTERSECTION 10 - FM 685 AT PFLUGERVILLE PKWY**

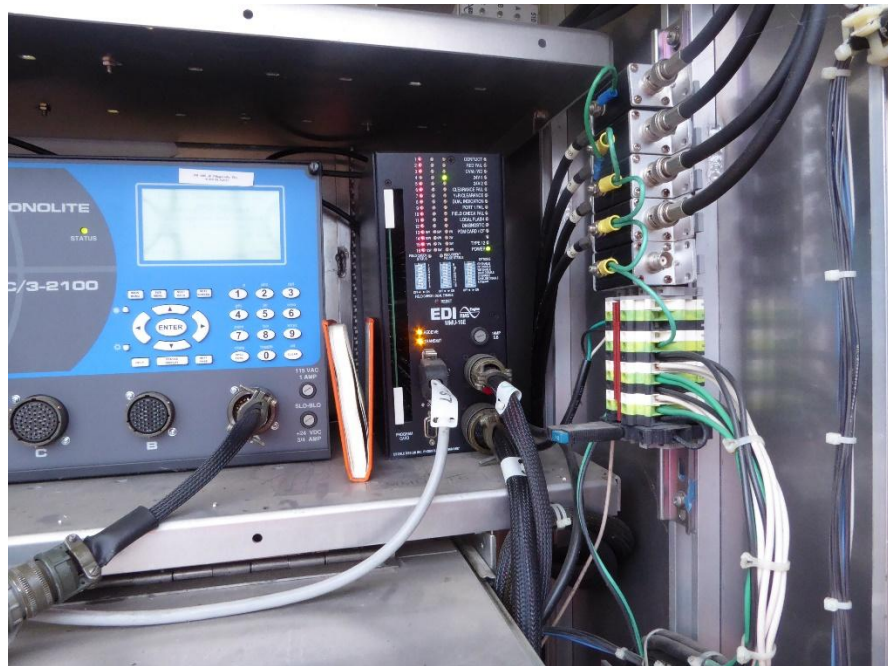


*NB Approach*





*NE Corner – Existing ground box below ground surface exposed due to water scouring*





**INTERSECTION 11 - FM 685 AT TOWNE CENTER DR**



*EB Approach*





*NB Approach*



*SB Approach*



**INTERSECTION 12 - SH45 EB FRONTAGE ROAD AT HEATHERWILDE BLVD**



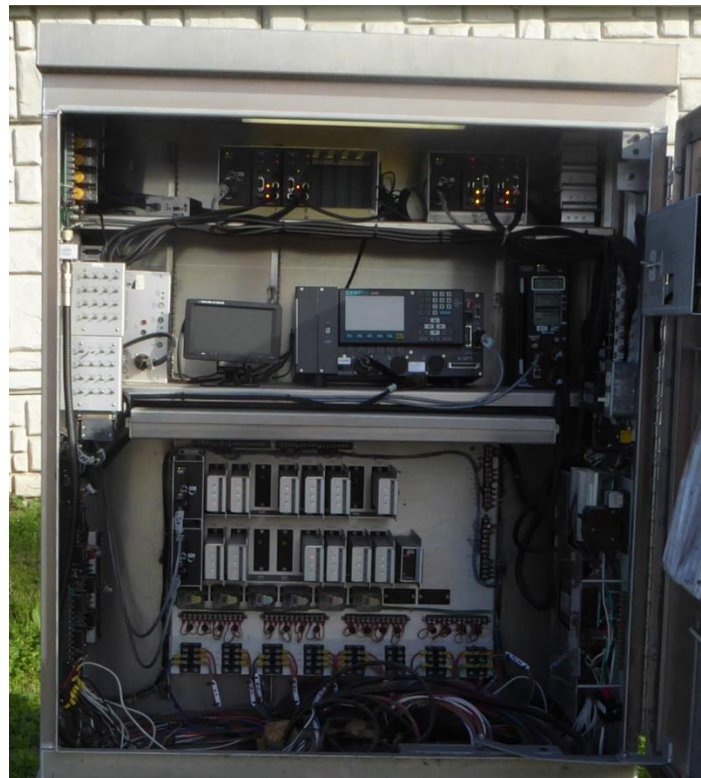
*EB Approach*



*NW Corner – Ped-head is not working; Push-button beep not working*



*Ground mounted sign in the median is bent*







**INTERSECTION 13 - SH45 WB FRONTAGE ROAD AT HEATHERWILDE BLVD**



*NB Approach*



*NE Corner – Ped-head not working*



*SE Corner – Ped-head not working*



*Ground mounted sign in NB median is bent*

**INTERSECTION 14 - SH130 SB FRONTAGE ROAD AT KELLY LANE**



*EB Approach*



*WB Approach*



**INTERSECTION 15 - SH130 NB FRONTAGE ROAD AT KELLY LANE**



*SE Corner – Ped push-button head not working for south crossing*

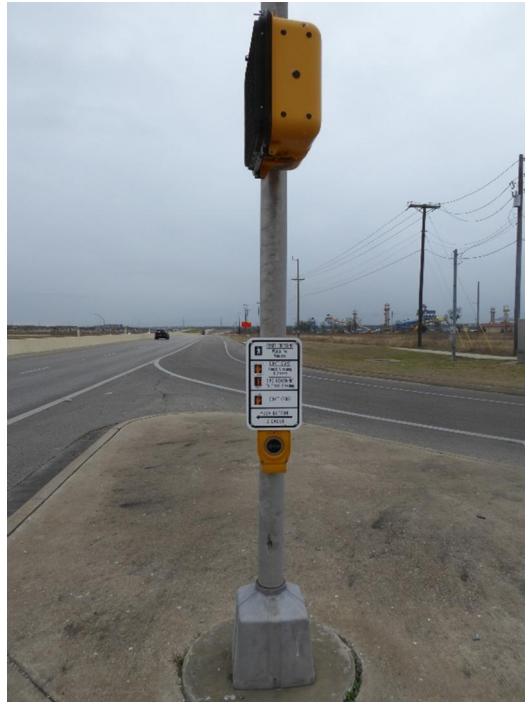


*SE Corner – Ped push-button head not working for south crossing*





**INTERSECTION 16 - SH130 SB FRONTAGE ROAD ATA FM 685**



*SE Corner – Ped push-button head not working for south crossing*



*SW Corner – Ped push-button head not working for south crossing*



**INTERSECTION 17 - SH130 NB FRONTAGE ROAD ATA FM 685**



*EB Approach*





***INTERSECTION 18 SH130 SB FRONTAGE ROAD AT PFLUGERVILLE PKWY***





*EB Approach*



*WB Approach*



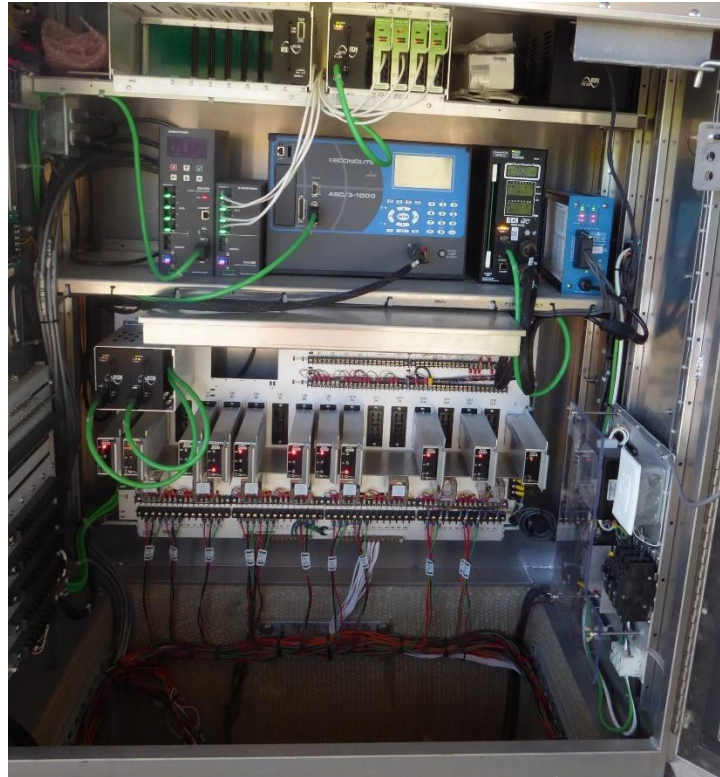
**INTERSECTION 19 SH130 NB FRONTAGE ROAD AT PFLUGERVILLE PKWY**



*EB Approach*



*WB Approach*



**INTERSECTION 20 - SH130 SB FRONTAGE ROAD AT FM 1825**







**INTERSECTION 21 - SH130 NB FRONTAGE ROAD AT FM 1825**



*NB Approach – Mast-arm shaking vigorously in wind*



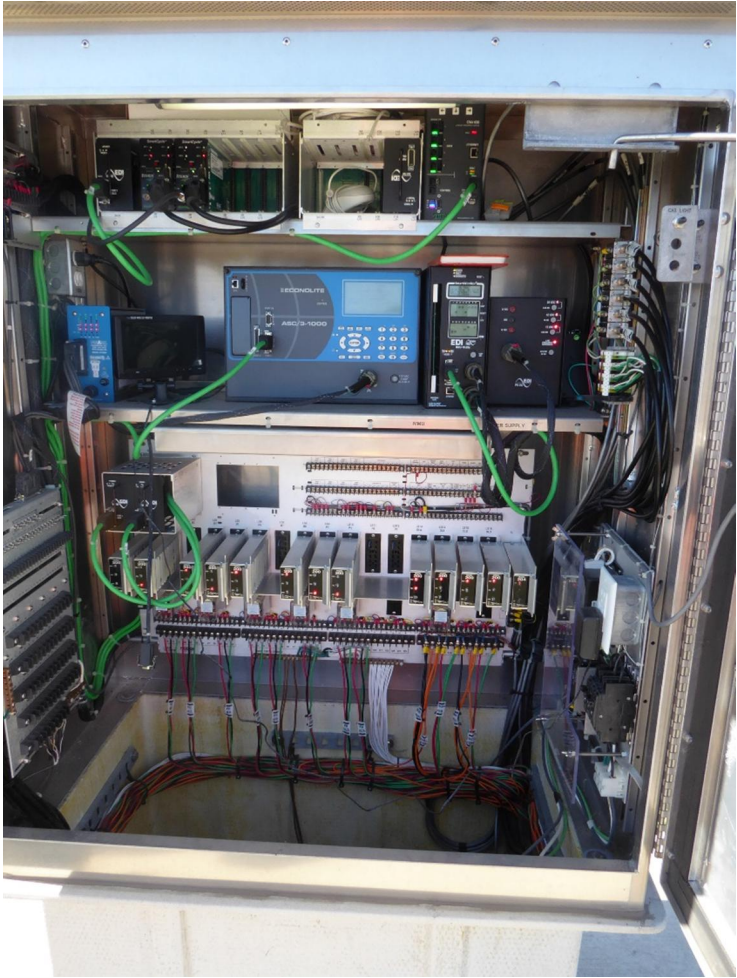
*EB Approach*

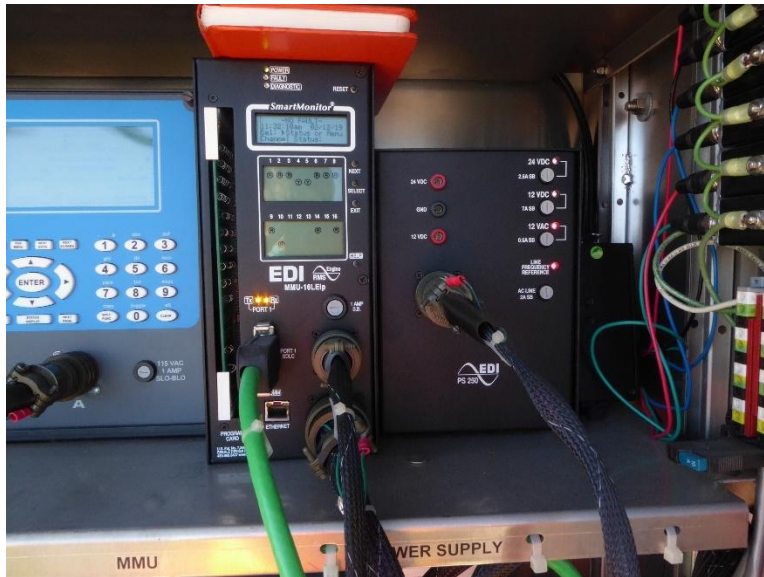


*NW Corner – Ped push-button head not working for north crossing*



*NE Corner – Ped push-button head not working for north-crossing*





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**INTERSECTION 1 – PFLUGERVILLE PARKWAY & GRAND AVENUE  
PARKWAY**





*WB approach on FM 1825. Needs 4-section Flashing Yellow Arrow left-turn signal.*



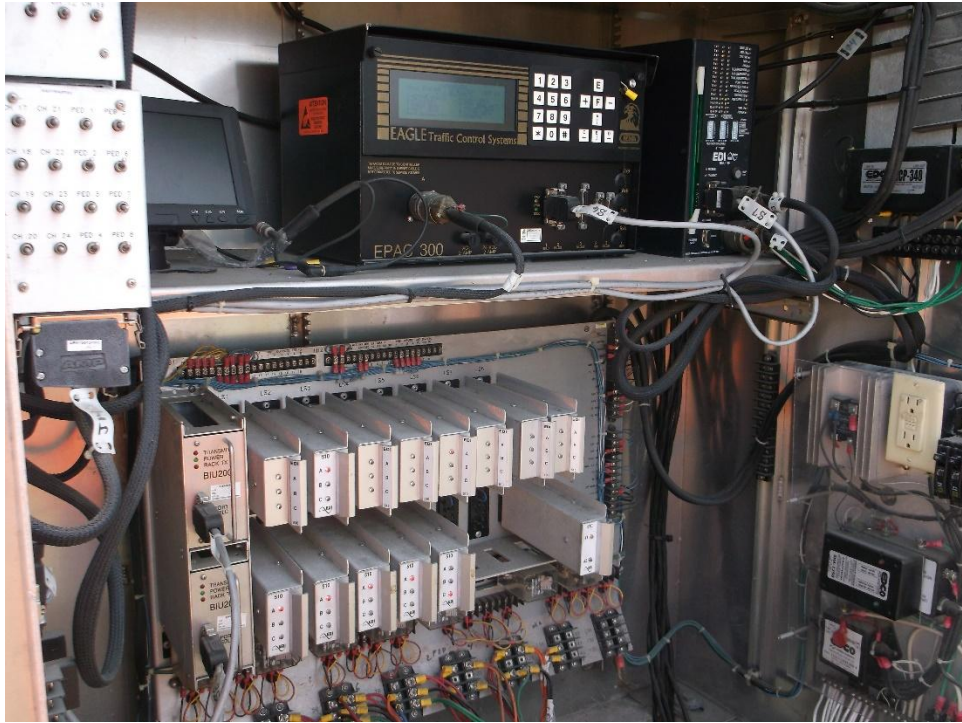
*Pedestrian push button too far from ramp on SE corner*



*View from NW corner*



*Dented signal pole on NE corner*



**INTERSECTION 2 - PICADILLY DRIVE & GRAND AVENUE PARKWAY**



*All pedestrian push buttons, including this one on the NE corner, are too far from the pedestrian ramps*



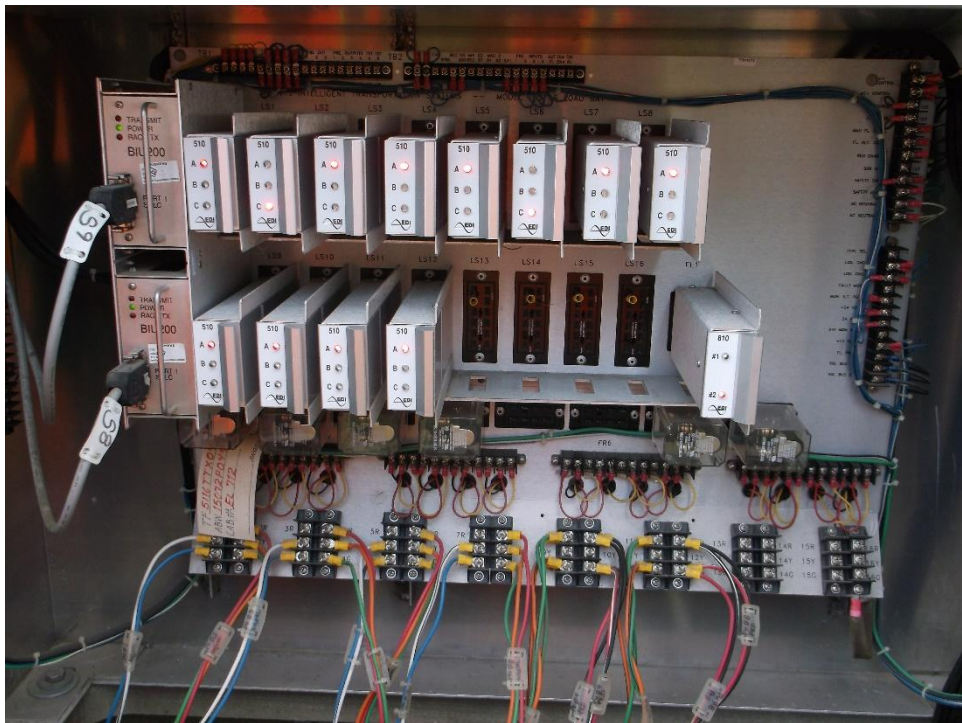
*All pedestrian push buttons, including this one on the SW corner, are too far from the pedestrian ramps*



*EB approach on Picadilly. Needs 4-section Flashing Yellow Arrow left-turn signal.*



*WB approach on Picadilly*



**INTERSECTION 3 - PFLUGERVILLE PARKWAY & HEATHERWILDE  
BLVD**





*Pedestrian push buttons on NE corner are too quiet*

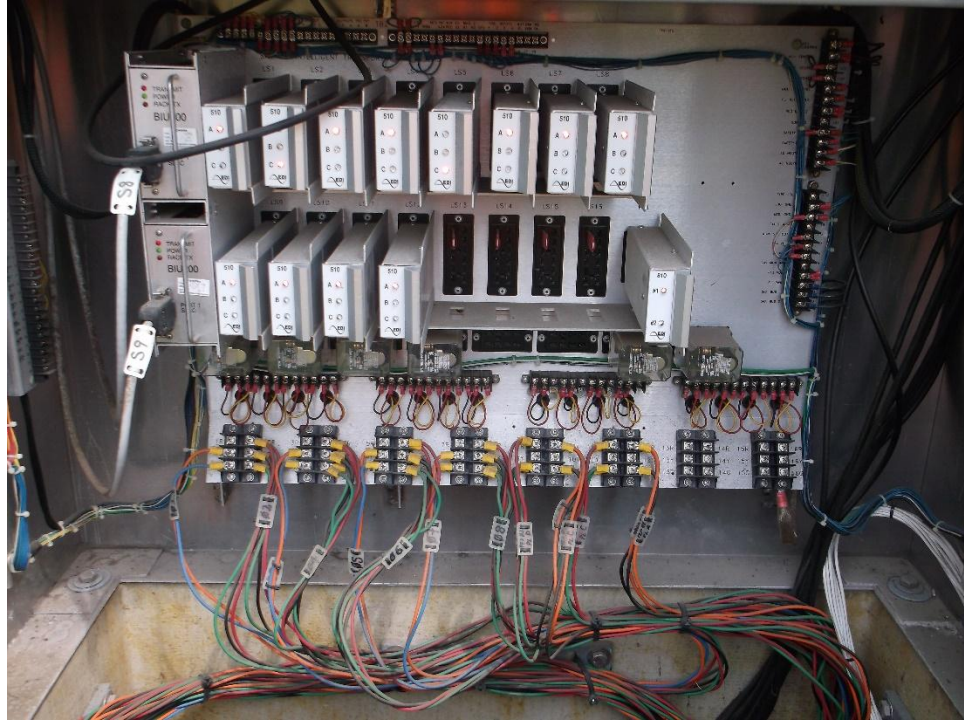


*NB approach on Heatherwilde. Needs 4-section Flashing Yellow Arrow left-turn signal.*



*Pedestrian ramp on SW corner (typ.) – ramp aligns toward intersection rather than crosswalk*





**INTERSECTION 4 - PFLUGERVILLE PARKWAY & RAILROAD  
AVENUE**



*WB approach on Pflugerville Parkway. Needs 4-section Flashing Yellow Arrow left-turn signal.*

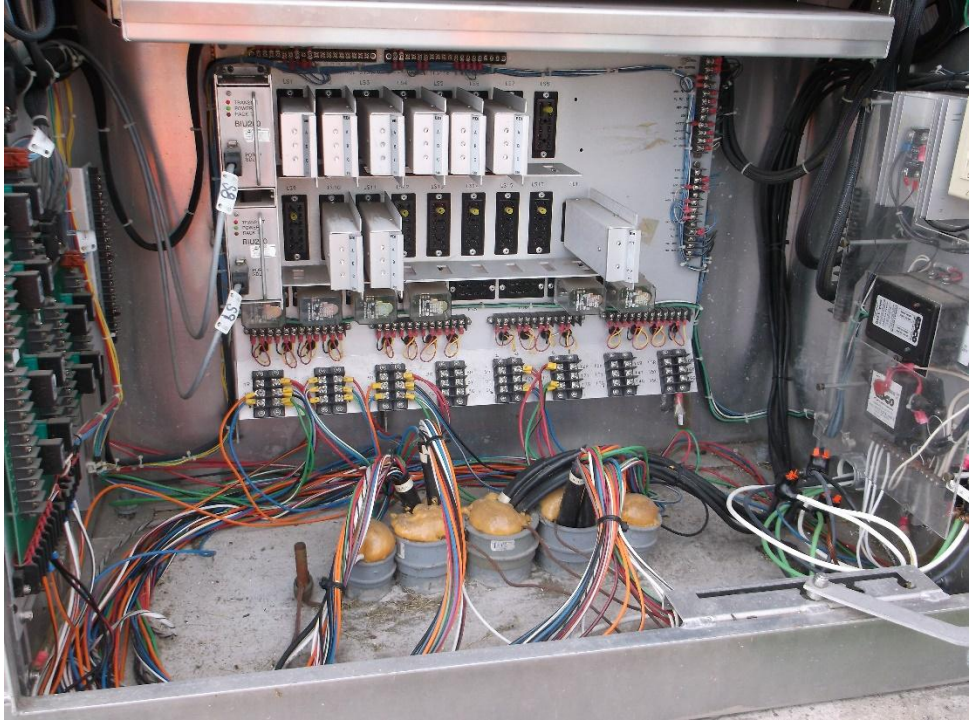


*Pedestrian push button on SW corner does not work*



*EB approach on Pflugerville Parkway. Needs 4-section Flashing Yellow Arrow left-turn signal.*





**INTERSECTION 5 - PFENNIG LANE & RAILROAD AVENUE**





*WB approach on Pfennig*

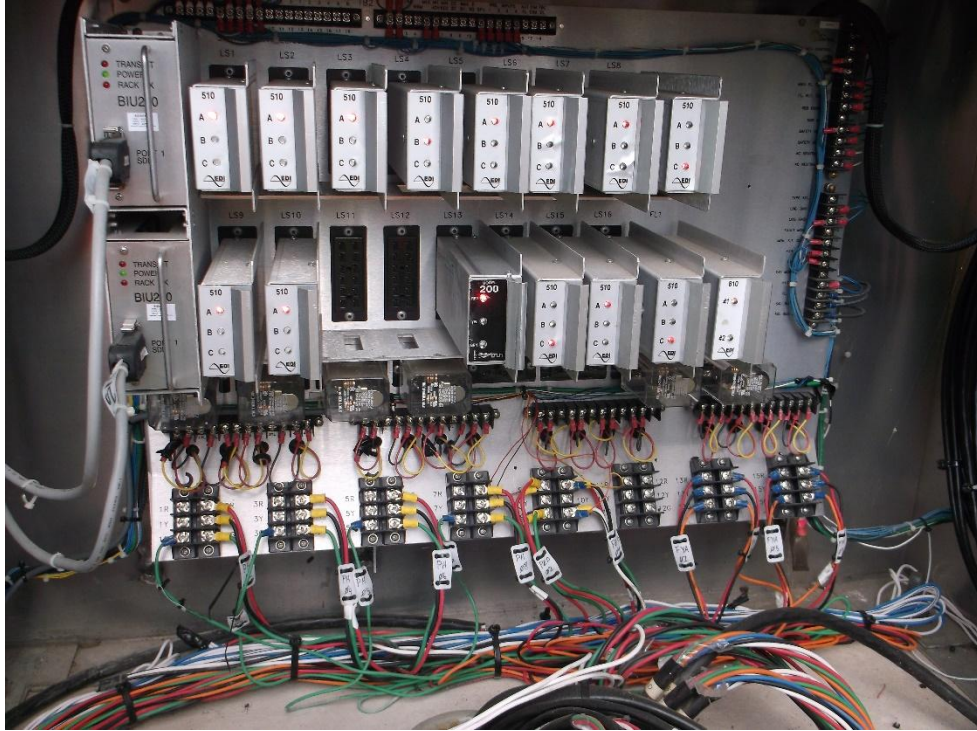


*SB approach on Railroad*



*Pedestrian push button on SE corner is too far from ramp*





**INTERSECTION 6 - KELLY LANE & COLORADO SANDS DRIVE**



*SW corner ramp is too short*

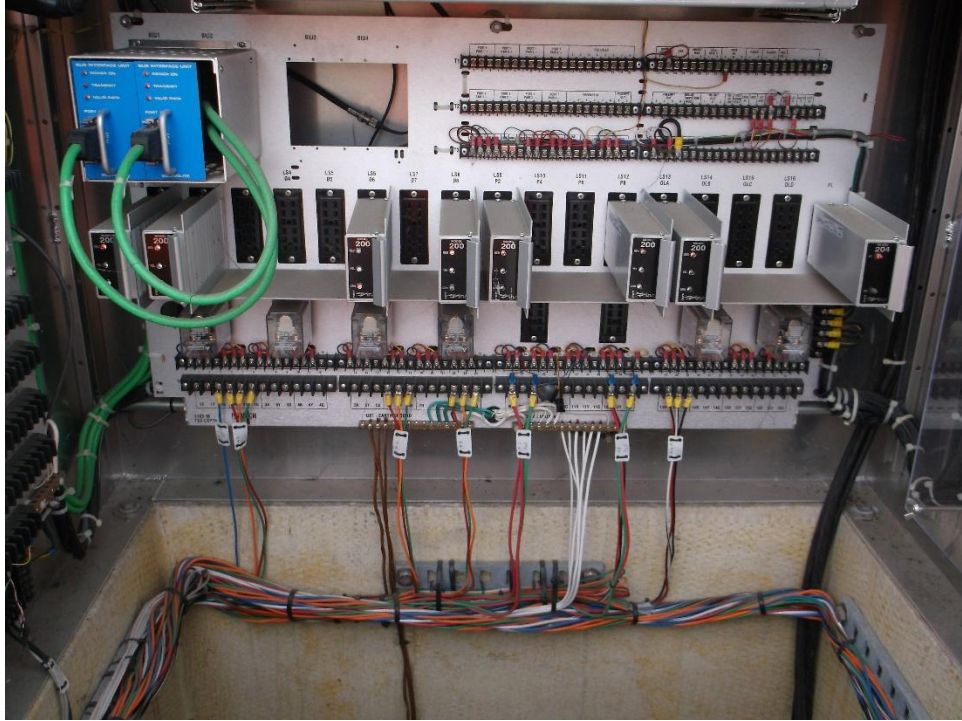


*NB approach to Colorado Sands*



*No pedestrian crossing on SW corner across Kelly*





**INTERSECTION 7 - KELLY LANE & KENNEMER DRIVE**





*SB approach to Kennemer*

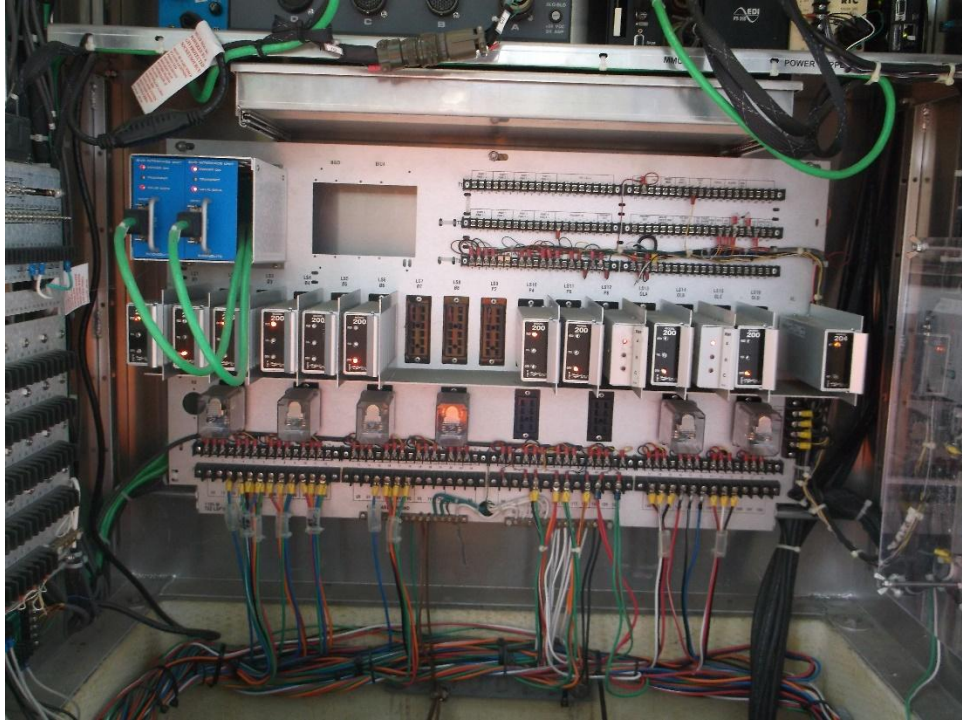


*WB approach to Kelly*



*NW corner pedestrian push buttons*





**INTERSECTION 8 - KELLY LANE & FALCON POINTE BLVD**



*NB approach to Falcon Pointe*



*WB approach to Kelly*



*Pedestrian push buttons at SE corner*

*No pictures are available for the inside of the signal cabinet as the cabinet would not open.*

**INTERSECTION 9 - WEISS LANE & WOLF PACK DRIVE**



*NB Approach on Weiss*

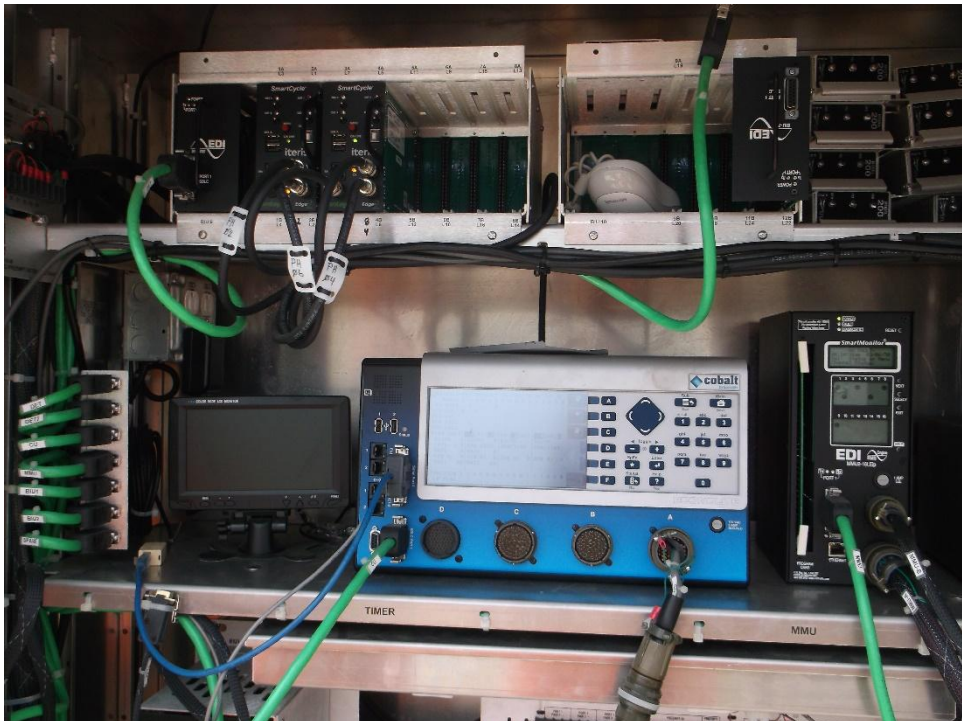


*WB Approach on Wolf Pack*





*Pedestrian infrastructure on SW corner*





**INTERSECTION 10 - PFLUGERVILLE PARKWAY & WEISS LANE**



*NE corner pedestrian push buttons*



*WB approach on Pflugerville Parkway*



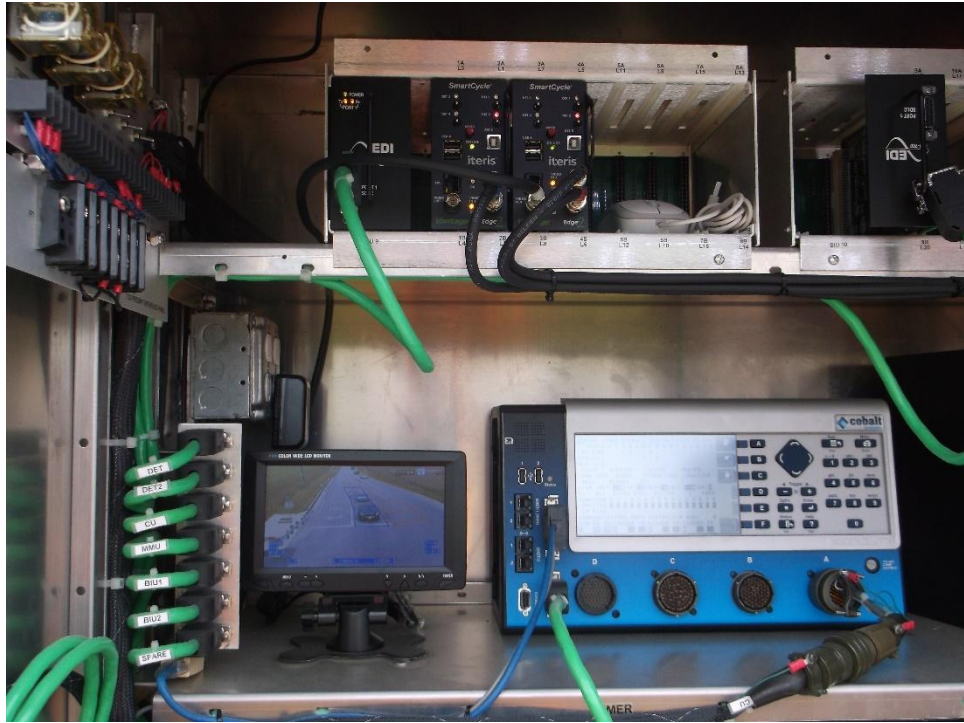
**INTERSECTION 11 - PECAN STREET & WEISS LANE**



*WB approach on Pecan*



*SB approach on Weiss*





**INTERSECTION 12 - PECAN STREET & OLD AUSTIN-HUTTO IMMANUEL RD**



*NB approach on Old Austin-Hutto*



*NE Corner*



*Pedestrian push button on SW corner*



*EB approach on Pecan*

*No pictures are available from inside the signal cabinet.*

**INTERSECTION 13 - IMMANUAL ROAD & OXFORD DRIVE**



*Faded crosswalk across SB approach*



*NB approach on Immanuel*



*No sidewalk across NB approach*



*EB approach on Oxford*

*No pictures are available from inside the signal cabinet.*

**INTERSECTION 14 - WELLS BRANCH & DESSAU LANE**



*NE corner – pedestrian push buttons do not work*



*Crosswalk available only on south leg*





*SB approach on Dessau*



*SE corner – pedestrian push button not accessible from sidewalk*

*No pictures are available from inside the signal cabinet.*