# City of Killeen Surface Travel Management and Safety

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# Goals in Transportation Safety

- **Provide High Quality Transportation Corridors**
  - Deficient or congested roadways can be costly to motorists and increase the rate of accident occurrence.
  - A quality corridor will reduce congestion, save on vehicle operating costs, and reduce the occurrence of traffic crashes.
  - The City identifies methods of accomplishing this goal on major thoroughfares in its Transportation Capital Improvements Program and Thoroughfare Plan.
  - Necessary maintenance on existing roadways is identified annually in the Street & Traffic Division Work Plan & Program Objectives.

- **Increase Multi-Modal Transportation Options**
  - A key component in public safety is the availability of multi-modal transportation through bicycle lanes, hike & bike trails, and neighborhood sidewalk systems.
  - The City works to incorporate the KTMPO Regional Thoroughfare and Pedestrian/Bicycle Plan into its CIP along with its own Trails Master Plan.

- **Monitor Existing Systems for Safety and Mobility Enhancements**
  - City staff regularly monitors established plans and systems for opportunity to improve the transportation network and offer a safer more efficient system.

# Divisional Responsibilities

The Transportation Division has three key components to its operation, all of which contribute to a safe and effective network of state, county, and local roadways.

- **Transportation**
  - The transportation group identifies the long term planning goals for the City's transportation network.
  - This group manages CIP projects and aids in securing partnerships with regional partners such as KTMPO, TxDOT, etc.

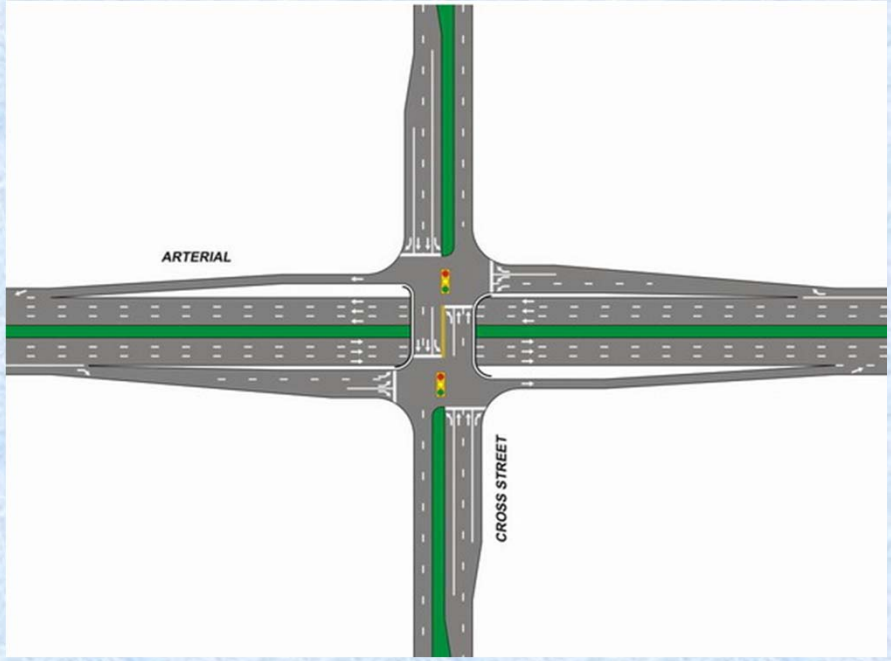
- **Streets**
  - The streets group manages operations of the City's existing network of streets.
  - This group provides maintenance for streets and sidewalks throughout the city, processes citizen inquiries and requests, oversees street sweeping activities, and responds to emergency incidents requiring street repairs for accidents, utility repairs, etc.

- **Traffic**
  - The traffic group operates and maintains the City's system of traffic control devices including traffic signals, school zone flashers, etc.
  - This team regularly evaluates the above for proper functionality and efficiency.

# Case Study
# Rosewood Drive / Central Texas Expressway Interchange

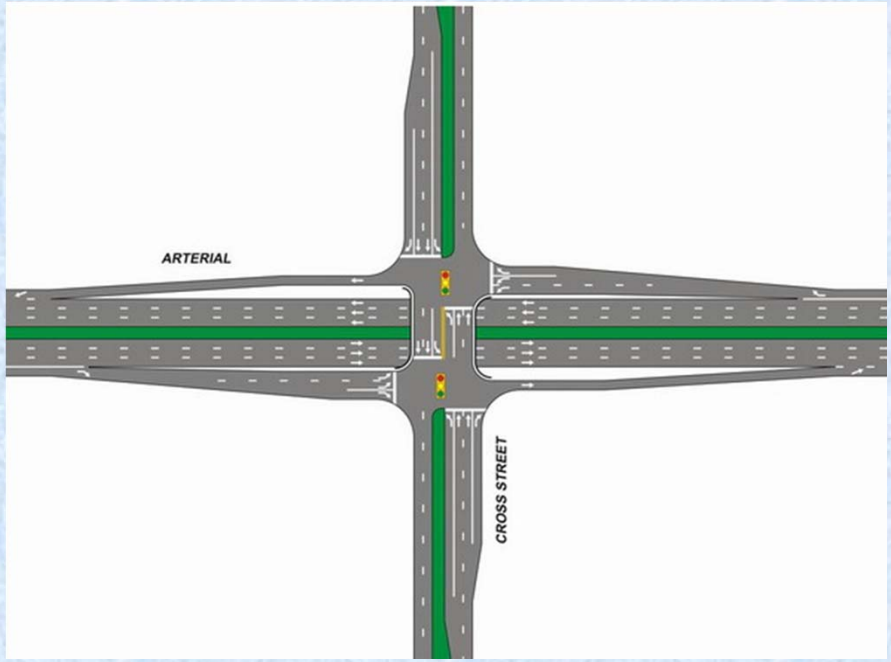
# Background

- The US 190 / Rosewood Drive / FM 2410 Pass Through Financing (PTF) project was opened to traffic on September 21, 2015. The project was deemed substantially complete on October 1, 2015.
- A key component of this project includes the US 190 overpass at Rosewood Drive. This type of intersection is known as a diamond interchange.
- In this type of intersection you have a cross street (Rosewood Drive) and a Freeway (Central Texas Expressway).
- When signalized, these intersections can operate in many ways. We will discuss two tonight: Three Phase Operation and Four Phase Operation.



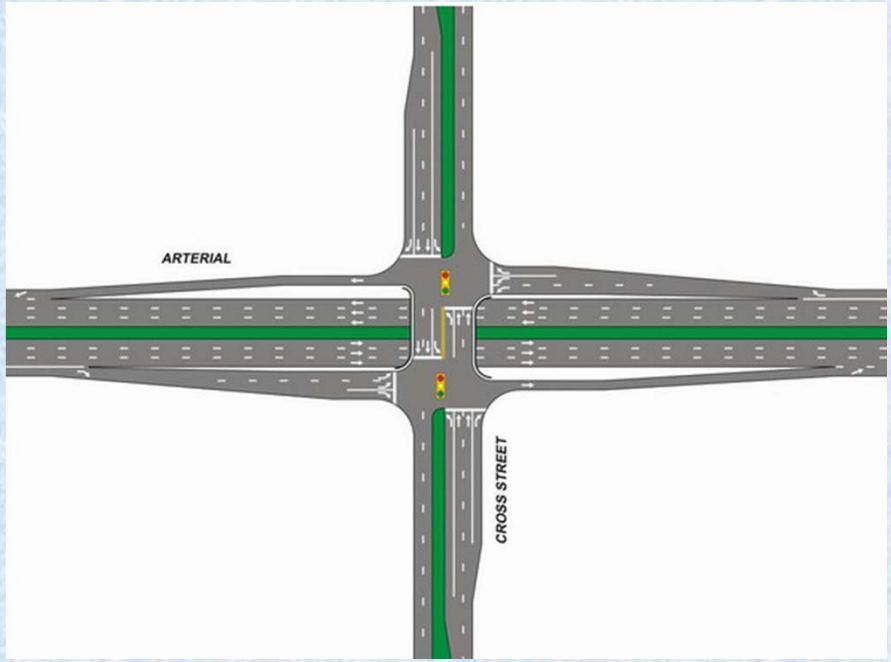
## Signal Operation – Four Phase

- Allows for equal traffic flow in all directions.
- Cross street traffic will typically receive a green light on both sides of the freeway at the same time.
- In Killeen this type of signal can be seen at WS Young/US 190, Trimmier/US 190, and Fort Hood Road / US 190.



## Signal Operation – Three Phase

- Allows for greater mobility on freeway frontage roads.
- Restricts mobility on lower traffic cross street.
- Cross street traffic will typically receive a green light on one side and a red light on the other side of the freeway. This means a stopping action is required.
- Other signals in Killeen have operated this way in the past, but Rosewood/US 190 is currently the only three phase signal in Killeen.



# Interchange Timeline

- **September 21, 2015 – Signal Activated**
  - The signal was activated and placed into flash mode for a period of 10 days.
  - During this time no accidents were reported to Killeen Police Department.
- **October 1, 2015 – Four Phase Operation**
  - The signal was changed from flashing mode to four phase operation.
  - The original design called for a three phase signal operation. It was discovered that two additional inside detection cameras were required to be installed for signal to operate per approved engineering plans; therefore, a four phase signal operation was put into place as an interim operation while awaiting the installation of the additional inside detection cameras.
  - This remained in place for a period of 132 days.
  - During this time 8 accidents were reported to Killeen Police Department.
- **February 10, 2016 – Three Phase Operation**
  - Installation of inside detection cameras is complete, and the signal is changed to a three phase operation, in accordance with the original TxDOT approved engineering plans.
  - After one week of three phase signal operation, a spike in the number of accidents was observed prompting an investigation into the root of this anomaly.

# Interchange Timeline

- **February 16, 2016 – City of Killeen Investigation**
  - The City brought in its signal consultant, Iteris, for a review of the functionality of this signalized interchange. The consultant reported the signal was functioning properly and per approved engineering plans and specifications. No adjustment was made to signal timing or operation.
  - City staff observed traffic flow through this intersection at various times of the day, and found that traffic turning north onto Rosewood from the eastbound CTE frontage road was sporadically failing to stop at the red light on the north side of the overpass. As a result, we placed a flashing message board on the eastbound CTE frontage road stating "TRAFFIC SIGNAL TIMING CHANGE USE CAUTION".
  - The message board was left in place for 7 days.
- **March 8, 2016 – After Action Review**
  - As of the date above, the signal has been in a three phase operation for 27 days.
  - During this time 12 accidents were reported, 7 of which occurred within the first 6 days of the traffic change.
  - We have since seen a decrease in frequency of reported accidents at this interchange, and hope to see this trend continue.

# Best Practices for Signal Operation Changes

- Research through the Texas Department of Transportation (TxDOT), Federal Highway Administration (FHWA), Texas Manual on Uniform Traffic Control Devices (TMUTCD), and the Texas Transportation Institute (TTI) reveals no written best management practices regarding signal operation changes.
- Signal timing and operation must be allowed to dynamically change to fit the traffic conditions making notification periods impractical.
- Many cities with dynamic traffic monitoring switch from four phase to three phase to many other types of signal operation freely throughout the day depending on traffic conditions.
- During special events, accidents, or even a heavy traffic condition a police officer or traffic signal technician may manually alter signal timing to adapt to the current situation. Requiring advanced notification would render the City helpless to make necessary adjustments in these situations.

# Current Action Items

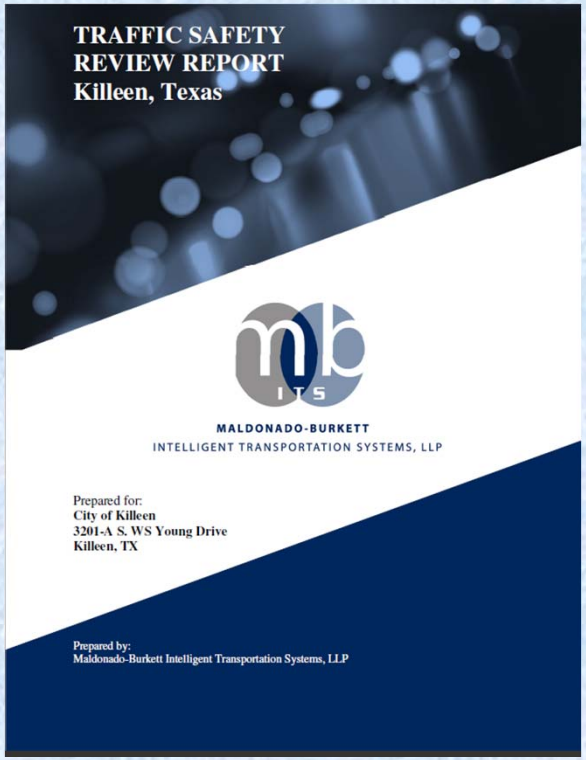
The City has many ongoing action items regarding safety and mobility enhancement. Recent requests by City Council members and City Management have sparked the following potential action items:

- Flashing beacons on CTE near Rosewood Dr. interchange in both directions.
- Speed limit evaluations on Rosewood Drive, Elms Road, and various other roadways throughout the City.
- Increased communication with TxDOT regarding signage and construction on US 190.
- Review of signal operation for various intersections including but not limited to: Glenwood/Rosewood, Parkwood/Rosewood, FM 2410/Rosewood, CTE/Rosewood
- Additional traffic safety studies

# Traffic Safety Review Report

In November 2015, the City received the final report from Maldonado-Burkett Intelligent Transportation Systems, LLP titled Traffic Safety Review Report Killeen, Texas

- Report is currently under review by the Transportation Division
- It studied SH 195 (Fort Hood St.) between Elms Road and Hallmark Avenue.
- It recommends potential projects for the Highway Safety Improvement Program (HSIP).
- Further recommendations are provided for action items to improve safety in the area.
- Upon review completion, we would be pleased to update City Council on recommended action items, and staff recommendations for each.
- Estimated completion of internal review – Early April 2016.



# City of Killeen Transportation Division

- The City of Killeen Traffic Division operates and maintains over 100 signalized intersections and over 600 lane miles of streets within the City of Killeen.
- Intersections within TxDOT rights-of-way are owned by the State and operated and maintained by the City.
- We regularly analyze and observe each of these intersections for proper functionality, safety enhancements, and traffic mobility.
- The City uses a signal consultant that specializes in signal design and operation to assist in matters that are beyond the standard day to day operations.

Questions or Comments?