APPENDIX A

VISION ZERO POLICY & CSAP RESOLUTIONS

Waco Metropolitan Planning Organization

RESOLUTION 2024-6

WHEREAS the Waco Metropolitan Planning Organization (MPO) was established to identify and support the implementation of regionally significant transportation projects to address future mobility needs of the Waco Region;

WHEREAS the Waco MPO Policy Board is composed of representatives appointed by the elected City Councils and Counties located within the jurisdiction of the MPO as well as the Texas Department of Transportation;

WHEREAS Section 134, Title 23, USC requires a comprehensive and continuing transportation planning process must be carried out cooperatively to ensure funds for transportation projects are effectively allocated to the Waco Metropolitan Area;

WHEREAS the Waco MPO has the authority and responsibility for transportation policy-making that leads to the efficient and safe movement of people and goods in its planning area of McLennan County, Texas;

WHEREAS motor vehicle crashes that result in death or serious injury are not inevitable but largely preventable and stem in part from human inattention and designs that are ineffective in accommodating multimodal uses;

WHEREAS the State of Texas leads the nation in total number of traffic deaths, and people dying and suffering serious injuries on our streets is a serious public health problem which necessitates public action;

WHEREAS crashes in the Waco MPO planning area necessitate a comprehensive and specific approach to street planning, design, policy, enforcement, legal processes, education, and communication to provide the most powerful solution to solve the problem;

WHEREAS a commitment to zero traffic deaths is a commitment to life and equitable opportunity for residents of McLennan County; and

WHEREAS implementing a commitment to zero traffic deaths requires the continued support of residents, business owners, and visitors to the Waco MPO planning area to improve the safety, comfort, and usability of streets in McLennan County for all roadway users;

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mpo@wacotx.gov

Now, therefore, be it ***RESOLVED***, that the Waco MPO Policy Board

1. hereby commits to a goal of zero deaths and serious injuries that are a result of crashes on streets within its planning area by 2050;

2. hereby acknowledges that achieving this goal requires significant effort and resources which will necessitate dedicated safety planning activities;

3. hereby officially found and determined that the meeting at which this resolution is passed is open to the public and that public notice of the time, place and purpose of said meeting was given as required by law;

4. hereby certifies this action complies with all applicable policies, procedures, and requirements identified within 23 CFR, Section 450, and Chapter 16 of Title 43 of the Texas Administrative Code.

PASSED AND APPROVED this the 29th day of April, 2024.

Josh Borderud
Council Member – City of Waco
Chair – Waco MPO Policy Board

ATTEST:

Mukesh Kumar
Director

Waco Metropolitan Planning Organization

RESOLUTION 2024-7

WHEREAS the Waco Metropolitan Planning Organization (MPO) was established to identify and support the implementation of regionally significant transportation projects to address future mobility needs of the Waco Region;

WHEREAS the Waco MPO Policy Board is composed of representatives appointed by the elected City Councils and Counties located within the jurisdiction of the MPO as well as the Texas Department of Transportation;

WHEREAS Section 134, Title 23, USC requires a comprehensive and continuing transportation planning process must be carried out cooperatively to ensure funds for transportation projects are effectively allocated to the Waco Metropolitan Area;

WHEREAS the Waco MPO recognizes that human inattention and ineffective designs are the primary factors behind fatalities and serious injuries on our roadways;

WHEREAS the Policy Board of the Waco MPO has resolved to commit to a goal of zero deaths and serious injuries that are a result of crashes on streets within its planning area by 2050;

WHEREAS the Policy Board of the Waco MPO has acknowledged that achieving this goal will require significant effort and resources and necessitate dedicated safety planning activities;

WHEREAS the Waco MPO is dedicated to utilizing a data-driven approach to reaching its Vision Zero goal which measures the progress, challenges, and successes of its progress and produces tangible, reportable metrics; and

WHEREAS the Waco MPO Policy Board has previously resolved to support the pursuit of developing a "Comprehensive Safety Action Plan" for the planning area of the MPO;

Now, therefore, be it ***RESOLVED***, that the Waco MPO Policy Board

1. hereby adopts the 2024 Waco MPO Comprehensive Safety Action Plan;

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2. hereby officially found and determined that the meeting at which this resolution is passed is open to the public and that public notice of the time, place and purpose of said meeting was given as required by law;

3. hereby officially found and determined that all public participation requirements identified within the Waco MPO Public Participation Plan related to this action by the Policy Board were met and completed; and,

4. hereby certifies this action complies with all applicable policies, procedures, and requirements identified within 23 CFR, Section 450, and Chapter 16 of Title 43 of the Texas Administrative Code.

PASSED AND APPROVED this the 29th day of April, 2024.

Josh Borderud
Council Member – City of Waco
Chair – Waco MPO Policy Board

ATTEST:

Mukesh Kumar
Director

Appendix B

MATRIX OF GOALS & POLICIES

Document	Relevant Goals and Policies

Connections 2045: The Waco Metropolitan Transportation Plan (2020)
Waco Metropolitan Planning Organization
	Relevant Strategies, Goals, and Objectives:
	• **Strategy 1**: Improve State Of Good Repair
	  ○ **Guiding Principle 1**: Satisfactorily maintain existing transportation facilities
	  ▪ **Objective 1-4**: Restripe all pavement markings and replace all traffic control signage in accordance with timelines identified within the Manual on Uniform Traffic Control Devices (MUTCD).
	  ▪ **Objective 1-7**: Reconstruct all sidewalks which cannot accommodate wheelchairs.
	  ▪ **Objective 1-8**: In addition to pavement markings and signage requirements identified within objective 1-4, ensure that bicycle facilities are swept at least once each month and kept free of debris.
	• **Strategy 2**: Improve Safety And Security
	  ○ **Guiding Principle 2**: Improve the safety and security of the transportation system
	  ▪ **Objective 2-1**: Eliminate all transportation related fatalities and serious injuries within the Waco Region by 2045.
	  ▪ **Objective 2-2**: Within 1 mile of all elementary, intermediate, and middle schools, construct Americans with Disabilities Act (ADA) compliant pedestrian facilities on both sides of all arterial and collector highways.
	  ▪ **Objective 2-3**: Within the Waco Urbanized Area, all freeway and interstate class facilities should have an ADA compliant facility at least every mile permitting pedestrians to cross the facility.
	  ▪ **Objective 2-4**: Arterial roadways greater than 40 feet in width should be constructed or retrofitted with an ADA compliant median refuge for pedestrians at least 10 feet wide at all signalized intersections.
	  ▪ **Objective 2-5**: Traffic signals at any roadway with a width greater than 40 feet should be timed such that a pedestrian can cross the intersection under a protected phase at a speed of no greater than 3ft per sec.
	  ▪ **Objective 2-6**: Convert the Waco Transit fixed route system from a 'flag stop' system to a system with clearly marked stops that are ADA accessible.
	  ▪ **Objective 2-7**: Raise or replace all bridges or culverts on freeway, arterial, and collector facilities that have a 10% or greater annual risk of being overtopped by water.
	• **Strategy 3**: Improve System Efficiency
	  ○ **Guiding Principle 3**: Maximize the use of existing transportation facilities before system expansion
	• **Strategy 4**: Improve Regional Livability
	  ○ **Guiding Principle 4**: Preserve regional air quality and environmental standards
	• **Strategy 5**: Address Demand For Future Mobility
	  ○ **Guiding Principle 5**: Support regional freight movement and economic development efforts
	• **Strategy 6**: Provide Equal Access And Benefits
	  ○ **Guiding Principle 6**: Improve access to economic opportunities and essential services

Active Transportation Plan (2019) **Waco Metropolitan Planning Organization**	**Relevant Objectives**: • Improve and expand the active transportation network in McLennan County to provide better connectivity between neighborhoods and destinations for people of all ages and abilities. • Prioritize active transportation modes in regional transportation planning so that people have a choice to utilize the transportation mode that best suits their trip. • Increase the safety and convenience of walking, rolling, and biking. • Facilitate the use of public transit by improving pedestrian and bicycle connections to transit routes and stops. • Enhance the quality of life in McLennan County by reducing vehicle emissions, encouraging physical activity, activating street life, and help to create dynamic connected communities.

Document	Relevant Goals and Policies
US Business-77 Corridor Study (2016) Waco Metropolitan Planning Organization	**Relevant Objectives:** • Reduce the number of lanes and structures along the corridor thereby reducing future maintenance costs. • Provide multi-modal solutions for the corridor. • Provide context sensitive solutions that would serve as a catalyst for economic development of the neighborhoods along the corridor.
Waco MPO Corridors Study: Valley Mills Drive and Hewitt Drive (2013) Waco Metropolitan Planning Organization	**Relevant Goals** Goals for the corridor improvements: • Improve Safety • Improve Traffic Flow • Reduce Motorist Delay • Establish a multi-modal design alternative • Examine pedestrian/transit/bicycle use
Waco Area Thoroughfare Plan (2012) Waco Metropolitan Planning Organization	**Relevant Guiding Principles:** • Maintain and improve regional mobility of people and goods. • Improve multimodal accessibility to, from, and within local communities. • Ensure the safety of all roadway users. • Expand multimodal travel options for people of all ages and abilities and for the movement of freight and goods. • Increase connectivity, particularly in conventional suburban areas. • Promote urban vitality, especially in areas that need revitalization. • Support rural enterprises and preserve the natural environment
Future Land Use Study for McLennan County (2007) Waco Metropolitan Planning Organization	**Relevant Values, Priorities and Indicators** **Priority**: Transportation for All • Convenient public transit for commuters & visitors • Effective transit & bike/walk options for those who can't drive • Safe, attractive pedestrian connections • Efficient roadway networks • Effective freight systems
Roadway Safety Performance Targets, Waco Metropolitan Planning Organization	**Roadway Safety Performance Targets** Presented in the Technical Advisory Committee Meeting, February 2rd, 2023 Proposed McLennan County 2023 5-Year Average Roadway Safety Performance Targets Year | Number of Fatalities | Rate of Fatalities* | Number of Serious Injuries | Serious Injury Rate* | Total Number of Non-Motorized Fatalities and Serious Injuries 2019 | 40 | 1.27 | 180 | 5.69 | 29 2020 | 35 | 1.24 | 187 | 6.64 | 29 2021 | 38 | 1.28 | 273 | 9.18 | 40 2022 | 42 | 1.40 | 211 | 7.05 | 32 2023 Target | 41 | 1.34 | 214 | 7.12 | 32 Target expressed as a 5-year average | 39.1 | 1.307 | 213.1 | 7.137 | 32.5 *rate per 100 million vehicle miles of travel

Document	Relevant Goals and Policies
McLennan County Parks, Recreation and Open Space Master Plan 2011-2021	**Relevant Goals and Objectives** **Goal 4**: To provide linkage open spaces and public spaces via non - motorized transportation facilities including trails, bicycle and pedestrian way, river paddle trails, and equestrian trails. • **Objective 4a**: To seek out design opportunities and solutions for I-35 as it is redeveloped to allow for non - motorized linkages across (above) under (below) eliminating barriers from one side to the other of the Interstate for non - motorized transportation. • **Objective 4b**: To seek out park, recreation and open space linkage opportunities along and across the major rivers (Brazos, Bosque, North Bosque, South Bosque, Middle Bosque Rivers). • **Objective 4c**: To begin the development of trails and other non - motorized transportation linkages between the County Precinct Level parks. • **Objective 4d**: To work cooperatively with local governments and other recreational interests to allow for development of trails and other non - motorized transportation linkages.

City of Bellmead Comprehensive Plan (2023)	**Relevant Portion of the Vision Statement:**
	• A family-oriented, pedestrian-friendly feel
	• Improved street conditions supported by a well-maintained storm drainage system
	Relevant Goals and Objectives
	• **Goal 3**: Thoroughfares Study
	  ○ **Goal 3.1** Adjust traffic controls and add street lighting to improve traveler safety
	  ○ **Goal 3.2** Develop an attractive thoroughfare system that accommodates pedestrians and cyclists
	  ○ **Goal 3.3** Ensure that the thoroughfare system maintains its capacity with new development and supports safety and rapid movement of people in emergency situations
	• **Goal 4**: Central Business District
	  ○ **Goal 4.4** Invest in amenities for pedestrians

City of Bruceville-Eddy Comprehensive Plan (2011)	**Relevant Section of the Strategic Action Plan**
	• **Goal 1**: Establish and maintain roadway tools for citizens, decision-makers, and city administrators
	  ○ **Objective 1:** Identify, maintain, and manage information for local roads
	  ▪ **Strategy 1:** Create a road inventory consisting of pictures, maps, and an assessment form to document the conditions of existing, locally maintained roads and sidewalks.
	  ○ **Objective 2:** Develop a thoroughfare map that illustrates the location and type of all existing roads (functional and non-functional) and the proposed locations for future roadways
	  ▪ **Strategy 1**: Work with local, county, or regional engineers or contract with a planning and engineering consulting firm to develop a Bruceville-Eddy Thoroughfare Plan Map.
	• **Goal 2:** Establish new access routes to the Bruceville-Eddy school complex to mitigate safety and traffic concerns created by the proposed new Eagle Drive overpass
	  ○ **Objective 1**: Identify locations for possible new routes to the Bruceville-Eddy school complex in relation to the location of the Eagle Drive overpass
	  ▪ **Strategy 1**: Work with the TxDOT to ascertain all existing and future capacity and/or level of service data generated as a result of the Eagle Drive overpass.
	  ▪ **Strategy 2:** Create a map of the proposed new routes and work with property owners to acquire the right-of-way needed to develop the proposed new routes.
	• **Goal 3:** Improve local circulation patterns in Bruceville-Eddy
	  ○ **Objective 1**: Identify potential locations for the development of new road network opportunities that will enhance north-south connectivity in Bruceville-Eddy and provide alternatives to using the I-35 corridor
	  ▪ **Strategy 1**: In addition to the preliminary road proposal map included in this Plan, the City should identify available land and begin land acquisition and right-of-way negotiations with property owners.

Document	Relevant Goals and Policies
City of Hewitt Comprehensive Plan 2022 | 2003	**Relevant Thoroughfares goals and objectives** ○ **Goal 1**: Provide an efficient, safe and connective transportation system that is coordinated with existing needs and with plans for future growth; this system should be economical and responsive to adjacent land uses. ○ **Objective 1.3**: Ensure that the following concerns are addressed when making decisions regarding transportation within the City: ▪ Regional transportation, ▪ Roadway integrity (i.e., ensuring mobility), ▪ Roadway maintenance, ▪ Adequate access (to and from Hewitt, and to and from land uses and residential subdivisions within Hewitt), ▪ Connections between existing roadways, ▪ Neighborhood traffic concerns, ▪ Signalization, and ▪ Impact of various types of land uses (i.e., trip generation and parking needs). ○ **Objective 1.8**: Ensure that local roadways, such as Hewitt Drive, can accommodate increases in traffic, and that local intersections, such as Old Temple and Spring Valley Boulevard, are adequate. ○ **Objective 1.9**: Utilize the Thoroughfare Plan to establish standards for shared drives, for circulation within new developments, and for protecting the integrity of major roadways; ensure that such standards are integrated into the City's Subdivision Ordinance ○ **Objective 1.10**: Investigate the feasibility of extending Hewitt Drive to I-35
City of Lorena Comprehensive Plan (2020)	**Relevant Goal for Transportation Chapter** • **Goal**: Lorena will have a transportation network which meets basic needs for movement, access, safety, and reasonably rapid travel for people and goods through and within the city. ○ **Objective** 4: Improve existing sidewalks and construct new sidewalks for pedestrian access and citizen health. ▪ **Strategy:** As shown on the Sidewalk Plan, fund and build sidewalks to help create an interconnected sidewalk system throughout the City. ▪ **Strategy:** When designing new sidewalks along existing streets recognize that right of-way may not be sufficient for the ideal street cross-section shown in Figure 2. In these circumstances, provide the widest sidewalk possible for pedestrians
City of Lorena Strategic Plan (2021-2022)	**Relevant Strategic Goals** • **Goal**: Improve City Infrastructure. Upgrade and implement improvement to all components of the City's infrastructure. This includes, but not restricted to, water, wastewater, streets, and drainage planning. ○ **Action Plan**: Create additional pedestrian and bicycle paths • **Goal**: Create Community Spaces. Expansion of community spaces provides enhanced quality of life for residents. This is achieved through the availably of more city spaces such as parks, bike and hiking trails, nature trails, etc.
City of McGregor Vision 2030 (2018)	**Relevant Action Points for Main Street/Place Making** • Activate Main Street for residents, visitors, and people who work in McGregor. • Create places people want to be.

Document	Relevant Goals and Policies

City of Robinson Comprehensive Plan: Community Visions 2034 (2014)	• **Vision Statement:** Ensure that the transportation needs are maintained and enhanced to meet the community's present and future needs, coordinate transportation improvements with regional entities and adjacent communities, and provide transportation and pedestrian connections from neighborhoods and commercial areas to recreation facilities.
	• **Goal**: Provide a transportation system that facilitates the movement of people and goods in a safe, efficient, and well-designed manner.
	  ○ **Objective 1.1** Continue to work with TxDOT officials to develop and implement access management standards.
	  ○ **Objective 1.2** Construct street access roads to commercial and industrial areas to eliminate heavy traffic on residential streets and add signalization at key intersections.
	  ○ **Objective 1.3** Enhance the mass transit system to include bus routes throughout the city and connecting areas.
	  ○ **Objective 1.4** Ensure both residential and non-residential streets are aesthetically pleasing and functional.
	  ○ **Objective 1.5** Ensure a pedestrian-friendly community through the provision of sidewalks, walkways, and bike paths.

The City Plan: Waco Comprehensive Plan 2040 (2016) City of Waco	**Relevant Goals and Objectives**
	• **Goal 2 Growth Management:** Promote sustainable patterns of growth that will provide opportunities for coordinated, well-planned new development, while strengthening Waco's existing neighborhoods.
	  ○ **Objective 2.09:** Continue proactive planning efforts for the development of the Brazos River Corridor and Greater Downtown Waco. (Reference Development and Design Guidelines for the Brazos River Corridor and Downtown; For All Our Lifetimes: A Vision for the Brazos and Bosque Rivers; Imagine Waco: A Plan for Greater Downtown; and Near Northside Master Plan).
	  ○ **Objective 2.17:** Reinforce the neighborhood concept in both a sociological and physical sense through new residential developments that feature elements such as linkages between neighborhoods and walkways to schools, parks, neighborhood shopping areas and other destinations.
	• **Goal 3 Transportation**: Provide a multimodal transportation network that effectively and economically serves the community's existing and projected travel needs through optimizing mobility while decreasing dependency upon the automobile.
	  ○ **Objective 3.01**: Maintain a continuous, coordinated transportation planning process that addresses long-term needs while facilitating short-term problem solving.
	  ○ **Objective 3.02:** Identify and plan for various roadway types based on how they are expected to function and upon expected build-out traffic volumes.
	  ○ **Objective 3.03:** Promote compatibility between roadway alignments/improvements, the environment, character, and land use patterns of the community.
	  ○ **Objective 3.04**: Continue systematic preventive maintenance, reconstruction, and improvement of existing streets.
	  ○ **Objective 3.05**: Implement traffic calming strategies to slow vehicular circulation, particularly within residential neighborhoods and the downtown area.
	  ○ **Objective 3.06:** Continue to coordinate transportation planning by working through the MPO with the TxDOT, the Heart of Texas Council of Governments, McLennan County, and neighboring cities.
	  ○ **Objective 3.07:** Encourage non-automotive transportation options including, but not limited to sidewalks, bicycle lanes, pedestrian and bicycle paths/trails, public transit, and water transportation.
	  ○ **Objective 3.08:** Encourage residential development in close proximity to schools, colleges, universities, childcare centers, and major employers.
	  ○ **Objective 3.09**: Encourage city employers to pursue travel reduction initiatives such as car and van pooling, flexible work schedules, and telecommuting that decrease dependency on single-occupancy vehicle trips.
	  ○ **Objective 3.10:** Continue to examine the role of the Waco Regional and TSTC Waco Airports in the context of long term development planning.
	  ○ **Objective 3.11:** Ensure that the City of Waco is in a position to actively participate in the location decisions of any future high-speed and/or commuter rail routes.
	• **Goal 6 Community Livability:** Recognize Waco's identity and manage growth and change to maintain and enhance community character in the way we address the economic, social, and environmental needs of a diverse population.
	  ○ **Objective 6.08:** Target residential developments with amenities to meet the needs of a diverse population such as community centers, senior centers, safe walking trails and sidewalks, playgrounds, and community gardens.
	  ○ **Objective 6.09:** Strengthen urban design standards to enhance the visual appeal of the city's streetscape, landscape, signage, right-of-ways, and public spaces.
	  ○ **Objective 6.10:** Initiate projects designed to improve the appearance of the I-35 corridor.
	  ○ **Objective 6.11:** Make pedestrian walkways more people oriented by adding features such as street trees, lighting, public art, wayfinding, exercise stations, and water fountains.
	Objective 6.21: Continue to strengthen ordinances and guidelines for Greater Downtown Waco that address historic preservation; traditional town form; context sensitive streets and mixed use structures; thereby, promoting downtown as a center for commerce, while preserving its historical and architectural character.

Document	Relevant Goals and Policies
Downtown Implementation Plan (2023) **City of Waco**	**Vision:** Waco's Downtown Streetscape theme provides a timeless canvas for accentuating the inherent cultural meeting place where Hispanic south, industrial north, wild west, deep south, and emergent black music collided and grew. **Guiding Principles:** The Downtown Streetscape Theme will: • Maintain its relevance over time • Be compatible with multiple architectural styles and historic periods without being reflective of those styles or periods • Provide a subtle tie between existing downtown attributes without proclaiming its own intrinsic characteristics • Encourage each downtown neighborhood/sub-district in accentuating its own character through specific area branding (signage, wayfinding, banners), public art, and aspirational design: Industrial North, Wild West, Deep South, Lost Hispanic Architecture, Emergent Black Music and Culture, The Brazos River The plan includes three toolboxes – Parking, Pedestrian and Street Design - with design treatments. Some of these elements also are safety-enhancing designs.
Waco City-Wide Trails Master Plan (2023) **City of Waco**	**Goals** • Both on-street and off-street multi-use trail corridors; identify priority corridors • Define appropriate facility options for each trail corridor segment based on the surrounding development context and user needs and preferences • Identify methods for leveraging trail investments to build local "active tourism" opportunities

Imagine Waco: A Plan For Greater Downtown (2010)
City of Waco
	Relevant Statements:
	• Be Designed for People and Be Walkable, Convenient and Accessible
	• Have a Vibrant Riverfront as a Centerpiece of the City
	• Provide Effective Transportation Choices and Linkages
	
	Relevant Guiding Principles for Transportation
	• Increase transportation options by creating a system that includes multiple modes of transportation – walking, biking, and river and transit in addition to auto. Integrate land uses and transportation to improve Waco's accessibility and livability.
	• Have a transportation system that connects workers to jobs and students to educational facilities. Structure the transportation system to provide needed service so that all segments of the community can meet daily living requirements.
	• Make Greater Downtown walkable with pedestrian-friendly streets in an urban environment.
	• Clean up and improve streets, curbs and gutters; finish sidewalks; provide lighting for safety.
	• Supporting Strategies for Transportation
	  ○ Transit system improvements
	  ○ Bicycle improvements
	  ○ Streetscape improvements and redesign
	  ○ Improved connections to the statewide transportation

Document	Relevant Goals and Policies

City of Woodway Comprehensive Plan (2004)	**Goals and Policies**
	• **Goal 4**: Promote compatibility between roadway improvements, land use, patterns, community character and the environment.
	• **Objectives**:
	  ○ Define "adequacy" standards for the transportation system.
	  ○ Plan roadways that are adequate to carry traffic generated by future development.
	  ○ Identify roadway types based on functions and expected volumes.
	  ○ Minimize disruption of residential areas by minimizing traffic volumes.
	  ○ Establish a development review process for planning and routing future roadways.
	  ○ Provide for acceptable interfacing between pedestrian traffic and motorized
	The Plan also identifies following deficiencies in Woodway's traffic circulation system:
	• Lack of a well-defined east/west and north/south collector street system.
	• Streets originally designed as low volume residential streets are now functioning as higher capacity collectors, or even as major arterials.
	• Intersection or interchange redesign at Wickson Road and U.S. Highway

Document	Relevant Goals and Policies

TxDOT
Unified Transportation Program 2024 (2023)
	Goal: Promote Safety: Highway Improvements in UTP
	• Increase safety at intersections
	  ○ Install traffic signal or rail crossing equipment
	  ○ Construct turn lane or deceleration lane
	  ○ Convert intersection to innovative design
	  ○ Construct grade separation or overpass
	• Reduce lane departures and head-on crashes
	  ○ Install center-line rumble strips
	  ○ Install median barrier
	  ○ Convert two-way frontage road to one-way
	  ○ Convert undivided roadway to divided
	  ○ Add passing lanes on two-lane highway
	• Reduce run-off-road crashes
	  ○ Install edge-line rumble strips or profile striping
	  ○ Increase pavement skid resistance
	  ○ Install guard rail
	  ○ Add or widen shoulders (for increased recovery area)
	  ○ Adjust roadway curve or super elevation (tilt)
	• Reduce collisions with bicyclists and pedestrians
	  ○ Install traffic signal or pedestrian hybrid beacon
	  ○ Install crosswalk or median island at intersection
	  ○ Construct shared use path, bike lane, or sidewalk
	  ○ Construct pedestrian bridge
	• Mitigate roadway obstacles
	  ○ Prevent or repair pavement deterioration
	  ○ Add or widen shoulders (for stopped vehicles)
	  ○ Reduce danger of fixed objects (trees, culverts, etc.)
	  ○ Increase vertical clearance for bridge or overpass
	  ○ Make emergency repairs due to crashes, weather, etc.
	• Improve driver awareness
	  ○ Install warning signs and pavement markings
	  ○ Install roadway lighting
	  ○ Build safety rest areas (prevent drowsy driving)

TxDOT
Texas Transportation Plan 2050 (2020)
	Relevant Goals and Strategies
	• **Goal**: Promote Safety: Champion a culture of safety.
	Improving the safety of the Texas transportation system has been and will continue to be TxDOT's highest priority. The safety goal focuses on TxDOT's efforts to reduce crashes and fatalities through the five "E's" of Evaluation, Engineering, Encouragement, Education, and Enforcement. Objectives
	  ○ [Evaluation] Work with stakeholders to identify and develop proven and data-driven strategies, countermeasures, and programs
	  ○ [Engineering] Reduce crashes and lessen crash severity by implementing engineering solutions
	  ○ [Encouragement/Education] Use education and outreach to promote safe driving, bicycling, and pedestrian activities
	  ○ [Enforcement] Coordinate with first responders to improve incident response times
	• **Safety Strategy:** Achieving a future with zero traffic fatalities and serious injuries is the department's top priority in terms of planning and investment. The Texas Strategic Highway Safety Plan outlines strategies TxDOT can implement to improve safety in Texas

APPENDIX C

LIST OF PROJECTS

WACO METROPOLITAN PLANNING ORGANIZATION

Connections 2045: The Waco Metropolitan Transportation Plan (2020)

Strategy 1:

Short-Term Priorities

Project ID: S-011: Facility: FM 2113 (Spring Valley Rd)

- Extent: FM 1695 (Hewitt Dr) to FM 2063 (Sun Valley Rd)
- Current: 2 lane FM road without shoulders
- Scope of Work: 1) Widen to add shoulders and center turn lane 2) Construct curb and gutter 3) Construct sidewalks and pedestrian crossings in vicinity of Spring Valley Elementary School

Project ID: L-044: Facility: Loop 2 (17th & 18th Streets)

- Extent: Homan Ave to US Bus 77 (LaSalle Ave)
- Current: 6 & 8 lane one-way streets
- Scope of Work: 1) Reconstruct 17th Street 2) Remove 1 lane in each direction 3) Narrow existing lanes and restripe to include bicycle lanes in each direction 4) Construct continuous sidewalks on both sides of each street

Project ID: L-013 : Facility: Mars Dr

- Extent: FM 1695 (Hewitt Dr) to Texas Central Pkwy Current: 2 lane county road without shoulders
- Scope of Work: 1) Reconstruct Roadway 2) Widen to 4 lanes divided 3) Construct multi-purpose bicycle / pedestrian path parallel to roadway from FM 1695 to Midway High School 4) Elevate culvert over drainage channel to avoid flooding potential

Long-Term Priorities

Project ID: L-018: Facility: Old McGregor Rd

- Extent: FM 1695 (Hewitt Dr) to Ritchie Rd
- Current: 2 lane county road without shoulders
- Scope of Work: 1) Reconstruct roadway 2) Widen to add bike lanes and center turn lane 3) Construct curb and gutter 4) Construct continuous sidewalks on both sides of roadway

Strategy 2: improve safety and security

Short-Term Priorities

Project ID: S-072: Facility: North Loop 340

- Extent: IH-35 to Union Pacific RR Overpass
- Current: Unsignalized intersections with no pedestrian facilities
- Scope of Work: 1) Install traffic signals at Bank Dr and Research Blvd 2) Install pedestrian crosswalks and refuge islands at both intersections 3) Construct continuous sidewalk along south side of road

Long-Term Priorities

Facility: IH-35

- Extent: Vicinity of Bellmead Wal-Mart
- Current: No Existing Facility
- Scope of Work: 1) Construct pedestrian overpass over IH-35 main lanes and frontage roads 2) Construct bus stop on Wal-Mart side of overpass or provide pedestrian connection to Bus Rapid Transit station at North Loop 340

Strategy 3: Improve System Efficiency

Short-Term Priorities

Project ID: L-036: Facility: Washington Ave

- Extent: S 5th St to S 18th St
- Current: 4 lane one-way street with parallel parking
- Scope of Work: Convert to 2 lane street with 2-way operations, parallel parking and bicycle lanes

Project ID: S-057: Facility: US 84 (East Waco Dr)

- Extent: Intersection at US Business 77 (Potts Interchange)
- Current: 3-level freeway to freeway interchange with continuous frontage roads
- Scope of Work: 1) Convert to at-grade roundabout 2) Construct bicycle and pedestrian path through intersection

Long-Term Priorities

Project ID: S-026B: Facility: Loop 574 / Loop 484 (Marlin Hwy)

- Extent: US Business 77 (LaSalle Ave) to UP RR Overpass
- Current: Loop 574 – No Existing Facility Loop 484 – 4 lane freeway with continuous frontage roads
- Scope of Work: 1) Extend Loop 574 as a 4 lane boulevard from current terminus at US Business 77 to connect to Loop 484 2) Construct roundabout at proposed Loop 574 / Loop 484 interchange 3) Convert 3-level interchange at Loop 484 / US Business 77 to an at-grade roundabout 4) Convert Loop 484 between US Business 77 and proposed Loop 574 interchange to a 4 lane boulevard with bicycle / pedestrian path

Strategy 4: Improve Regional Livability

Short-Term Priorities

Project ID: L-016: Facility: North 18th & North 19th Streets

- Extent: Live Oak Ave to Lake Shore Dr
- Current: 4 lane arterial with center turn lane Revised
- Scope of Work: 1) Conduct Road Diet to create 2 lane arterial with center turn lane and bike lanes 2) Construct on- and off-road facilities for bicycles and pedestrians along N 19th St between Lake Shore Dr and Park Lake Dr 3) Construct continuous sidewalks on both sides from Park Lake Dr to Live Oak Ave

Project ID: S-035 : Facility: Franklin Ave

- Extent: South 17th Street to South 4th Street
- Current: 4 lane one-way arterial with parallel parking
- Scope of Work: Convert to 2 lane arterial with 2-way operations and parallel parking

Project ID: L-040: Facility: South University Parks Dr

- Extent: IH-35 to US Business 77 (LaSalle Ave)
- Current: 6 lane arterial with center median
- Scope of Work: 1) Conduct Road Diet to create 4 lane arterial with bike lanes 2) Construct continuous sidewalks on both sides

Project ID: B-007: Facility: MKT Trail

- Extent: US 84 (East Waco Dr) to FM 933 (Gholson Rd)
- Current: No existing facility
- Scope of Work: 1) Construct bicycle / pedestrian path 2) Reconstruct traffic signal at US 84 & Dallas St

Project ID: B-068A: Facility: Dallas St

- Extent: Elm Ave to US 84 (East Waco Dr)
- Current: 2 lane collector
- Scope of Work: 1) Resurface roadway and restripe to include bike lanes 2) Construct continuous sidewalks on one side

<u>Long-Term Priorities</u>

Project ID: P-027A : Facility: South 26th St

- Extent: Franklin Ave to Bagby Ave
- Current: 2 lane collector
- Scope of Work: 1) Construct continuous sidewalks on one side 2) Upgrade traffic signal at 26th / Dutton to better accommodate pedestrians 3) Upgrade RR crossing warnings / protections to quiet zone standards

Project ID: L-024: Facility: Sanger Ave

- Extent: Harvey Dr to Loop 396 (North Valley Mills Dr)
- Current: 4 lane arterial with no center turn lane
- Scope of Work: 1) Conduct Road Diet to create 2 lane arterial with center turn lane and bike lanes 2) Construct continuous sidewalks on both sides

Project ID: L-037: Facility: 4th & 5th Streets

- Extent: Herring Ave to IH-35
- Current: 4th Street: 3 lane one-way arterial with partial bike lane and parallel parking 5th Street: 2 lane one-way arterial with partial bike lane and parallel parking
- Scope of Work: Convert to 2 lane arterial with 2-way operations, parallel parking and bicycle lanes

Project ID: B-073A : Facility: Forrest St

- Extent: Elm Ave to Brooklyn St
- Current: 2 lane collector
- Scope of Work: 1) Resurface roadway and restripe for bike lanes 2) Construct sidewalk on one side 3) Upgrade RR crossing warnings / protections to quiet zone standards

Strategy 5: Address Demand For Future Mobility

Long-Term Priorities

Project ID: S-038A: Facility: Speegleville Rd

- Extent: US 84 to Maple Shade
- Current: 2 lane rural county road without shoulders
- Scope of Work: 1) Widen to 4 lanes with center median 2) Construct curb and gutter 3) Replace existing 2 lane bridge over Middle Bosque River with 4 lane bridge 4) Construct bicycle and pedestrian path

Project ID: L-027-2: Facility: Panther Way

- Extent: FM 1695 (Hewitt Dr) to Panther Run Current: 2 lane rural county road without shoulders
- Scope of Work: 1) Widen to add center turn lane and bike lanes 2) Construct continuous sidewalks on both sides 3) Redesign intersection with FM 1695 to better accommodate bicycle and pedestrian crossings

Strategy 6: Provide Equal Access And Benefits

Short-Term Priorities

Project ID: T-016 Service: Bus Rapid Transit

- Extent: Texas Central Industrial Park to Bellmead
- Scope of Work: 1) Operate express transit service with limited stops following locally preferred alternative alignment (Map 7.6) 2) Construct up to 13 bus stop facilities consistent with Thoroughfare Plan design guidelines for transit transfer points 3) Construct pedestrian sidewalks and crosswalks at appropriate locations to connect stops with significant destinations 4) Reconstruct roadways with poor pavement conditions 5) Retrofit traffic signals in corridor to accommodate transit priority and pedestrian crossings

Project ID: T-017 Service: Realignment of Waco Transit Fixed Routes

- Extent: Waco Urbanized Area
- Scope of Work: 1) Realign routes to 20 or 30 minute loops and connect with Bus Rapid Transit route at major stops. Estimated 12 routes. 2) Convert system from flag stops to dedicated bus stops. Bus stops to be constructed consistent with Thoroughfare Plan design guidelines based on estimated daily boardings. 3) Construct pedestrian sidewalks and crosswalks at appropriate locations to connect stops with significant destinations

Long-Term Priorities

Project ID: T-018 Service: Commuter Bus Service

- Extent: Downtown Waco to McGregor Industrial Park

- Scope of Work: 1) Operate commuter bus service during peak hours between Downtown Intermodal Center to McGregor Industrial Park within stops at bus rapid transit stations 2) Construct 2 stops in McGregor consistent with Thoroughfare Plan design guidelines based on estimated daily boardings 3) Construct pedestrian sidewalks and crosswalks at appropriate locations to connect stops with significant destinations

Strategy 4: Improve Regional Livability

Short-Term Priorities (2020 to 2030)

Project ID: BP-001 Facility: Elm Ave

- Extent: Brazos River to Forrest St / Garrison St
- Current: 2 lane urban arterial
- Scope of Work: Construct continuous sidewalks, bike lanes and streetscape improvements

Project ID: BP-004 Facilities: Garrison St, Elm Ave, Clifton St

- Extents: Garrison St from J.H. Hines Elementary School to Taylor St; Elm Ave from Garrison St to Clifton St; Clifton St from Elm Ave to Chestnut St
- Current: 2 lane urban arterials Scope of Work: 1) Construct 6-ft wide accessible sidewalks along Garrison St, Elm Ave, and Clifton St adjacent to and near J.H. Hines Elementary School 2) Construct pedestrian signal and crossing improvements

Project ID: BP-005 Facilities: Williams Rd, N Houston St

- Extents: Williams Rd from Lorena Middle School to N Houston St; N Houston St from Williams Rd to Lorena Elementary School
- Current: 2 lane suburban arterial
- Scope of Work: 1) Construct a 6-ft wide continuous sidewalk along the south side of Williams Rd from existing sidewalk at Lorena Middle School to N Houston St 2) Construct a 6-ft wide continuous sidewalk along the west side of N Houston St from Williams Dr to existing sidewalk at Lorena Elementary School

Project ID: BP-006 Facility: Center St

- Extent: McBrayer St to Bordon St
- Current: 2 lane urban arterial
- Scope of Work: 1) Construct continuous ADA compliant sidewalks on both sides of Center St 2) Construct roadway bumpouts (curb extensions) and ADA compliant parking spaces

The Transportation Improvement Program 2023-26 (2022)

Grouped Projects CSJ Program

- Primrose from S 12th St to US 77: Safety treat fixed objects
- Hillcrest Dr at McArthur: Install reflective backplate to traffic signal

This TIP includes three grouped projects to address pedestrian safety within the vicinity of schools, community centers, grocery stores, retail, and restaurants.

- J H Hines Elementary School Sidewalks: Garrison St, Clifton St, and Elm Ave
- Cedar Ridge Sidewalks: N 19th St
- Indian Spring Pedestrian Connectivity Sidewalks: Jefferson Ave and 3rd St

Project: MKT Rails to Trails Street Tree Installation Project

- Applicant: City of Waco
- Extent: Purchased UPRR property from Dallas Avenue to FM 933 (Gholson Rd)
- Install street trees along a 12-foot-wide reinforced concrete shared use trail that supports alternative mobility in an area of the city facing decline. Street trees will contribute to carbon reduction by filtering drinking water, cleaning air we breathe, shading mobility options on sunny days, and providing habitat to terrestrial biodiversity.

Project: Mars Drive Street Tree Installation Project

- Applicant: City of Waco
- Extent: FM 1695 (Hewitt Dr) to Texas Central Pkwy
- Install street trees along an active construction project that supports various alternative mobility options adjacent to Midway High School. Street trees will contribute to carbon reduction by filtering drinking water, cleaning the air we breathe, shading mobility options on sunny days, and providing habitat to terrestrial biodiversity.

Project: City of McGregor Frogger

- Applicant: City of McGregor
- Extent: SH-317 at corners of W 3rd/TX-317 and W 6th/TX-317
- Install pedestrian activated crossings at the corners of W 3rd/TX-317 and W 6th/TX-317 with the ability to be activated for safe pedestrian and bicycle crossing to encourage non-motorized travel throughout the downtown area of McGregor.

Project: Fourth Street Sidewalk Improvements

- Applicant: City of Waco
- Extent: S 4th Street between Webster Ave and Jackson Ave
- Reconstruct sidewalks adjacent to Live Oak School to revitalize the west side of 4th Street from Webster Avenue to Jackson Avenue. Project includes reconstruction/addition of curb and sidewalks, ADA ramps, decorative limestone retaining walls, trees, landscaping, and pedestrian lighting.

Project: Ritchie Road Sidewalk Extension

- Applicant: City of Waco
- Extent: Ritchie Rd between Park Meadows subdivision and West Warren St
- Extend sidewalk from Park Meadows residential subdivision to pedestrian crossing at West Warren Street to provide a safe connection to Park Hill Elementary School. Project includes addition of sidewalks, ADA ramps, and drainage improvements.

Project: Clay Avenue Sidewalk Improvements

- Applicant: City of Waco
- Extent: Clay Avenue between South 3rd St and South 8th St
- Add and improve sidewalks along Clay Avenue to provide safe and continuous pedestrian connections. Project will contribute to the revitalization of Clay Avenue and includes curb and sidewalks, ADA ramps, decorative limestone retaining walls and landscaping

Active Transportation plan (2019)

Non-Engineering projects

- Community Rides and Walks
- Bicycle and Pedestrian Audits
- Shared Mobility/Micro-Mobility Programs
- Mobile Apps, Maps, and Websites
- Bicycle or Pedestrian Challenges
- Smart Cycling Class or Group Riding Clinic
- Share the Road Campaign and Other Safety PSAs
- Expand Drivers Education and Training
- Bike Rodeo
- Open Streets Event ("Cyclavia")
- Bicycle Friendly Communities (BFC) Recognition
- Walk Friendly Communities (WFC) Recognition
- Pop-Up Demonstration/Tactical Urbanism Project
- Support for Local Advocacy Groups

Engineering projects

Project Number	Location	Project Description
B-002A, B-002B, B-002C, B-016, B-017, B-018, P- 005	Tree Lake Dr, Flat Rock Rd, Skeet Eason Dr, MacArthur Dr, N 36th St, N 34th St	Provide bikeway and continuous sidewalk (and/or off-street shared-use path) to connect China Spring neighborhoods to Lake Waco Dam Trail and central Waco. China Spring improvements will likely need to occur as part of a larger roadway improvement project, because additional pavement (roadway width) will be required. An interim treatment could be utilized in lieu of roadway widening, such as a bike route with harrows. Provide bikeway and continuous sidewalk between Lakeshore Dr and Waco Dr. Install a safe crossing to allow bikes and pedestrians to cross Lake Shore Dr to connect to the Lake Waco Dam Trail.
B-003A, B-003B, B-003C, B-003D, B-003E, B-003F, B-003G, B-003H	Sanger Ave and N 29th St	Provide bikeway and continuous sidewalk, including across the Hwy 6 overpass, to connect Wood way to North Waco and Uptown Waco. On Sanger between N 29th St and N 15th St, repair and replace existing sidewalk as needed.
B-072, B-074, B-116	Clifton St, Elm Ave, La Salle Ave,	Implement recommendations of US Business 77 Corridor Study and initiate a new corridor study

Project Number	Location	Project Description
	Business 77, and E. Waco Dr	For La Salle Ave to improve bicycle and pedestrian mobility along the corridor and at high- priority intersections (e.g., S 3rd St, University Parks Dr). Connect to local bikeway corridors via a bikeway and sidewalk along Clifton St/Elm Ave
B-103A, B-103B, B-109A, B-109B	Santa Fe Dr and Texas Central Parkway	Provide a bikeway along Santa Fe Dr and Texas Central Pkwy from Bosque Blvd to Bagby Ave, connecting Woodway, Hewitt, and Waco neighborhoods. Provide continuous sidewalk in Woodway from Bosque Blvd to Old McGregor Rd.
B-005A, B-005B, B-115A, B-115B, P-009, P-021	Estates Dr and Hewitt Dr	Provide bikeway along Estates Dr and Hewitt Dr from Woodway Park to Chapel Rd and along Panther Way to Hewitt Dr. Provide continuous sidewalk along the entire corridor from Woodway Park in Woodway to Warren Dr in Hewitt. Provide pedestrian and bicycle accommodation along Panther Way and Hewitt Dr to provide safe route to Midway ISD schools, and to connect to existing bike and pedestrian facilities along Panther Way.
B-045A, B-045B, B-045C-1, B-045C-2, B-045C-3, P-054	Old Temple Rd, Bagby Ave	Provide bikeway along Old Temple Rd and Bagby Ave from Hewitt Dr in Hewitt to S 26th St in Waco. Provide pedestrian accommodation along Bagby between Central Texas Marketplace and S 26th St. Improve intersection of Valley Mills Dr and Bagby Ave to accommodate ADA pedestrian needs and bicyclists.
B-053A, B-053B, B-044A, B-044B	Old Robinson Rd, Primrose Dr, Irving Lee St	Provide an off-street shared-use path along Old Robinson Rd from Moonlight Dr in Robinson to Kenwood Dr in Waco. Provide bikeway and continuous sidewalk along Old Robinson Rd from Kenwood Dr to Primrose Dr, and along Primrose Dr/Irving Lee St.
B-013A, B-013B, B-013C, B-013D, B-104	E 3rd St, former Cottonbelt rail corridor, Harris Creek Rd, Hannah Hill Rd, Hwy 84 Frontage Rd, Ritchie Rd, Old Ritchie Rd	Provide an off-street shared-use path to extend the existing Cottonbelt Trail to the east and West, connecting to McGregor, existing Cottonbelt Trail, and neighborhoods in Woodway, west Waco, and Hewitt.

Project Number	Location	Project Description
B-009A, B-009B, B-083A, B-083B	Speegleville Rd, Old Lorena Rd, N Houston St, Center St	Provide an off-street shared-use path along Speegleville Rd from River Valley Intermediate School to Church Rd, connecting to the existing Cottonbelt Trail. Provide a bike route along Old Lorena Rd from Church Rd in Waco to the IH-35 south bound frontage lane in Lorena. Provide continuous sidewalk within Lorena city limits.
B-007	Former MKT rail corridor	Provide an off-street shared-use path along the former MKT rail corridor to connect Lacy Lakeview, Bellmead, and Waco neighborhoods
B-033, B-034, B- 038A, B-038B, B-041, P-071	S 3rd St, Dutton Ave, N 4th and N 5th Streets in Waco	Provide bikeway and continuous sidewalk from Garden Dr to Herring Ave first along S 3rd St, transitioning to 4th St and 5th St.
B-027A, B-027B	Washington Ave in Waco	Provide bikeway along Washington Ave from 29th St to 18th St to connect to the Sanger Ave bikeway and Washington Ave protected bike lanes. Provide continuous sidewalk from N 29th St to N 25th St (as needed). Repair and replace sidewalk as needed between N 25th St and N18th St.
B-050	Clay Ave in Waco	Provide bikeway and continuous sidewalk along Clay Ave from Valley Mills Dr to University Parks Dr
B-035, B-036A, B- 036B	N 15A, N 15th St in Waco	Provide bikeway between Alexander Ave and Washington Ave. Provide continuous sidewalk between Herring Ave and Washington Ave.
B-063	Colcord Ave in Waco	Provide bikeway and continuous sidewalk along Colcord Ave from N 42nd St to University Parks Dr.
B-112A, B-112B	17th, 18th, and 19th Streets in Waco	Implement recommendations from 17-18-19 Corridor Study for complete streets with bicycle and pedestrian accommodations throughout the corridor
B-032A, B-032B, B- 032C	S 26th St in Waco	Provide bikeway along S 26th St between Mary Ave and Dutton Ave, to connect to proposed bike lanes. Provide continuous sidewalk along S 26th St between Mary Ave and Bagby Ave.

Project Number	Location	Project Description
B-021, B-022, B- 023A, B-023B	Hillcrest Dr, Lyle Ave, Herring Ave in Waco	Provide bikeway along Hillcrest Dr/Herring Ave/Lyle Ave from Lake Shore Dr to the Brazos Riverwalk. Provide continuous sidewalk along Hillcrest Dr from Lake Shore Dr to N 32nd St. Repair or replace existing sidewalk along Herring Ave and Lyle Ave as needed.
B-020, B-054A	Cobbs Dr, N 41st St, and New Rd in Waco	Provide bikeway and continuous sidewalk along Cobbs Dr and N 41st St from Fish Pond Rd to Hillcrest Dr and along New Rd from Cobbs Dr to Colcord Ave.
B-044C	Primrose Dr	Provide bikeway and continuous sidewalk along Primrose Dr to connect regional bikeway along Old Robinson Rd and proposed bikeway along S 12th St
B-028B, B-028C	Chapel Rd and Imperial Dr in Waco	Provide bikeway and pedestrian accommodations along Chapel Rd and Imperial Dr from Ritchie Rd to Texas Central Pkwy. This will likely need to occur as part of a roadway widening project, because additional pavement will be required. An interim treatment may also be considered for Chapel Dr.
B-068, B-069, B- 070A, B-070B, B-073	Dallas St, Garrison St/Forrest St, Faulkner Ln, JJ Flewellen Rd in Waco	Provide bikeways and continuous sidewalk within East Waco along Dallas St, Garrison St/Forrest St, Faulkner Ln, and JJ Flewellen Rd. This will connect to the Elm Ave corridor, existing bike lanes along Orchard Ln, and MKT Trail.
B-141A, B-141B, B- 141C	Craven Ave in Lacy-Lakeview	Provide bikeway and continuous sidewalk along Craven Ave from US Business 77 to Campus Dr on the Texas State Technical College (TSTC) campus. This will connect the Lacy-Lakeview neighborhood to the active transportation corridor along US Business 77. Provide a pedestrian/bicycle cut-through near Langley Dr and Air Base Rd.

Project Number	Location	Project Description
B-008, B-024, P- 058, P-064, P-001	Behrens Circle and Bellmead Dr in Bellmead	Provide bikeway from MKT Trail to Bellmead Dr, and along the commercialized portion of Bellmead Dr. Provide continuous sidewalk along the same portion of Bellmead Dr and on Behrens Circle from the MKT Trail to Wheler Ave. Connect to proposed improvements along Business 77. Construct pedestrian overpass and connecting sidewalks along the IH-35 frontage road in the vicinity of Walmart.
B-114B, B-114C	Spring Valley Road in Hewitt	Provide bikeway along Spring Valley Rd from Old Lorena Rd to Sun Valley Rd. Provide continuous sidewalk within Hewitt city limits from Hewitt Dr to Sun Valley Rd.
B-055, B-075, B- 076, B-085, B-143	1st St, Warren Rd, Ritchie Rd, Devonshire Rd, Longwood Circle in Hewitt	Provide bikeway along 1st St, Warren Rd, Ritchie Rd (off-street shared-use path), Devonshire Rd, and Longwood Circle. Provide continuous sidewalk along Warren Rd and 1st St.
B-083C, P-060	N Houston St, Williams Rd, Old Lorena Rd, Center St in Lorena	Provide continuous sidewalk along Williams Rd, Leopard Ln, and a portion of Old Lorena Rd (to post office and primary school). Provide bikeway with sharrows along Williams Rd and Leopard Ln in vicinity of Lorena ISD schools
P-014, P-032, P- 033A, P-033B, P-036, P-037, P-038, B-118	Hwy 317 (Main St), Hwy 84, Bluebonnet Pkwy, E 3rd St, Old- McGregor Crawford Rd in McGregor	Provide bike route along Old McGregor/Crawford Rd and Hwy 317 (Main St) from approximately Navajo Trail to E 7th St (with connection to Cottonbelt Trail via E 3rd St). Provide continuous sidewalks along Hwy 317 (Main St), Hwy 84, and Bluebonnet Pkwy in vicinity of central McGregor neighborhoods and McGregor ISD schools.
B-026, B-029, B-145, P-007, P-025, P-078, P-079, P- 080	Tate Ave, Lyndale Ave, Stegall Dr, Shamrock Dr, Peplow Dr/Chaddo Ln, Moonlight Dr, US- 77 (Robinson Rd) in Robinson	Provide off-street shared-use path in vicinity of Robinson ISD schools along Peplow Dr/Chaddo Ln, and W Tate Ave. Provide sidewalk and bike route along Lyndale St, and provide continuous sidewalk along Shamrock Dr, Stegall Dr, Tate Ave, Moonlight Dr, and Robinson Rd (US-77).
P-081	State Hwy 6 and Eagle Way in Valley Mills	Provide off-street shared-use path along State Hwy 6 and Eagle Way to connect residences to Valley Mills middle/high school campus

US Business-77 Corridor Study (2016)

Safety Improvements: Intersection Improvement

- BUS 77 @ Crest Drive
    - Initiate discussions with property owners along east side of BUS 77 between Brenda Avenue and Lakeview Drive and along Spring Flower Lane.
    - Prepare property access management and cross access agreements, as needed.
    - Evaluate intersection control as roundabout to confirm adequate existing and future year operations.
- BUS 77 @ Craven Avenue
    - Initiate discussions with property owners along east side of BUS 77 between Brenda Avenue and Lakeview Drive and along Spring Flower Lane.
    - Prepare property access management and cross access agreements, as needed.
    - Evaluate intersection control as roundabout to confirm adequate existing and future year operations.
    - Initial street closure for one block of Powers Street
- Access Management along the highway

Waco MPO Corridors Study: Valley Mills Drive and Hewitt Drive (2013)

Main Recommendations are as follows. Check the document for segment-by-segment design and improvement details.

- Access management,
    - Raised medians,
    - Driveway consolidation
    - Cross access provision,
- Operational improvements
    - Right and left turn lanes,
    - Improving signal timings,
    - Creating pedestrian, bicycle and transit facilities.

Project specifics

4.6. Short, Medium and Long Term Recommendation Summary

VALLEY MILLS INTERSECTION IMPROVEMENTS

Intersection	Improvement	Type	Jurisdiction	Project Phase
Bagby	Widen EB approach	Traffic	Waco	Short-term
	Restripe approaches	Traffic	Waco	Short-term
	No pedestrian crossing signs	Pedestrian	Waco	Short-term
Speight	Restripe approaches	Traffic	Beverly Hills	Short-term
	Curb ramps	Pedestrian	Beverly Hills	Short-term
	Crosswalks	Pedestrian	Beverly Hills	Short-term
	Pedestrian signals	Pedestrian	Beverly Hills	Short-term
Dutton/Memorial	EB right-turn lane extension and striping	Traffic	Beverly Hills	Short-term
	Crosswalks	Pedestrian	Beverly Hills	Short-term
Clay	Curb ramps	Pedestrian	Beverly Hills	Short-term
	Crosswalks	Pedestrian	Beverly Hills	Short-term
	Pedestrian signals	Pedestrian	Beverly Hills	Short-term
	Restripe approaches	Traffic	Beverly Hills	Short-term
Franklin	Reduce number of lanes at overpass	Traffic	Waco	Short-term
	Curb ramps	Pedestrian	Waco	Short-term
	Crosswalks	Pedestrian	Waco	Short-term
	Pedestrian signals	Pedestrian	Waco	Short-term
Waco	None	Traffic	Waco	Short-term
New	Curb ramps	Pedestrian	Waco	Short-term
	Crosswalks	Pedestrian	Waco	Short-term
	Pedestrian signals	Pedestrian	Waco	Short-term
Sanger	Curb ramps	Pedestrian	Waco	Short-term
	Crosswalks	Pedestrian	Waco	Short-term
	Pedestrian signals	Pedestrian	Waco	Short-term
Lake Air	Extend NB right-turn lane	Traffic	Waco	Short-term
	Curb ramps	Pedestrian	Waco	Short-term
	Crosswalks	Pedestrian	Waco	Short-term
	Pedestrian signals	Pedestrian	Waco	Short-term
Wooded Acres	Extend NB right-turn lane	Traffic	Waco	Short-term
	Curb ramps	Pedestrian	Waco	Short-term
	Crosswalks	Pedestrian	Waco	Short-term
	Pedestrian signals	Pedestrian	Waco	Short-term
Bosque	Curb ramps	Pedestrian	Waco	Short-term
Cobbs	Curb ramps	Pedestrian	Waco	Short-term

VALLEY MILLS PROPOSED ROADWAY PROJECTS

Project	Jurisdiction	Project Phase	Cost
Franklin Overpass Restriping Option 1	Waco	Short-term	$42,000
Franklin Overpass Restriping Option 1	Beverly Hills	Short-term	$11,000
Right Turn Lane to NB Waco Dr	Waco	Short-term	$100,000
Franklin to Waco Dr Lane Addition Option 2	Waco	Long-term	$380,000

VALLEY MILLS PROPOSED MEDIANS

		Short-term	Medium-term
Project Limits	Jurisdiction	Cost	Cost
Cobbs to Bosque	Waco	$150,000	$180,000
Bosque to Wooded Acres	Waco	$150,000	$140,000
Wooded Acres to Lake Air	Waco	$100,000	-
Lake Air to Sanger	Waco	$150,000	$200,000
Sanger to New	Waco	$220,000	-
New to Waco	Waco	-	-
Waco to Franklin	Waco	-	-
Franklin to Clay	Beverly Hills	$40,000	-
Clay to Memorial/Dutton	Beverly Hills	$80,000	$130,000
Memorial/Dutton to Speight	Beverly Hills	$150,000	$180,000
Speight to Bagby	Beverly Hills	$150,000	-
	Total	$1,190,000	$830,000

VALLEY MILLS PROPOSED SIDEWALK PROJECTS

Jurisdiction	Total Length (ft)	Project Phase	Cost
Beverly Hills	12,193	Medium-term	$240,000
Waco	28,645	Medium-term	$570,000

5.6. Short, Medium and Long Term Recommendation Summary

HEWITT DRIVE INTERSECTION IMPROVEMENTS

Intersection	Improvement	Type	Jurisdiction	Project Phase
Chama	Flashing yellow arrow	Traffic	Hewitt	Short-term
Panther	Restripe east-west approaches	Traffic	Hewitt	Short-term
	Curb ramps	Pedestrian	Hewitt	Short-term
	Flashing yellow arrow	Traffic	Hewitt	Short-term
Regal	Flashing yellow arrow	Traffic	Hewitt	Short-term
Mars	Flashing yellow arrow	Traffic	Waco	Short-term
	Widen approach	Traffic	Waco	Short-term
Chapel/Imperial	Pedestrian signals	Pedestrian	Waco	Short-term
Walmart Driveway	Check detection	Traffic	Waco	Short-term
	Crosswalk markings	Pedestrian	Waco	Short-term
	No pedestrian crossing signs	Pedestrian	Waco	Short-term
Hwy 84 EB	Channelized EB right-turn lane	Traffic	Waco	Short-term
	Pedestrian signals	Pedestrian	Waco	Short-term
	Crosswalk markings	Pedestrian	Waco	Short-term
Hwy 84 WB	Crosswalk	Pedestrian	Waco	Short-term
	Pedestal pole	Pedestrian	Waco	Short-term
	Pedestrian signals	Pedestrian	Waco	Short-term

HEWITT DRIVE PROPOSED ROADWAY PROJECTS

Project	Jurisdiction	Project Phase	Cost
Six Lane Rural Section			
Hwy 84 to City Limits	Waco	Short-Medium	$1,800,000
City Limits to Panther Way	Waco	Short-Medium	$500,000
Panther Way to Sun Valley Boulevard	Hewitt	Short-Medium	$1,000,000
Six Lane Urban Section			
Hwy 84 to City Limits	Waco	Medium-Long	$8,900,000
City Limits to Panther Way	Waco	Medium-Long	$2,300,000
Panther Way to Sun Valley Boulevard	Hewitt	Medium-Long	$5,200,000

HEWITT DRIVE PROPOSED MEDIANS

Project Limits	Jurisdiction	Short-term Cost	Medium-term Cost
Hwy 84 to EBFR to Old McGregor	Woodway	$20,000	-
Hwy 84 to EBFR to Old McGregor	Waco	$120,000	-
Old McGregor to Rail Crossing	Waco	$100,000	-
Rail Crossing to Walmart Entrance	Waco	$80,000	-
Walmart Entrance to Chapel/Imperial	Waco	$130,000	-
Chapel/Imperial to Mars	Waco	$150,000	$320,000
Mars to Regal	Waco	$90,000	-
Mars to Regal	Hewitt	$40,000	-
Regal to Panther Way	Hewitt	$200,000	-
Panther Way to Chama	Hewitt	$150,000	$460,000
	Total	$1,080,000	$780,000

HEWITT DRIVE PROPOSED SIDEWALK PROJECTS

Jurisdiction	Total Length (ft)	Project Phase	Cost
Hewitt	16,759	Medium-term	$340,000
Waco	14,956	Medium-term	$300,000
Woodway	1,066	Medium-term	$20,000

Waco Area Thoroughfare Plan (2012)

Context Sensitive Solutions Project Opportunities

1. 4th Street and 5th Street at I-35 – Improve the multimodal connections between Baylor University and downtown.
2. Potential Redevelopment Area (Old Tire Site) around SR 6 and Business US 77 - Explore a public-private partnership with Baylor to plan and build multimodal local street networks that improve connectivity and accessibility throughout this subarea.
3. Business US 77 –Revitalize the urban community by converting the facility and the original freeway concepts to an at-grade, medium
4. University Parks Drive and Baylor Avenue – Improve pedestrian safety by enhancing crossing areas across University Parks Drive and completing sidewalk network on both sides of the street.
5. 3rd Street from Dutton Avenue to Speight Avenue – Convert 3rd Street to a two-way through street and designate it as a collector to improve mobility through the Baylor University campus.
6. 8TH Street on Baylor campus – Reclassify as a local street and rely on 12th Street as a collector and Bagby Avenue as a minor arterial.

7. University Parks Drive from I-35 to State Loop 491 – Improve pedestrian safety and accessibility along this segment through the eastern portion of the Baylor Campus. Reduce conflicts between campus pedestrians and through vehicles by adding continuous sidewalks and enhanced crossing areas.
8. Area around intersection of Loop 340 and University Parks Drive/FM 3400 – Improve vehicle and pedestrian safety by reducing vehicle speeds on Loop in area of intersection (currently 60 mph).
9. US 77 from Loop 340 to Moonlight Drive – Implement Context Sensitive Solutions along US 77/Robinson Drive to complement the mixed-use neighborhoods and village areas in Robinson.
10. Intersection of South New Road and Old Robinson Road – Create sidewalks along Old Robinson Road and add other multimodal connections to the high school.
11. Interchange at South New Road and I-35 – Improve the functionality and safety around the truck stop and intersection with I-35.
12. Traffic Circle at Valley Mills Road/State Loop 491 – Improve local access, traffic flow and operations, directional signage and multimodal facilities.
13. 13.Waco Drive from New Road to New Dallas Highway – Generate economic development by making multimodal improvements, such as bicycle lanes, sidewalks, landscaping, and other design features that will increase the appeal of this area for both pedestrians and motorists.
14. Interchange of Loop 340 and Waco Drive/US 84 and Franklin Avenue – Resolve congestion and operations issues, especially the eastbound weave before Franklin Avenue and Waco Drive.
15. Interchange at 84 West and Hewitt Drive/Estates Drive – Relieve congestion at afternoon peak and school hours by improving exit ramp configuration and access road intersections.
16. Lake Shore Drive between Hillcrest Drive and N. Valley Mills Road – Begin long-term planning for new bridge(s) on Lake Shore Drive, which will become necessary due to the impact of sandy soil and sinkholes on area roadways.
17. Airport Road from FM 3051 to Lake Shore Drive – Reduce travel speeds, particularly on steep downhill sections. The impacts on traffic must also be considered should the land in this area be developed as residential and/or office.
18. Business 77 from US 84 to Loop 340 – Convert from minor arterial to a boulevard to improve mobility and foster economic development.
19. Intersection of Lake Shore Drive/FM 3051 and Steinbeck Bend Drive/Lake Brazos Parkway – Develop a concept for processing traffic through intersection in light of increased traffic volumes and surrounding development. The new Waco Water Park is located near this intersection, which will increase the amount of vehicles, pedestrians, and bicyclists entering and exiting the facility, as well as using the intersection.
20. Area bordered by Steinbeck Bend Drive, Lake Shore Drive, and 19th Street – Improve accessibility to the growing cluster of regional attractions & parks (Mammoth park, baseball fields, MCC, etc).
21. Steinbeck Bend Drive from FM 1637 to Lake Shore Drive/FM 3051 – Balance the need for through traffic flow with accessibility to local destinations, particularly addressing concerns about high-speed traffic affecting residential areas.
22. China Spring Road/from FM 3434 to Old China Road west of China Spring – Reclassify from rural arterial designation to minor arterial in order to suit the future Village or Low Density residential development pattern of the surrounding area. Consider opportunities to convert strip commercial development into walkable, bicycle friendly places by adding sidewalks, bicycle lanes, and local connector streets.
23. Area of China Spring Road and North River Crossing – Improve multimodal access to the high school, clinic and other local uses.
24. 24.Old China Spring Road – Reclassify as minor arterial in order to suit the future Village or Low Density Residential development pattern.
25. 25. Area around Speegleville Elementary school / Speegleville Road – Improve connectivity, safety and access for all types of travelers throughout this area. 26. Area of Lone Star Parkway/317 and US 84 – Add new bypass (as shown in Thoroughfare Plan).
26. 27. US 84 west of McGregor – Improve access from industrial park and Space X facilities.

Future Land Use Study for McLennan County (2007)

<u>Recommendations</u>

<u>For Municipalities</u>

- Amend Development Regulations— Update zoning and subdivision ordinances to ensure that they allow and encourage development patterns that support the preferred scenario. Specific strategies include
    - Establish urban design guidelines in key areas such as town centers and transit station areas, to ensure that new development projects enhance the pedestrian environment, safety, and aesthetic appeal of the area.
    - Revise parking standards to allow reduced or shared parking in areas where transit ridership is desired or anticipated to be high
- Provide Infrastructure and Improvements Strategically— Prioritize infrastructure investments in areas identified for growth under the preferred scenario
    - Prioritize roadway improvements in areas designated to receive additional growth under the preferred scenario to improve access to these areas.
    - Invest in pedestrian and cycling infrastructure to encourage non-motorized transportation.
    - Concentrate public improvements such as beautification and streetscaping in areas identified for redevelopment and growth in the preferred scenario (i.e., town centers, transit corridors

For School Areas

- Provide Safe Routes to School— Pedestrian and bicycling infrastructure should be provided to connect schools to surrounding residential neighborhoods. Providing safe pedestrian infrastructure promotes daily physical activity for children and reduces traffic from parents dropping students off at school. TxDOT currently has a Safe Routes to School funding program that provides grants for schools looking to improve the pedestrian environment around schools. Safe Routes funding can be used for a variety of infrastructure projects including sidewalks, street crossings, traffic calming measures, on- or off-street bicycle facilities, and bicycle parking. Funds for program- related activities such as pedestrian safety classes and public awareness are also available through this funding program

Roadway Safety Performance Targets

- No Projects

CITY OF BELLMEAD

Comprehensive Plan (2023)

Proposed Projects

Short-Term Priorities (2020-2030)

1. North Loop 340, IH-35 to Union Pacific RR Overpass
    a. Issue/Need: Current unsignalized intersections with no pedestrian facilities. Need to reduce total crashes due to vehicles turning left or going straight at both intersections and address lack of safe pedestrian crossing of Loop 340.
    b. Scope
        i. Install traffic signals at Bank Dr and Research Blvd
        ii. Install pedestrian crosswalks and refuge islands at both intersections
        iii. Construct continuous sidewalk along south side of road

Long-Term Priorities (2031-2045)

2. Facility IH-35, Vicinity of Bellmead Wal-Mart
    a. Issue/Need: Need to reduce high number of fatalities resulting from pedestrian crossing of IH-35 main lanes, address lack of pedestrian crossings of IH-35 between Loop 340 and Behrens Circle, and provide better transit connection to Bellmead Wal-Mart shopping district
    b. Scope
        i. Construct pedestrian overpass over IH-35 main lanes and frontage roads
        ii. Construct bus stop on Wal-Mart side of overpass or provide pedestrian connection to Bus Rapid Transit station at North Loop 340
3. Facility US Business 77, Behrens Circle to Spring Lake Rd
    a. Issue/Need: Current four-lane hybrid boulevard with discontinuous frontage roads. Frontage roads do not meet current design standards and are not necessary to accommodate future traffic volumes. Intersections at FM 2417 and Craven require better traffic control to reduce probability of future crash problems.
    b. Scope
        i. Remove frontage roads and convert to standard boulevard design with bicycle and pedestrian path
        ii. Construct roundabouts at intersections with FM 2417 (Crest Dr) and Craven Ave

Goal 3 Projects

1. Install STOP signs to calm traffic on Hogan Ln near Brame Park (Hogan Ln & Briarwood Ln, Hogan Ln and Shelton St). Replace YIELD sign at Shelton St and Hogan Ln with STOP sign
2. Install additional street lighting on Ashleman St, Behrens Cir, Bellmead Dr, Harrison St, Hogan St, and Wheeler St
3. Install additional signage to limit freight traffic outside of regional routes
4. Repair approximately 2,900 LF of existing sidewalks in deteriorated condition
5. Construct approximately 19,600 LF of additional sidewalk along Ashleman St, Behrens Cir, Bellmead Dr, Harrison St, Hogan St, and Wheeler
6. Install six (6) additional crosswalks at intersection of Hogan Ln & Bellmead Dr, at intersection of Ashleman St & Bellmead Drive, and crossing Wheeler St at Maxfield St and Ashleman St
7. Develop sidewalk and bike network, goals, criteria, and scoring to further prioritize and plan for multimodal improvements
8. Local Add bike shared lane marking/signage to Behrens Cir, Bellmead Dr, Ashleman St, Harrison St, Hogan St, and Wheeler St as appropriate
9. Consider developing a master pedestrian/bike plan
10. Amend Zoning Ordinance to heightened standards for thoroughfare-fronting development
11. Ensure that all future upgrades to thoroughfares within the city limits are designed to ITE CSS standards with provisions for sidewalks and bike lanes or shoulders
12. TxDOT Plant at least one (1) tree annually to enhance public right-of-way along US 84/Bellmead Dr
13. Adopt a Future Land Use Map/Plan that encourages infill development
14. Update Subdivision Ordinance to require subdivision streets to connect to existing streets and limit block length to a minimum of 200' and a maximum of 1000'
15. Develop local emergency routes/procedures
16. Disseminate and inform residents of emergency routes/procedures
17. Incorporate targeted projects to improve road network connectivity in capital improvement projects so residents have more options to access emergency routes

Goal 4 Projects

1. Construct approximately 6,060 LF of sidewalk along both sides of Bellmead Drive & Ashleman St
2. Install an additional three (3) crosswalks to Bellmead drive, 1 at Hogan Ln & 2 at Ashleman St
3. Install decorative lighting along Bellmead Drive to increase pedestrian visibility and safety
4. Establish shared parking agreements with local businesses

CITY OF BRUCEVILLE-EDDY

Comprehensive Plan (2011)

Numbered road proposals

1. Extend Christopher Rd. north to Lake Shore Drive.
2. Establish a road northeast of Soules Cir., which will connect to Old Moody Rd. to the north, and Eagle Dr. to the south. If this road is established, a yield or stop sign will be necessary at Eagle Drive. Eagle Drive will become a two-way street following the I-35 expansion and new overpass construction at Eagle Dr.
3. Develop a road on the north or south side of B-E ISD property. This road should be a priority in an effort to mitigate school related traffic congestion and safety concerns caused by the I-35 corridor expansion and Eagle Drive overpass construction.
4. Develop two collector roads (one connecting Old Moody Rd. and Eagle Dr. and the other connecting the B-E ISD complex to road #5 on the connectivity map (see next page).
5. Develop a road to connect the neighborhood to the southwest to the northern part of the city.
6. Extend Eagle Dr. southwest. However, this road expansion might not be feasible due to the close proximity of private residential property on the corner of 3rd St.
7. Extend Mackey Ranch Rd. Mackey Ranch Rd. southeast bound becomes 4th Street and it extends northwest of Franklin Rd. This road could be reconfigured and opened for better circulation.
8. Develop a road north of the TV station.
9. Extend existing road to allow for development.

10. Extend Old Blevins Rd. (CR 451) northwest to Franklin Rd. This will allow better east-west access in the community and it will open up an additional route to the future downtown Bruceville-Eddy.

CITY OF HEWITT

Comprehensive Plan 2022 | 2003

Issues identified - Thoroughfare

- Increasing traffic (especially on Hewitt Drive)
- Lack of roadway standards for construction
- Need for the extension of Hewitt Drive through to Interstate Highway 35; thought that this would help with growth
- Challenges related to the railroad
- Future signalized intersections (e.g., the intersection of Old Temple and Spring Valley)
- Need for shared drives, circulation w/in new development along major roadways

Recommendations

- Construct arterials with raised medians, for safety as well as aesthetics.
- Ensure that adequate access spacing standards are implemented for land uses located on arterial and major collector streets in order to promote a smooth flow of traffic to minimize the impact of individual developments on the function of the roadways
- Arrange future residential lots such that they do not front onto major roadways; utilize the guidelines herein to ensure that such lots are properly placed in relation to these roadways
- Ensure that the future MISD school site, when it is developed, allows for adequate automobile circulation, especially in relation to Hewitt Drive and for adequate pedestrian circulation, especially in relation to adjacent neighborhoods and to Heiwtt Park
- Hike-and-Bike Trails: Concentrate on a City-wide system. Implement the system within existing developed areas first. Require future developments to provide access to the system

Specific Roadway Recommendations

- Two arterial connections
  - A new east-west roadway connecting Hewitt Drive and Ritchie Road
  - The extension of Hewitt Drive to Interstate Highway 35.
- Collector Roadways
  - Extension of Ava Drive east and south to Hewitt Drive;
  - Extension of Sapphire Boulevard north, to accommodate a future residential area;
  - A new roadway connecting Sun Valley Boulevard and Old Temple Road;
  - A new east-west roadway connecting Old Temple Road and Interstate Highway 35;
  - A new roadway extending north from Sun Valley Boulevard (between Old Temple Road and Interstate Highway 35), to accommodate a future industrial area;
  - Extension of Choctaw Trail southeast to Hewitt Drive (consistent with the MISD plans for the school site); and,
  - A new north-south roadway parallel to Interstate Highway 35 connecting Baxley Street to Industrial Drive

We are Hewitt: Strategic Plan 2022-2027 | 2022

- Street reconstruction - $366,190: East Warren Street – Design/Bid in 2022

- Street reconstruction - $584,649
    - Chapparal Rd,
    - Will Boleman
    - Crescent St
- Reclamation/reconstruction - $314,508
    - Boleman Drive
    - Hillside Drive
- Reclamation/reconstruction
    - Sunny Dale Dr
    - Sunset Dr
    - Redbud Cir
- Reclamation/reconstruction - $744,510
    - Ivy Lane

CITY OF LORENA

Lorena Parks, Recreation, and Open Space Master Plan 2019-2028

Relevant Projects

- Bike Lanes Painted on State Roads & Bridges (FM2837 North, FM2837 South/Rosenthal, Signature Bridges) - to be completed by 2023
- Bike Lanes painted on County Roads Bike Lanes – to be completed by 2023

CITY OF MCGREGOR

Vision 2030

- Enhance walkability and streetscapes on Main – On Hold
- Complete all 4 gateway entrances – 50%
- Implement multi-layered Way Finding program – On Hold
- Main Street Master Plan – On Hold
- Conduct monthly main street business visits – Ongoing
- Consider Main Street incentives to attract new businesses – Ongoing
- Dedicate staff to Main Street McGregor and local businesses - Done
- Brand and Market Main Street McGregor – Ongoing
- Develop an online presence for Main Street – Ongoing
- Promote Wi-Fi hot spots in small businesses – Ongoing
- Facilitate sustainable redevelopment opportunities – On Hold
- Track and promote a property inventory and project priorities

- Engage Historic District Committee Federal Registry status – On Hold
- Review boundary that is eligible for the Main Street incentive – Done
- Downtown Exchange – Funded
- Engage expertise in public space www.teambetterblock.com/ – On Hold
- Prove market for the Exchange – Done
- Secure funding to complete construction of the Exchange – Done
- One Time Investment {National Draw, i.e. Mice on Main) – On Hold
- Annual events (statewide draw1 i .e . Rocket Festival) – On Hold
- Seasonal events {regional draw, i.e. Spring Fling on Main) – In progress
- Regular events (local draw, weekly/monthly, i.e. 4th Friday) – In Progress
- Tell our story – Ongoing

CITY OF WACO

The City Plan: Waco Comprehensive Plan 2040 (2016)

4.5.2 Regionally Significant Highway Projects

The MTP identifies the most regionally significant mobility projects that the Waco Region is anticipating sufficient financial resources to construct or implement by the year 2040. The following list includes those MTP project recommendations impacting the City of Waco or its Extraterritorial Jurisdiction (ETJ). These recommendations are identified on Map 4.2.

Interstate Highway 35

- North Loop 340 to South Loop 340
- Widen to 8 main lanes
- Reconstruct main lanes, frontage roads and on/off ramps

FM 1637 (China Spring Road)

- FM 3051 (Steinbeck Bend Dr) to FM 185
- Widen to 4 lanes

Loop 340

- Brazos River to SH 6 / Marlin Hwy
- Widen to 4 lanes
- IH-35 to US 77
- Construct Frontage Roads
- Construct overpass at Old Robinson Rd

US 84 at FM 2837 / Speegleville Road

- Construct overpass and extend US 84 frontage roads

State Highway 6

- McLaughlin Rd to FM 185

- Widen to 4 lanes

Franklin Avenue
- Lake Air Dr to New Rd
- Eliminate existing frontage roads
- Relocate main lanes to frontage roads and widen to 6 lanes
- Reconstruct interchange at New Rd

One-Way to Two-Way Conversions
- Franklin Ave: 4th St to 17th St
- Washington Ave: 5th St to 18th St
- 4th and 5th Streets: IH-35 to Herring Ave

Road Diets
- Current – 4 lanes with no center turn lane
- Proposed – 2 travel lanes with center turn lane and bicycle lanes
- Sanger Ave: Valley Mills Dr to Harvey Ln
- N 18th and N 19th Streets: Live Oak Ave to College Dr

The MPO staff also identified several other highway priorities during the development of the MTP that could not be included due to fiscal constraint. These projects are, nevertheless, considered important priorities in order to address forecasted mobility needs but will require funding outside of traditional state or federal sources. The following list identifies these projects that are also identified on Map 4.2.

North Loop 340
- SH 6 / Marlin Hwy to Williams Rd (Bellmead)
- Widen to 4 lanes

West Loop 340
- IH-35 to US 84 (Waco Dr)
- Construct continuous frontage roads
- Widen main lanes to 6 lanes

Speegleville Road
- SH 6 to US 84
- Widen to 4 lanes

Hewitt Drive (FM 1695)
- US 84 to Sun Valley Rd (FM 2063)
- Widen to 6 lanes

Steinbeck Bend Drive (FM 3051)

- China Spring Rd to Lake Shore Dr
- Widen to 4 lanes

Loop 574
- Extension from LaSalle Ave to Marlin Hwy
- Construct 4 lane boulevard
- Reconstruct existing interchange of LaSalle Ave at Marlin Hwy

Chapel Road
- Woodgate Dr to Old Lorena Rd (FM 2837)
- Widen to 4 lanes

Ritchie Road
- Panther Way to Hewitt Dr (FM 1695)
- Widen to 4 lanes

Texas Central Parkway
- US 84 to Imperial Dr
- Widen to 4 lanes

MacArthur Drive
- Park Lake Dr to Hillcrest Dr
- Perform Road Diet

Pavement Management
Traffic Operations
- Replacement of all signals greater than 40 years in age
- Upgrade of all traffic signals to be compatible with the latest communication technology
- Synchronization of all signals via the City's traffic management center
- Retrofit all signals with crosswalks to meet the standards of the Americans with Disabilities Act (ADA)
- Develop a standard policy regarding the installation of streetlights

Public Transit
- Establishment of a central Bus Rapid Transit (BRT) line upon which all other routes would feed into at one of eight transfer locations.
    - The BRT line would operate parallel to Waco Dr or Franklin Ave between Bellmead and Woodway
    - The BRT line would operate on 15 minute headways and stop only at one of the eight transfer locations
- Realign all other routes into feeder routes that operate on loops no greater than 30 minutes in duration
- Discontinue the existing flag stop service and transition to a dedicated stop system
- Improve pedestrian access to each proposed stop and transfer location to meet ADA requirements

- Extend the hours of operation until at least 11:00pm
- Refurbishment of the Downtown Intermodal Center

4.7 Non-Motorized Transportation

4.7.1 Bicycle

- Completion of Brazos Riverwalk between the Lake Waco Dam and LaSalle Ave
  - Priority recommendation is to construct in phases providing connection between the Waco Mammoth National Monument and the existing terminus at Brazos Park East
- Convert the former MKT rail line through East Waco to a multipurpose bicycle/pedestrian trail
- Convert Mary Avenue to a multi-purpose bicycle/pedestrian trail from South 8th Street to South 32nd Street
- ・Extend Cotton Belt Trail eastward from current terminus to vicinity of Ritchie Rd

4.7.2 Pedestrian Transportation

- Retrofit existing stormwater channels to incorporate more permeable groundcover and pedestrian walkways
- Require future stormwater channels to be constructed such that pedestrian walkways may be incorporated into the easement
- Retrofit existing sidewalks and crosswalks to meet accessibility standards of the Americans with Disabilities Act
- Explore strategies by which sidewalks can be adequately maintained
- Limit circumstances in which variances to sidewalk requirements may be permitted

4.9 Passenger Rail

- Purchase or lease of property within general vicinity of the Waco Transit Intermodal Center
  - Solicit proposals for development of the site similar to the Brazos Commons
- Improvements in pedestrian and bicycle access to the site
  - Enhancement of connection to Downtown
  - Addition of bicycle lockers
- Provision of additional long-term parking
- Establishment of a zoning overlay district to ensure compatible development with the immediate vicinity
- Explore establishment of a “Quiet Zone” through Downtown and East Waco
  - Study to identify signal infrastructure needs to eliminate need for trains to sound their horns at intersections with roadways
  - Quiet Zone to minimally extend from South 18th Street to US Business 77

Capital Improvement Projects, City Of Waco

Waco Capital Improvement Projects have been compiled by the city in an interactive Dashboard here. https://www.waco-texas.com/Government/CIP. There are 189 projects, including 65 streets and 9 traffic related projects, and are available to view on the dashboard.

Downtown Implementation Plan (2023)

Priority Project List

Phase 1

1. **University Parks Drive** – between IH-35 and Washington Avenue
    - Green Boulevard, 0.6 Miles
    - Construct a 10' shared use path during University Parks Drive redevelopment. Where possible, connect this shared use path to to adjacent destinations and trail networks, including the existing Baylor Trail and the Brazos River.
    - Coordinate with TxDOT, Baylor, the Waco Metropolitan Planning Organization (MPO), and other key partners when identifying the specific design layout of the University Parks Drive corridor.
    - Integrate Waco's unique culture and heritage into median sculpture and gateway signage design.
2. **8th Street** – between Columbus Avenue and Webster Avenue
    - Entertainment Street, 0.5 Miles
    - Conduct a pedestrian monitoring program in preparation for this streetscape redesign to identify areas of high pedestrian activity. If areas are identified where unsignalized midblock crossings frequently occur, consider the construction of a Rectangular Rapid Flashing Beacon (RRFB) or a Pedestrian Hybrid Beacon (PHB).
    - Construct enhanced crosswalks with brick pavers and increased pedestrian walk times. Integrate leading pedestrian intervals (LPIs) on crosswalks with high pedestrian activity.
    - Implement parking recommendations found in the parking toolkit section of the Downtown Implementation Plan for the 8th Street corridor.
3. **Franklin Avenue** – between 11th Street and 4th Street
    - Gateway Street, 0.8 Miles
    - Evaluate traffic patterns along Franklin Avenue to determine if a two-way conversion should be implemented. In this review, utilize the cross sections provided for Arterial/Gateway Streets provided on page 46 to determine the appropriate cross section for Franklin Avenue.
    - Place parking and destination wayfinding signage along the Franklin Avenue corridor.
    - Implement Leading Pedestrian Intervals (LPIs) on all signals along Franklin Avenue.
4. **Austin Avenue** - between 11th Street and 4th Street
    - Entertainment Street, 0.8 Miles
    - Coordinate with local businesses along Austin Avenue to identify partnerships for pedestrian enhancements, such as additional seating areas and public art along building facades.
    - Implement other additional tools found in the Pedestrian Experience Toolkit on page 18 - 19 along the Austin Avenue corridor due to its high pedestrian traffic and activity areas.
    - Construct parking and destination wayfinding signage along the Franklin Avenue corridor. Construct this signage for both pedestrian and vehicle usage.

Phase 2

5. **Jackson Avenue** – between 8th Street and University Parks Drive
    - Shared Street, 0.5 Miles
    - Repave Jackson Avenue with enhanced and textured pavers to slow vehicular traffic.
    - Promote pedestrian and cyclist safety along this corridor by constructing significant automobile-oriented signage informing drivers about the function of the shared street.
    - Coordinate with the railroad to construct additional signage, pedestrian safety measures (including fences and new level crossing signals), and right-of-way usage.
    - Capitalize on Waco's unique heritage by identifying areas where new public art, sculptures, and banners can be placed along Jackson Avenue.
    - Inform adjacent business owners of the new Shared Street function of Jackson Avenue.
6. **6th Street** – between Columbus Avenue and Webster Avenue
    - Entertainment Street, 0.5 Miles
    - Increase crosswalk visibility by constructing enhanced crosswalks with brick pavers and increased pedestrian walk times (specifically at the intersections of Austin Avenue and Franklin Avenue). Integrate leading pedestrian intervals (LPIs) on crosswalks with high pedestrian activity.
    - Construct bulbouts at all public street crossings.
    - Conduct a pedestrian monitoring program in preparation for this streetscape redesign to identify areas of high pedestrian activity. If areas are identified where unsignalized midblock crossings frequently occur (specifically around the Silos), consider the construction of a Rectangular Rapid Flashing Beacon (RRFB) or a Pedestrian Hybrid Beacon (PHB).

- Construct pedestrian and auto-oriented parking and destination wayfinding signage.

7. **Webster Avenue** – between University Parks Drive and 11th Street
    - Entertainment Street, 0.8 Miles
    - Jumpstart improvements along the Webster Avenue corridor by improving intersection and the surrounding streetscape on cross streets that will be completed in Phase 1 (including University Parks Drive, 8th Street, and possibly 6th Street if completed first).
8. **Mary Avenue** – between 8th Street and 3rd Street
    - Activated Street, 0.8 Miles
    - Completely repave Mary Avenue with enhanced and unique pavers along the corridor.
    - Plant additional shade trees and pedestrian amenities found in the Pedestrian Experience Toolkit on page 18 - 19, such as seating, public art, sculptures, green infrastructure, banners, destination signage, and bike or scooter rentals.
    - Install string lighting along the corridor.
    - Construct bollards at key intersections where streets are intended to be closed, such as the intersection of Mary Avenue and University Parks Drive, as well as the intersection of Mary Avenue and 8th Street.

<u>Phase 3</u>

9. **3rd Street** – between Franklin Avenue and Webster Avenue
    - Entertainment Street, 0.2 Miles
    - As a high priority, fill existing sidewalk gaps to complete the sidewalk network.
    - Widen existing sidewalk to improve pedestrian comfort.
10. **2nd Street** – between IH-35 and Jackson Avenue
    - Circulation Street, 0.3 Miles
    - Consider closing S 2nd Street Crossing and divert all automobile traffic through to Ross Avenue. Consider creating a parklet facility for public use.
    - Widen existing sidewalks and fill sidewalk gaps to improve pedestrian comfort.
    - Coordinate with TxDOT to streamline streetscape improvement efforts where 2nd Street meets IH-35.
11. **7th Street** – between Austin Avenue and Franklin Avenue
    - Pedestrian Only Street, 0.2 Miles
    - Completely close 7th Street between Austin Avenue and Franklin Avenue.
    - Create a “living room” area for pedestrians by installing numerous pedestrian amenities and activities.
    - Install amenities found in the pedestrian comfort and experience toolkit. Specifically, add amenities that will encourage pedestrians to stay and enjoy the space, such as public art, lawn games, seating, shade trees, and lighting.

Streetscape Improvements

- Utilize the Prioritization Matrix on page 56 to identify street or streetscape improvement projects that are most critical to implementation. Periodically review and update this prioritization matrix as projects are completed.
- Improve walkability and placemaking so the pedestrian environment is conducive to people walking between parking and destinations.
- Adopt the preferred Streetscape Design Package and utilize these elements in new streetscape improvement projects.
- Upgrade all streets in Downtown Waco with the tools found in the Pedestrian Comfort Toolkit.
- Identify key locations and high activity areas to implement tools found in the Pedestrian Experience Toolkit. Utilize guidance found in the Prioritized Project Action Items section (pages 79 - 84) to help identify specific areas where this toolkit can be applied.
- Plant additional shade trees to further enhance the aesthetics and walkability of Downtown Waco’s corridors.
- Ensure tree shade and landscaping is well-maintained along corridors in Downtown Waco.
- Where possible, implement curb management best practices by closing underutilized driveways into parking lots or alleys to improve pedestrian connectivity.
- Where possible, integrate the use of technology in curbside management improvements to manage the demand of parking, especially near popular destinations.
- Implement tools found in the street design pedestrian toolkit to increase pedestrian safety along heavily traveled corridors.

- Construct bulbouts along high foot traffic street crossings.
- Partner with the development community to enhance pedestrian safety, comfort, and street design of Downtown Waco's streets as new development projects occur.

Policy Action Items

- Review existing City ordinances and standards for their ability to support the recommendations of this plan, and make updates as needed.
- Adopt a downtown-wide policy goal of upgrading all sidewalks in Downtown Waco to be compliant with the American Disabilities Act (ADA).

Waco City-Wide Trails Master Plan (2023)

System Enhancement Projects

General enhancement on the trail system, and specific enhancement on the following trails

- Brazos Riverwalk Trail
- River Trail (Cameron Park)
- Cotton Belt Trail
- Lake Waco Dam Trail

Construction Projects – Priority List

- **TIER ONE TRAIL SEGMENTS**: Over 16 miles of roadside and greenway trails are proposed to be constructed as part of the City's initial phase of trail development at an estimated cost of between $4,224,000.00 and $8,870,400.00 dollars
- **TIER TWO TRAIL SEGMENTS**: Tier Two segments include over 33 miles of roadside and greenway trails to be constructed at an estimated cost of between $8,712,000.00 and $18,295,200.00 dollars.
- **TIER THREE TRAIL SEGMENTS:** Tier Three trail segments include the remaining 76 miles of roadside and greenway trail proposed by this Master Plan. Total estimated construction costs for Tier Three trail segments are estimated to cost between $20,064,000.00 and $42,134,400.00 dollars (2022) but it is acknowledged that overall costs may far exceed this estimate due to inflation over an extended period of time.

Project list in table below.

Key	Project Name	Project Type	Beginning	End	Distance (Miles)
Tier One Trail Segments					
34	Mary Ave. North	Roadside	S MLK Jr. Blvd	S 16th St	1.5
60	Waco Creek	Greenway	S 16th St	S 32nd St	1.5
20	Floyd Casey/Valley Mills Connector	Greenway	UP Railline at Waco Creek	S Valley Mills Dr	0.6
29	Lake Shore	Roadside	Industrial Blvd/FM 3051	Lake Waco Dam Trail	5.7
35	Mary Ave. South	Roadside	S 11th St	S 32nd St	1.3

Tier Two Trail Segments

53	Speegleville Rd	Roadside	Oak Rd	Old Lorena Rd/Church Rd (Cottonbelt Trail)	1.5
5	Bosque River/Lake Waco Dam Connection	Greenway	N 19th Street (Fm 1637)	Lake Waco Dam Trail	2.2
9	BrazosRFBaylorExt.1	Greenway	Brazos Riverfront Baylor	Treatment Plant Dr.	3.5
12	Cottonbelt Extention	Greenway	Cottonbelt Terminus	E 2nd St/S Johnson St	7.0
41	New Rd.	Roadside	Old Robinson Road	New Road/W Industrial Dr.	3.5
57	US 84/Hannah Hill Rd	Roadside	Ritchie Rd	UP Railline (East of Bush Dr)	1.0
58	Waco-McGregor North Segment	Roadside	Mary Ave / S 32nd St	Old Hewitt Rd	4.3

Tier Three Trail Segments

11	Cement Plant Rail	Greenway	UP Railline near Wick-son Rd	North Flat Creek	4.4
13	Cottonwood Creek	Greenway	South of TX-340 Loop	TH-35	5.7
19	Flat Rock Road	Roadside	Skeet Eason Dr	Desperado Dr	0.7
26	Hewitt to Cottonbelt	Roadside	Panther Way	US 84 @ Ritchie Rd	2.6
31	Lake Waco Dam Trail North Ext.	Roadside	Access Road/Skeet Eason Dr.	China Spring Rd (FM 1637)	2.9
33	Mars Dr	Roadside	Hewitt Dr	Midway High School	0.4
39	N MLK Jr. Connector	Roadside	Brazos RF North Shore	Lake Shore Dr	0.6
40	N. River Crossing Connector	Greenway	n/a	N River Xing (FM 185)	0.9
49	S University Parks Dr West	Roadside	Roadside La Salle Ave (US 77)	Garden Dr	0.8
51	SH 6/Midway Park Connector	Greenway	Old Fish Pond Road	Midway Park	0.8

56	TSTC Extension	Roadside	Roadside IH-35 / TX-340 Loop	Texas State Technical College Waco	4.4
59	Waco-McGregor South Segment	Roadside	Roadside Old Hewitt Rd	Cottonbelt Terminus	3.2
30	Lake Shore Drive to Koehne Park	Roadside	Roadside Lake Waco Dam SE Terminus	Koehne Park	3.0
42	North 19th St (FM 1637)	Roadside	Roadside Lake Shore Dr	Park Lake Dr	1.1
1	340 Loop	Roadside	Roadside Airbase Rd US 84/Loop Brazos River South 340)	Shore	5.0
3	Bagby Ave	Roadside	Roadside S New Rd	Exchange Pkwy @ North Flat Creek	1.4
16	Cottwood Creek Alt @ W. Uni HS	Greenway	South of University HS	New Rd.	0.5
21	Greenway Yankee Rd	Greenway	Yankee Rd./Flat Rock Rd.	Yankee Rd./Tulum Lane	2.8
22	Harris Creek Rd	Roadside	UP Railline @ Harris Creek Rd	Stageline Dr	0.5
46	Primrose Trail	Greenway	TX-340 Loop	IH-35	

Park Projects (2022-2024)

1. Floyd Casey Development Project (ongoing): Improve connectivity to Bell's Hill Park to establish inclusive community park benefits, essential neighborhood connectivity, and expansion of the Waco city-wide trail system.
2. Lions Park Revitalization Project (2023): Walking path and connectivity to neighborhoods, with sidewalk improvements.
3. China Spring Park Project (ongoing): The City of Waco purchased 85 acres for the future development of a city park in China Spring. The China Spring Park project is currently in the works, and the Waco City Council approved a contract with the design firm RVI. The first public engagement meeting will be set in the upcoming weeks.
4. Cotton Palace Park Master Plan (2022): The City of Waco is preparing a Master Plan for major improvements to Cotton Palace Park, one of the oldest parks in Waco. Maximizes the park's capacity to serve a growing neighborhood and anticipates increased use from Downtown

Americans with Disability Act Transition Plan (2019)

Project List

Street Name	Limits		Recommended Modification	Status
	From	To		
City Hall	3rd Street	Towards University Parks Dr	Construct sidewalk and ramps	Completed
Bosque Blvd	3rd Street	University Parks Dr	Construct sidewalks, ramps, and retaining walls	Completed
New Road	At Waco Drive		Traffic signal bring up to ADA standards and install ramps	Completed
Salvation Army Webster Avenue	3rd Street	5th Street	Construct curb ramps and selected sidewalk	Completed
Beverly Drive	New Road	State Highway 6	Reconstruct Road, ramps and selected sidewalk	Completed
Webster Avenue	Along, at, and near Intersection with	6th Street	Construct sidewalk and ramps	Completed
9th Street	Webster Avenue	Clay Avenue	Construct sidewalk and ramps	Completed
Webster Avenue	9th Street	Towards 8th Street	Construct sidewalk and ramps	Completed
Kendrick School Sidewalk Improvements	Various Adjacent Streets		Construct sidewalk and ramps	Completed
Mountainview School Sidewalk Improvements	Various Adjacent Streets		Construct sidewalk and ramps	Completed
Tennyson School sidewalk Improvements	Various Adjacent Streets		Construct sidewalk and ramps	Completed
Woodgate School Sidewalk Improvements	Various Adjacent Streets		Construct sidewalk and ramps	Completed
Colcord	15th Street	Towards 13th street	Place thermoplastic surface pattern in pedestrian walkways	Completed
Ritchie Road			Reconstruct road and add sidewalk and ramps Under Construction	

Elm Avenue	Preston Street	Turner Street	Reconstruct sidewalk and add ramps	Under Construction
Traffic Signals	Various		Bring into ADA compliance with upgrades	Ongoing
Austin Avenue	111h Street	20th Street	Utility, replacement, mill and overlay, ramps, selected sidewalk	Planned 2019
Elm Avenue Phase I	Spring Street	Clifton Street	Water infrastructure, mill and overlay, ramps, storm drain	Planned 2019
Washington Avenue	University Parks Drive	18th Street	Mill and overlay, dedicated bike lanes, median, traffic signals, ramps, selected sidewalk	Planned 2019
Webster Avenue	8th Street	11th Street	Reconstruct sidewalk, add ramps, and ADA parking	Planned 2019
5th Street	US 84	IH 35	Reconstruct street, selected sidewalk, and ramps	Planned 2020
Dallas Street	Herring Avenue	Tyler Street	Reconstruct street, selected sidewalk, and ramps	Planned 2020
Franklin Avenue	3rd Street	18th Street	Mill and overlay, traffic signal ADA compliance, ramps, and selected sidewalk	Planned 2020
Elm Avenue Phase II	Brazos River	Spring Forrest Garrison	Sidewalks, ramps, bicycle lanes, lighting, markings, paving, storm drains water and wastewater	Planned 2021

17th/18th/19th Streets Corridor Study (2017)

Phase 1 – Safety and Operational Enhancements

- Project 1a. Replace the existing school crossing flashing beacon near Meridian Avenue with pedestrian activated hybrid beacon (often call a HAWK signal), restripe the crosswalk and stop bars, and upgrade the ramps.. Estimated cost: $163,000.
- Project 1b. Restripe 18th Street between Homan Drive and Bosque Boulevard to convert one of the three southbound lanes to a northbound lane, add to and modify the pedestrian crossings, and modify the curb line and landings. Add the needed signal indications for the northbound 18th Street movement at Homan and change the westbound green arrow to a right turn on red. Estimated cost: $168,000.
- Project 1c. Reconfigure the intersection at Wilson Avenue and install a new traffic signal Estimated cost: $490,000.

Total Estimated Cost of Phase 1: $815,000

Phase 2 – Pavement Markings for Traffic Management

- Project 2a. Restripe 17th and 18th Streets between La Salle Avenue and IH 35 (see Figure 21) and between IH 35 and Webster Avenue (see Figure 21, Phase 1) to convert the outside travel lane to a buffered bike lane, for a total of 13,200 LF of buffered bike lane striping. Designate Webster Avenue as a bike route between 18th Street and 11th Street, and 11th Street between Webster and Waco Drive. Estimated cost: $132,000.
- Project 2b. Restripe 17th and 18th Street between Webster Avenue and Franklin Avenue from four 10-foot lanes to three 11-foot/12-foot wide travel lanes (see Figure 27, Phase 1). Estimated cost: $15,000.

- Project 2c. Clean and repair the existing sidewalks along 18th Street between Webster Avenue and Franklin Avenue. Estimated cost: $80,000.
- Project 2d. Restripe 17th Street between Waco Drive and Bosque Boulevard (2,250 LF) as a two-lane one-way street, allocating the center 22 feet to travel lanes and using pavement markings to delineate the edge-of-travel lanes about 5 feet from the curb on both sides. Restripe outside lane of 18th Street as a buffered bike lane between Bosque Boulevard and Franklin Avenue. Estimated cost: $42,000.
- Project 2e. Restripe 18th Street from Homan Drive to Wilson Avenue (9,000 LF) to be a three-lane roadway, consisting of one 12-foot lane in each direction and a 12-foot wide center turn lane and using pavement markings to delineate the edge-of-travel lanes about 5 feet from the curb on both sides. Estimated cost: $80,000.
- Project 2f. Re-program the traffic signal operations at Lyle and Herring Avenues to change from a 4-phase configuration to a 3-phase configuration. Provide signal timing coordination between the signals at Lyle/Herring and the signal at Alexander. Estimated cost: $150,000.
- Project 2g. Restripe 19th Street from Wilson Avenue to Clark Street (2,000 LF) to be a three-lane roadway, consisting of one 12-foot lane in each direction and a 12-foot wide center turn lane, then transitioning to the existing five-lane section at Park Lake Drive. Estimated cost: $38,000.

Total Estimated Cost of Phase 2: $547,000

Phase 3 – Sidewalks and Curb Line Modifications between La Salle Avenue and Waco Drive

- Project 3a. Reconfigure the 17th and 18th Street bridges to add the shared bicycle and pedestrian path along each bridge, removing the temporarily striped buffered bike lane. Estimated cost: $728,000 including engineering, survey and contingency.
- Project 3b. Sidewalks, both sides of 17th and 18th Streets, approximately 27,000 LF. Estimated cost: $1,134,000 including engineering, survey and contingency.
- Project 3c. Accessible ramps at all street corners, approximately 320 ramps. Estimated cost: $570,000 including engineering, survey and contingency.
- Project 3d. Streetscape plantings and other enhancements along the roadside edge, enhanced between IH 35 and Franklin Avenue, 13,000 LF along both streets. Estimated cost: $749,000 including engineering, survey and contingency.

Total Estimated Cost of Phase 3: $3,181,000

Phase 4 – Signal Upgrades for Enhanced Pedestrian Crossings

The signal upgrades at 29 intersections include the following (IH 35 intersections to be implemented by TxDOT):

- 17th @ Dutton, Clay, Webster, Franklin, Austin, Washington, Columbus, Waco, and Bosque
- 18th @ LaSalle, Dutton, Clay, Webster, Franklin, Austin, Washington, Columbus, Waco, Bosque, Homan, Colcord, Maple, Windsor, Herring, Lyle, and Alexander
- 19th @ Park Lake, Powell, Gregory/College

Total Estimated Cost of Phase 4: $324,000

Phase 5 – Street Reconstruction for Curb Line Modifications and Enhanced Sidewalk Zone North of Waco Drive

Phase 5 of the implementation plan will require coordination with the utility modifications north of Waco Drive to Park Lake Drive, and will also require significant funding. These elements include:

- Repair/upgrade existing underground water, sanitary and storm sewer utilities (to be programmed by City of Waco)
- Reconstruct the existing roadway pavement to the proposed configuration (to be included as part of the repairs needed as part of repairing the underground utilities)
- Install final Sidewalk Zone including: curbline modifications, 12-foot sidewalks, streetscape and lighting improvements

Total Estimated Cost of Phase 5: $4,429,000

Imagine Waco: A Plan For Greater Downtown (2010)

The plan has list of projects proposed. Since the 2023 Downtown implementation plan is more recent, the project list has been compiled for the 2023 plan instead.

TxDOT

Unified Transportation Program

Highway	Project ID (CSJ)	Est. Let Date Range	Limits From	Limits To	UTP Action	Est. Construction Cost ($)	Authorized Funding Category 2 ($)	Authorized Funding Category 4 ($)	Authorized Funding Category 12 ($)
SH 6	0258-09-147	FY 2024-2027	AT LAKE WACO	-	New Authorization	29,328,000	-	2,000,000	-
SH 6	0258-09-148	FY 2024-2027	AT LAKE WACO	-	New Authorization	29,328,000	-	2,000,000	-
SS 298	0055-08-120	FY 2024-2027	US 84	SL 396	No Funding Change	36,400,000	36,399,999	-	-
IH 35	0015-01-246	FY 2024-2027	S LP 340	12TH STREET	Funding Adjustment	262,500,000	64,050,000	67,200,000	131,250,000
SH 31	0162-01-100	FY 2024-2027	0.5 MI S of FM 2311	0.5 MI N of FM 2311	No Funding Change	11,200,000	5,600,000	5,600,000	-
SH 6	0258-08-035	FY 2024-2027	FM 185	MCLAUGHLIN RD (SPUR 412)	Funding Adjustment	5,040,000	5,040,000	-	-
SL 340	2362-01-034	FY 2028-2033	US 84	LP 484	Funding Adjustment	81,951,472	51,915,131	-	-
US 84	0055-08-121	FY 2028-2033	FM 1695	SS 298	New Authorization	223,283,200	25,300,000	15,600,000	-

APPENDIX D

MEETING AGENDAS AND MINUTES

List of Meetings

- Safety Action Task Force Meeting 5
- Safety Action Task Force Meeting 4
- Stakeholder Engagement Meeting 2: City of Lacy Lakeview
- Stakeholder Engagement Meeting 2: McLennan County
- Stakeholder Engagement Meeting 2: City of Waco
- Stakeholder Engagement Meeting 2: City of Hewitt
- Stakeholder Engagement Meeting 2: City of Woodway
- Stakeholder Engagement Meeting 2: City of Bellmead
- Stakeholder Engagement Meeting 2: City of Robinson
- Stakeholder Engagement Meeting 2: City of McGregor
- Stakeholder Engagement Meeting 1: McLennan County
- Safety Action Task Force Meeting 3
- Stakeholder Engagement Meeting 1: City of McGregor
- Stakeholder Engagement Meeting 1: City of Woodway
- Stakeholder Engagement Meeting 1: City of Hewitt
- Stakeholder Engagement Meeting 1: City of Robinson
- Stakeholder Engagement Meeting 1: City of Lacy Lakeview
- Stakeholder Engagement Meeting 1: City of Bellmead
- Stakeholder Engagement Meeting 1: City of Waco
- Stakeholder Engagement Meeting 1: Connally ISD
- Stakeholder Engagement Meeting 1: Waco ISD
- Stakeholder Engagement Meeting 1: Midway ISD
- Stakeholder Engagement Meeting 1: La Vega ISD
- Safety Action Task Force Meeting 2
- Safety Action Task Force Meeting 1

Waco MPO Comprehensive Safety Action Plan

Safety Action Task Force Meeting 5

Date: April 15th, 2024
Time:

ATTENDEES

- City of Waco - Mukesh Kumar - MukeshK@wacotx.gov, Paul Campos - PCampos@wacotx.gov, Nora Roy - NoraR@wacotx.gov, Arthur Chambers - arthurc@wacotx.gov , Daniela Gallegos danielag@wacotx.gov , Annette Polk annettep@wacotx.gov
- TJKM - Ruta Jariwala rjariwala@tjkm.com

Other Agencies

Name	Email	Agency	Attendance
Yost Zakary	yzakhary@bellmeadtx.gov	Bellmead	
Greg Snydal	gsnydal@bellmeadtx.gov	Bellmead	
Shanna Sanders	Ssanders@connally.org	Connally ISD	
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Jeron Barnett	jeron.barnett@lacylakeview.org	Lacy Lakeview	
Andy Moore	andy.moore@lacylakeview.org	Lacy Lakeview	
Kerry Blakemore	kerry.blakemore@lavegaisd.org	La Vega ISD	
Zane Dunnam	zane.dunnam@co.mclennan.tx.us	McLennan County	
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Ricky Edison	ricky.edison@wacoisd.org	Waco ISD	
Gloria Barrera	gloria.barrera@wacoisd.org	Waco ISD	
Sgt. Chad Ashworth	ChadA@wacotx.gov	Waco PD	
Mitch Davison	mdavison@woodwaytexas.gov	Woodway	

AGENDA

Waco MPO Comprehensive Safety Action Plan

Safety Action Task Force Meeting 4

Date: March 11th, 2024
Time:

ATTENDEES

- City of Waco - Mukesh Kumar - MukeshK@wacotx.gov, Paul Campos - PCampos@wacotx.gov, Nora Roy - NoraR@wacotx.gov, Arthur Chambers - arthurc@wacotx.gov , Daniela Gallegos danielag@wacotx.gov , Annette Polk annettep@wacotx.gov
- TJKM - Ruta Jariwala rjariwala@tjkm.com , Kurt Schulte kschulte@TJKM.com

Other Agencies

Name	Email	Agency	Attendance
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Sgt. Chad Ashworth	ChadA@wacotx.gov	Waco PD	
Mitch Davison	mdavison@woodwaytexas.gov	Woodway	

AGENDA

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 2: City of Lacy Lakeview

Date: April 1th, 2024
Time: 3pm - 4pm CT

ATTENDEES

Present

- Waco MPO: Mukesh Kumar MukeshK@wacotx.gov, Nora Roy NoraR@wacotx.gov, Annette Polk AnnetteP@wacotx.gov, Arthur Chambers <ArthurC@wacotx.gov>
- TJKM: Ruta Jariwala, Kurt Schulte, Chaithra Navada, Andrew Dickinson, Talha Majeed

Not Present

- City of Lacy Lakeview: Jeron Barnett, Andy Moore

AGENDA

1. Safety projects presentation for the City of Lacy Lakeview
2. City staff feedback on the safety projects presentation
3. Presenting City of Lacy Lakeview collision analysis chapter of the report
4. Next Steps
   a. City to review and provide feedback, and priorities on safety projects and improvements
   b. City to review City of Lacy Lakeview collision analysis chapter of the report

NOTES

- The invitees from of Lacy Lakeview did not attend the meeting. Meeting was shortened after a discussion with Waco MPO. Safety projects will be emailed to the City staff for their review and comments.
- Add to the mailing list for Lacy Lakeview: Calvin Hodde - calvin.hodde@lacylakeview.org

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 2: McLennan County

Date: April 1th, 2024
Time: 1pm - 2pm CT

ATTENDEES

McLennan County:

Zane Dunnam	zane.dunnam@co.mclennan.tx.us	McLennan County	Present
Monica Hendrix	mhendrix@lorenatx.gov	Lorena	•
Kevin Neal	kneal@lorenatx.gov	Lorena	Present
Pam Neal	pcombs@bruceville-eddy.us	Bruceville-Eddy	•
Kent Manton	kmanton@bruceville-eddy.us	Bruceville-Eddy	•
Nancy Hunt-Coffey	Citymanager@beverlyhills.org	Beverly Hills	•
Huma Ahmed	hahmed@beverlyhills.org	Beverly Hills	•
Vanessa Perez	(254) 826-5351	West	•
Shelly Gillaspie	(254) 826-5352	West	•
Jim Jaska	mjcjaska@att.net	Ross, Riesel	•
Keith Fisher	kfisher@moodytx.gov	Moody	•
Molly McGraw	cityofgholson05@gmail.com	Gholson	•
Tina Veselka	leroytownship@gmail.com	Leroy	•
Brian Bolfing	(254) 486-2125	Crawford	•
Alicia Chaney	(254) 486-2126	Crawford	•
Phyllis Glockzin	(254) 875-2519	Hallsburg	•
Mike Glockzin	mike.glockzin@memberschoicectfcu.org	Hallsburg	•
Doug Marvin	doug.marvin@hallsburgisd.net	Hallsburg ISD	•

Lambert Little	cityadmin@cityofmart.org	Mart	•
City Staff		Golinda	•
City Staff		Valley Mills	•
City Staff		Elm Mott	•
City Staff		China Spring	•
City Staff		Eddy	•

Present

- Waco MPO: Mukesh Kumar MukeshK@wacotx.gov, Nora Roy NoraR@wacotx.gov, Annette Polk AnnetteP@wacotx.gov, Arthur Chambers <ArthurC@wacotx.gov>
- TJKM: Ruta Jariwala, Kurt Schulte, Chaithra Navada, Andrew Dickinson, Talha Majeed

AGENDA

1. Safety projects presentation for the McLennan County
2. City staff feedback on the safety projects presentation
3. Presenting collision analysis chapter of the report
4. Next Steps
    a. City to review and provide feedback, and priorities on safety projects and improvements
    b. City to review County collision analysis chapter of the report

NOTES

- I-35 Frontage and Ross Rd: Does not recommend roundabout, Flashing/blinking red light on top of stop sign
- Fm 939 and HS 31: Mail lane overpass near completion. TxDOT has photographs for project update. Clint and Zaka - TxDOT waco office
- FM2113 and FM2837: Driveways close to intersection - potential conflict point
- County Specified Intersections
    - Roger Hills - Blind Curve. County needs to buy RoW to relay intersection geometry. The signing, and other improvement might not help
    - Harrison Rd and Trading Post Road - Potential location for roundabout or traffic circle
- Chapel Rd:
- Speegleville Road:
- Rock Creek Rd: intersection with flat rock road - requests for a four-way stop. County is not putting the stop because Rock Creek Rd is high volume traffic- Planning Study with new developments
- Mazanec Rd -
- Park hill Elementary School -
- Turn on Warren road on west - water - erosion. (E) Warren to Old Lorena - water erosion on the South side. Deep Ditches.
- Interested in existing lighting inventory
- Unincorporated communities - sidewalk connectivity in these locations
- One other intersection to look at - Baylor Camp Rd/Higginbotham Rd/Meandering rd intersection. Previous request - 4-way stop . The intersection/roadway will need to be realigned. 31.626825199148687, -97.30915769077355
- **Lorena (from public input**) Line of sight from vertical elevations, and reduced site limitations due to east-west direction of travel at times of sunrise and sunset. Lorena, Unincorporate - Rosenthal Rd - Sight Distance

- McGregor, Waco and Bellmead - SS4A grants are applying

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 2: City of Waco

Date: Mar 28th, 2024
Time: 4pm - 6pm CT

ATTENDEES

Present

- Waco MPO: Mukesh Kumar MukeshK@wacotx.gov, Nora Roy NoraR@wacotx.gov, Annette Polk AnnetteP@wacotx.gov, Arthur Chambers <ArthurC@wacotx.gov>
- TJKM: Ruta Jariwala, Kurt Schulte, Chaithra Navada, Andrew Dickinson, Talha Majeed, Rutvij Patel
- City Of Waco: J Bailey, Jbailey@Wacotx.Gov, Chad Ashwort, Waco Police Department Police Unit, Christine Miller, Traffic Engineer And Public Works, Jim Reed, Streets Division Manager, Jimr@Wacotx.Gov, Roger Blakley, Senior Streets Engineer, Rblakley@Wacotx.Gov, Rodriguez

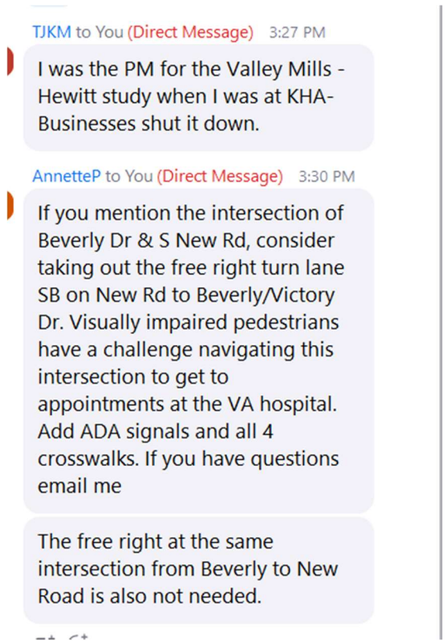
AGENDA

1. Safety projects presentation for the City of Waco
2. City staff feedback on the safety projects presentation
3. Presenting Waco collision analysis chapter of the report
4. Next Steps
    a. City to review and provide feedback, and priorities on safety projects and improvements
    b. City to review Waco collision analysis chapter of the report

NOTES

- N Valley Mills Rd
    - Lakeshore Dr - Raised median, lighting in thinking of the city. One direction roads on local roads.
    - Turning movements. Two hit-on crashes. Wet weather, hydroplaning.
    - Not success under HSIP
    - SI index - pretty expensive project. We were going to go up to 19th St. We can focus on some of the curve sections.
    - Road from Mt Carmel down the slope is two lanes. You cannot do a separation island in that section. On north - they north of Hillcrest Dr to 19th
    - Re-did intersection recently at Mt Carmel.
    - Hillcrest - further than where we want to start.
    - Median - some location, we will need feedback if we are crossing access to cross streets, etc. Mt Carmel to 19th - location
    - Each location has to be studied. It can be a smaller study. Some public input opportunity for feedback is enough.
    - Redone all pavement - all good.
    - Little walkability issue - no sidewalk on corridor, all in neighborhood.
    - Traffic signals, lighting, and raised median.

- Biking - no demand for biking. Traffic on the road is fast. At present, there is a bike shoulder, with no bike symbols on Lakeshore Dr
- N Valley Mills Dr
  - TxDOT opposes installing median on this road.
  - HSIP sidewalk project has been completed
  - Will have to convince TxDOT for the safety project reccomendations.
  - Regarding Phase 2 - Median. With space for turnaround in some locations. Presented in public meetings
  - Phased study - feasibility, design – is possible. An example of good median is at Median example is in City of Copperas Cove
  - Safety issues present at the following intersection - Sangers Ave, N New road
  - City limit line with Beverly Hills. Each segment of the corridor needs to be complete.
  - We don't need agreement from TxDOT on things in the safety proejcts listed. It can be funded via a HSIP
- Priority for funding in this grant for the City is Lakeshore Dr. It cannot be funded with HSIP. It is an off-system project - not a lot of money to compete with the other projects.
- Minor street improvements – City is not interested in maintaining striping
- 18th st
  - A TxDOT facility. Sidewalks done from Waco Dr to La Salle Dr
  - There is an available Jacobs study on 17/18/19th st among others. Recommend any additions.
- FM1637
  - 5th St - will be improved this year.
    - Downtown section of 5th St extended to Herring, with similar projects as listed in the safety project.
    - Street lighting is missing along the corridor
  - Between Park and Powell Dr
    - lane reduction and bike lane addition will be done.
    - Three lane with a turn lane up in next change
  - 4th St
    - No sidewalk. A lot of bamboo. Making it accessible is a primary concern.
  - Will compete for funds for 4th and 5th. Should be highlighted in the report.
  - Will be hard to lump into one project. Leave it as it is in the final project list., even for 5th St. no sidewalk
  - Improvement to consider intersection at 18/19th St split. People drive into the grocery store.
- Bosque Blvd
  - Blue Bosque Blvd. - TxDOT facility
    - Not sure if there is real bigger projects here.
    - Street project - 30th valley mills drive
  - Signal timings improve Lake Air Dr to 35. Five signals are improving
  - New Road needs updated curb ramps. Medians improvements for Bosque can be considered. There is significant roadway deterioration. It will need relocation utilities for any complete streets like improvement.
  - HSIP project - Wooded Acres, New Rd, 39th, 34th and one more
  - Wider 2-year segment - can be stripped for parking, etc
  - There is an existing bike lane on Colcord.
- Hewitt
  - Yes to improvements
- S New Rd
  - City attempting to get New bridge on railroad - bridge grants
- Franklin Ave/Taylor Ave
  - Franklin 17/18 - signal upgrade is upcoming. Planned two-way conversation till the 11th. Parking is a challenge. There are no bikelanes on the road as it sees semi-truck traffic.
  - Projected left turns at intersection – City can consider and model it to check if it is necessary.



- US-84/Waco Drive.
  - All corridors are complete. - Reconstruction. Crosswalk and signal changes
  - Median Break closures - considering. On unsignalized side streets
  - Roadway needs to be reconstructed (TxDOT). Two projects - HSIP
  - You can do lighting in median
- Neighborhood streets
  - Centerline striping - done when roads are resurfaced
  - School safety and pedestrian improvement - hard to get schools on board
  - Mars Dr - looking for a grant opportunity for this area
  - Sanger Ave – considering a road diet alongside reconstructing signals. It will need public input and engagement, to prepare application for the next HSIP cycle.
- HSIP intersection 9
- New Rd and Old Robinson Rd
- #2 intersections - Add pedestrian crossing there.
- School projects
  - Sanger Ave - 20mph school speed, RRFB
  - High volume crossing
- Chapel Rd
  - City working on : Dummy curb ramp on one side
  - Widening Ritchie Rd to Woodgate - sidewalks will be installed
  - City does not support Bikelane on Chapel Rd. Can consider a 10-ft bikelane shared use path on school side of the roadway
- City will not pursue sign inventory project. There are multiple similar initiatives in the city
- City is not interested in city wide projects like ATP, traffic calming, street light inventory, stop sign inventory, traffic signal upgrades. City has an unofficial NTCP in place.

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 2: City of Hewitt

Date: Mar 28th, 2024
Time: 3pm - 4pm CT

ATTENDEES

Present

- Waco MPO: Nora Roy NoraR@wacotx.gov, Annette Polk AnnetteP@wacotx.gov, Arthur Chambers <ArthurC@wacotx.gov>
- TJKM: Ruta Jariwala, Kurt Schulte, Chaithra Navada, Andrew Dickinson, Talha Majeed
- City of Hewitt: S Coleman, Director General Services, Bo Thomas, City Manager, Jim Devlin, Assistant City Manager, Kevin Reinke, Utilities Director, Miles Whitney, City Engineer Jonathan Christian, Fire Chief

AGENDA

1. Safety projects presentation for the City of Hewitt
2. City staff feedback on the safety projects presentation
3. Presenting Hewitt collision analysis chapter of the report
4. Next Steps
    a. City to review and provide feedback, and priorities on safety projects and improvements
    b. City to review Hewitt collision analysis chapter of the report

NOTES

- N Hewitt Dr
    - Panther Way and Hewitt Dr - issue with turning lanes. Geometry issue. Angle of the turn - difficult to see the turn without being exposed to danger on the South bound lane.
    - Shopping center and first St - dicey left turn
    - Chama/Hewitt Dr - potential to become a busy intersection with a new tea shop upcoming - shared drives on the city side that will create an issue. Driveway consolidation
    - Traffic study on the project
    - Across Chama St - little Caesars pizza, etc. Multiple businesses with wide driveway into the business off Hewitt Dr. 7:30-8am and in the evening. Left hand traffic on southbound Hewitt Dr traffic. Backed Up traffic on the left turn to Sun Valley on Hewitt Dr. People passing through parking lots
    - Discussed with TxDOT timing of signals of Sun Valley intersection. Timing is off on the left hand turn. In conjunction with train track that is coming up
    - Is there a policy that limits the driveway on Hewitt Dr.
    - Median on Hewitt Dr - business owners opposed. Designated as no access point
    - Flexible Bollards on Chama to stop cut-through traffic, but still access businesses
    - Issue - trucks/semi making delivery to the shops
- S Hewitt Dr
    - S Hewitt Dr / Spring Valley - U turn on southbound Hewitt to get on to Spring Valley entrance ramp - flexible bollards to prevent left turn
    - Propose improvement for the U-turn - signalization at Agile St - Warrant Study is required

    - TIA or warrant study - possible signal at Agile St. Can it include old temple intersection? Yes.
    - Suggest it to a future CSAP - study - spring valley intersection
    - Pay attention to sidewalks along Hewitt Dr that are already in place near the regional park. You need to zoom to be able to see them - Annette in the meeting
- Warren St
    - Warren in Waco - narrow road.
- Old Temple Road
    - Truck traffic- north of Sun Valley intersection (with construction - temporary, and Waco - businesses coming up)
- Spring Valley
    - Sidewalks will be addressed. Crosswalk - not sure.
    - Roadway widening - center left turn lane all the way through the corridor.
- Sun Valley
- S 1st and Warren
    - Issue - Drainage, with deep valley gutters on both sides of the intersection. Additional RoW will be required to construct a traffic circle - not possible

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 2: City of Woodway

Date: Mar 27th, 2024
Time: 2pm - 3pm CT

ATTENDEES

Present

- Waco MPO: Nora Roy NoraR@wacotx.gov, Annette Polk AnnetteP@wacotx.gov, Arthur Chambers <ArthurC@wacotx.gov>
- TJKM: Ruta Jariwala, Chaithra Navada, Andrew Dickinson, Talha Majeed

Not Present

- City of Woodway: Mitch Davison

AGENDA

1. Safety projects presentation for the City of Woodway
2. City staff feedback on the safety projects presentation
3. Presenting Woodway collision analysis chapter of the report
4. Next Steps
    a. City to review and provide feedback, and priorities on safety projects and improvements
    b. City to review Woodway collision analysis chapter of the report

NOTES

- City staff did not attend the meeting. Safety projects were discussed with the MPO. The projects to be sent to the City staff for review.
- Estates Road - check with the city about the sidewalk project on Woodway Elementary School. Woodway turned down the TA grant. With Midway ISD to spend money on the project. They did not want to develop a sidewalk in front of the private company.
- This is the TA project that Woodway was approved for but is now in jeopardy: Project: Neighborhood and Elementary School Sidewalk Connector, Program: Transportation Alternatives, Fiscal Year: 2025, Applicant: City of Woodway, Extent: Midway Dr from Harvey Dr to Estate Dr; Estates Dr from Midway Dr to Jordan Ln , GROUP ID 5000-00-916, TxDOT CSJ 0909-22-216, STATUS Expected Let 5/3/2025: Construct continuous sidewalk along Midway and Estates Drives to improve pedestrian safety and ease vehicular use near Woodway Elementary School, and to connect adjacent neighborhoods to nearby retail opportunities.
    - Ask city for the status of the TA funding
    - Neighborhood and Elementary School Sidewalk Connector Program
    - On Midway and Estates Drive
- **Woodway Projects:**
    - **Supplemental Planning:**
        - Neighborhood Traffic Calming Program
        - Develop an Active Transportation Plan
    - **Design and Implementation:**
        - Bosque Blvd Complete Streets Project: Include all intersection improvement on Bosque. Roundabout - separate project need to discuss with the city
        - *[optional]* Estates Dr Safety Improvement Project: Sidewalk Gap on Estates all the way till 84 intersection.

- Santa Fe Corridor Safety Improvement Project: Remove roundabout recommendation
- Ritchie Road and Old McGregor Road Intersection Improvements
- Citywide Streetlight Inventory (Inventory and Replacement)
- Citywide Sign Inventory and Pavement Delineation (Inventory and Replacement)

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 2: City of Bellmead

Date: Mar 20th, 2024
Time: 4pm - 5pm CT

ATTENDEES

Present

- Waco MPO: Mukesh Kumar MukeshK@wacotx.gov, Nora Roy NoraR@wacotx.gov, Annette Polk AnnetteP@wacotx.gov, Arthur Chambers <ArthurC@wacotx.gov>
- TJKM: Ruta Jariwala, Kurt Schulte, Chaithra Navada, Andrew Dickinson, Talha Majeed
- City of Bellmead: Yost Zakhary <yzakhary@bellmeadtx.gov>; Fred Morris, Director of Community Development; Karen Evans, Assistant City Manager / Chief Financial Officer

Not Present

- City of Bellmead: Gregory Snydal <gsnydal@bellmeadtx.gov>;

AGENDA

1. Safety projects presentation for the City of Bellmead
2. City staff feedback on the safety projects presentation
3. Presenting Bellmead collision analysis chapter of the report
4. Next Steps
    a. City to review and provide feedback, and priorities on safety projects and improvements
    b. City to review Bellmead collision analysis chapter of the report
    c. Reminder: Community/stakeholder input deadline: March 24th

NOTES

- Airbase Rd
    - TxDOT RoW. 55 mph.
    - City - wants to know the chances of getting roundabout or street lights.
    - Roundabouts have come up positive terms in SS4A meetings with FHWA. Let's focus on the roundabout for this intersection.
        - Example: Chapel Rd at Ritchie Rd in West Waco
        - Implementation and Design grant
    - Traffic counts: AADT in 2022 - 2839 https://txdot.maps.arcgis.com/apps/webappviewer/index.html?id=06fea0307dda42c1976194bf5a98b3a1
- Concord Rd
    - No comments
- Harrison St
    - Not many bikes on Harrison St. Nice to have the ability to do it.
    - **Two narrow road lanes, and a shared bike/walk path on one side**. More walking than biking on this street. Bikes being stolen complaints - more internal discussion on it needed. Office on streets see it more. Pavement section to allow narrower road lanes - shared use-path.
    - Needs further discussion.
- School/Neighborhood Traffic Calming on Parrish St

    - Wheeler - Lot of kids on street - sidewalk #1 priority
- Bellmead Dr
    - #1 priority, does not want attention taken away from it to do other projects.
    - Already exists - analysis of corridors for projects.
- Lighting City wide - matter of funding.
- Sign inventory
    - Interested in going for a sign inventory with MPO.
    - Currently updating and replacing old signs - 200 a year
    - Approximately 1000 signs in the city
- Loop 340
    - Drainage issues on this corridor. Have an increased cost to cover the drainage work.
- Signalized Intersections in Bellmead
    - Bellmead Dr, New Dallas Hwy. All are maintained by TxDOT
- Pedestrian Safety in School Zone
    - Around elementary school - good project for the neighborhood.
    - Cost breakdowns - two cost breakdowns, one for each project
- Other projects
- 20% - 6 - 7 Million $
    - Priority
    - #1 Bellmead Dr Corridor Safety Improvement Project
    - #2 Concord Rd
        - CDBG Water sewer project to get some of the work done.
    - Sidewalks Improvements
    - Harrison St Multimodal Corridor Project
        - Center striping, marking and bike lane- how many crashes in last three years
        - More enforcement in the last three years. Maintenance budget.
    - Basic Thoroughfare Plan - supplemental plan
- Katy Ln - water and sewer project in plan. Check possibility for other projects -street rehab.
- Loop 84 and 35 - 340 elevated highway - April 15th in MTP - Chaithra to check MTP
    - Loop 340 - between 84 and 35. Standalone document - sin MTP. - April 15 discussion with TxDOT. Please look at the project in the MTP - eventual goal - elevated highways ending at 84, making safety conditions more severe. What is the kind of project that needs to be done in conjunction with this improvement? 4 lanes of main lane, and 4 lanes of frontage.
    - Eventually the goal is to connect to 35 on an elevated highway.

- (6M (Bellmead Drive, Concord Dr (CDBG money water sewer), Sidewalks, Harrison (Center Striping & Bike Lane))), Basic Thoroughfare Plan. Katie Lane Water Sewer

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 2: City of Robinson

Date: Mar 20th, 2024
Time: 1pm - 2pm CT

ATTENDEES

Present

- Waco MPO: Mukesh Kumar MukeshK@wacotx.gov, Nora Roy NoraR@wacotx.gov, Annette Polk AnnetteP@wacotx.gov, Arthur Chambers <ArthurC@wacotx.gov>
- TJKM: Ruta Jariwala, Kurt Schulte, Chaithra Navada, Andrew Dickinson, Talha Majeed
- City of Robinson: Craig Lemin <c.lemin@robinsontexas.org>; David Harrell <d.harrell@robinsontexas.org>;

Not Present

- City of Robinson: Danny Smith <d.smith@robinsontexas.org>; Destiny DeLillo <d.delillo@robinsontexas.org>;

AGENDA

1. Safety projects presentation for the City of Robinson
2. City staff feedback on the safety projects presentation
3. Presenting Robinson collision analysis chapter of the report
4. Next Steps
    a. City to review and provide feedback, and priorities on safety projects and improvements
    b. City to review Robinson collision analysis chapter of the report
    c. Reminder: Community/stakeholder input deadline: March 24th

NOTES

- Hwy 77
    - Sidewalk - challenge - drainage ditches on each side of the roadway.
        - Peplow Dr - driveways and parking lot. Not enough space for sidewalk
        - Consider higher end for cost estimate to account for the drainage
    - Upcoming Pavement replacement - 2025
    - Median - right direction
        - Additional steps - Florida DOT - U-turns with signalization at intersections (what about it?)
    - Bikelane - Robinson Dr goes through areas that will be redeveloped- it will have higher density - mixed use path would be appropriate.
- Intersections on Hwy 77
    - Moonlight and Hwy 77 - New Signal from TxDOT. Details not available

- Lyndale and Hwy 77 - New Signal from TxDOT. Details not available
- Moonlight Dr
  - Effective countermeasures for speeding - extra patrolling, speed trailers with data capturing. More issues at night
- Old Robinson Rd
  - We have to consider the cost to acquire ROW. Narrow ROW, houses very close to the road. Prescriptive ROW.
  - Weather issues - road sinks/rises in summer/rains. In 2011 Road was reclaimed, re-stabilize. Drainage on either side of the street
  - City tried to put together a sidewalk grant for the length of the school on Old Robinson, but not enough ROW to go ahead - Get document from City - Green Application (TxDOT Safe Routes to School)
    - Recommend: Supplemental Planning Study for Feasibility of Safe Routes to School project and Multimodal Corridor on Old Robinson Rd
  - Some cut through, no recent traffic count data. Street mostly used to reach the schools.
  - Mention that street lighting and other elements are missing in the corridor. But no specific project recommendation for this corridor. Street lighting - larger city-wide project.
- Overall Street light inventory - Yes.
- School Sidewalk Project
  - Sidewalk around the schools: Lots of movement between schools - high and junior high share facilities.
  - Issue - main road in front of high school has drainage ditches. Cost issue
  - Include drainage in cost estimation
  - Recommend: Supplemental Planning Study - include it for all school area in a single project along with Old Robinson Dr
  - Interim improvement: separate project for priority crosswalk locations.
- Other Projects
  - Greig Dr - industrial developments along the area. Plan to build the road till Gateway. 18-19M project. Funding source: Tax increment reinvestment zone, waiting for developments to come up to get the money.
    - Timeline - bridge replacement - 24 months. Rest - depends on how much development comes in the region. Need to create increment. 4-5 years
- Other issues - Streets, including residential streets needing rehab.
- 20% Match - several million dollars

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 2: City of McGregor

Date: Mar 19th, 2024
Time: 3pm - 4pm CT

ATTENDEES

Present

- Waco MPO: Mukesh Kumar MukeshK@wacotx.gov, Nora Roy NoraR@wacotx.gov, Annette Polk AnnetteP@wacotx.gov, Arthur Chambers <ArthurC@wacotx.gov>
- TJKM: Ruta Jariwala, Kurt Schulte, Chaithra Navada, Andrew Dickinson, Talha Majeed, Rutvij Patel
- City of McGregor: Bryan LeMeilluer <blemeilleur@mcgregor-texas.com>; Chad Saylors <csaylors@mcgregor-texas.com> Allex

AGENDA

1. Safety Project Presentation for the City of McGregor
2. City Staff Feedback on the presentation
3. Next Steps
    a. City to review McGregor Collision Analysis Chapter of the report
    b. City to review and provide feedback on safety projects and improvements
    c. Community/stakeholder input deadline: March 24th

NOTES

- Main St: https://apps3.txdot.gov/apps-cq/project_tracker/
    - McGregor Relief Route: 400’ wide freeway - Neighborhood is going to be disconnected (McGregor relief route) 84-317 Interchange - Short-term 4-5yrs, Long-term 10-20 years
        - Rails south of 84 - to the industrial park after the neighborhood. The road goes through an overpass.
        - Leave the countermeasures, without any caveats
        - Map sent to MPO
    - Recommendations: Supplemental action items: City is okay
        - Main St Improvement Project,
        - Neighborhood Traffic Calming Program.
        - Traffic Flow Analysis/Movement analysis
    - Intersection: Third/6th Street - Full ADA Crosswalks. AFA and resolution in process of being finalized. - Document request
    - Bike-ped
        - Bike Lanes - Potential in 6th street, a shared bike markings. City not positive about bike lanes.
        - Downtown in redevelopment, Main St will see more traffic, and interaction with pedestrians. Open to safety, walkability, bikeability improvements.
    - MPO - fire department agreement on improvements. City has a volunteer fire department.
    - (check recording again ~20 mins) Lighting -

- Supplemental Action Plan grant - signage inventory - will be taken up by MPO - all cities can participate if requested to be included. City/County will not be listed in the Grant. Discussion ongoing at the policy board and TAC

- Supplementary Planning Application - NTCP
  - Main St Improvement Project,
  - Neighborhood Traffic Calming Program
- Traffic Flow Analysis/Movement analysis
- US-84
  - US-84 & Cotton Belt Pkwy no deceleration lane
  - Red area - Johnson and 84 reconfiguration to be a hard turn instead of a yield. Pedestrian southside to north side of 84 to crossing at Johnson Dr and 317
  - **Carbon Reduction Program: Sidewalk/Shared use path on 84,** Link on Server: J:\JURISDICTION\W\Waco-TX\373-001 Waco MPO Comprehensive Safety Action Plan (CSAP)\Data collected\Literature Review\Planning Documents\McGregor
    - Earlier funding attempt Transportation Alternatives TxDOT was unsuccessful
      - 3.3$ Million
      - New Sidewalk - Downtown McGregor to Johnson St
      - Shared Use path- Johnson St to Cotton Belt Pkwy along the rail bed
      - Serving: 4 neighborhoods, 2 multi-family apt complexes
      - Implementation grant - feasibility design and construction - for Shared use path
    - **City interested in this year's SS4A Application grant cycle.** City can put in-house data together. Defer to partners for design. Break down into two grant applications can be looked for into this plan - sidewalk and shared use path.
- Intersections - US-84 and Johnson - Gatesville. Not Greenville. West end Rd - needs to be considered in the signal timing.
- Schools
  - School bond election - if it passes, A100 on Johnson Dr building transferred ownership to School District, and middle school transfer over to other school location
  - Rehabilitating Johnson Drive, Bluebonnet to 84 - one way each way with a center turn lane.
  - Bike lanes/SRST to the area - Supplemental Planning Project can be considered by the city
- Bikelanes -
  - E-W: 6th St - wide road - better option for bike lane. Easiest one to implement.
  - E-W: 11th St - future project - bike lane
  - N-S: Tyler/Jackson Ave
  - 11st St turns into Randle -
- Navajo Trail - Lighting and Signage possible. Others, difficult to fix.

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 1: McLennan County

Date: Feb 21st, 2024
Time: 9:00 am to 10:30 am CT

ATTENDEES

Present

- Waco MPO: Mukesh Kumar MukeshK@wacotx.gov, Nora Roy NoraR@wacotx.gov, Annette Polk AnnetteP@wacotx.gov, Arthur Chambers <ArthurC@wacotx.gov>
- TJKM: Ruta Jariwala, Kurt Schulte, Chaithra Navada, Utsav Domadia,

McLennan County and other Agencies -

Name	Email	Agency	Attendance
Zane Dunnam	zane.dunnam@co.mclennan.tx.us	McLennan County	Present
Monica Hendrix	mhendrix@lorenatx.gov	Lorena	•
Kevin Neal	kneal@lorenatx.gov	Lorena	Present
Pam Neal	pcombs@bruceville-eddy.us	Bruceville-Eddy	•
Kent Manton	kmanton@bruceville-eddy.us	Bruceville-Eddy	•
Nancy Hunt-Coffey	Citymanager@beverlyhills.org	Beverly Hills	•
Huma Ahmed	hahmed@beverlyhills.org	Beverly Hills	•
Vanessa Perez	(254) 826-5351	West	•
Shelly Gillaspie	(254) 826-5352	West	•
Jim Jaska	mjcjaska@att.net	Ross, Riesel	•
Keith Fisher	kfisher@moodytx.gov	Moody	•
Molly McGraw	cityofgholson05@gmail.com	Gholson	•
Tina Veselka	leroytownship@gmail.com	Leroy	•
Brian Bolfing	(254) 486-2125	Crawford	•
Alicia Chaney	(254) 486-2126	Crawford	•

Phyllis Glockzin	(254) 875-2519	Hallsburg	•
Mike Glockzin	mike.glockzin@memberschoicectfcu.org	Hallsburg	•
Doug Marvin	doug.marvin@hallsburgisd.net	Hallsburg ISD	•
City Administration	cityadmin@cityofmart.org	Mart	•
		Golinda	•
		Valley Mills	•
		Elm Mott	•
		China Spring	•
		Eddy	•

AGENDA

1. Introductions
2. Overview of the Waco MPO Safety Action Plan
    a. Primary goal: Reducing crashes
    b. Safety of traveling public (auto, pedestrian, bicycle)
3. Safety overview for:
    a. Collision summaries
    b. Location-based collisions for 2014-2023
    c. Quick overview of crash severity, contributing factors, etc.
    d. County vs. TxDOT ROW
4. City Staff Open Forum
    a. Known Issues with safety (roads/locations)
    b. Safety guards, police, speeds
    c. Other observations
5. Next Steps
    a. Document comments from meetings with the city
    b. Conduct community/stakeholder input session - Online Survey https://app.maptionnaire.com/q/62agr3zbn3v8
    c. Evaluate collisions for potential mitigation

NOTES

County

1. Roadway Segments
    a. Chapel Road:
        i. Planned: Under contract to widen the road and remove ditches
        ii. Current issues:
            1. Narrow road, with deep ditches
            2. Limited sign distance in turns or hilly segments
            3. Sidewalk gaps, especially in smaller urban settlements
    b. Speegleville Rd
        i. Existing: Improved from a two-lane to a three-lane road - middle Bosque River to north HWY-6
        ii. Planned: City of Waco limits - Middle Bosque River to SR-84 improvements with a new bridge on Middle Bosque
        iii. Issues (county owned)
            1. Unsafe Speeds: Rural roads with 50 Mph limit, but people drive faster. With more development, this can lead to issues
            2. Inadequate sidewalks: More sidewalks in urban areas of the road might be helpful. Middle School (river valley?) - City of Waco has some sidewalks near the school in Speegleville. Does not continue beyond the city limits.
    c. Ritchie Rd: Missing sidewalks near Park Hill Elementary School on county side of the street. Needs to identify funding opportunities.
        i. The City of Hewitt is constructing sidewalks on its side under the carbon reduction program.
        ii. Residential developments near the school would mean more kids walk to school. No possibility of adding sidewalk requirement for site plan approval within the County/ These areas may be annexed into Hewitt once they develop. However at present the county manages that side of the street.
        iii. County already partnered with the City to put up school zone signs.
2. Intersections
    a. Chapel Rd and Old Lorena Rd (FM 2837): New signal has been placed by TxDOT. Earlier had sight-distance issues when approaching the intersection from south.
    b. 

3. County-wide:
    a. Issues on county roads in McLennan
        i. Unsafe speeds: De Facto speed on Unsigned roads speed range is between 30 to 60 mph. People drive over 70.
            1. Speed feedback signs: were used without a data capture radar. Did not provide much useful insights into speeding and were discontinued.
            2. Interested: speed feedback signs with data capture radars
        ii. Narrow roads with no shoulders and deep ditches on either side - 21 ft road, with 10.5’ travel lanes. No place to recover if a driver veers off the road
        iii. Postal mailboxes improperly placed too close to the road,
        iv. Limited sight distance: limited vertical sight distance on hilly roads and limited horizontal sight distance on curves
            1. Solar powered flashing lights, and more signage
        v. County does not maintain street lighting, as there is no way to fund its maintenance.
    b. MPO Question: Hitting fixed objects if a top collision type for rural roads.
    c. Interested in Sign inventory project
4. Actions: City Engineer to discuss with road foremen for each precinct to identify problem areas through the map input platform.
5. Local sheriff’s deputies also have useful inputs for road safety data.

City of Lorena

1. I-35: Explore the effects of: TxDOT has experimented with diamond grading of concrete pavements near [31.387920417309488, -97.21194942253771]. However it drains water slowly.

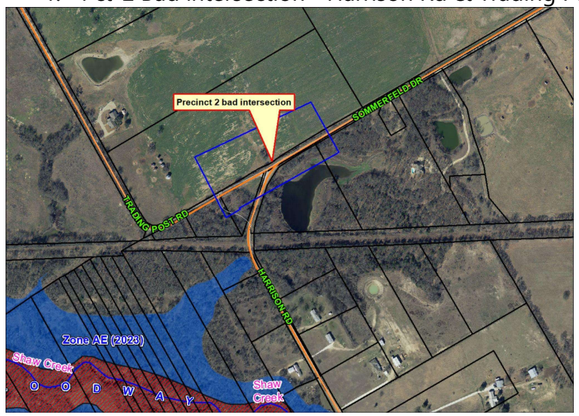
2. City streets mostly have a 30mph speed limit or lower.
3. City-wide issue: tight turns at intersections. Causes crashes when larger vehicles are present. There is limited ROW to expand or widen the turns.
4. Rosenthal Rd:
    a. Limited signage
    b. Vertical side distance issues due to hilly terrain. Sunlight limits visibility when driving east in the mornings, and west in the evenings.
5. Rosenthal Rd/Old Rosenthal Rd. 31.377495, -97.201227
    a. Limited sight distance

Projects:

- Sign inventory: either one for entire county, or break county into regions (precincts) based on B/C ratio
- Sidewalk improvements in urban areas of the county
- Flashing lights/warnings in limited visibility locations

Email from City

1. Pct-2 Bad intersection - Harrison Rd & Trading Post Rd



2. Pct-3 bad intersections
    a. Rogers Hill Spur & Ft Graham
    b. Hlavenka Rd. & E County Line East
    c. Beheler Rd. & N Katy Rd.
    d. E Hilltop Dr. & N Katy Rd.
    e. E Rainer Ln. & Ft Graham Rd.
    f. Shepperd Rd. & Meixner Rd.
    g. A J Muska rd. & E Weinberger Rd.
    h. Chudej Spur & Old Railroad Rd.

Waco MPO Comprehensive Safety Action Plan

Safety Action Task Force Meeting 3

Date: February 12th, 2024
Time: 2:00 pm to 3:00 pm

ATTENDEES

WacoMPO - Mukesh Kumar - MukeshK@wacotx.gov, Paul Campos - PCampos@wacotx.gov, Nora Roy - NoraR@wacotx.gov, Arthur Chambers - arthurc@wacotx.gov , Daniela Gallegos danielag@wacotx.gov , Annette Polk annettep@wacotx.gov

TJKM - Ruta Jariwala rjariwala@tjkm.com , Kurt Schulte kschulte@TJKM.com

Other Agencies

Name	Email	Agency	Attendance
Yost Zakary	yzakhary@bellmeadtx.gov	Bellmead	
Greg Snydal	gsnydal@bellmeadtx.gov	Bellmead	**Present**
Shanna Sanders	Ssanders@connally.org	Connally ISD	**Present**
Jim Devlin	jdevlin@cityofhewitt.com	Hewitt	**Present**
John McGrath	jmcgrath@cityofhewitt.com	Hewitt	**Present**
Jeron Barnett	jeron.barnett@lacylakeview.org	Lacy Lakeview	
Andy Moore	andy.moore@lacylakeview.org	Lacy Lakeview	
Kerry Blakemore	kerry.blakemore@lavegaisd.org	La Vega ISD	**Present**
Zane Dunnam	zane.dunnam@co.mclennan.tx.us	McLennan County	
Lashonda Malrey-Horne	lashondam@wacotx.gov	Waco Health District	
Bryan LeMeilluer	blemeilleur@mcgregor-texas.com	McGregor	
Chad Saylors	csaylors@mcgregor-texas.com	McGregor	
Jeff Foley	jeff.foley@midwayisd.org	Midway ISD	**Present**

Aaron Pena	aaron.pena@midwayisd.org	Midway ISD	
Craig Lemin	c.lemin@robinsontexas.org	Robinson	**Present**
David Harrell	d.harrell@robinsontexas.org	Robinson	**Present**
Jacob Chau	jacob.chau@txdot.gov	TxDOT	**Present**
Colton Smith	colton.smith@txdot.gov	TxDOT	**Present**
Amy Burlarley-Hyland	amyb@wacotx.gov	Waco	
Christine MIller	christinem@wacotx.gov	Waco	
Ricky Edison	ricky.edison@wacoisd.org	Waco ISD	
Gloria Barrera	gloria.barrera@wacoisd.org	Waco ISD	**Present**
Sgt. Chad Ashworth	ChadA@wacotx.gov	Waco PD	
Mitch Davison	mdavison@woodwaytexas.gov	Woodway	**Present**

AGENDA

- Online Map-based Survey Platform: https://app.maptionnaire.com/q/62agr3zbn3v8
- Data Request
    a. Provide list of Road Safety related Projects - https://docs.google.com/spreadsheets/d/18CA8s61Vd9k-FmYWRpGRfqV7m8DUux_GOy0o7pGoxf4/edit?usp=sharing Waco MPO Safety Action Plan - Planning Document Checklist & HSIP Projects
    b. Confirm the list of top corridors and intersections within your city and operating agency for these locations: Waco MPO Cities Top Corridors and Intersections
        i. Confirm if intersection list can combine both TxDOT and City maintained locations
- Recent Outreach Meetings:
    - City of Waco
    - City of Bellmead
    - City of Lacy Lakeview
    - City of Robinson
    - City of Hewitt
    - City of Woodway
    - City of McGregor
    - Waco ISD
    - La Vega ISD
    - Midway ISD
    - Connally ISD

- Outreach Meeting with McLennan County on **Feb 21, 9 - 10:30 am CT**
    a. All cities within the County are invited to attend and provide feedback on road safety concerns

- Preliminary Collision Analysis Dashboard on ArcGIS online portal: https://tjkm.maps.arcgis.com/apps/dashboards/9abb79d6e852415993b6594e5a28ec52

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 1: City of McGregor

Date: Feb 6th, 2024
Time: 2:30 pm to 3:30 pm CT

ATTENDEES

Present

- Waco MPO: Mukesh Kumar MukeshK@wacotx.gov, Nora Roy NoraR@wacotx.gov, Annette Polk AnnetteP@wacotx.gov, Arthur Chambers <ArthurC@wacotx.gov>
- TJKM: Ruta Jariwala, Kurt Schulte, Chaithra Navada, Utsav Domadia,
- City of McGregor - Kevins Evans, Brian

AGENDA

1. Introductions
2. Overview of the Waco MPO Safety Action Plan
    a. Primary goal: Reducing crashes
    b. Safety of traveling public (auto, pedestrian, bicycle)
3. Safety overview for:
    a. Collision summaries
    b. Location-based collisions for 2014-2023
    c. Quick overview of crash severity, contributing factors, etc.
    d. City vs. TxDOT ROW
4. City Staff Open Forum
    a. Known Issues with safety (roads/locations)
    b. Safety guards, police, speeds
    c. Other observations
5. Next Steps
    a. Document comments from meetings with the city
    b. Conduct community/stakeholder input session
    c. Evaluate collisions for potential mitigation

NOTES

1. Overview
    a. Intersections at SR-84 and SR-317 need improvements
2. Streets
    a. Navajo Trail
        i. Serves a subdivision with single access
        ii. One way in, and one way out road, causing crashes at intersections/driveway conflicts.

b. SR-317/N Main St
    i. Serves heavy truck traffic (carrying wind turbines, etc.). Oversized vehicles redirected to this direction.
    ii. Used by pedestrians
    iii. Railroad crossing on SR-317: Not used, a challenge to heavy load vehicles.
        1. Vehicles diverting from 317 via Johnson Dr – Bluebonnet Parkway to avoid the railroad pinch point.
c. Bluebonnet Parkway
    i. School route with heavy trucks on this road (attempting to avoid the railway pinch point on SR-317)
    ii. Plans to divert heavy traffic from this road
    iii. Traffic count got close to needing a warrant at Bluebonnet Pkwy and SR-317. Once truck traffic is taken out can be safer.
d. Johnson Dr
    i. In Plans – designate as Industrial Arterial in McGregor, to divert traffic from SR-317
    ii. Johnson Dr/ via Judith Dr – Mother Neff Parkway

3. Intersections
a. SR -84 and SR-317 intersection
    i. SR-84 is a high-speed road serving west going east traffic in the morning, east going west in evening from/towards Greenville.
    ii. Serves heavy truck traffic. Oversized vehicles redirected to this direction.
    iii. No crosswalk./pedestrian protection at intersection
    iv. Signal countermeasure - studies will not support a signal warrant.
b. SR-84 and Johnson Dr
    i. Y/Three way intersection.
    ii. Yield intersection
    iii. Some pedestrian activity. A busy intersection on heavily traveled SR-84 with oversized vehicles which also is close to commercial/shopping areas including grocery stores.
    iv. Blind spot and no protected merge lane for vehicles entering SR-84 from the right turn lane on Johnson Dr [31.44102117450095, -97.41786409140973]
        1. Make it a stop, and not yield intersection. Take away free right turn
c. Johnson Dr/Judith Dr and Bluebonnet parkway
    i. Intersection redesign – from 3-way/skewed intersection to a 4-way intersection by realigning Judit Dr.
d. Intersection Improvements on 317 – 3rd St and 6th St – TxDOT funded
e. Mother Neff pkwy/317
    i. Future need : Signalization
    ii. With redirected truck traffic Via Johnson Dr/Judit Dr, this becomes the entry point into 317..
f. Lighting
    i. Lack of street lighting in downtown.
    ii. In plans - Working with Heart of Texas to add lighting on SR-317 south of Bluebonnet Pkwy

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 1: City of Woodway

Date: Feb 6th, 2024
Time: 1 pm to 2 pm CT

ATTENDEES

Present

- Waco MPO: Mukesh Kumar MukeshK@wacotx.gov, Nora Roy NoraR@wacotx.gov, Annette Polk AnnetteP@wacotx.gov, Arthur Chambers <ArthurC@wacotx.gov>
- TJKM: Ruta Jariwala, Kurt Schulte, Chaithra Navada, Utsav Domadia,
- City of Woodway - Mitch Davison (Director of Community Services)

AGENDA

1. Introductions
2. Overview of the Waco MPO Safety Action Plan
    a. Primary goal: Reducing crashes
    b. Safety of traveling public (auto, pedestrian, bicycle)
3. Safety overview for:
    a. Collision summaries
    b. Location-based collisions for 2014-2023
    c. Quick overview of crash severity, contributing factors, etc.
    d. City vs. TxDOT ROW
4. City Staff Open Forum
    a. Known Issues with safety (roads/locations)
    b. Safety guards, police, speeds
    c. Other observations
5. Next Steps
    a. Document comments from meetings with the city
    b. Conduct community/stakeholder input session
    c. Evaluate collisions for potential mitigation

NOTES

1. Overview
    a. City lacks sidewalks, and faces connectivity issues
    b. Street lighting is lacking
    c. New multimodal road diet project underway on Estates Dr.
2. Streets
        i. Small streets, with speed limits up to 30mph on local streets.

ii. Limited internal connectivity on local streets - Single family residences
iii. Low pedestrian traffic
iv. No adequate sidewalks - especially on internal roads. City adopted a sidewalk ordinance last year
v. Low growth expectations - City is built out, with little scope for further development or growth.
vi. Inadequate Street Lighting, also a problem of insufficient lighting due to the city foliage.
vii. All signals in city are along US-84, and are TxDOT owned.

b. Estates Rd
   i. Multiple projects underway.
   ii. TxDOT Grant obtained to connect sidewalks to Woodrow Elementary School
   iii. Road diet, Shared bike-ped Lane and street retrofit (in design phase)
      1. From Bosque Blvd (Arboretum) till Midway Dr, Connecting to elementary school
      2. Transportation alternative program grant award for funding allocation through construction phase
      3. No changes in front of elementary school
      4. Midway Dr to Fairway Rd -
         a. Existing condition - Two lanes each direction
         b. Proposed Project - Remove one lane, adds a dedicated shared path. One traffic lane in each direction with a turn lane.
      5. Ties into existing sidewalks on city property
c. Bosque Blvd: Possibility - Striping - New Shared bike lane on Northmost lane
d. Richie Rd
   i. Resident complaints on the condition of the road, complaints that the traffic is slow by non-resident commuters.
   ii. Sees heavy traffic, coming from outside the city
   iii. Intersection by Old McGrego Road - issues
e. Old McGregor Rd. : Long term plans for redoing the street. Old county road
f. MPO Questions
   i. Possibility of Bosque Blvd Road Diet - City could discuss the possibility, dependent on the success of the road diet at Estates Dr.
   ii. US-84 Ramp Reversal -
      1. Three possible projects: US-84 capacity increase to 6 lanes, redoing bridges at estates drive, and get rid of intersections for a roundabout.
      2. Not much support from the residents for ramp reversal.

3. Intersections
   a. Richir dr/mcGregor intersection - complaints.
   b. Bosque Blvd/Estates
      i. A recent traffic study found that the intersection did not warrant a signal.
      ii. Lane removal - Entrance to the Arboretum parking has shifted so reduced usage of the existing entrance
      iii. Turn lanes exclusively for Arboretum can be removed (right hand turn lane)
      iv. Stripping - Shared bike path can be added - Northernmost lane on Bosque
   c. Bosque Blvd/Woodland W Dr
      i. Lack of Clear Line of Sight - due to the trees
      ii. Intersection needs examination
   d. TxDOT is undertaking paperwork. Council resolution
4. Action Items
   a. Plan for Estates Rd Road Diet from the city.

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 1: City of Hewitt

Date: Feb 6th, 2024
Time: 10:30 am to 11:30 am CT

ATTENDEES

Present

- Waco MPO - Mukesh Kumar - MukeshK@wacotx.gov, Nora Roy - NoraR@wacotx.gov, Arthur Chambers - arthurc@wacotx.gov, Annette Polk annettep@wacotx.gov
- City of Hewitt - John McGrath, Police Chief, Bo Thomas, City Manager, Jim Devlin, Assistant City Manager, Jonathan Christian, Fire Chief, Kevin Reinke, Utilities Director, Miles Whitney, City Engineer
- TJKM - Ruta Jariwala rjariwala@tjkm.com , Kurt Schulte kschulte@TJKM.com, Utsav Domadia, Chaithra Navada

AGENDA

1. Introductions
2. Overview of the Waco MPO Safety Action Plan
    a. Primary goal: Reducing crashes
    b. Safety of traveling public (auto, pedestrian, bicycle)
3. Safety overview for:
    a. Collision summaries
    b. Location-based collisions for 2014-2023
    c. Quick overview of crash severity, contributing factors, etc.
    d. City vs. TxDOT ROW
4. City Staff Open Forum
    a. Known Issues with safety (roads/locations)
    b. Safety guards, police, speeds
    c. Other observations
5. Next Steps
    a. Document comments from meetings with the city
    b. Conduct community/stakeholder input session
    c. Evaluate collisions for potential mitigation

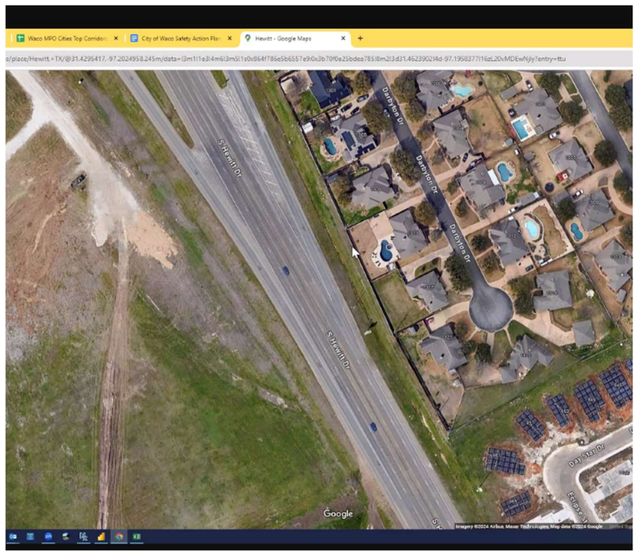
NOTES

1. Overview
    a. Center turn lanes on Hewitt Dr causing collisions.
2. Streets
    a. Hewitt Dr
        i. Major road in the city, heavily used by residents and commuters.

ii. Passes through commercial center along north, schools, residential developments, and upcoming residential developments
iii. Configuration: 2-lanes on either side with a center turn lane
iv. School Route Sidewalks
    1. No adequate sidewalks:
    2. Hewit Dr Contains schools - elementary and middle schools
    3. Students and pedestrians walk on shoulders from schools to residential developments
    4. Drainage issues on Hewitt Dr make sidewalks a challenge. TxDOT control
    5. Majority of the issues in TxDOT roadways
v. Hewitt Dr. Between Northern City Limits to Panther Way
    1. Signals very close to each other at Mars Dr. and Regal Dr.
vi. Hewitt Dr. Between Panther Way and Sun Valley
    1. Heavy Traffic
    2. Collusion due to people trying to turn left.
        a. Recommendation: Install dedicated turn lanes - prevent all or any traffic from going across the road and turning the left
        b. Fire department uses the center turn lane for its response activities
vii. Hewitt Dr. at Sun Valley
    1. Business on both sides of Hewitt Dr.
    2. No restricted median
viii. Traffic bottle neck near school
ix. Hewitt Dr. from Panther Way to South
    1. Potential for conflicts- Future development taking place along this segment, issues similar to the ones seen on northern segment will take place here
    2. Unsafe Speeds
    3. Unsafe U-turn activities leading to conflict

b. Warren Rd
    i. Potential issue: Increased traffic on Warren onto Hewitt Dr with new developments to the West of the City
    ii. Plans to designate and make Warren Rd a collector street
c. MPO Question:
    i. Should Hewitt Dr become a road or a street
        1. Road has mixed uses - commercial where there are more frequent turns and more pedestrian traffic, and residential where faster speeds are seen.
        2. Conflict between lowering speeds v/s more access control to allow higher speeds
        3. Potential issues: Businesses would oppose access control measures. Median put it on the road and was opposed by businesses..
    ii. Impact of Bollards on Panther Way to keep people from turning left to the service station
        1. No complaints received from residents. No perceived impact.

3. Intersections
a. Hewitt Dr / Ritchie Rd.
    i. Intersection Geometry - wide intersection
    ii. Unsafe Speeds - Speed limit in the area is 60.
    iii. With development, more accidents and fatalities expected
b. Hewitt Dr and Spring Valley
    i. Unsafe turns - people make unsafe u-turns to enter residential developments.
    ii. Could benefit from Bollards

iii. 

c. Hewitt Dr. and Old Temple Rd/I-35 intersection
   i. Intersection Geometry - skewed intersection up for changes
   ii. Long wait times
   iii. Upcoming projects: signal, restricted turns from developments
   d. Hewitt Dr and Aglie St
      i. Signal Anticipated

4. Action Items
   a. List of potential projects
   b. CIP Project list.

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 1: City of Robinson

Date: Feb 6th, 2024
Time: 9:00 am to 10:00 am CT

ATTENDEES

Present

- Waco MPO - Mukesh Kumar - MukeshK@wacotx.gov, Nora Roy - NoraR@wacotx.gov, Arthur Chambers - arthurc@wacotx.gov, Annette Polk annettep@wacotx.gov
- City of Robinson - Craig Lemin - City Manager, David Harrell, Planning and Development Director, Destiny DeLillo - Director of Administrative Services and Danny Smith, Police Chief
- TJKM - Ruta Jariwala rjariwala@tjkm.com , Kurt Schulte kschulte@TJKM.com, Utsav Domadia, Achal Parikh, Aaditya Patel, Chaithra Navada

AGENDA

1. Introductions
2. Overview of the Waco MPO Safety Action Plan
    a. Primary goal: Reducing crashes
    b. Safety of traveling public (auto, pedestrian, bicycle)
3. Safety overview for:
    a. Collision summaries
    b. Location-based collisions for 2014-2023
    c. Quick overview of crash severity, contributing factors, etc.
    d. City vs. TxDOT ROW
4. City Staff Open Forum
    a. Known Issues with safety (roads/locations)
    b. Safety guards, police, speeds
    c. Other observations
        - FM3148 (Moonlight Dr)- Speeding
        - FM2837 (Rosenthal)
        - US77 - Too many driveways, TWLTL
        - US77 at Hwy 6 - Right turn slip to go south and immediately turn left to go to San Benito Dr
        - Cloverleaf at US77/Hwy6 - Merge lane is short
        - City of Waco signalizing S New Rd at Old Robinson
        - Less ped traffic except for schools
        - Policy update recommendation as countermeasure
        - Poor Pavement throughout City
5. Next Steps
    a. Document comments from meetings with the city
    b. Conduct community/stakeholder input session
    c. Evaluate collisions for potential mitigation

NOTES

1. Overview
    a. Access management on streets is a key issue. City does not have standards for access management. Past direct access to main streets need management.
    b. Policy update recommendation as countermeasure
    c. Limited pedestrian traffic in the city, except around schools.
2. Streets
    a. W. Moonlight Dr/TxDOT 3148
        i. Unsafe Speeds: within city limits speed limits up to 60 miles even within the city
        ii. 11 collisions and many near misses on this segment
        iii. Limited passing area on street
        iv. Truck traffic, farm equipment carried through this road
        v. Future Issue: When I-35 construction starts, traffic will divert to this route
    a. Rosenthal Parkway/TxDOT 2837: One collision
    b. Grieg Dr:
        vi. Rural road section, bridge on low rated bridge on a creek.
        vii. Longer term plans to reconstruct and widen the street
    b. North Robinson Dr/SR-77
        i. Major road, 2-lane on either side with a center turn lane.
        ii. No adequate sidewalks
        iii. Future Potential: more traffic expected with I-35 construction, and future growth
        iv. Crashes - head-on near misses.
        i. Carries School Traffic - Piplow Dr
        ii. Access Control Issues
            1. Multiple commercial driveway and side streets open to the street, very close to SL-340 ramps.
            2. TxDOT is working with the city to eliminate some driveways.
            3. TWLTL
        iii. Turn Issues: Only a center turn lane, also caused by multiple driveway openings
            1. Queues on center lane to take a left turn
            2. Center turn lane will create more issues with future growth
    c. N Old Robinson Dr/ Cottonwood creek - check correctly.
        i. 2-lane road, edge of the city, high school on the left.
        ii. Future Potential: Commercial and Multifamily zoning in the region. With anticipated future growth, more collisions are likely.
        iii. Serves as a shortcut to I-35 while avoiding the SL-340.
        iv. School Zones
        v. Narrow roads around the schools. Do not have sufficient space to widen.
2. Intersections
    a. US77 at Hwy 6
        i. Vehicles take Right turn slip to go south and immediately turn left to go to San Benito Dr
        ii. Cloverleaf at US77/Hwy6 - Merge lane/distance is short
    b. City of Waco signalizing S New Rd at Old Robinson
2. Action Items
    a. Greig Dr reconstruction - Craig

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 1: City of Lacy Lakeview

Date: Feb 5th, 2024
Time: 1 pm to 2 pm CT

ATTENDEES

Present

- Waco MPO - Mukesh Kumar - MukeshK@wacotx.gov, Nora Roy - NoraR@wacotx.gov, Arthur Chambers - arthurc@wacotx.gov, Annette Polk annettep@wacotx.gov
- City of Lacy-Lakeview- Andy Moore, Jennifer Tindell
- TJKM - Ruta Jariwala rjariwala@tjkm.com , Kurt Schulte kschulte@TJKM.com, Utsav Domadia, Achal Parikh, Aaditya Patel, Chaithra Navada

AGENDA

1. Introductions
2. Overview of the Waco MPO Safety Action Plan
    a. Primary goal: Reducing crashes
    b. Safety of traveling public (auto, pedestrian, bicycle)
3. Safety overview for:
    a. Collision summaries
    b. Location-based collisions for 2014-2023
    c. Quick overview of crash severity, contributing factors, etc.
    d. City vs. TxDOT ROW (e.g.Airbase Rd/FM2418)
4. City Staff Open Forum
    a. Safety guards, police, speeds
    b. Other observations
5. Next Steps
    a. Document comments from meetings with the city
    b. Conduct community/stakeholder input session
    c. Evaluate collisions for potential mitigation

NOTES

1. Overview
    a. Sidewalks are missing on streets, causing pedestrians to walk on streets
    b. Poor lighting on streets, including at major intersections
    c. Speeding along major corridors.
    d. Unsafe intersections – lighting, geometry and lack of signals
    e. Recommendations from City Stakeholders

   i. Blinking lights to warn traffic of an upcoming intersection on Lacy Dr
   ii. Improved street lighting
   iii. Signage improvements to warn motorists and pedestrians
   iv. Improving Sidewalks
2. Streets
   a. N Rita St. – Is a narrow street with no sidewalks and it connects to Elementary School. Crashes can take place when vehicles back into the street from residential driveways.
      i. Sidewalks missing. Moore recommended sidewalks on the west side of the street to avoid the electric poles on the other side
   b. E Crest Dr. – A TxDOT road running through the city that connects US-77 and I-35. Used by motorists to change between the driveways. Higher speeds common
      i. High speeds
      ii. Missing Sidewalks
      iii. No adequate Lighting
   c. E Craven St.
      i. High speeds
      ii. Missing Sidewalks
      iii. No adequate Lighting
      iv. Sidewalk in development – city to provide some easements to create sidewalks. Need more information on this from the City (Andy Moore)
      v. Speeding – From Airbase to Airport – through the TSTC property. Future development of the region.
   d. New Dallas Highway/US-77
      i. No adequate Lighting on the corridor and in intersections
      ii. Access Control issues along N/S Lacy Dr.
      iii. Potential Project – Pavement rehab between W Craven and 933 – citizen to voice to approve an election bond in May
      iv. Waco MPO-TxDOT 2016 Corridor Study recommends improvements to the corridor. No projects currently under consideration.
   e. N/S Lacy Dr – multiple access points to US-77 along Lacy Dr transform it into a service road for the highway rather than a street by itself. Multiple local streets turn on to Lacy Dr. There is high speed traffic along the road.
      i. Access Control issues – Can check the possibility to close some intersections
      ii. Lack of adequate Yield or stop signs on Lacy
      iii. Near-misses along the corridor – attributed to the two-way traffic on the street.
      iv. Waco MPO-TxDOT 2016 Corridor Study recommends improvements to the corridor. No projects currently under consideration.
   f. N Walnut St
      i. Upcoming Water, Waste, Water Street and Curb project
   g. Meyers St
      i. Can become a cut way for traffic between I-35 and US-77 Future Possible issue
3. Intersections
   a. E Crest/US-77
      i. Lighting, sidewalk
   b. E Craven/US-77
      i. Intersection geometry: Difficulty in Crossing: Wide Street with non-square intersection geometry. Drivers have to cross one lane, wait by the median and then cross the other lane.
4. Others
   a. Bright light on Northcrest Auto along the highway is blinding to the motorists.
   b. TxDOT will closely monitor the CSAP recommendations and look for opportunities to partner, including based on the 2016 US-77 study.
5. Open to
   a. Street light inventory, signage inventory. Striping, pavement delineation
6. Action
   a. Information on Sidewalk easement on E Craven

b. Information on Pavement rehab on US-77 between W Craven and 933

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 1: City of Bellmead

Date: Feb 5th, 2024
Time: 1 pm to 2 pm CT

ATTENDEES

Present

- Waco MPO - Mukesh Kumar - MukeshK@wacotx.gov, Nora Roy - NoraR@wacotx.gov, Arthur Chambers - arthurc@wacotx.gov, Annette Polk annettep@wacotx.gov
- City of Bellmead - Shawn Myatt - Chief of Police, Yost Zakhary - City manager, Karen Evans - Assistant City Manager and Chief Financial Officer
- TJKM - Ruta Jariwala rjariwala@tjkm.com , Kurt Schulte kschulte@TJKM.com, Utsav Domadia, Achal Parikh, Aaditya Patel, Chaithra Navada

AGENDA

1. Introductions
2. Overview of the Waco MPO Safety Action Plan
    a. Primary goal: Reducing crashes
    b. Safety of traveling public (auto, pedestrian, bicycle)
3. Safety overview for:
    a. Collision summaries
    b. Location-based collisions for 2014-2023
    c. Quick overview of crash severity, contributing factors, etc.
    d. City vs. TxDOT ROW (e.g.Airbase Rd/FM2418)
4. City Staff Open Forum
    a. Known Issues with safety (roads/locations)
    b. Safety guards, police, speeds
    c. Other observations
5. Next Steps
    a. Document comments from meetings with the city
    b. Conduct community/stakeholder input session
    c. Evaluate collisions for potential mitigation

NOTES

1. Overview
    a. Research Blvd.
        i. Future Potential: Development along the area.
        ii. At present an uncontrolled T-intersection onto SL-340

b. Bellmead Dr
   i. Access Control: Businesses have curb cuts along the drive without clear entry or exit. Driveways and parking lots used by motorists to cut through to other roads, or parking lots used as streets
   ii. Improvements: Better lighting, sidewalks, get lanes marked more frequently. A lot of people walk there at night in darker lights.

c. SL-340
   i. La Vega High school is along this road.
   ii. Heavily traffic road, with higher speeds, in afternoons, with young drivers, and traffic to Walmart and other commercial spaces alongside.
   iii. Lots of activity, turning and cuts along this stretch.
   iv. Stop controlled intersections at Scroggins Dr (taken by high school traffic) and Bank Dr.
   v. TxDOT is looking to redo Loop 340
d. Parrish
   i. Heavy traffic area, with two streets going into the civic center. It is also a backway to get into high school and elementary school.
   ii. Traffic control devices – two-way and four-way stop sign controlled
e. Wheeler St: Busy street, carries school traffic
f. La Clede St and Hogan Ln: Speeding reported. Heavy Traffic as it crosses the freeway.
g. Air Base Rd : Ped/Vehicles Crashes, No adequate lighting
h. Concord Rd: Lighting and Restriping. needs infrastructure upgrade. drainage, water, sewers and manholes
i. SL-340/Scroggins Rd: Signalization: Stop-controlled currently. School intersection
j. Berhans Cir - under 35 safety concerns

2. Others
   a. Distracted Driving: Possibility to regulate in school zones, or among young drivers though mandates. But not possible to regulate all over the city
   b. City's traffic response – City has a flexible schedule officer who addresses traffic and safety issues, a proactive approach. There is also a speed trailer with the city that collects data. Most streets operate within the designated speed limits as per the data.
   c. MPO Question: Speed bumps as traffic calming mechanism, not supported under the city Insurance.
   d. Street rehab combined with safety projects: Part of the issue in Bellmead is the poor state of infrastructure that needs to be resolved first before addressing safety. CDBG
   e. Citizens' requests are commonly for sidewalks and lighting.
   f. Downtown Rehabilitation StreetScaping
3. Open to
   a. Striping
   b. Lighting
   c. Sign and signal upgrades
4. Action Items
   a. List of projects in pipeline, or applied to grant – Assist city manager, and director of community development. – forward via the MPO
   b. Send crash data and map input platform.

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 1: City of Waco

Date: Feb 5th, 2024
Time: 10:30 am to 11:30 am CT

ATTENDEES

Present

- Waco MPO - Mukesh Kumar - MukeshK@wacotx.gov, Nora Roy - NoraR@wacotx.gov, Arthur Chambers - arthurc@wacotx.gov, Annette Polk annettep@wacotx.gov
- City of Waco - Baylor University Representatives - Chief John Kolinek, Danny Knight, Lori Fogleman, Don Rodman, City Parks Department: Matt Penney, City Public Works Department - Amy B, Christine Miller
- TJKM - Ruta Jariwala rjariwala@tjkm.com , Kurt Schulte kschulte@TJKM.com, Utsav Domadia, Achal Parikh, Aaditya Patel, Chaithra Navada

AGENDA

6. Introductions
7. Overview of the Waco MPO Safety Action Plan
    a. Primary goal: Reducing crashes
    b. Safety of traveling public (auto, pedestrian, bicycle)
8. Safety overview for:
    a. Collision summaries
    b. Location-based collisions for 2014-2023
    c. Quick overview of crash severity, contributing factors, etc.
    d. City vs. TxDOT ROW (e.g. N Valley Mills Dr, Lake Shore Dr)
9. City Staff Open Forum
    a. Known Issues with safety (roads/locations)
    b. Safety guards, police, speeds
    c. Other observations
10. Next Steps
    a. Document comments from meetings with the city
    b. Conduct community/stakeholder input session
    c. Evaluate collisions for potential mitigation

NOTES

1. Streets
    a. Bagby Ave: \ Heavy Pedestrian and Motorist traffic
    b. University Parks Dr
        i. US77 to Dutton.

        ii. Used by students living on University Parks
        iii. Needs Walkway, signage to direct students to a signals and safe crossings·
        iv. Pedestrian connectivity gaps: Midblock crossing by Amber Museum and Athletic Complex [31.550493308304816, -97.11263247621906]
    c. La Salle Ave·
        i. Contains shopping areas.
        ii. Heavy traffic, and 6 Lane road.
2. Intersections
    a. Bagby and 3rd Street: Signalized
    b. Bagby and 4th Street
        i. Needs Signalization: Very congestion
        ii. Narrow Pavements, missing sidewalks on some sections
        iii. 4-way stop, choke-point with disjointed intersection.
        iv. No adequate lighting.
    c. SL-2 and 17th St: City Street
    d. L-2 and 18th St: 18th St is TxDOT,
    e. La Salle and 4th St
        i. Contains the only traffic signal
        ii. 4th st, 5th on Valley Mills
3. Others
    a. No measures against distracted driving in place.
    b. Radar enforcement, speed limit trailers have been effective (Dutton st).
    c. Emerging micro mobility devices – no regulation on their usage. Bicycles are being replaced by e-scooters and others.
    d. Bicycle Registration on Baylor campus: possibility to connect to registered students.
    e. Challenge in infrastructure projects: Every few years the direction of the student movement changes – Students live primarily on the east side of campus now
    f. Educational campaigns – Open to possibility. Discuss further with Matt Penny
4. Action Points
    a. HSIP list from City of Waco
    b. TJKM to provide data from meeting to Matt Penney

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 1: Connally ISD

Date: January 29th, 2024
Time: 2::30 pm to 3:30 pm CT

ATTENDEES

- City of Waco - Mukesh Kumar - MukeshK@wacotx.gov, Nora Roy - NoraR@wacotx.gov, Arthur Chambers - arthurc@wacotx.gov, Annette Polk annettep@wacotx.gov
- Connally ISD - Shanna Sanders Ssanders@connally.org;
- TJKM - Ruta Jariwala rjariwala@tjkm.com , Kurt Schulte kschulte@TJKM.com, Utsav Domadia, Achal Parikh, Aaditya Patel

AGENDA

1. SCHOOL AGENDA:
    a. Introductions
    b. Overview of the Waco MPO Safety Action Plan
        i. Primary goal: Reducing crashes
        ii. Safety of traveling public (auto, pedestrian, bicycle)
    c. Safety overview for:
        i. ¼ mile from school
        ii. Collision summaries
        iii. Location based collisions for 2014-2023
        iv. Quick overview of crash severity, contributing factors, etc.
    d. School Members Open Forum
        i. Known Issues with safety (roads/locations)
        ii. Safety guards, police, speeds
        iii. Other observations
    e. Next Steps
        i. Document comments from school meetings
        ii. Conduct community/stakeholder input session
        iii. Evaluate collisions for potential mitigation

NOTES

- The meeting concluded after a discussion with the MPO. Representatives of Connalley ISD did not attend the meeting.
- No signal at Crest/US-77 – intersection leads to school. Students also use Cadet Way to get to school. Speeding is a common issue on the streets leading to the school

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 1: Waco ISD

Date: January 29th, 2024
Time: 1:00 pm to 2:00 pm CT

ATTENDEES

- City of Waco - Mukesh Kumar - MukeshK@wacotx.gov, Nora Roy - NoraR@wacotx.gov, Arthur Chambers - arthurc@wacotx.gov, Annette Polk annettep@wacotx.gov
- Waco ISD - Susan susan.kincannon@wacoisd.org; Ricky Edison ricky.edison@wacoisd.org ; Gloria Barrera gloria.barrera@wacoisd.org ;
- TJKM - Ruta Jariwala rjariwala@tjkm.com , Kurt Schulte kschulte@TJKM.com, Utsav Domadia, Aaditya Patel

AGENDA

1. SCHOOL AGENDA:
    a. Introductions
    b. Overview of the Waco MPO Safety Action Plan
        i. Primary goal: Reducing crashes
        ii. Safety of traveling public (auto, pedestrian, bicycle, transit)
    c. Safety overview for:
        i. ¼ mile from school
        ii. Collision summaries
        iii. Location based collisions for 2014-2023
        iv. Quick overview of crash severity, contributing factors, etc.
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        i. Known Issues with safety (roads/locations)
        ii. Safety guards, police, speeds
        iii. Other observations
    e. Next Steps
        i. Document comments from school meetings
        ii. Conduct community/stakeholder input session
        iii. Evaluate collisions for potential mitigation

NOTES

1. Schools
    - Alta Vista Elementary
    - Bell's Hill Elementary
    - Brazos High School
    - Brook Ave Elementary
    - Cedar Ridge Elementary

- Cesar Chavez Middle School
- Crestview Elementary
- Dean Highland Elementary
- Future Educators Academy
- G.W. Carver Middle School
- Greater Waco Advanced Health Care Academy
- Greater Waco Advanced Manufacturing Academy
- Hillcrest PDS
- J.H. Hines Elementary
- Kendrick Elementary
- Lake Air Montessori Magnet School
- McLennan County Challenge Academy (MCCA)
- Mountainview Elementary
- Parkdale Elementary
- Provident Heights Elementary
- South Waco Elementary
- Tennyson Middle School
- Tennyson Middle School-ATLAS Academy
- University High School
- Waco High School
- West Avenue Elementary
- Wiley Opportunity Center

2. New Waco High
    - Roads: N New Road, Colcord Ave, Trice Ave, N44th St
    - New construction along N New Road. N 44st street closed.
    - Colcord Ave: Wide two lane, No Sidewalks
    - N New Road – New school frontage road. Expect more traffic, potential issues. 5 Lane road currently.
3. Greater Waco Advanced Manufacturing Academy
    - Frontage Roads Issues: Poor lighting, Unsafe Speeds, Signage not visible
    - Other issues
        i. Sidewalk and lighting issues
        ii. Lightning upgradation is not part of maintenance by the ISD, part of the city lights
4. Renovations in schools underway at Tennyson Middle School, Kendrick Elementary, South Waco Elementary
5. Kendrick Elementary and South Waco Elementary
    - Issues:
        i. School frontage roads have higher traffic volume with speed. Potential collisions.
        ii. Lack sidewalks on some streets/sides
        iii. MPO has had discussion internally on potential for building pedestrian friendly improvements depending on how many students come from the neighborhood.
6. Providence Heights Elementary
    - School in neighborhood, and there are multiple destination points in the neighborhood
    - N 25h Street corridor planning of City of Waco – will bring some improvements
    - Beyond this, this should not be thought of as a location specific project, but reduce speed for entire area
    - Unsuccessful funding applications by the City of Waco via SFTS, Transportation Alternative Funding – MPO might need to reconsider strategy for the area. A corridor study is underway.
    - Having this in the CSAP might help the city of Waco to get funding.

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 1: Midway ISD

Date: January 29th, 2024
Time: 10:30 am to 11:30 am CT

ATTENDEES

- City of Waco - Mukesh Kumar - MukeshK@wacotx.gov, Paul Campos - PCampos@wacotx.gov, Nora Roy - NoraR@wacotx.gov, Arthur Chambers - arthurc@wacotx.gov, Annette Polk annettep@wacotx.gov
- Ssanders@connally.org;
- TJKM - Ruta Jariwala rjariwala@tjkm.com , Kurt Schulte kschulte@TJKM.com, Utsav Domadia, Achal Parikh, Aaditya Patel

AGENDA

a. Introductions
b. Overview of the Waco MPO Safety Action Plan
    i. Primary goal: Reducing crashes
    ii. Safety of traveling public (auto, pedestrian, bicycle)
c. Safety overview for:
    i. ¼ mile from school
    ii. Collision summaries
    iii. Location based collisions for 2014-2023
    iv. Quick overview of crash severity, contributing factors, etc.
d. School Members Open Forum
    i. Known Issues with safety (roads/locations)
    ii. Safety guards, police, speeds
    iii. Other observations
e. Next Steps
    i. Document comments from school meetings
    ii. Conduct community/stakeholder input session
    iii. Evaluate collisions for potential mitigation

NOTES

Schools
- Midway High School
- Midway Middle School
- River Valley Middle School
- Castleman Creek Elementary
- Chapel Park Elementary
- Hewitt Elementary
- Park Hill Elementary

- South Bosque Elementary
- Speegleville Elementary
- Spring Valley Elementary
- Woodway Elementary

Midway Middle School, Midway High School, Hewitt Middle School

- Roadway: Hewitt Dr, Marks Dr, Panther Way
- Intersections: Hewitt Dr and Panther Way, Hewitt Dr. and Regal.
- Hewitt Dr is a heavy traffic roadway that also serves the school
- Issues
    - Improper Crossing: Outside intersections: On Hewitt Drive at the middle school and high school
    - Low Visibility at Intersection: At early mornings, when it rains, foggy, or when it is still dark.
    - Violation of No Turn on Red at intersections
    - Speeding on Mars Dr – after street improvement. Lack of visual landscape cues to slow down.
- Recommendations:
    - MPO suggestion: Scrambled crosswalk, Landscaping to slow traffic.
    - ISD suggestions: In pavement lights
    - TJKM suggestions: Leading pedestrian intersections, RRFB, Median fencing to prevent midblock crossings outside intersection

Chapel Park Elementary School

- Roadways: Chapel Dr, Woodgate Dr
- Chapel Dr is used as a through road to get on Hewitt Dr and highways. Higher speeds, high volume traffic common
- Issues:
    - School crosswalks are not at signal, not signalized. It is crossing guard controlled
    - Curve on Chapel Rd causes safety issues
    - Speeding issue due to lack of landscape cues to slow down (after Woodgate Dr)
- Recommendations:
    - Landscape treatment near the school to slow down drivers through visual cues
    - Medians

River Valley Middle School

- Roads: Speegleville Rd. Oak Rd
- Issues
    - Speegleville complaints from drivers and pedestrians about its geometry. Two lane road.
    - Pedestrians come from Sunnydale Dr and River Park Dr, no sidewalks
    - No sidewalks on Oak Rd
    - Speeding, Disregarding Crossing guards

Hewitt Elementary School

- Streets: Panther way
- Issues
    - No signals at school crossing
    - Students do not heed to designated intersections with crossing guards.
- Recommendations
    - Signals and lighting

- RRFBs

Others

- Speed radars are effective on Mars Dr
- Police department's patrolling around schools was effective, but is being phased out.

Waco MPO Comprehensive Safety Action Plan

Stakeholder Engagement Meeting 1: La Vega ISD

Date: January 29th, 2024
Time: 9:00 am to 10:00 am CT

ATTENDEES

- City of Waco - Mukesh Kumar - MukeshK@wacotx.gov, Nora Roy - NoraR@wacotx.gov, Arthur Chambers - arthurc@wacotx.gov, Annette Polk annettep@wacotx.gov
- Lavega ISD-Sharon Shields- sharon.shields@lavegaisd.org, Dr. Peggy Johnson peggy.johnson@lavegaisd.org, Chief Kerry Blakemore Kerry.blakemore@lavegaisd.org,
- TJKM - Ruta Jariwala rjariwala@tjkm.com , Kurt Schulte kschulte@TJKM.com, Utsav Domadia, Achal Parikh, Aaditya Patel

AGENDA

- SCHOOL AGENDA:
  a. Introductions
  b. Overview of the Waco MPO Safety Action Plan
     i. Primary goal: Reducing injury crashes
     ii. Safety of traveling public (auto, pedestrian, bicycle, transit)
  c. Safety overview for:
     i. ¼ mile from school
     ii. Collision summaries
     iii. Location based collisions for 2014-2023
     iv. Quick overview of crash severity, contributing factors, etc.
  d. School Members Open Forum
     i. Known Issues with safety (roads/locations)
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  e. Next Steps
     i. Document comments from school meetings
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NOTES

Distracted driving includes following TxDOT CRIS form categories:

- DRIVER INATTENTION
- DISTRACTION IN VEHICLE

Schools

- La Vega High School
- La Vega Early College High School
- La Vega P-TECH Academy
- La Vega Junior High School - George Dixon Campus
- La Vega Intermediate School - H.P. Miles Campus
- La Vega Elementary School
- La Vega Primary School - Phil Bancale Campus

Issues

- SL-340
  - High speed on TxDOT Roads near the schools
    - Suggestion: Landscaping to reduce speeds
  - High volume of traffic in front of La Vega High School
  - Congestion at intersection with Bellmead Dr, people getting off to Bellmead Dr.
  - Driving/speeding through shoulders High school to Orchard Ln.
    - Suggestion: Rumble strips or other shoulder treatment

La Vega Primary Phil Bancale Campus

- Vehicle backup from behind the school (Harrison St) to Bellmead Dr (SR-84)
- Conflicts with businesses

La Vega Elementary School/ High School

- Parrish St: Higher speeds as there is no stop control at intersections. (Two way stop control on N-S streets, and Parrish is E-W)

Others

- ISD open to landscaping as a recommendation to reduce speeds on roadways near schools

Waco MPO Comprehensive Safety Action Plan

Safety Action Task Force Meeting 2

Date: January 8th, 2024
Time: 2:00 pm to 3:00 pm

ATTENDEES

- City of Waco - Mukesh Kumar - MukeshK@wacotx.gov, Paul Campos - PCampos@wacotx.gov, Nora Roy - NoraR@wacotx.gov, Arthur Chambers - arthurc@wacotx.gov , Daniela Gallegos danielag@wacotx.gov , Annette Polk annettep@wacotx.gov
- TJKM - Ruta Jariwala rjariwala@tjkm.com , Kurt Schulte kschulte@TJKM.com

Other Agencies

Name	Email	Agency	Attendance
Yost Zakary	yzakhary@bellmeadtx.gov	Bellmead	**Y**
Greg Snydal	gsnydal@bellmeadtx.gov	Bellmead	**N**
Shanna Sanders	Ssanders@connally.org	Connally ISD	**Y**
Jim Devlin	jdevlin@cityofhewitt.com	Hewitt	**Y**
John McGrath	jmcgrath@cityofhewitt.com	Hewitt	**Y**
Jeron Barnett	jeron.barnett@lacylakeview.org	Lacy Lakeview	**N**
Andy Moore	andy.moore@lacylakeview.org	Lacy Lakeview	**Y**
Kerry Blakemore	kerry.blakemore@lavegaisd.org	La Vega ISD	**Y**
Zane Dunnam	zane.dunnam@co.mclennan.tx.us	McLennan County	**Y**
Lashonda Malrey-Horne	lashondam@wacotx.gov	Waco Health District	**N**
Bryan LeMeilluer	blemeilleur@mcgregor-texas.com	McGregor	**N**
Chad Saylors	csaylors@mcgregor-texas.com	McGregor	**N**
Jeff Foley	jeff.foley@midwayisd.org	Midway ISD	**N**
Aaron Pena	aaron.pena@midwayisd.org	Midway ISD	**N**
Craig Lemin	c.lemin@robinsontexas.org	Robinson	**Y**

David Harrell	d.harrell@robinsontexas.org	Robinson	**N**
Jacob Chau	jacob.chau@txdot.gov	TxDOT	**Y**
Colton Smith	colton.smith@txdot.gov	TxDOT	**Y**
Amy Burlarley-Hyland	amyb@wacotx.gov	Waco	**N**
Christine MIller	christinem@wacotx.gov	Waco	**Y**
Ricky Edison	ricky.edison@wacoisd.org	Waco ISD	**Y**
Gloria Barrera	gloria.barrera@wacoisd.org	Waco ISD	**N**
Sgt. Chad Ashworth	ChadA@wacotx.gov	Waco PD	**Y**
Mitch Davison	mdavison@woodwaytexas.gov	Woodway	**N**

AGENDA

- Project Website Preview

  This is the link to the draft project website: https://tjkmweb.wixsite.com/website-29

- Data Request
  a. Review and Confirm the documents - **https://docs.google.com/spreadsheets/d/1-o9aWXmU-9d1ex1AcfS3cX1GOQby8mnZrADRFMOcLPE/edit?usp=sharing**
  b. Share Initial Collision Data Findings
- Upcoming Meetings
  a. Community/Public Outreach Meetings (Feb/April)
     i. Only Public or Staff ? Only Staff
     ii. Morning or Afternoon ? Afternoon
     iii. No Friday Afternoon
     iv. Wednesday/Thursday
     v. 1.5 /meeting
     vi. How should we treat school districts ? per City or per ISD
     vii. Meetings with the individual school districts first (County and TxDOT ROW)
     viii. Superintendent contact Info
  ix. List of stakeholders specific to your Agencies
  x. Feb 2024 - (Listening Workshop and share Existing Collision Data)
     a. Tuesdays and Fridays Feb 5th, 6th, 9th, 13th and 16th
     b. No to 1st and 12th and 15th
     c. ISD - No Fridays
     d. City of Waco Tuesday Council Meeting

- CRIS Data - 10 year Data

i. https://cris.dot.state.tx.us/public/Query/app/home - DONE
ii. Location Based Data not available for 4,944 collisions
iii.

Row Labels	Count of Crash ID
99 - UNKNOWN	1482
A - SUSPECTED SERIOUS INJURY	53
B - SUSPECTED MINOR INJURY	297
C - POSSIBLE INJURY	392
K - FATAL INJURY	8
N - NOT INJURED	2712
(blank)	
Grand Total	**4944**

Waco MPO Comprehensive Safety Action Plan

Safety Action Task Force Meeting 1

Date: December 11th, 2023
Time:

ATTENDEES

- City of Waco - Mukesh Kumar - MukeshK@wacotx.gov, Paul Campos - PCampos@wacotx.gov, Nora Roy - NoraR@wacotx.gov, Arthur Chambers - arthurc@wacotx.gov , Daniela Gallegos danielag@wacotx.gov , Annette Polk annettep@wacotx.gov
- TJKM - Ruta Jariwala rjariwala@tjkm.com , Kurt Schulte kschulte@TJKM.com

Other Agencies

Name	Email	Agency	Attendance
Yost Zakary	yzakhary@bellmeadtx.gov	Bellmead	
Greg Snydal	gsnydal@bellmeadtx.gov	Bellmead	
Shanna Sanders	Ssanders@connally.org	Connally ISD	
Jim Devlin	jdevlin@cityofhewitt.com	Hewitt	
John McGrath	jmcgrath@cityofhewitt.com	Hewitt	
Jeron Barnett	jeron.barnett@lacylakeview.org	Lacy Lakeview	
Andy Moore	andy.moore@lacylakeview.org	Lacy Lakeview	
Kerry Blakemore	kerry.blakemore@lavegaisd.org	La Vega ISD	
Zane Dunnam	zane.dunnam@co.mclennan.tx.us	McLennan County	
Lashonda Malrey-Horne	lashondam@wacotx.gov	Waco Health District	
Bryan LeMeilluer	blemeilleur@mcgregor-texas.com	McGregor	
Chad Saylors	csaylors@mcgregor-texas.com	McGregor	
Jeff Foley	jeff.foley@midwayisd.org	Midway ISD	
Aaron Pena	aaron.pena@midwayisd.org	Midway ISD	
Craig Lemin	c.lemin@robinsontexas.org	Robinson	

David Harrell	d.harrell@robinsontexas.org	Robinson	
Jacob Chau	jacob.chau@txdot.gov	TxDOT	
Colton Smith	colton.smith@txdot.gov	TxDOT	
Amy Burlarley-Hyland	amyb@wacotx.gov	Waco	
Christine MIller	christinem@wacotx.gov	Waco	
Ricky Edison	ricky.edison@wacoisd.org	Waco ISD	
Gloria Barrera	gloria.barrera@wacoisd.org	Waco ISD	
Sgt. Chad Ashworth	ChadA@wacotx.gov	Waco PD	
Mitch Davison	mdavison@woodwaytexas.gov	Woodway	

AGENDA

1. Welcome
2. Introductions
    a. TJKM
    b. Bill Frawley (MPO Research Assistant)
3. Brief Review of Purpose and Goals
4. MPO Planning Area Safety Brief
    a. Current statistics
    b. Takeaways and concerns
    c. Discussion of use of data and task force approach
5. Discussion of Ideas with Task Force Members
    a. Project thoughts/ideas since November meeting
    b. Areas of concern/focus areas
6. Next Steps

APPENDIX E

Public Comments Received for Waco MPO CSAP

#	Filtered ID	Comment	City	Location	Street/Intersection	Corridor	Issue	Additional Details	Primary Mode Affected
1	27	Increased motor vehicle and pedestrian traffic due to residential construction, new MISD elementary school. The intersection is controlled by flashing LED stop signs. lighting is extremely poor (several complaints about not being to see the crossing guard during the early hours of the morning). Speed is also an issue - designated as 35 mph - motoring traffic travels well above posted speed. The road is wide and straight, feels like everything is wide open.	Hewitt	[31.452936,-97.217933]	Ritchie Rd & W Warren St	Ritchie Rd	Lighting		Pedestrian
2	27	Increased motor vehicle and pedestrian traffic due to residential construction, new MISD elementary school. The intersection is controlled by flashing LED stop signs. lighting is extremely poor (several complaints about not being to see the crossing guard during the early hours of the morning). Speed is also an issue - designated as 35 mph - motoring traffic travels well above posted speed. The road is wide and straight, feels like everything is wide open.	Hewitt	[31.452936,-97.217933]	Ritchie Rd & W Warren St	Ritchie Rd	Pedestrian Safety		Pedestrian
3	27	Increased motor vehicle and pedestrian traffic due to residential construction, new MISD elementary school. The intersection is controlled by flashing LED stop signs. lighting is extremely poor (several complaints about not being to see the crossing guard during the early hours of the morning). Speed is also an issue - designated as 35 mph - motoring traffic travels well above posted speed. The road is wide and straight, feels like everything is wide open.	Hewitt	[31.452936,-97.217933]	Ritchie Rd & W Warren St	Ritchie Rd	Unsafe Speed		Pedestrian
4	27	Increased motor vehicle and pedestrian traffic due to residential construction, new MISD elementary school. The intersection is controlled by flashing LED stop signs. lighting is extremely poor (several complaints about not being to see the crossing guard during the early hours of the morning). Speed is also an issue - designated as 35 mph - motoring traffic travels well above posted speed. The road is wide and straight, feels like everything is wide open.	Hewitt	[31.452936,-97.217933]	Ritchie Rd & W Warren St	Ritchie Rd	School Zone		Pedestrian
5	44	Rough road, poorly lit at night, high speed traffic, no shoulder Signal needed at Concord x Cloverleaf	Bellmead	LINESTRING (-97.07736 31.606123, -97.07736 31.606123, -97.088288 31.620726)	Cloverleaf Rd	Cloverleaf Rd	Lighting	Shoulder, Pavement	Motor Vehicle
6	44	Rough road, poorly lit at night, high speed traffic, no shoulder Signal needed at Concord x Cloverleaf	Bellmead	LINESTRING (-97.07736 31.606123, -97.07736 31.606123, -97.088288 31.620726)	Cloverleaf Rd	Cloverleaf Rd	Roadway Related	Shoulder, Pavement	Motor Vehicle

#	Filtered ID	Comment	City	Location	Street/Intersection	Corridor	Issue	Additional Details	Primary Mode Affected
7	44	Rough road, poorly lit at night, high speed traffic, no shoulder Signal needed at Concord x Cloverleaf	Bellmead	LINESTRING (-97.07736 31.606123, -97.07736 31.606123, -97.088288 31.620726)	Cloverleaf Rd	Cloverleaf Rd	Unsafe Speed	Shoulder, Pavement	Motor Vehicle
8	44	Rough road, poorly lit at night, high speed traffic, no shoulder Signal needed at Concord x Cloverleaf	Bellmead	LINESTRING (-97.07736 31.606123, -97.07736 31.606123, -97.088288 31.620726)	Cloverleaf Rd	Cloverleaf Rd	Sign and Signal Related	Shoulder, Pavement	Motor Vehicle
9	33	Warren Rd will become a multi jurisdictional project in the future. Half of the roadway is in questionable condition, it lacks sidewalks and it is difficult for pedestrians/bikes to access Ritchie and Hewit Dr.	Hewitt	LINESTRING (-97.198392 31.461259, -97.202405 31.460294, -97.21309 31.455216, -97.217869 31.452954)	W Warren St	W Warren St	Pedestrian Safety	narrow lane, Sidewalk,	Pedestrian
10	33	Warren Rd will become a multi jurisdictional project in the future. Half of the roadway is in questionable condition, it lacks sidewalks and it is difficult for pedestrians/bikes to access Ritchie and Hewit Dr.	Hewitt	LINESTRING (-97.198392 31.461259, -97.202405 31.460294, -97.21309 31.455216, -97.217869 31.452954)	W Warren St	W Warren St	Roadway Related	narrow lane, Sidewalk,	Pedestrian
11	33	Warren Rd will become a multi jurisdictional project in the future. Half of the roadway is in questionable condition, it lacks sidewalks and it is difficult for pedestrians/bikes to access Ritchie and Hewit Dr.	Hewitt	LINESTRING (-97.198392 31.461259, -97.202405 31.460294, -97.21309 31.455216, -97.217869 31.452954)	W Warren St	W Warren St	Bicycle-related	narrow lane, Sidewalk,	Bicycle
12	71	side walks and street lighting	Bellmead	LINESTRING (-97.109591 31.59529, -97.110777 31.595432, -97.11208 31.595123, -97.114607 31.595432, -97.116273 31.595065, -97.117732 31.594964, -97.118722 31.595315)	Behrans Cir	Behrans Cir	Pedestrian Safety		Pedestrian
13	71	side walks and street lighting	Bellmead	LINESTRING (-97.109591 31.59529, -97.110777 31.595432, -97.11208 31.595123, -97.114607 31.595432, -97.116273 31.595065, -97.117732 31.594964, -97.118722 31.595315)	Behrans Cir	Behrans Cir	Lighting		Pedestrian
14	72	sidewalks, street lighting	Bellmead	LINESTRING (-97.120208 31.585824, -97.11976 31.592747, -97.119613 31.593406, -97.118996 31.595075, -97.117037 31.598129, -97.115371 31.599572, -97.114313 31.600549)	S Old Dallas Rd	S Old Dallas Rd	Lighting		Pedestrian
15	72	sidewalks, street lighting	Bellmead	LINESTRING (-97.120208 31.585824, -97.11976 31.592747, -97.119613 31.593406, -97.118996 31.595075, -97.117037 31.598129, -97.115371 31.599572, -97.114313 31.600549)	S Old Dallas Rd	S Old Dallas Rd	Pedestrian Safety		Pedestrian
16	43	Rough road, narrow shoulder, poor drainage, not well lit at night, high speed traffic	Bellmead	LINESTRING (-97.101368 31.614493, -97.0996 31.614808, -97.085331 31.622454, -97.077715 31.626476)	Meyers Ln	Meyers Ln	Roadway Related	Pavement, Narrow Lanes	Motor Vehicle
17	43	Rough road, narrow shoulder, poor drainage, not well lit at night, high speed traffic	Bellmead	LINESTRING (-97.101368 31.614493, -97.0996 31.614808, -97.085331 31.622454, -97.077715 31.626476)	Meyers Ln	Meyers Ln	Lighting	Pavement, Narrow Lanes	Motor Vehicle
18	43	Rough road, narrow shoulder, poor drainage, not well lit at night, high speed traffic	Bellmead	LINESTRING (-97.101368 31.614493, -97.0996 31.614808, -97.085331 31.622454, -97.077715 31.626476)	Meyers Ln	Meyers Ln	Unsafe Speed	Pavement, Narrow Lanes	Motor Vehicle
19	95	Need a light here. Seems that Baylor and public traffic is at this point. That people just shoot across when your going 40m at a close range of 8ft. To them just to cut across toward Baylor University.	Waco	[31.541255,-97.111332]	La Salle Ave & S 4th St	La Salle Ave	Lighting		Pedestrian

#	Filtered ID	Comment	City	Location	Street/Intersection	Corridor	Issue	Additional Details	Primary Mode Affected
20	95	Need a light here. Seems that Baylor and public traffic is at this point. That people just shoot across when your going 40m at a close range of 8ft. To them just to cut across toward Baylor University.	Waco	[31.541255,-97.111332]	La Salle Ave & S 4th St	La Salle Ave	Unsafe Speed		Pedestrian
21	95	Need a light here. Seems that Baylor and public traffic is at this point. That people just shoot across when your going 40m at a close range of 8ft. To them just to cut across toward Baylor University.	Waco	[31.541255,-97.111332]	La Salle Ave & S 4th St	La Salle Ave	Pedestrian Safety		Pedestrian
22	10	Upgraded crosswalk with added lighting	Waco	[31.471006,-97.214918]	Panther Way & Century Dr	Panther Way	Pedestrian Safety		Pedestrian
23	10	Upgraded crosswalk with added lighting	Waco	[31.471006,-97.214918]	Panther Way & Century Dr	Panther Way	Lighting		Pedestrian
24	10	Upgraded crosswalk with added lighting	Waco	[31.471006,-97.214918]	Panther Way & Century Dr	Panther Way	School Safety		Pedestrian
25	41	Wheeler needs better drainage, a smoother road surface and school zone designation. Traffic moves fast on this road	Bellmead	LINESTRING (-97.097962 31.600106, -97.107303 31.595638)	Wheeler St	Wheeler St	Unsafe Speed	Drainage, Pavement	Motor Vehicle
26	41	Wheeler needs better drainage, a smoother road surface and school zone designation. Traffic moves fast on this road	Bellmead	LINESTRING (-97.097962 31.600106, -97.107303 31.595638)	Wheeler St	Wheeler St	Roadway Related	Drainage, Pavement	Motor Vehicle
27	41	Wheeler needs better drainage, a smoother road surface and school zone designation. Traffic moves fast on this road	Bellmead	LINESTRING (-97.097962 31.600106, -97.107303 31.595638)	Wheeler St	Wheeler St	School Safety	Drainage, Pavement	Motor Vehicle
28	88	Way too many speeders. Lots of kids in this area. Lots of people pass busses on this road in the mornings.	Bellmead	[31.589366,-97.120252]	Old Dallas Rd	Old Dallas Rd	Unsafe Speed	transit	Pedestrian
29	88	Way too many speeders. Lots of kids in this area. Lots of people pass busses on this road in the mornings.	Bellmead	[31.589366,-97.120252]	Old Dallas Rd	Old Dallas Rd	Pedestrian Safety	transit	Pedestrian
30	88	Way too many speeders. Lots of kids in this area. Lots of people pass busses on this road in the mornings.	Bellmead	[31.589366,-97.120252]	Old Dallas Rd	Old Dallas Rd	Transit	transit	Pedestrian
31	96	A speed pump placement and pedestrian walking lane across for students to stand at the public transportation. Too many close calls.	Waco	[31.531552,-97.114656]	S 12th St	S 12th St	Pedestrian Safety		Pedestrian
32	96	A speed pump placement and pedestrian walking lane across for students to stand at the public transportation. Too many close calls.	Waco	[31.531552,-97.114656]	S 12th St	S 12th St	Unsafe Speed		Pedestrian
33	96	A speed pump placement and pedestrian walking lane across for students to stand at the public transportation. Too many close calls.	Waco	[31.531552,-97.114656]	S 12th St	S 12th St	Transit		Pedestrian

#	Filtered ID	Comment	City	Location	Street/Intersection	Corridor	Issue	Additional Details	Primary Mode Affected
34	114	ECA and parent pickup lines down Fish Pond. Cars zooming from Bosque onto Fish Pond here has felt overwhelming. Thank goodness there are lots of cars to slow them down on some days. Early mornings and low traffic days speeders zoom down this road. I wonder if a school zone should be put on Bosque however it's really not the area where children cross. Only Fish Pond would be or Batson Drive potentially. Both ECA and Harmony School may benefit from taking a look at traffic patterns to see if all is well. We have a great system I think. It's working. My only concern is the transition from Bosque onto Fish Pond.	Waco	[31.529531,-97.199886]	Bosque Blvd & Fish Pond Rd	Bosque Blvd	Traffic		Motor Vehicle
35	114	ECA and parent pickup lines down Fish Pond. Cars zooming from Bosque onto Fish Pond here has felt overwhelming. Thank goodness there are lots of cars to slow them down on some days. Early mornings and low traffic days speeders zoom down this road. I wonder if a school zone should be put on Bosque however it's really not the area where children cross. Only Fish Pond would be or Batson Drive potentially. Both ECA and Harmony School may benefit from taking a look at traffic patterns to see if all is well. We have a great system I think. It's working. My only concern is the transition from Bosque onto Fish Pond.	Waco	[31.529531,-97.199886]	Bosque Blvd & Fish Pond Rd	Bosque Blvd	School Safety		Motor Vehicle
36	114	ECA and parent pickup lines down Fish Pond. Cars zooming from Bosque onto Fish Pond here has felt overwhelming. Thank goodness there are lots of cars to slow them down on some days. Early mornings and low traffic days speeders zoom down this road. I wonder if a school zone should be put on Bosque however it's really not the area where children cross. Only Fish Pond would be or Batson Drive potentially. Both ECA and Harmony School may benefit from taking a look at traffic patterns to see if all is well. We have a great system I think. It's working. My only concern is the transition from Bosque onto Fish Pond.	Waco	[31.529531,-97.199886]	Bosque Blvd & Fish Pond Rd	Bosque Blvd	Unsafe Speed		Motor Vehicle
37	121	Not a bike/pedestrian friendly intersection. Stoneridge and Grosse-Yowell neighborhoods residents don't have a safe way to cross Spring Valley Road on foot or bicycle.	Hewitt	LINESTRING (-97.207893 31.4375, -97.208169 31.435497, -97.20535 31.436377, -97.206035 31.438107, -97.207911 31.437523)	Spring Valley Rd & S Hewitt Dr	Hewitt Dr	Bicycle-related		Bicycle
38	57	Needs sidewalks, pedestrian crossings, and street lighting	Bellmead	LINESTRING (-97.103012 31.587355, -97.108351 31.59524, -97.107313 31.595507, -97.102758 31.589058, -97.102209 31.588281)	Hogan Ln and La Clede St	Hogan Ln	Lighting	sidewalk, crosswalk	Pedestrian
39	58	sidewalks, pedestrian crossings, street lighting	Bellmead	LINESTRING (-97.100717 31.589681, -97.099862 31.590611, -97.099637 31.590853, -97.09851 31.591905, -97.095745 31.594028)	US-84 (Bellmead Dr)	US-84	Lighting	sidewalk, crosswalk	Pedestrian

#	Filtered ID	Comment	City	Location	Street/Intersection	Corridor	Issue	Additional Details	Primary Mode Affected
40	94	Baylor games and public traffic conflict one another on game days. Causing delays, wrecks,running red light. Also, Baylor Students don't have a safe walking across area. Especially, when the area isn't lighten up for visual. Also, I feel there should be an emergency push button pole for the students at that intersection. Too many close calls of a students being a victim	Waco	[31.545873,-97.105883]	La Salle Ave & University Parks Dr	University Parks Dr	Lighting		Pedestrian
41	86	No pedestrian walks, people and kids are always walking in the street and at night this is dangerous as there are no street lights either	Bellmead	LINESTRING (-97.075704 31.622433, -97.076103 31.622272, -97.076544 31.62195, -97.076944 31.621807, -97.077322 31.621592, -97.077596 31.621395, -97.077911 31.621198, -97.078247 31.621001, -97.078647 31.62084, -97.078899 31.620679, -97.079172 31.620518, -97.079572 31.620303, -97.079887 31.620106, -97.080265 31.619873, -97.080497 31.619694, -97.080749 31.61939, -97.081043 31.619068, -97.081316 31.61871, -97.081569 31.618388, -97.081653 31.61803, -97.081758 31.617618, -97.081947 31.617242, -97.08168 31.617313, -97.081743 31.616793, -97.081849 31.616328, -97.081849 31.615916, -97.08208 31.61554, -97.082122 31.615129, -97.082206 31.614645, -97.082164 31.614162, -97.082185 31.613786, -97.082332 31.613535, -97.0825 31.61311, -97.082479 31.612341, -97.08271 31.611893, -97.0825 31.611732, -97.082731 31.61107, -97.082563 31.61064, -97.08271 31.609745, -97.082837 31.609261, -97.083152 31.608903, -97.083362 31.608671, -97.083656 31.607453, -97.083951 31.606862, -97.084245 31.606271, -97.084476 31.605412, -97.084665 31.604606, -97.085296 31.603604, -97.085885 31.602494, -97.086578 31.601724, -97.086999 31.601043)	Concord Rd	Concord Rd	Lighting		Pedestrian
42	18	Poor sightline, lighting	Lacy Lakeview	[31.621628,-97.107726]	New Dallas Hwy & W Craven Ave	New Dallas Hwy	Lighting		Motor Vehicle
43	60	sidewalks, pedestrian crossings, lighting	Bellmead	LINESTRING (-97.105292 31.603843, -97.097308 31.602809)	SL-340	SL-340	Pedestrian Safety		Pedestrian
44	108	People walk this road a lot including at night and there are very few lights to eliminate the area.	Bellmead	LINESTRING (-97.08735 31.600867, -97.08547 31.60318, -97.083042 31.608618, -97.082464 31.612669, -97.081975 31.616079, -97.081779 31.617638, -97.080108 31.619873, -97.078907 31.620707, -97.077771 31.621474, -97.075491 31.622456, -97.073517 31.623456)	Concord Rd	Concord Rd	Pedestrian Safety		Pedestrian
45	63	Street lighting, sidewalks.	Bellmead	LINESTRING (-97.107008 31.593122, -97.103658 31.594721, -97.102858 31.595103, -97.100868 31.596052, -97.096741 31.598021)	Parrish St	Parrish St	Pedestrian Safety		Pedestrian
46	64	Street lighting and sidewalks	Bellmead	LINESTRING (-97.090496 31.600161, -97.09224 31.602489, -97.092867 31.604458, -97.093442 31.6179, -97.093747 31.624859)	Airbase Rd	Airbase Rd	Pedestrian Safety		Pedestrian

#	Filtered ID	Comment	City	Location	Street/Intersection	Corridor	Issue	Additional Details	Primary Mode Affected
47	67	street lighting, sidewalk	Bellmead	LINESTRING (-97.092915 31.604073, -97.092984 31.600735, -97.089927 31.598899)	Airbase Rd	Airbase Rd	Pedestrian Safety		Pedestrian
48	68	sidewalk, street lighting	Bellmead	LINESTRING (-97.095712 31.594073, -97.091323 31.597652)	US-84	US-84	Pedestrian Safety		Pedestrian
49	31	The worst intersection in Hewitt. Very congested with vehicles and pedestrian traffic. This is the main intersection for children to access Midway Middle School. There have been multiple pedestrians struck at this intersection. School zone speed limit should be lowered to 20 mph and the crosswalks need further safety measures.	Hewitt	[31.476139,-97.20378]	Panther Way & N Hewitt Dr	Hewitt Dr	Pedestrian Safety		Pedestrian
50	13	Bagby/4th - Narrow ROW, no sidewalk, 4 way stops, there is a jog at the intersection	Waco	[31.544353,-97.115258]	Bagby Ave & S 4th St	Bagby Ave	Pedestrian Safety		Pedestrian
51	37	Unsafe/congested intersection multiple times per day when Baylor classes in session. High pedestrian/bike/scooter traffic combined with vehicles queuing up a the 4-way stop. Sidewalks inadequate or non-existent on 1 corner. Consider a traffic light similar to one block away at Bagby & 3rd.	Waco	[31.544358,-97.115263]	Bagby Ave & S 4th St	Bagby Ave	Pedestrian Safety	high volume traffic	Pedestrian
52	109	Hewitt Drive is horrible. North Old Temple has too many big trucks zooming by and others speeding vehicles. Not safe for pedestrians and very difficult for residents to back out of driveways or park on the street.	Hewitt	[31.460132,-97.173]	N Old Temple Rd	Old Temple Rd	Pedestrian Safety		Pedestrian
53	29	Spring Valley has a 50 mph speed limit. The entire roadway through Hewitt travels completely through residential neighborhoods and one elementary school. The roadway is currently under construction and adding a center turn lane. Speed needs to be reduced , and several complaints about the lack of sidewalks along the roadway to facilitate pedestrian traffic to Spring Valley Elementary.	Hewitt	LINESTRING (-97.211461 31.434424, -97.200928 31.43981, -97.19795 31.44135, -97.1969 31.442276, -97.19597 31.443537, -97.194984 31.444363, -97.193213 31.44525, -97.188541 31.447555, -97.18064 31.451274, -97.17907 31.452255, -97.176825 31.454762)	Spring Valley Rd	Spring Valley Rd	Pedestrian Safety		Pedestrian
54	62	Better road surface, road widened, street lighting	Bellmead	LINESTRING (-97.0874 31.60058, -97.085617 31.603042, -97.083046 31.609156, -97.081821 31.617757, -97.080205 31.619976, -97.066999 31.626378)	Concord Rd	Concord Rd	Roadway Related	Narrow Lanes, Pavement	Motor Vehicle
55	42	Road is in bad shape, highly traveled, not well lit,	Bellmead	LINESTRING (-97.109487 31.595448, -97.11119 31.595368, -97.112069 31.59512, -97.114637 31.595408, -97.115415 31.595345, -97.116706 31.594982, -97.117659 31.594959, -97.118389 31.595183)	Behrans Cir	Behrans Cir	Roadway Related	Pavement	Motor Vehicle
56	75	street lighting, improved shoulders	Bellmead	LINESTRING (-97.084279 31.593528, -97.077953 31.605581)	Williams Dr	Williams Dr	Roadway Related	Shoulder	Motor Vehicle
57	76	street lighting, improved shoulders	Bellmead	LINESTRING (-97.077788 31.605895, -97.066971 31.626298)	Williams Dr	Williams Dr	Roadway Related	Shoulder	Motor Vehicle
58	80	road widened, street lighting	Bellmead	LINESTRING (-97.088264 31.598631, -97.075294 31.605498, -97.074988 31.60663)	Harrison St	Harrison St	Roadway Related	Narrow Lanes	Motor Vehicle

#	Filtered ID	Comment	City	Location	Street/Intersection	Corridor	Issue	Additional Details	Primary Mode Affected
59	81	Road widened, Street lighting	Bellmead	LINESTRING (-97.081982 31.597742, -97.0818 31.597677, -97.081666 31.597701, -97.081437 31.597807, -97.08048 31.598231, -97.078644 31.595192, -97.078672 31.595045, -97.078758 31.59489, -97.078787 31.594792, -97.078513 31.594358, -97.07696 31.5919)	Penton Ln	Penton Ln	Roadway Related	Narrow Lanes	Motor Vehicle
60	82	Road widened, Street lighting	Bellmead	LINESTRING (-97.077109 31.60447, -97.073697 31.599126, -97.073717 31.598955, -97.074405 31.598613, -97.074463 31.598442, -97.072674 31.595574, -97.072301 31.595329, -97.072416 31.595411)	Wilson Rd	Wilson Rd	Roadway Related	Narrow Lanes	Motor Vehicle
61	83	Off-the-road single vehicle collisions on this curve. A curb & gutter, divided road with chevrons on curve. Collisions are due to speeding on MLK Jr Blvd. Are there improvements that can lower speeds or help prevent off-the-road on this curvilinear section?	Waco	[31.571828,-97.139313]	M L K Jr Blvd	M L K Jr Blvd	Roadway Related	Curve on the road	Motor Vehicle
62	7	Kids crossin. Pedestrian Crossing Safety	Hewitt	LINESTRING (-97.202843 31.484257, -97.198731 31.478528)	Old Hewitt Dr	Old Hewitt Dr	School Safety		Pedestrian
63	8	Crossing not on crosswalk	Waco	LINESTRING (-97.216545 31.482056, -97.216597 31.481705, -97.216829 31.481076, -97.217472 31.480349, -97.217787 31.480132, -97.218778 31.479615, -97.218998 31.47949)	Chapel Rd	Chapel Rd	School Safety		Pedestrian
64	40	Rough road, no paved shoulder, complicated intersections with stop signs. It could use traffic signals at Katy, Harrison, Penton.	Bellmead	LINESTRING (-97.086848 31.588349, -97.067802 31.624675)	Williams Dr	Williams Dr	Sign and Signal Related	Pavement	Motor Vehicle
65	93	No one respect the speed limit 20m. So why not place lights to direct traffic more smoothly. Too many cars try to speed by busses with minor children aboard.	Waco	[31.523915,-97.131846]	S Valley Mills & La Salle Ave & Circle Rd	La Salle Ave	Sign and Signal Related	School Bus	Motor Vehicle
66	115	High Pedestrian Traffic and vehicle traffic with no sidewalk	Waco	LINESTRING (-97.114413 31.543561, -97.11647 31.545287, -97.115364 31.54436, -97.11368 31.542949, -97.113282 31.542632, -97.113023 31.542426, -97.112765 31.542221)	S 4th St	S 4th St	Traffic		Pedestrian
67	39	narrow road, high speed traffic, very dark at night	Bellmead	LINESTRING (-97.089008 31.599801, -97.085647 31.602731, -97.082687 31.610092, -97.081726 31.617724, -97.079486 31.620518, -97.06052 31.629308)	Concord Rd	Concord Rd	Unsafe Speed		Motor Vehicle
68	32	School Zone. Roadway is 55 mph with a 35mph school zone. Would like to see it dropped to 20 mph	Hewitt	LINESTRING (-97.202302 31.452285, -97.200867 31.455363)	S Hewitt Dr	Hewitt Dr	Unsafe Speed		Motor Vehicle
69	121	Not a bike/pedestrian friendly intersection. Stoneridge and Grosse-Yowell neighborhoods residents don't have a safe way to cross Spring Valley Road on foot or bicycle.	Hewitt	LINESTRING (-97.207893 31.4375, -97.208169 31.435497, -97.20535 31.436377, -97.206035 31.438107, -97.207911 31.437523)	Spring Valley Rd & S Hewitt Dr	Hewitt Dr	Pedestrian Safety		Pedestrian
70	57	Needs sidewalks, pedestrian crossings, and street lighting	Bellmead	LINESTRING (-97.103012 31.587355, -97.108351 31.59524, -97.107313 31.595507, -97.102758 31.589058, -97.102209 31.588281)	Hogan Ln and La Clede St	Hogan Ln	Pedestrian Safety	sidewalk, crosswalk	Pedestrian

#	Filtered ID	Comment	City	Location	Street/Intersection	Corridor	Issue	Additional Details	Primary Mode Affected
71	58	sidewalks, pedestrian crossings, street lighting	Bellmead	LINESTRING (-97.100717 31.589681, -97.099862 31.590611, -97.099637 31.590853, -97.09851 31.591905, -97.095745 31.594028)	US-84 (Bellmead Dr)	US-84	Pedestrian Safety	sidewalk, crosswalk	Pedestrian
72	94	Baylor games and public traffic conflict one another on game days. Causing delays, wrecks,running red light. Also, Baylor Students don't have a safe walking across area. Especially, when the area isn't lighten up for visual. Also, I feel there should be an emergency push button pole for the students at that intersection. Too many close calls of a students being a victim	Waco	[31.545873,-97.105883]	La Salle Ave & University Parks Dr	University Parks Dr	Pedestrian Safety		Pedestrian
73	86	No pedestrian walks, people and kids are always walking in the street and at night this is dangerous as there are no street lights either	Bellmead	LINESTRING (-97.075704 31.622433, -97.076103 31.622272, -97.076544 31.62195, -97.076944 31.621807, -97.077322 31.621592, -97.077596 31.621395, -97.077911 31.621198, -97.078247 31.621001, -97.078647 31.62084, -97.078899 31.620679, -97.079172 31.620518, -97.079572 31.620303, -97.079887 31.620106, -97.080265 31.619873, -97.080497 31.619694, -97.080749 31.61939, -97.081043 31.619068, -97.081316 31.61871, -97.081569 31.618388, -97.081653 31.61803, -97.081758 31.617618, -97.081947 31.617242, -97.08168 31.617313, -97.081743 31.616793, -97.081849 31.616328, -97.081849 31.615916, -97.08208 31.61554, -97.082122 31.615129, -97.082206 31.614645, -97.082164 31.614162, -97.082185 31.613786, -97.082332 31.613535, -97.0825 31.61311, -97.082479 31.612341, -97.08271 31.611893, -97.0825 31.611732, -97.082731 31.61107, -97.082563 31.61064, -97.08271 31.609745, -97.082837 31.609261, -97.083152 31.608903, -97.083362 31.608671, -97.083656 31.607453, -97.083951 31.606862, -97.084245 31.606271, -97.084476 31.605412, -97.084665 31.604606, -97.085296 31.603604, -97.085885 31.602494, -97.086578 31.601724, -97.086999 31.601043)	Concord Rd	Concord Rd	Pedestrian Safety		Pedestrian
74	18	Poor sightline, lighting	Lacy Lakeview	[31.621628,-97.107726]	New Dallas Hwy & W Craven Ave	New Dallas Hwy	Sight Distance		Motor Vehicle
75	60	sidewalks, pedestrian crossings, lighting	Bellmead	LINESTRING (-97.105292 31.603843, -97.097308 31.602809)	SL-340	SL-340	Lighting		Pedestrian
76	108	People walk this road a lot including at night and there are very few lights to eliminate the area.	Bellmead	LINESTRING (-97.08735 31.600867, -97.08547 31.60318, -97.083042 31.608618, -97.082464 31.612669, -97.081975 31.616079, -97.081779 31.617638, -97.080108 31.619873, -97.078907 31.620707, -97.077771 31.621474, -97.075491 31.622456, -97.073517 31.623456)	Concord Rd	Concord Rd	Lighting		Pedestrian
77	63	Street lighting, sidewalks.	Bellmead	LINESTRING (-97.107008 31.593122, -97.103658 31.594721, -97.102858 31.595103, -97.100868 31.596052, -97.096741 31.598021)	Parrish St	Parrish St	Lighting		Pedestrian

#	Filtered ID	Comment	City	Location	Street/Intersection	Corridor	Issue	Additional Details	Primary Mode Affected
78	64	Street lighting and sidewalks	Bellmead	LINESTRING (-97.090496 31.600161, -97.09224 31.602489, -97.092867 31.604458, -97.093442 31.6179, -97.093747 31.624859)	Airbase Rd	Airbase Rd	Lighting		Pedestrian
79	67	street lighting, sidewalk	Bellmead	LINESTRING (-97.092915 31.604073, -97.092984 31.600735, -97.089927 31.598899)	Airbase Rd	Airbase Rd	Lighting		Pedestrian
80	68	sidewalk, street lighting	Bellmead	LINESTRING (-97.095712 31.594073, -97.091323 31.597652)	US-84	US-84	Lighting		Pedestrian
81	31	The worst intersection in Hewitt. Very congested with vehicles and pedestrian traffic. This is the main intersection for children to access Midway Middle School. There have been multiple pedestrians struck at this intersection. School zone speed limit should be lowered to 20 mph and the crosswalks need further safety measures.	Hewitt	[31.476139,-97.20378]	Panther Way & N Hewitt Dr	Hewitt Dr	School Safety		Pedestrian
82	13	Bagby/4th - Narrow ROW, no sidewalk, 4 way stops, there is a jog at the intersection	Waco	[31.544353,-97.115258]	Bagby Ave & S 4th St	Bagby Ave	Sign and Signal Related		Pedestrian
83	37	Unsafe/congested intersection multiple times per day when Baylor classes in session. High pedestrian/bike/scooter traffic combined with vehicles queuing up a the 4-way stop. Sidewalks inadequate or non-existent on 1 corner. Consider a traffic light similar to one block away at Bagby & 3rd.	Waco	[31.544358,-97.115263]	Bagby Ave & S 4th St	Bagby Ave	Sign and Signal Related	high volume traffic	Pedestrian
84	109	Hewitt Drive is horrible. North Old Temple has too many big trucks zooming by and others speeding vehicles. Not safe for pedestrians and very difficult for residents to back out of driveways or park on the street.	Hewitt	[31.460132,-97.173]	N Old Temple Rd	Old Temple Rd	Unsafe Speed		Pedestrian
85	29	Spring Valley has a 50 mph speed limit. The entire roadway through Hewitt travels completely through residential neighborhoods and one elementary school. The roadway is currently under construction and adding a center turn lane. Speed needs to be reduced , and several complaints about the lack of sidewalks along the roadway to facilitate pedestrian traffic to Spring Valley Elementary.	Hewitt	LINESTRING (-97.211461 31.434424, -97.200928 31.43981, -97.19795 31.44135, -97.1969 31.442276, -97.19597 31.443537, -97.194984 31.444363, -97.193213 31.44525, -97.188541 31.447555, -97.18064 31.451274, -97.17907 31.452255, -97.176825 31.454762)	Spring Valley Rd	Spring Valley Rd	Unsafe Speed		Pedestrian
86	62	Better road surface, road widened, street lighting	Bellmead	LINESTRING (-97.0874 31.60058, -97.085617 31.603042, -97.083046 31.609156, -97.081821 31.617757, -97.080205 31.619976, -97.066999 31.626378)	Concord Rd	Concord Rd	Lighting	Narrow Lanes, Pavement	Motor Vehicle
87	42	Road is in bad shape, highly traveled, not well lit,	Bellmead	LINESTRING (-97.109487 31.595448, -97.11119 31.595368, -97.112069 31.59512, -97.114637 31.595408, -97.115415 31.595345, -97.116706 31.594982, -97.117659 31.594959, -97.118389 31.595183)	Behrans Cir	Behrans Cir	Lighting	Pavement	Motor Vehicle
88	75	street lighting, improved shoulders	Bellmead	LINESTRING (-97.084279 31.593528, -97.077953 31.605581)	Williams Dr	Williams Dr	Lighting	Shoulder	Motor Vehicle

#	Filtered ID	Comment	City	Location	Street/Intersection	Corridor	Issue	Additional Details	Primary Mode Affected
89	76	street lighting, improved shoulders	Bellmead	LINESTRING (-97.077788 31.605895, -97.066971 31.626298)	Williams Dr	Williams Dr	Lighting	Shoulder	Motor Vehicle
90	80	road widened, street lighting	Bellmead	LINESTRING (-97.088264 31.598631, -97.075294 31.605498, -97.074988 31.60663)	Harrison St	Harrison St	Lighting	Narrow Lanes	Motor Vehicle
91	81	Road widened, Street lighting	Bellmead	LINESTRING (-97.081982 31.597742, -97.0818 31.597677, -97.081666 31.597701, -97.081437 31.597807, -97.08048 31.598231, -97.078644 31.595192, -97.078672 31.595045, -97.078758 31.59489, -97.078787 31.594792, -97.078513 31.594358, -97.07696 31.5919)	Penton Ln	Penton Ln	Lighting	Narrow Lanes	Motor Vehicle
92	82	Road widened, Street lighting	Bellmead	LINESTRING (-97.077109 31.60447, -97.073697 31.599126, -97.073717 31.598955, -97.074405 31.598613, -97.074463 31.598442, -97.072674 31.595574, -97.072301 31.595329, -97.072416 31.595411)	Wilson Rd	Wilson Rd	Lighting	Narrow Lanes	Motor Vehicle
93	83	Off-the-road single vehicle collisions on this curve. A curb & gutter, divided road with chevrons on curve. Collisions are due to speeding on MLK Jr Blvd. Are there improvements that can lower speeds or help prevent off-the-road on this curvilinear section?	Waco	[31.571828,-97.139313]	M L K Jr Blvd	M L K Jr Blvd	Unsafe Speed	Curve on the road	Motor Vehicle
94	7	Kids crossin. Pedestrian Crossing Safety	Hewitt	LINESTRING (-97.202843 31.484257, -97.198731 31.478528)	Old Hewitt Dr	Old Hewitt Dr	Pedestrian Safety		Pedestrian
95	8	Crossing not on crosswalk	Waco	LINESTRING (-97.216545 31.482056, -97.216597 31.481705, -97.216829 31.481076, -97.217472 31.480349, -97.217787 31.480132, -97.218778 31.479615, -97.218998 31.47949)	Chapel Rd	Chapel Rd	Pedestrian Safety		Pedestrian
96	40	Rough road, no paved shoulder, complicated intersections with stop signs. It could use traffic signals at Katy, Harrison, Penton.	Bellmead	LINESTRING (-97.086848 31.588349, -97.067802 31.624675)	Williams Dr	Williams Dr	Roadway Related	Pavement	Motor Vehicle
97	93	No one respect the speed limit 20m. So why not place lights to direct traffic more smoothly. Too many cars try to speed by busses with minor children aboard.	Waco	[31.523915,-97.131846]	S Valley Mills & La Salle Ave & Circle Rd	La Salle Ave	Unsafe Speed	School Bus	Motor Vehicle
98	115	High Pedestrian Traffic and vehicle traffic with no sidewalk	Waco	LINESTRING (-97.114413 31.543561, -97.11647 31.545287, -97.115364 31.54436, -97.11368 31.542949, -97.113282 31.542632, -97.113023 31.542426, -97.112765 31.542221)	S 4th St	S 4th St	Pedestrian Safety		Pedestrian
99	39	narrow road, high speed traffic, very dark at night	Bellmead	LINESTRING (-97.089008 31.599801, -97.085647 31.602731, -97.082687 31.610092, -97.081726 31.617724, -97.079486 31.620518, -97.06052 31.629308)	Concord Rd	Concord Rd	Lighting		Motor Vehicle
100	32	School Zone. Roadway is 55 mph with a 35mph school zone. Would like to see it dropped to 20 mph	Hewitt	LINESTRING (-97.202302 31.452285, -97.200867 31.455363)	S Hewitt Dr	Hewitt Dr	School Safety		Motor Vehicle
101	56	Would prefer to have sidewalks with Bike facilties	Woodway	LINESTRING (-97.212739 31.519961, -97.213935 31.518365, -97.214882 31.517807, -97.216077 31.516289, -97.217836 31.51502, -97.22352 31.512001)	Bosque Blvd	Bosque Blvd	Bicycle-related		Bicycle

#	Filtered ID	Comment	City	Location	Street/Intersection	Corridor	Issue	Additional Details	Primary Mode Affected
102	2	I would like Bike	Waco	LINESTRING (-97.178331 31.543109, -97.171854 31.546503, -97.171864 31.546074, -97.171834 31.546508)	Ethel Ave	Ethel Ave	Bicycle-related		Bicycle
103	61	Street Lighting	Bellmead	LINESTRING (-97.091302 31.597684, -97.09059 31.598198, -97.087418 31.600487, -97.082327 31.604161, -97.074656 31.606873, -97.071893 31.608183)	US-84	US-84	Lighting		Motor Vehicle
104	14	Ped Crossing, No sidewalk	Waco	[31.544352,-97.115266]	Bagby Ave & S 4th St	Bagby Ave	Pedestrian Safety		Pedestrian
105	38	Many Baylor students cross this intersection on foot, bike or scooter. Unsafe conditions due to speed, etc...	Waco	[31.546188,-97.105596]	La Salle Ave & University Parks Dr	University Parks Dr	Pedestrian Safety		Pedestrian
106	90	Auto peds	Bellmead	[31.593467,-97.096536]	State Hwy 31 & Katy St	State Hwy 31	Pedestrian Safety		Pedestrian
107	89	Auto peds	Bellmead	[31.594629,-97.108103]	Hogan Ln	Hogan Ln	Pedestrian Safety		Pedestrian
108	91	Auto peds	Bellmead	[31.598925,-97.089289]	US-84 & SL-340	US-84	Pedestrian Safety		Pedestrian
109	11	No sidewalk	Waco	LINESTRING (-97.182029 31.542586, -97.181271 31.542956, -97.180555 31.543348, -97.179329 31.543969, -97.178528 31.544328, -97.177694 31.544821, -97.176391 31.545445, -97.175008 31.546167, -97.174227 31.546598)	Colcord Ave	Colcord Ave	Pedestrian Safety		1
110	116	Pedestrians want to cross in this area but have no safe way to do so.	Waco	LINESTRING (-97.115391 31.551181, -97.11529 31.551452, -97.115118 31.55141, -97.115216 31.551102, -97.115403 31.551165)	Baylor Ave & University Parks Dr	University Parks Dr	Pedestrian Safety		Pedestrian
111	117	Pedestrians want to cross in this area but there is no crosswalk	Waco	LINESTRING (-97.113616 31.550635, -97.113493 31.550932, -97.113867 31.551029, -97.11399 31.550747, -97.113641 31.550637, -97.113736 31.550608)	University Parks Dr	University Parks Dr	Pedestrian Safety		Pedestrian
112	74	sidewalks	Bellmead	LINESTRING (-97.109574 31.580177, -97.103925 31.586256)	US-84 (Bellmead Dr)	US-84	Pedestrian Safety		Pedestrian
113	30	Mis-aligned intersection. 4 way stop with heavy pedestrian usage.	Waco	[31.544353,-97.115223]	Bagby Ave & S 4th St	Bagby Ave	Roadway Related	Intersection Geometry	Motor Vehicle
114	100	No rails nor space to get by due to no to limited space	Hallsburg	[31.548288,-96.963446]	Sommerfeld Dr	Sommerfeld Dr	Roadway Related	Narrow Lanes	Motor Vehicle
115	112	On Hewitt Drive near Old McGregor Road intersection, the railroad crossing is very bumpy. Everyone on the inside lane traveling North has to almost stop when crossing. Also traffic is very heavy in the morning and afternoons on Hewitt Drive.	Waco	[31.4944283529456,-97.2180901336065]	Hewitt Dr & Old McGregor Rd	Hewitt Dr	Roadway Related	railroald crossing	Motor Vehicle
116	97	Is this a single lane turning left or two lanes to turn left. Some 18 wheeler take up two lanes. More like how the set up is under bridge by HEB. Would not fitting here. That's how the 18 wheeler crushed the car not too long ago. The car tried to make it a two lane turn and got stuck under the 18 wheeler.	Waco	[31.577589,-97.112589]	New Dallas Hwy & 1-35 Frontage Rd	New Dallas Hwy	Roadway Related	Striping, Narrow Lanes	Motor Vehicle

#	Filtered ID	Comment	City	Location	Street/Intersection	Corridor	Issue	Additional Details	Primary Mode Affected
117	111	New Road near Walmart. The road was repaired by the bridge, but towards the VA nothing was done. That section of the road, over time, will knock your vehicle out of alignment.	Waco	[31.58773,-97.151028]	S New Road	S New Road	Roadway Related	Pavement	Motor Vehicle
118	85	Wrecks, people take the corner spinning out an end up the the ditch	Bellmead	[31.619873,-97.080433]	Sam Houston St & Concord Rd	Concord Rd	Roadway Related	Ditch	Motor Vehicle
119	20	Striping	Robinson	LINESTRING (-97.112682 31.458815, -97.11276 31.459332, -97.113288 31.460306, -97.115997 31.464492, -97.118125 31.467699, -97.120203 31.470865)	S Old Robinson Rd	S Old Robinson Rd	Roadway Related	Striping	Motor Vehicle
120	106	All the way down Concord there are man hole covers that protrude out of the road causing huge bumps in the road	Bellmead	LINESTRING (-97.08657 31.601766, -97.082383 31.612563, -97.081376 31.618235, -97.078971 31.620756, -97.073572 31.62334, -97.070462 31.624812, -97.066782 31.626475, -97.060376 31.629418)	Concord Rd	Concord Rd	Roadway Related	Pavement	Motor Vehicle
121	107	All of cloverleaf rd is covered in patches and potholes	Bellmead	LINESTRING (-97.082537 31.613004, -97.088197 31.620885, -97.082507 31.61298, -97.077643 31.606588)	Cloverleaf Rd	Cloverleaf Rd	Roadway Related	Pavement	Motor Vehicle
122	70	Eliminate this frontage road.	Bellmead	LINESTRING (-97.113216 31.592745, -97.112168 31.598002)	US-77 Frontage Rd	US-77 Frontage Rd	Roadway Related	Remove Road	Motor Vehicle
123	113	Need to retrench all drainage ditches down Concord and Sam Houston. Flooding is a big issue in the streets.	Bellmead	LINESTRING (-97.076761 31.621723, -97.077222 31.62174, -97.077442 31.621621, -97.077763 31.621399, -97.078083 31.621212, -97.078504 31.620956, -97.078964 31.620683, -97.079184 31.620581, -97.079465 31.620427, -97.079725 31.620257, -97.079925 31.620103, -97.080266 31.619796, -97.080847 31.618995, -97.081387 31.618381, -97.081628 31.618074, -97.081808 31.617681, -97.081948 31.617392, -97.082088 31.616965, -97.082148 31.616539, -97.082229 31.616164, -97.081968 31.615866, -97.081928 31.615542, -97.082008 31.615201, -97.082148 31.614808, -97.082309 31.614365, -97.082409 31.61399, -97.082449 31.613529, -97.082489 31.613001, -97.082409 31.612625, -97.080144 31.620019, -97.080385 31.620429, -97.080725 31.620855, -97.080845 31.621111, -97.081146 31.621367, -97.081426 31.621554, -97.081546 31.621981, -97.081686 31.622253, -97.081947 31.622458, -97.081947 31.622782, -97.082027 31.622987, -97.082286 31.623303, -97.082887 31.623866, -97.08249 31.61265, -97.082631 31.61236, -97.082691 31.612036)	Concord Rd	Concord Rd	Roadway Related	Drainage	Motor Vehicle
124	51	Street not marked, taco stand customers park on street	Bellmead	LINESTRING (-97.090794 31.597954, -97.090259 31.597496)	US-84 & SL-340 Shopping area	US-84	Roadway Related	Striping	Motor Vehicle

#	Filtered ID	Comment	City	Location	Street/Intersection	Corridor	Issue	Additional Details	Primary Mode Affected
125	5	Traffic congestion near school	Bellmead	LINESTRING (-97.100832 31.603379, -97.098694 31.603061, -97.096081 31.602492, -97.093479 31.60148)	SL-340	SL-340	School Safety		Motor Vehicle
126	12	We don├t have a fence around castleman creek playground and have strangers from Hewitt park playing disc golf come onto property often.	Hewitt	LINESTRING (-97.205938 31.454809, -97.205712 31.455077, -97.205854 31.454548, -97.205716 31.453411, -97.204951 31.453227, -97.204549 31.453938, -97.20504 31.454633, -97.205579 31.455085)	Castleman Creek Elementary	Seminole Trail	School Safety	Fencing	Other
127	99	Needs a better view for busses to safely transport students.	Bellmead	[31.58129,-97.097763]	Katy Ln & Preston	Katy Ln	Sight Distance	School Bus	Motor Vehicle
128	122	Line of sight from vertical elevations, and reduced site limitations due to east-west direction of travel at times of sunrise and sunset.	Lorena (Unincorporated)	LINESTRING (-97.206792 31.377945, -97.202213 31.377293, -97.201297 31.377391, -97.20021 31.377928, -97.198168 31.378906)	Rosenthal Rd	Rosenthal Rd	Sight Distance		Motor Vehicle
129	125	Hills, increasing traffic levels, one fatality in recent years, possibly add flashing lights or other safety measures.	Unincorporated McLennan County	LINESTRING (-97.144946 31.671582, -97.14436 31.670197)	Gholson Rd	Gholson Rd	Sight Distance		Motor Vehicle
130	26	Increased traffic at this location due to residential development in Waco. Speed is designated at 55 mph and changes to 60 mph just past this intersection. Possibility of a traffic signal at this location.	Hewitt	[31.445723,-97.204356]	S Hewitt Dr & Ritchie Rd	Hewitt Dr	Sign and Signal Related	Signalization	Motor Vehicle
131	127	Unsafe intersection	Hewitt	[31.445733,-97.204324]	S Hewitt Dr & Ritchie Rd	Hewitt Dr	Sign and Signal Related		Motor Vehicle
132	28	There are two very large Manufactuing facilities being built northwest of this intersection in Waco. We believe these manufactures will utilize Alliance and this intersection to reach either IH 35 or Highway 6. There will be an increase in commercial motor vehicle traffic at this intersection - we are currently seeing the CMV traffic as a result of construction. This is not a controlled intersection - may need a traffic signal at this location.	Hewitt	[31.467985,-97.180991]	N Old Temple Rd & Alliance Pkwy	Old Temple Rd	Sign and Signal Related		Motor Vehicle
133	55	Can we look at installing Signal	Woodway	[31.505954,-97.205277]	Santa Fe Dr & Old McGregor Rd	Santa Fe Dr	Sign and Signal Related		Motor Vehicle
134	118	High Traffic area. Traffic control device needed	Waco	[31.542082,-97.110552]	La Salle Ave & S 3th St	La Salle Ave	Sign and Signal Related		Motor Vehicle
135	35	This is a super dangerous intersection. Thousands of students cross here before and after classes and cars come from all 4 directions, with left turns in two directions. Someone will get hurt if we don't put traffic lights here.	Waco	[31.544377,-97.115198]	Bagby Ave & S 4th St	Bagby Ave	Sign and Signal Related		Motor Vehicle
136	119	high pedestrian and high traffic area. traffic control device needed	Waco	[31.544377,-97.115257]	Bagby Ave & S 4th St	Bagby Ave	Sign and Signal Related		Motor Vehicle
137	98	Stop sign is missing at the corner. It was taken down.	Bellmead	[31.582807,-97.095835]	Katy Ln & Carla St	Katy Ln	Sign and Signal Related		Motor Vehicle
138	69	four way stop	Bellmead	[31.589272,-97.098676]	Harrison St & Ashleman St	Harrison St	Sign and Signal Related		Motor Vehicle

#	Filtered ID	Comment	City	Location	Street/Intersection	Corridor	Issue	Additional Details	Primary Mode Affected
139	77	four way stop	Bellmead	[31.594085,-97.10499]	Parrish St & Maxfield St	Parrish St	Sign and Signal Related		Motor Vehicle
140	48	No stop signs	Bellmead	[31.594531,-97.087359]	San Pedro St & Gram Ln	San Pedro St	Sign and Signal Related		Motor Vehicle
141	78	four way stop	Bellmead	[31.595165,-97.102742]	Parrish St & Ashlemand St	Parrish St	Sign and Signal Related		Motor Vehicle
142	47	No stop signs	Bellmead	[31.595294,-97.087803]	San Pedro St & San Jose St	San Pedro St	Sign and Signal Related		Motor Vehicle
143	73	four way stop or redlight	Bellmead	[31.595325,-97.118794]	Old Dallas Rd & Montrose St	Old Dallas Rd	Sign and Signal Related		Motor Vehicle
144	54	No stop sign	Bellmead	[31.595442,-97.087995]	San Pedro St & San Jose St	San Pedro St	Sign and Signal Related		Motor Vehicle
145	79	four way stop	Bellmead	[31.596048,-97.10088]	Parrish St & La Vega St	Parrish St	Sign and Signal Related		Motor Vehicle
146	52	No stop sign	Bellmead	[31.597512,-97.090252]	Harrison St &	Harrison St	Sign and Signal Related		Motor Vehicle
147	53	No stop sign	Bellmead	[31.598112,-97.089107]	Harrison St & Lopez St	Harrison St	Sign and Signal Related		Motor Vehicle
148	105	The lights on hwy 84 turn green BEFORE the lights on loop340 side have even changed red.	Bellmead	[31.59869,-97.089422]	US-84 and Airbase Rd	US-84	Sign and Signal Related		Motor Vehicle
149	103	The lights on hwy 84 turn green BEFORE the lights on loop340 side have even changed red.	Bellmead	[31.598828,-97.089841]	US-84 and Airbase Rd	US-84	Sign and Signal Related		Motor Vehicle
150	104	The lights on hwy 84 turn green BEFORE the lights on loop340 side have even changed red.	Bellmead	[31.599036,-97.088789]	US-84 and Airbase Rd	US-84	Sign and Signal Related		Motor Vehicle
151	102	The lights on hwy 84 turn green BEFORE the lights on loop340 side have even changed red.	Bellmead	[31.599449,-97.089364]	US-84 and Airbase Rd	US-84	Sign and Signal Related		Motor Vehicle
152	59	needs a redlight placed	Bellmead	[31.6027,-97.097161]	SL-340	SL-340	Sign and Signal Related		Motor Vehicle
153	101	The lights change to fast, and semi trucks blow through the red light on hwy 84 while the green light on Williams changes from green to red within 10 seconds.	Bellmead	[31.605791,-97.077727]	US-84	US-84	Sign and Signal Related		Motor Vehicle
154	66	Red light	Bellmead	[31.614218,-97.093258]	Airbase Rd & Pecan Ave	Airbase Rd	Sign and Signal Related		Motor Vehicle
155	65	redlight	Bellmead	[31.618067,-97.093452]	Airbase Rd & Meyers Ln	Airbase Rd	Sign and Signal Related		Motor Vehicle
156	87	Crashes	Waco	[31.576602,-97.111384]	S Loop Dr	S Loop Dr	Traffic	Collision	Motor Vehicle
157	16	Cut thru traffic	Bellmead	[31.587275,-97.103051]	US-84 (Bellmead Dr)	US-84	Traffic	Cut-through traffic	Motor Vehicle
158	45	To many entryways for the on coming traffic and no one yeilds when the light turns green	Bellmead	[31.599495,-97.089459]	US-84 & SL-340	US-84	Traffic	Access Management	Motor Vehicle
159	3	Traffic concerns	Bellmead	LINESTRING (-97.103136 31.587132, -97.100603 31.589888, -97.098071 31.592306, -97.096185 31.593699, -97.092414 31.596806, -97.090187 31.598505)	US-84 (Bellmead Dr)	US-84	Traffic		Motor Vehicle

#	Filtered ID	Comment	City	Location	Street/Intersection	Corridor	Issue	Additional Details	Primary Mode Affected
160	9	Traffic Congestion	Waco	LINESTRING (-97.216813 31.484902, -97.216514 31.482206, -97.21697 31.480865, -97.21785 31.480046, -97.219972 31.479, -97.221686 31.478115)	Chapel Rd	Chapel Rd	Traffic		Motor Vehicle
161	128	Speeding	Hewitt	[31.445409,-97.207563]	Ritchie Rd	Ritchie Rd	Unsafe Speed		Motor Vehicle
162	129	Speeding	Waco	[31.486728,-97.211054]	N Hewitt Dr	Hewitt Dr	Unsafe Speed		Motor Vehicle
163	110	Sanger off New Road towards 42nd street. Speed limit is never observed by motorists. Everyone speeds through this residential area.	Waco	[31.552629,-97.141415]	Sanger Ave	Sanger Ave	Unsafe Speed		Motor Vehicle
164	46	Heavy traffic and speeding vehicles	Bellmead	[31.599517,-97.0885]	US-84	US-84	Unsafe Speed		Motor Vehicle
165	4	Speeding	Bellmead	LINESTRING (-97.105972 31.593632, -97.103634 31.594747, -97.101521 31.595755, -97.099489 31.596724, -97.096723 31.598009)	Parrish St	Parrish St	Unsafe Speed		Motor Vehicle
166	84	Constant speeding	Bellmead	LINESTRING (-97.077049 31.621986, -97.076965 31.621968, -97.077049 31.621574, -97.077806 31.621323, -97.078058 31.621091, -97.07871 31.62084, -97.078899 31.620607, -97.079109 31.62041, -97.079361 31.620321, -97.07974 31.620088, -97.080202 31.619766, -97.080644 31.619301, -97.080938 31.618996, -97.081085 31.618746, -97.081211 31.618549, -97.081464 31.618227, -97.081548 31.617994, -97.081695 31.617743)	Concord Rd	Concord Rd	Unsafe Speed		Motor Vehicle
167	49	Speeding	Bellmead	LINESTRING (-97.08928 31.597628, -97.087182 31.5943)	San Pedro St	San Pedro St	Unsafe Speed		Motor Vehicle
168	50	Speeding	Bellmead	LINESTRING (-97.088262 31.597457, -97.085179 31.592523)	Lopez St	Lopez St	Unsafe Speed		Motor Vehicle
169	25	Old Temple is a right turn only at S. Hewitt Dr. Traffic disregards the right turn only and makes left turns to access IH 35.	Hewitt	[31.422543,-97.196076]	S Hewitt Dr & Old Temple Rd	Hewitt Dr	Unsafe Turn		Motor Vehicle
170	24	Southbound traffic on Hewitt Dr. are U-turning to access the exit ramp to Spring Valley.	Hewitt	[31.429072,-97.202358]	S Hewitt Dr	Hewitt Dr	Unsafe Turn		Motor Vehicle
171	21	Unsafe U-turns from On-ramp to Off-ramp	Hewitt	[31.429271,-97.202517]	S Hewitt Dr	Hewitt Dr	Unsafe Turn		Motor Vehicle
172	23	Unsafe Right Turn	McGregor	[31.441013,-97.418189]	US-84 & N Johnson Dr	US-84	Unsafe Turn		Motor Vehicle
173	123	Many accidents have happen, because people are turning into the Walmart parking lot off of New Road just over the rail road over pass. Maybe put some barrier so they have to go around . The accidents happen as they are coming off of Franklin on to New Road and attempting to turn left onto the Walmart parking lot.	Waco	[31.518911,-97.166113]	S New Road	S New Road	Unsafe Turn		Motor Vehicle

#	Filtered ID	Comment	City	Location	Street/Intersection	Corridor	Issue	Additional Details	Primary Mode Affected
174	34	Multiple traffic collisions according to the data - believed to be a result of the open left turn lane.	Hewitt	LINESTRING (-97.198179 31.466518, -97.198332 31.466901, -97.199728 31.469376, -97.200109 31.470335, -97.200508 31.471092, -97.201305 31.472345, -97.201972 31.473429, -97.202075 31.473585, -97.202794 31.474734, -97.206564 31.480177)	N Hewitt Dr	Hewitt Dr	Unsafe Turn		Motor Vehicle
175	6	Car use shoulder to zoom and may hit with turning cars because sight line block by lined cars	Waco	LINESTRING (-97.076482 31.582543, -97.079238 31.58105, -97.080645 31.580258)	Orchard Ln & SL-340	SL-340	Unsafe Turn		Motor Vehicle
176	36	SB vehicles from turnaround are trying to cross lanes to get to restaurants. Recently installed delineators will hopefully help.	Waco	LINESTRING (-97.12479 31.548603, -97.124962 31.548358, -97.124968 31.548172, -97.124841 31.548123, -97.124635 31.548329, -97.124187 31.549141, -97.123957 31.549557, -97.124009 31.549698, -97.124193 31.549786, -97.124457 31.549288, -97.12479 31.548598)	S Jack Kultegen Expy	S Jack Kultegen Expy	Unsafe Turn		Motor Vehicle

APPENDIX F

FHWA PROVEN SAFETY COUNTERMEASURES

MAKING OUR ROADS SAFER

One Countermeasure at a Time

28 Proven Safety Countermeasures that offer significant and measurable impacts to improving safety

U.S. Department of Transportation
Federal Highway Administration

ZERO IS OUR GOAL
A SAFE SYSTEM IS HOW WE GET THERE
https://safety.fhwa.dot.gov/

Technical Report Documentation Page

1. REPORT NO.	2. GOVERNMENT ACCESSION NO.	3. RECIPIENT'S CATALOG NO.
FHWA-SA-21-071		

4. TITLE AND SUBTITLE	5. REPORT DATE
Making Our Roads Safer | One Countermeasure at a Time	October 2021
	6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
Matt Albee, Phillip Bobitz	

9. PERFORMING ORGANIZATION NAME & ADDRESS	10. WORK UNIT NO.
VHB 940 Main Campus Dr Ste 500 Raleigh, NC 27606	11. CONTRACT OR GRANT NO. DTFH6116D00040-693JJ320F000262

12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD
Federal Highway Administration Office of Safety 1200 New Jersey Ave., SE Washington, DC 20590	Final Report, July 2020 – October 2021
	14. SPONSORING AGENCY CODE HSST

15. SUPPLEMENTARY NOTES

The Contract Manager for this report was Phillip Bobitz (FHWA Office of Safety). Matt Albee (VHB) was the Principal Investigator.

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16. ABSTRACT

The Proven Safety Countermeasure Initiative (PSCi) is a collection of 28 countermeasures and strategies effective in reducing roadway fatalities and serious injuries on our Nation's highways. Transportation agencies are strongly encouraged to consider widespread implementation of PSCs to accelerate the achievement of local, State, and National safety goals. This booklet provides 1-page handouts for all 28 PSCs, broken into the focus areas of speed management, roadway departure, intersections, pedestrians/bicyclists, and crosscutting for countermeasures that apply across categories.

17. KEY WORDS	18. DISTRIBUTION STATEMENT
safety, countermeasures, speed management, roadway departure, intersections, pedestrian, bicyclist	No restrictions.

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OFFICE OF SAFETY

Proven Safety Countermeasures

SPEED MANAGEMENT

Speed Safety Cameras

Variable Speed Limits

Appropriate Speed Limits for All Road Users

ROADWAY DEPARTURE

Wider Edge Lines

Enhanced Delineation for Horizontal Curves

Longitudinal Rumble Strips and Stripes on Two-Lane Roads

SafetyEdge℠

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Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections

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PEDESTRIANS/BICYCLES

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Leading Pedestrian Interval

Medians and Pedestrian Refuge Islands in Urban and Suburban Areas

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Walkways

CROSSCUTTING

Pavement Friction Management

Lighting

Local Road Safety Plans

Road Safety Audit

Introduction

Widespread use of the 28 Proven Safety Countermeasures (PSCs) identified in this booklet can offer significant, measurable impacts as part of any agency's approach to improving safety. These strategies are designed for all road users and all kinds of roads—from rural to urban, from high-volume freeways to less traveled two-lane State and county roads, from signalized crossings to horizontal curves, and everything in between. Each countermeasure addresses at least one safety focus area – speed management, intersections, roadway departures, or pedestrians/bicyclists – while others are crosscutting strategies that address multiple safety focus areas.

Between 2016 and 2019, 85 percent[1] of all public highway fatalities occurred on Federal-aid highways, which represent 25 percent[2] of the entire public highway network. FHWA's partner agencies have invested in highway safety through the Highway Safety Improvement Program (HSIP), which provides targeted safety funding that is eligible for use on all public roads. However, this dedicated funding source represents only about 6 percent of the total Federal-aid program.[3] Every transportation project, whether or not the specific project purpose is safety related, is a new opportunity to save lives on our roadways. The FHWA's Proven Safety Countermeasures are eligible under most Federal-aid highway funding programs, and can support state, local, and tribal agency efforts to effectively accomplish goals to reduce fatalities and serious injuries. These countermeasures should serve as the basis for what agencies consider and implement when designing any highway project to improve safety.

To assist practitioners with determining the most appropriate PSC for their location of interest, the PSC webpage includes a filter tool that allows users to obtain a tailored listing of potential PSCs. Users answer questions regarding area types, functional classification, traffic volumes, issue identified, targeted crash types, and other information to receive a list of PSCs meeting thecriteria. This search function is intended to better serve practitioners, including those with limited safety background, when identifying and considering treatments and strategies that can improve safety as part of their program or project.

Transportation agencies are strongly encouraged to consider widespread implementation of PSCs to accelerate the achievement of local, State, and National safety goals. Reaching our goal of zero deaths and serious injuries requires all of us to take ownership in safety. Together, we can consider the safety needs at every stage of the project development process, the safety impact of every investment decision, and the appropriate safety countermeasures for every Federal-aid project.

1 NHTSA Fatality Analysis Reporting System (FARS) 2016-2018 Final and 2019 Annual Report File (ARF)
2 FHWA Highway Statistics 2019 (https://www.fhwa.dot.gov/policyinformation/statistics/2019/hm16.cfm)
3 Federal-aid apportioned programs under the Fixing America's Surface Transportation (FAST) Act (https://www.fhwa.dot.gov/fastact/funding.cfm)

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Proven Safety Countermeasures

Speed Safety Cameras

Safe Speeds is a core principle of the Safe System Approach since humans are less likely to survive high-speed crashes. Enforcing safe speeds has been challenging; however, with more information and tools communities can make progress in reducing speeds. Agencies can use speed safety cameras (SSCs) as an effective and reliable technology to supplement more traditional methods of enforcement, engineering measures, and education to alter the social norms of speeding. SSCs use speed measurement devices to detect speeding and capture photographic or video evidence of vehicles that are violating a set speed threshold.

Safety Benefits:

Fixed units can reduce crashes on urban principal arterials up to:

54% for all crashes.[4]

47% for injury crashes.[4]

P2P units can reduce crashes on urban expressways, freeways, and principal arterials up to:

37% for fatal and injury crashes.[2]

Mobile units can reduce crashes on urban principal arterials up to:

20% for fatal and injury crashes.[5]

In New York City, fixed units reduced speeding in school zones up to 63% during school hours.[6]

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/speedmgt/.

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Applications

Agencies should conduct a network analysis of speeding-related crashes to identify locations to implement SSCs. The analysis can include scope (e.g., widespread, localized), location types (e.g., urban/suburban/rural, work zones, residential, school zones), roadway types (e.g., expressways, arterials, local streets), times of day, and road users most affected by speed-related crashes (e.g., pedestrians, bicyclists).

SSCs can be deployed as:

- **Fixed units**—a single, stationary camera targeting one location.
- **Point-to-Point (P2P) units**—multiple cameras to capture average speed over a certain distance.
- **Mobile units**—a portable camera, generally in a vehicle or trailer.

The table below describes suitable circumstances for SSC deployment.[1]

Considerations

- SSCs can produce a crash reduction upstream and downstream, thus generating a spillover effect.[2]
- Public trust is essential for any type of enforcement. With proper controls in place, SSCs can offer fair and equitable enforcement of speeding, regardless of driver age, race, gender, or socio-economic status. SSCs should be planned with community input and equity impacts in mind.
- Using both overt (i.e., highly visible) and covert (i.e., hidden) enforcement may encourage drivers to comply with limits everywhere, not only at sites they are aware are enforced.
- Agencies should conduct evaluations regularly to determine if SSCs are accomplishing safety goals and whether changes in strategy, scheduling, communications, or public engagement are necessary.
- Agencies should conduct a legal and policy review to determine if SSCs are authorized within a jurisdiction and how the authorization and other traffic laws will affect a SSC program.
- Agencies should develop an SSC program plan with consideration of the USDOT SSC guidelines for planning, public involvement, stakeholder coordination, implementation, maintenance, evaluation, etc.[3]

Considerations for Selection	Fixed	P2P	Mobile
Problems are long-term and site-specific.	X	X	—
Problems are network-wide, and shift based on enforcement efforts.	—	—	X
Speeds at enforcement site vary largely from downstream sites.	—	X	X
Overt enforcement is legally required.	X	X	X
Sight distance for the enforcement unit is limited.	X	X	—
Enforcement sites are multilane facilities.	X	X	—

1 Thomas et al. Speed Safety Camera Program Planning and Operations Guide. FHWA, (2021).
2 Montella et al. "Effects on speed and safety of point-to-point speed enforcement systems". Accident Analysis and Prevention, Vol. 75, (2015). Note that this is an international study.
3 Speed Enforcement Camera Systems Operational Guidelines. NHTSA, (2008).
4 Shin et al. "Evaluation of the Scottsdale Loop 101 automated speed enforcement demonstration program." Accident Analysis and Prevention, Vol. 41, (2009).
5 Li et al. "A Before-and-After Empirical Bayes Evaluation of Automated Mobile Speed Enforcement on Urban Arterial Roads." Presented at the 94th Annual Meeting of the Transportation Research Board, Paper No. 15-1563, Washington, D.C., (2015). Note that this is an international study.
6 Automated Speed Enforcement Program Report 2014-2017. New York City DOT, (2018).

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Variable Speed Limits

Selecting appropriate speed limits on roadways is important in maintaining a safe and efficient transportation network. Speed limits are established with an engineering study based on inputs like traffic volumes, operating speeds, roadway characteristics, and crash history. However, conditions on the roadway are susceptible to change in a short amount of time (e.g., congestion, crashes, weather). Drivers typically determine their operating speeds under normal weather conditions on a straight roadway section with good pavement quality and adequate sight distances. If ideal conditions do not exist and the roadway does not meet the driver's expectations, there is a greater chance that a driver error could result in a crash. Providing variable speeds limits (VSLs) capable of adapting to changing circumstances could reduce crash frequency and severity.

Speed management strategies, including VSLs, are integral to the Safe Speeds element of the Safe System Approach. Because humans are unlikely to survive high-speed crashes, VSLs reduce speeds so that human injury tolerances are accommodated in three ways: improving visibility, providing additional time for drivers to stop, and reducing impact forces.

Safety Benefits:

VSLs can reduce crashes on freeways up to:

34%
for total crashes.[1]

65%
for rear-end crashes.[1]

51%
for fatal and injury crashes.[1]

Benefit/Cost Ratios range between[1]

9:1 - 40:1

Applications

VSLs use prevailing information on the roadway, like traffic speed, volumes, weather, and road surface conditions, to determine appropriate speeds and display them to drivers. This strategy improves safety performance and traffic flow by reducing speed variance (i.e., improving speed harmonization). VSLs may also improve driver expectation by providing information in advance of slowdowns and potential lane closures, which could reduce the probability for secondary crashes. VSLs can mitigate adverse weather conditions or to slow faster-moving traffic as it approaches a queue or bottleneck.

Agencies can implement VSLs for the following applications:


CONGESTION


INCIDENTS


WORK ZONES


INCLEMENT WEATHER

Considerations

- Particularly effective on urban and rural freeways and high-speed arterials with posted speed limits greater than 40 mph.
- Often implemented as part of Active Traffic Management (ATM) plans or incorporated into existing Road Weather Information Systems.
- When used with ATM, VSLs can mitigate rear-end, sideswipe, and other crashes on high-speed roadways.
- May be implemented as a regulatory and/or an advisory system.
- Can be applied to an entire roadway segment or individual lanes.

Source: WSDOT

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/speedmgt/ref_mats/.

1 Avelar et al. Developing Crash Modification Factors for Variable Speed Limit. FHWA, (2020).

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Appropriate Speed Limits for All Road Users

There is broad consensus among global roadway safety experts that speed control is one of the most important methods for reducing fatalities and serious injuries. Speed is an especially important factor on non-limited access roadways where vehicles and vulnerable road users mix.

A driver may not see or be aware of the conditions within a corridor, and may drive at a speed that feels reasonable for themselves but may not be for all users of the system, especially vulnerable road users, including children and seniors. A driver traveling at 30 miles per hour who hits a pedestrian has a 45 percent chance of killing or seriously injuring them.[1] At 20 miles per hour, that percentage drops to 5 percent.[1] A number of cities across the United States, including New York, Washington, Seattle and Minneapolis, have reduced their local speed limits in recent years in an effort to reduce fatalities and serious injuries, with most having to secure State legislative authorization to do so.

States and local jurisdictions should set appropriate speed limits to reduce the significant risks drivers impose on others—especially vulnerable road users—and on themselves. Addressing speed is fundamental to the Safe System Approach to making streets safer, and a growing body of research shows that speed limit changes alone can lead to measurable declines in speeds and crashes.[2]

Safety Benefits:

Traffic fatalities in the City of Seattle decreased 26 percent after the city implemented comprehensive, city-wide speed management strategies and countermeasures inspired by Vision Zero. This included setting speed limits on all non-arterial streets at 20 mph and 200 miles of arterial streets at 25 mph.[5]

One study found that on rural roads, when considering other relevant factors in the engineering study along with the speed distribution, setting a speed limit no more than 5 mph below the 85th-percentile speed may result in fewer total and fatal plus injury crashes, and lead to drivers complying closely with the posted speed limit.[6]

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/speedmgt/ref_mats/.

Applications

Posted speed limits are often the same as the legislative statutory speed limit. Agencies with designated authorities to set speed limits, which include States, and sometimes local jurisdictions, can establish non-statutory speed limits or designate reduced speed zones, and a growing number are doing so. While non-statutory speed limits must be based on an engineering study, conducted in accordance with the *Manual on Uniform Traffic Control Devices* (MUTCD) involving multiple factors and engineering judgment, FHWA is also encouraging agencies to use the following:[3]

- Expert Systems tools.
  - USLIMITS2.
  - NCHRP 966: Posted Speed Limit Setting Procedure and Tool.
- Safe System approach.

Based on international experience and implementation in the United States, the use of 20 mph speed zones or speed limits in urban core areas where vulnerable users share the road environment with motorists may result in further safety benefits.[4]

Considerations

When setting a speed limit, agencies should consider a range of factors such as pedestrian and bicyclist activity, crash history, land use context, intersection spacing, driveway density, roadway geometry, roadside conditions, roadway functional classification, traffic volume, and observed speeds.

To achieve desired speeds, agencies often implement other speed management strategies concurrently with setting speed limits, such as self-enforcing roadways, traffic calming, and speed safety cameras. Additional information is in the following FHWA resources:

- FHWA Speed Management website.
- Self-Enforcing Roadways: A Guidance Report.
- Noteworthy Speed Management Practices.
- Jurisdiction Speed Management Action Plan Development Package.
- Traffic Calming ePrimer.

1 Reducing the speed limit to 20 mph in urban areas: Child deaths and injuries would be decreased.
2 Lowering the speed limit from 30 to 25 mph in Boston: effects on vehicle speeds.
3 FHWA's Methods and Practices for Setting Speed Limits: An Informational Report, (2012).
4 Recommendations of the Academic Expert Group for the 3rd Global Ministerial Conference on Road Safety.
5 https://safety.fhwa.dot.gov/speedmgt/ref_mats/fhwasa20047/sec8.cfm#foot813
6 Safety and Operational Impacts of Setting Speed Limits below Engineering Recommendations.

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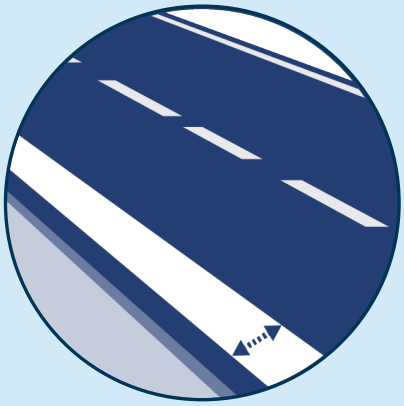

Wider Edge Lines

Roadway departures account for over half of all traffic fatalities in the United States. If drivers cannot clearly identify the edge of the travel lanes and see the road alignment ahead, the risk of roadway departure may be greater. Wider edge lines enhance the visibility of travel lane boundaries compared to traditional edge lines. Edge lines are considered "wider" when the marking width is increased from the minimum normal line width of 4 inches to the maximum normal line width of 6 inches.[1]

Safety Benefits:

Wider edge lines can reduce crashes up to:

37%
for non-intersection, fatal and injury crashes on rural, two-lane roads.[2]

22%
for fatal and injury crashes on rural freeways.[3]

Benefit Cost Ratio
25:1
for fatal and serious injury crashes on two-lane rural roads.[4]

Applications

Wider edge lines increase drivers' perception of the edge of the travel lane and can provide a safety benefit to all facility types (e.g., freeways, multilane divided and undivided highways, two-lane highways) in both urban and rural areas.[2] Wider edge lines are most effective in reducing crashes on rural two-lane highways, especially for single-vehicle crashes.[3] Agencies should also consider implementing a systemic approach to wider edge line installation based roadway departure crash risk factors. Potential risk factors for two-lane rural roads include:

- Pavement and shoulder widths.
- Presence of curves.
- Traffic volumes.
- History of nighttime crashes.

Considerations

- Wider edge lines are relatively low cost.
- Wider edge lines can be implemented using existing equipment during maintenance procedures like re-striping and resurfacing, with the only cost increase being the additional material.
- Paint may have a lower initial cost, but more durable materials (e.g., thermoplastic) may result in a lower life cycle cost based on their longer service life.
- As the number of automated vehicles increases on roadways, wider edge lines may provide better guidance for these vehicles' sensors.

Source: Texas Transportation Institute

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/roadway_dept/night_visib/pavement-markings.cfm.

1 Manual on Uniform Traffic Control Devices, Section 3A.06. FHWA, (2009).
2 Park et al. "Safety effects of wider edge lines on rural, two-lane highways." Accident Analysis and Prevention Vol. 48, pp.317-325, (2012).
3 Potts et al. Benefit/Cost Evaluation of MoDOT's Total Striping and Delineation Program: Phase II. Missouri Department of Transportation, (2011).
4 Abdel-Rahim et al. Safety Impacts of Using Wider Pavement Markings on Two-Lane Rural Highways in Idaho. Idaho Transportation Department, (2018).

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Safety Benefits:

Chevron Signs

25% reduction in nighttime crashes.[1]

16% reduction in non-intersection fatal and injury crashes.[2]

Oversized Chevron Signs

15% reduction in fatal and injury crashes.[3]

Sequential Dynamic Chevrons

60% reduction in fatal and injury crashes.[3]

In-Lane Curve Warning Pavement Markings

35 - 38% reduction in all crashes.[4,5]

New Fluorescent Curve Signs or Upgrade Existing Curve Signs to Fluorescent Sheeting

18% reduction in non-intersection, head-on, run-off-road, and sideswipe in rural areas.[1]

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/roadway_dept/countermeasures/horicurves/.

FHWA-SA-21-035

Enhanced Delineation for Horizontal Curves

Enhanced delineation at horizontal curves includes a variety of potential strategies that can be implemented in advance of or within curves, in combination, or individually.

Potential Strategies	In Advance of Curve	Within Curve
Pavement markings (standard width or wider)	✓	✓
In-lane curve warning pavement markings	✓	
Retroreflective strips on sign posts	✓	✓
Delineators		✓
Chevron signs		✓
Enhanced Conspicuity (larger, fluorescent, and/or retroreflective signs)	✓	✓
Dynamic curve warning signs (including speed radar feedback signs)	✓	
Sequential dynamic chevrons		✓

Enhanced delineation treatments can alert drivers to upcoming curves, the direction and sharpness of the curve, and appropriate operating speed.

Agencies can take the following steps to implement enhanced delineation strategies:

1. Review signing practices and policies to ensure they comply with the Manual on Uniform Traffic Control Devices (MUTCD) principles of traffic control devices. Consistent practice for similar curves sets the appropriate driver expectancy.
2. Use the systemic approach to identify and treat problem curves. For example, Minnesota uses risk factors that include curve radii between 500 and 1,200 ft, traffic volumes between 500 and 1,000 vehicles per day, intersection in the curve, and presence of a visual trap.[1]
3. Match the appropriate strategy to the identified problem(s), considering the full range of enhanced delineation treatments. Once the MUTCD requirements and recommendations have been met, an incremental approach is often beneficial to avoid excessive cost.

Chevron signs with retroreflective strips on sign posts installed along a curve. Source: FHWA

1 Albin et al. Low-Cost Treatments for Horizontal Curve Safety 2016. FHWA-SA-15-084, (2016).
2 Srinivasan et al. Safety Evaluation of Improved Curve Delineation. FHWA-HRT-09-045, (2009).
3 Lyon et al. Safety Evaluation of Two Curve Warning Treatments: In-Lane Curve Warning Pavement Markings and Oversized Chevron Signs. Presented at the 96th TRB Annual Meeting, Paper No. 17-00432, (2017).
4 Hallmark, S. Evaluation of Sequential Dynamic Chevrons on Rural Two-lane Highways. FHWA, (2017).
5 Donnell et al. Reducing Roadway Departure Crashes at Horizontal Curve Sections on Two-lane Rural Highways. FHWA-SA-19-005, (2019).

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Longitudinal Rumble Strips and Stripes

Longitudinal rumble strips are milled or raised elements on the pavement intended to alert drivers through vibration and sound that their vehicle has left the travel lane. They can be installed on the shoulder, edge line, or at or near the center line of an undivided roadway.

Rumble stripes are edge line or center line rumble strips where the pavement marking is placed over the rumble strip. This can increase the visibility and durability of the pavement marking during wet, nighttime conditions, and can improve the durability of the marking on roads with snowplowing operations.

Safety Benefits:

Center Line Rumble Strips

44-64%

reduction in head-on fatal and injury crashes on two-lane rural roads.[4]

Shoulder Rumble Strips

13-51%

reduction in single vehicle, run-off-road fatal and injury crashes on two-lane rural roads.[4]

With roadway departure crashes accounting for more than half of the fatal roadway crashes annually in the United States, rumble strips and stripes are designed to address these crashes by alerting distracted, drowsy, or otherwise inattentive drivers who drift from their lane. They are most effective when deployed systemically.

Transportation agencies should consider milled center line rumble strips (including in passing zone areas) and milled edge line or shoulder rumble strips with bicycle gaps for systemic safety projects, location-specific corridor safety improvements, as well as reconstruction or resurfacing projects.

Considerations

- Rumble strips are relatively low-cost, and economic analyses have indicated benefit/cost ratios that exceed 100.[1]
- Where rumble strips cannot be placed due to noise concerns, agencies may consider a design using an oscillating sine wave pattern (also known as "mumble strips") that reduces noise outside of the vehicle. However, the safety benefits of this design need more study.[2]
- Maintenance concerns:
  - Where rumble strips are placed along a pavement joint, there are typically no issues with joint stability if the pavement structure and joint was already in good condition.
  - Studies have shown no evidence of issues related to snow, ice, or rain build-up in the rumble strip.[3]

Shoulder rumble strips and center line rumble stripes are installed on this roadway. Source: FHWA

Example of an edge line rumble stripe. Source: Missouri DOT

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/roadway_dept/pavement/rumble_strips/.

FHWA-SA-21-036

1 Himes, S., and McGee, H. Decision Support Guide for the Installation of Shoulder and Center Line Rumble Strips on Non-Freeways. Federal Highway Administration Report No. FHWA-SA-16-115. (August 2016).
2 Bedsole et al. *Did You Hear That?* Public Roads Magazine, Volume 80, No. 4. FHWA Publication No. FHWA-HRT-17-002, (2017).
3 NCHRP Synthesis 339: Centerline Rumble Strips – A Synthesis of Highway Practices, (2005).
4 NCHRP Report 641: Guidance for the Design and Application of Shoulder and Centerline Rumble Strips, (2009).

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Proven Safety Countermeasures

SafetyEdge℠

The SafetyEdge℠ technology shapes the edge of the pavement at approximately 30 degrees from the pavement cross slope during the paving process. This safety practice eliminates the potential for vertical drop-off at the pavement edge, has minimal effect on project cost, and can improve pavement durability by reducing edge raveling of asphalt.

Safety Benefits:

11%
reduction in fatal and injury crashes.[2]

21%
reduction in run-off-road crashes.[2]

19%
reduction in head-on crashes.[2]

Benefit-Cost Ratio Range[3]

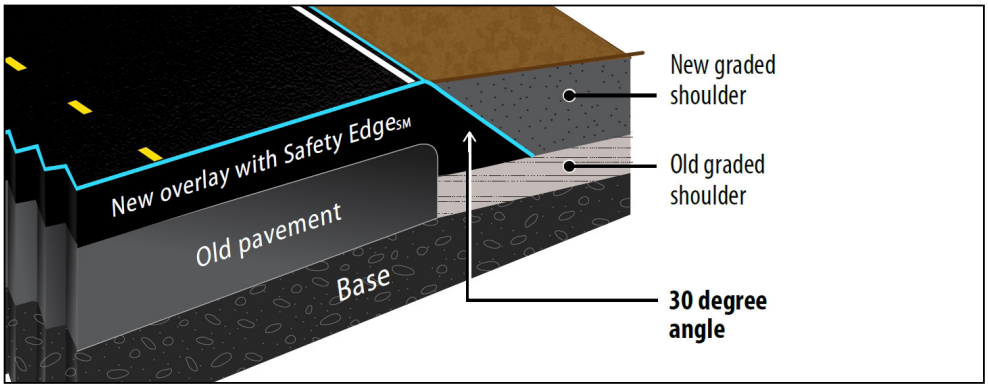
700:1 to 1,500:1

Rural road crashes involving edge drop-offs are 2-4 times more likely to include a fatality than other crashes on similar roads.[1] Vehicles may leave the roadway for various reasons ranging from distracted driver errors to low visibility, or to the presence of an animal on the road. Exposed vertical pavement edges can cause vehicles to become unstable and prevent their safe return to the roadway. The SafetyEdge℠ gives drivers the opportunity to return to their travel lane while maintaining control of their vehicle.

The SafetyEdge℠ technology only requires adding one of several commercially available devices to the screed or endgate when placing hot-mix asphalt. Forms for shaping the edge of concrete pavement are simpler and can be made on site by the contractor. Some agencies allow the SafetyEdge℠ to remain exposed while a segment is under construction, unlike conventional pavement edges. However, before construction ends, agencies should bring the adjacent roadside flush with the top of the pavement for both the SafetyEdge℠ and traditional pavement edge. Over time, regardless of the edge type, the edge may become exposed due to settling, erosion, and tire wear. When this occurs, the gentle slope provided by the SafetyEdge℠ is preferred versus the traditional vertical pavement edge.

Transportation agencies should develop standards for implementing the SafetyEdge℠ systemwide on all new asphalt paving and resurfacing projects where curbs and/or guardrail are not present, while also encouraging standard application for concrete pavements.

Example of the SafetyEdge℠ after backfill material settles or erodes. Source: FHWA



Cross-section view of an overlay with the SafetyEdge℠. Source: FHWA-SA-17-044

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/safetyedge/.

1 Hallmark et al. Safety Impacts of Pavement Edge Drop-offs, (Washington, DC: AAA Foundation for Traffic Safety: 2006), p 93.
2 Donnell et al. Development of Crash Modification Factors for the Application of the SafetyEdge℠ on Two-Lane Rural Roads. FHWA-HRT-17-081, (2017).
3 Safety Effects of the SafetyEdge℠, FHWA-SA-17-044, (2017).

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Safety Benefits:

Flatten sideslope from 1V:3H to 1V:4H:

8%

reduction for single-vehicle crashes.[2]

Flatten sideslope from 1V:4H to 1V:6H:

12%

reduction for single-vehicle crashes.[2]

Increase the distance to roadside features from 3.3 ft to 16.7 ft:

22%

reduction for all crashes.[3]

Increase the distance to roadside features from 16.7 ft to 30 ft:

44%

reduction for all crashes.[3]

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/roadway_dept/countermeasures/safe_recovery/clear_zones/.

FHWA-SA-21-029

Roadside Design Improvements at Curves

Horizontal curves account for 27 percent of all fatal crashes and 80 percent of all fatal crashes at curves are roadway departure crashes.[1] Roadside design improvements at curves is a strategy encompassing several treatments that target the high-risk roadside environment along the outside of horizontal curves. These treatments can reduce roadway departure fatalities and serious injuries by giving vehicles the opportunity to recover safely and by reducing crash severity.

Roadside design improvements can be implemented alone or in combination, and are particularly recommended at horizontal curves—where data indicates a higher risk for roadway departure fatalities and serious injuries.

Roadside Design Improvements to Provide for a Safe Recovery

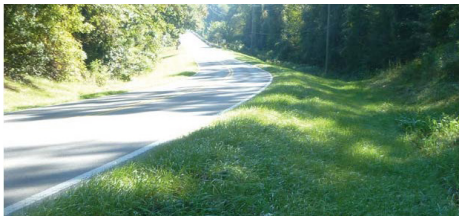
In cases where a vehicle leaves the roadway, having strategic roadside design elements, including an added or widened shoulder, flattened sideslopes, or a widened clear zone can provide drivers with an opportunity to regain control and re-enter the roadway in their lane or come to a safe stop before rolling over or encountering a fixed object.

- A **clear zone** is an unobstructed, traversable roadside area that allows a driver to stop safely or regain control of a vehicle that has left the roadway. Agencies should avoid adding new fixed objects such as trees and utility cabinets or poles in the clear zone. AASHTO's *Roadside Design Guide* details the clear zone width adjustment factors to be applied at horizontal curves.
- **Slope flattening** reduces the steepness of the sideslope to increase drivers' ability to keep the vehicle stable, regain control of the vehicle, and avoid obstacles. Slopes of 1V:4H or flatter are considered recoverable (i.e., drivers can retain control of a vehicle by slowing or stopping). Slopes between 1V:3H and 1V:4H are generally considered traversable, but non-recoverable (i.e., errant vehicle will continue to the bottom of the slope).
- **Adding or widening shoulders** gives drivers more recovery area to regain control in the event of a roadway departure.

Roadside Design Improvements to Reduce Crash Severity

Since not all roadside hazards can be removed, relocated, or redesigned at curves, installing roadside barriers to shield unmovable objects or steep embankments may be an appropriate treatment. Three common types of roadside barriers are:

- **Cable barrier** is a flexible barrier made from steel cables mounted on weak steel posts. Flexible barriers are more forgiving and have the most deflection.
- **Metal-beam guardrail** is a semi-rigid barrier where a W-beam or box-beam is mounted on steel or timber posts. These deflect less than cable barriers, so they can be located closer to objects where space is limited.
- **Concrete barrier** is a rigid barrier that has little to no deflection.



Clear zone provided on the outside of the curve. Source: FHWA.

1 Fatality Analysis Reporting System.
2 NCHRP Report 617: Accident Modification Factors for Traffic Engineering and ITS Improvements, (2008).
3 Elvik, R., and Vaa, T. Handbook of Road Safety Measures, (2004).

U.S. Department of Transportation
Federal Highway Administration

8%

of all fatalities on divided highways are due to head-on crashes.[1]

Safety Benefits:

Median Barriers Installed on Rural Four-Lane Freeways

97%

reduction in cross-median crashes.[2]

Median Barriers

Median barriers are longitudinal barriers that separate opposing traffic on a divided highway and are designed to redirect vehicles striking either side of the barrier. Median barriers significantly reduce the number of cross-median crashes, which are attributed to the relatively high speeds that are typical on divided highways. AASHTO's ***Roadside Design Guide*** (RDG) recommends guidelines for the use of median barriers on high-speed, fully controlled-access roadways for locations where the median is 30 ft in width or less and the average daily traffic (ADT) is greater than 20,000 vehicles per day (vpd). For locations with median widths greater than 50 ft and where the ADT is less than 20,000 vpd, a median barrier is optional. For locations where the median is between 30 and 50 feet, the RDG suggests an analysis to determine the cost effectiveness of median barrier installation. Median barriers can be cable, metal-beam, or concrete.

- **Cable barriers** are flexible barriers, made from steel cables mounted on weak steel posts, resulting in less occupant impact force as it absorbs energy from the crash, capturing or redirecting the vehicle. Due to larger deflection, median width is an important consideration. These barriers are more adaptable to slopes typically found in medians. Cable barriers tend to require more frequent maintenance and repair than other barrier types.
- **Metal-beam guardrails** are considered semi-rigid barriers, where the W-beam or box-beam is mounted to steel or timber posts. When impacted, they are designed to deform and deflect, absorbing some of the crash energy and redirecting the vehicle. Metal-beam guardrails often do not require maintenance after minor impacts. They deflect less than cable barriers, so they can be located closer to objects where space is limited.
- **Concrete barriers** are usually rigid and result in little to no deflection. They redirect rather than absorb energy from the impact. Rigid concrete barriers seldom require repair or maintenance. Some agencies have used portable concrete barriers as median barriers. These barriers require repositioning after an impact but are typically less maintenance than a post mounted barrier.

To reduce cross-median crashes, transportation agencies should review their head-on crash history on divided highways to identify hot spots. Agencies should also consider implementing a systemic approach to median barrier placement based on cross-median crash risk factors. Potential risk factors include:

- Traffic volumes.
- Vehicle classifications.
- Median crossover history.
- Crash incidents.
- Vertical and horizontal alignment.
- Median terrain configurations.

Median cable barrier prevents a potential head-on crash.
Source: Washington State DOT

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/roadway_dept/countermeasures/reduce_crash_severity/.

1 Fatality Analysis Reporting System.
2 NCHRP Report 794: Median Cross-Section Design for Rural Divided Highways, (2011).

FHWA-SA-21-037

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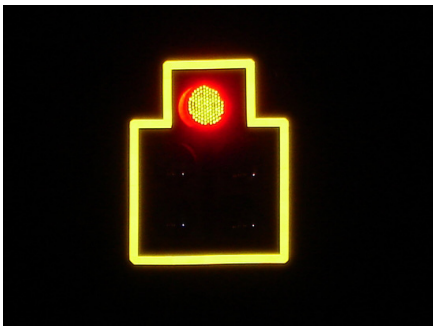
Backplates with Retroreflective Borders

Backplates added to a traffic signal head improve the visibility of the illuminated face of the signal by introducing a controlled-contrast background. The improved visibility of a signal head with a backplate is made even more conspicuous by framing it with a 1- to 3-inch yellow retroreflective border. Signal heads that have backplates equipped with retroreflective borders are more visible and conspicuous in both daytime and nighttime conditions.

Safety Benefits:

15%
reduction in total crashes.[1]

This treatment is recognized as a human factors enhancement of traffic signal visibility, conspicuity, and orientation for both older and color vision deficient drivers. This countermeasure is also advantageous during periods of power outages when the signals would otherwise be dark, providing a visible cue for motorists to stop at the intersection ahead.



Retroreflective borders are highly visible during the night. Source: South Carolina DOT

Considerations

Transportation agencies should consider backplates with retroreflective borders as part of their efforts to systematically improve safety performance at signalized intersections. Adding a retroreflective border to an existing signal backplate is a very low-cost safety treatment. This can be done by either adding retroreflective tape to an existing backplate or purchasing a new backplate with a retroreflective border already incorporated. The most efficient means of implementing this proven safety countermeasure is to adopt it as a standard treatment for signalized intersections across a jurisdiction or State.

Implementation challenges include minimizing installation time, accessing existing signal heads, and structural limitations due to added wind load in instances where an entire backplate is added. Agencies should consider the design of the existing signal support structure to determine if the design is sufficient to support the added wind load.

Signal backplate framed with a retroreflective border. Source: FHWA

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://rosap.ntl.bts.gov/view/dot/42807.

1 Sayed, T., Leur, P., and Pump, J., "Safety Impact of Increased Traffic Signal Backboards Conspicuity." 2005 TRB 84th Annual Meeting: Compendium of Papers CD-ROM, Vol. TRB#05-16, Washington, D.C., (2005).

FHWA-SA-21-039

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Safety Benefits:

Reducing driveway density

5-23%
reduction in total crashes along 2-lane rural roads.[3]

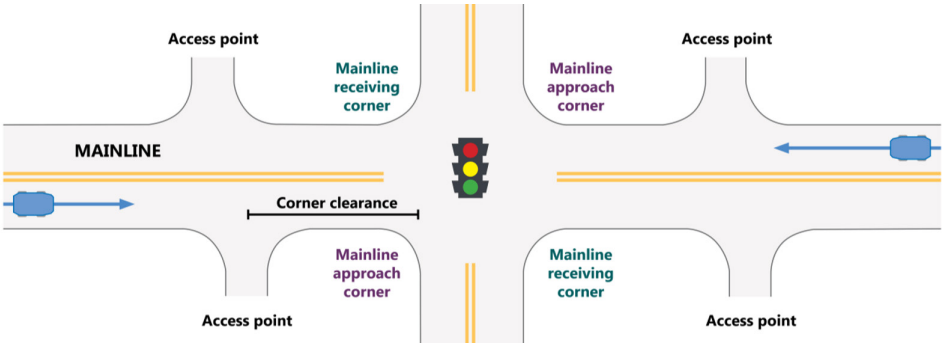
25-31%
reduction in fatal and injury crashes along urban/ suburban arterials.[4]

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/intersection/cam/index.cfm.

FHWA-SA-21-040

Corridor Access Management

Access management refers to the design, application, and control of entry and exit points along a roadway. This includes intersections with other roads and driveways that serve adjacent properties. Thoughtful access management along a corridor can simultaneously enhance safety for all modes, facilitate walking and biking, and reduce trip delay and congestion.



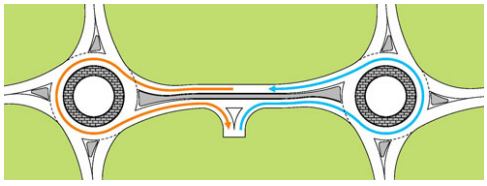
Schematic of an intersection and adjacent access points. Source: FHWA

Every intersection, from a signalized intersection to an unpaved driveway, has the potential for conflicts between vehicles, pedestrians, and bicyclists. The number and types of conflict points—locations where the travel paths of two users intersect—influence the safety performance of the intersection or driveway. FHWA developed corridor-level crash prediction models to estimate and analyze the safety effects of selected access management techniques for different area types, land uses, roadway variables, and traffic volumes.[1]

The following access management strategies can be used individually or in combination with one another:

- Reduce density through driveway closure, consolidation, or relocation.
- Manage spacing of intersection and access points.
- Limit allowable movements at driveways (such as right-in/ right-out only).
- Place driveways on an intersection approach corner rather than a receiving corner, which is expected to have fewer total crashes.[2]
- Implement raised medians that preclude across-roadway movements.
- Utilize designs such as roundabouts or reduced left-turn conflicts (such as restricted crossing U-turn, median U-turns, etc.).
- Provide turn lanes (i.e., left-only, right-only, or interior two-way left).
- Use lower speed one-way or two-way off-arterial circulation roads.

Successful corridor access management involves balancing overall safety and mobility for all users along with the needs of adjacent land uses.



Tandem roundabouts with a continuous raised median eliminates left-turn and across-roadway conflicts. Source: FHWA

1 Gross et al. Safety Evaluation of Access Management Policies and Techniques. FHWA-HRT-14-057, (2018).
2 Le et al. Safety Evaluation of Corner Clearance at Signalized Intersections. FHWA-HRT-17-084, (2018).
3 Harwood et al. Prediction of the Expected Safety Performance of Rural Two-Lane Highways. FHWA-RD-99-207, (2000).
4 Elvik, R. and Vaa, T., Handbook of Road Safety Measures. Oxford, United Kingdom, Elsevier, (2004).

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Dedicated Left- and Right-Turn Lanes at Intersections

Auxiliary turn lanes—either for left turns or right turns—provide physical separation between turning traffic that is slowing or stopped and adjacent through traffic at approaches to intersections. Turn lanes can be designed to provide for deceleration prior to a turn, as well as for storage of vehicles that are stopped and waiting for the opportunity to complete a turn.

Safety Benefits:

Left-Turn Lanes

28-48%

reduction in total crashes.[1]

Positive Offset Left-Turn Lanes

36%

reduction in fatal and injury crashes.[2]

Right-Turn Lanes

14-26%

reduction in total crashes.[1]

Left- and right-turn lanes on a two-lane road. Source: City of Greeley, CO

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://www.fhwa.dot.gov/publications/research/safety/02103/02103techbrief.pdf.

FHWA-SA-21-041

While turn lanes provide measurable safety and operational benefits at many types of intersections, they are particularly helpful at two-way stop-controlled intersections. Crashes occurring at these intersections are often related to turning maneuvers. Since the major route traffic is free flowing and typically travels at higher speeds, crashes that do occur are often severe. The main crash types include collisions of vehicles turning left across opposing through traffic and rear-end collisions of vehicles turning left or right with other vehicles following closely behind. Turn lanes reduce the potential for these types of crashes.

Installing left-turn lanes and/or right-turn lanes should be considered for the major road approaches for improving safety at both three- and four-leg intersections with stop control on the minor road, where significant turning volumes exist, or where there is a history of turn-related crashes. Pedestrian and bicyclist safety and convenience should also be considered when adding turn lanes at an intersection. Specifically, offset left- and right-turn lanes will lengthen crossing distances for pedestrians.

Offset Turn Lanes

Providing offset of left- and right-turn lanes to increase visibility can provide added safety benefits, and is preferable in many situations, particularly at locations with higher speeds, or where free-flow or permissive movements are possible.

At turn lanes with zero or negative offset, turning vehicles can block sightlines. For left-turn lanes, this usually involves opposing left-turning vehicles occupying the turn lanes at the same time. For right-turn lanes, this typically involves right-turning vehicles from the major road and vehicles entering the intersection from the minor road. In both scenarios, adding positive offset to turn lanes enhances the sight distance to approaching vehicles that conflict with the turning movement. Offset turn lanes should be considered when there is a high frequency of these types of conflicts in order to reduce the likelihood of a severe crash.

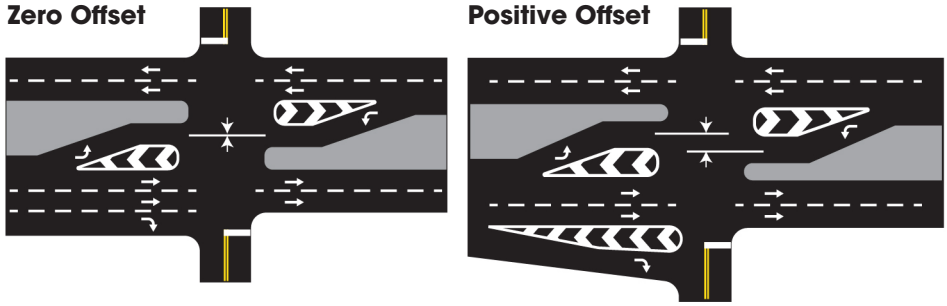

Illustration comparing zero offset to positive offset of left- and right-turn lanes. Source: FHWA

1 Harwood et al. Safety Effectiveness of Intersection Left- and Right-Turn Lanes. FHWA-HRD-02-089, (2002).
2 Persaud et al. Safety Evaluation of Offset Improvements for Left-Turn Lanes. FHWA-HRT-09-035, (2009).

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Safety Benefits:

RCUT
Two-Way Stop-Controlled to RCUT:

54%
reduction in fatal and injury crashes.[2]

Signalized Intersection to Signalized RCUT:

22%
reduction in fatal and injury crashes.[3]

Unsignalized Intersection to Unsignalized RCUT:

63%
reduction in fatal and injury crashes. [4]

MUT

30%
reduction in intersection-related injury crash rate.[5]

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/intersection/rltci/index.cfm.

Reduced Left-Turn Conflict Intersections

Reduced left-turn conflict intersections are geometric designs that alter how left-turn movements occur. These intersections simplify decision-making for drivers and minimize the potential for higher severity crash types, such as head-on and angle. Two highly effective designs that rely on U-turns to complete certain left-turn movements are known as the Restricted Crossing U-turn (RCUT) and the Median U-turn (MUT).

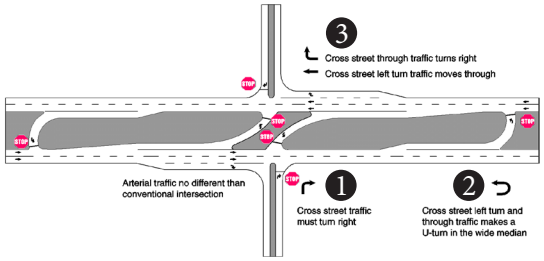
Restricted Crossing U-turn

The RCUT intersection, also known as a J-Turn, Superstreet, or Reduced Conflict Intersection, modifies the direct left-turn and through movements from cross-street approaches. Minor road traffic makes a right turn followed by a U-turn at a designated location—either signalized or unsignalized—to continue in the desired direction. The RCUT is suitable for and adaptable to a wide variety of circumstances, ranging from isolated rural, high-speed locations to urban and suburban high-volume, multimodal corridors. It is a competitive and less costly alternative to constructing an interchange. RCUTs work well when consistently used along a corridor, but also can be used effectively at individual intersections. Studies have shown that installing an RCUT can result in a 30-percent increase in throughput and a 40-percent reduction in network intersection travel time.[1]

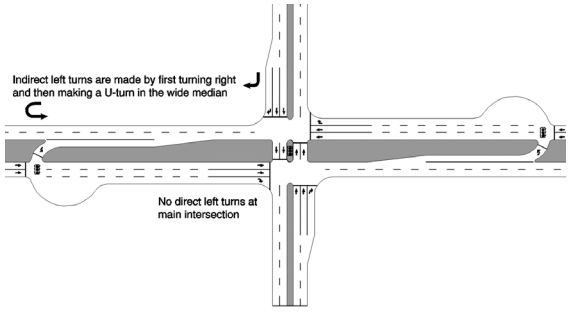
Median U-turn

The MUT intersection modifies direct left turns from the major approaches. Vehicles proceed through the main intersection, make a U-turn a short distance downstream, followed by a right turn at the main intersection. The U-turns can also be used for modifying the cross-street left turns, similar to the RCUT.

The MUT is an excellent choice for intersections with heavy through traffic and moderate left-turn volumes. Studies have shown a 20- to 50-percent improvement in intersection throughput for various lane configurations as a result of implementing the MUT design. When implemented at multiple intersections along a corridor, the efficient two-phase signal operation of the MUT can reduce delay, improve travel times, and create more crossing opportunities for pedestrians and bicyclists.



Example of a unsignalized RCUT intersection. Source: FHWA



Example of a MUT intersection. Source: FHWA

1 Hugher and Jagannathan. Restricted Crossing U-Turn Intersection. FHWA-HRT-09-059, (2009).
2 Edara et al. Evaluation of J-turn Intersection Design Performance in Missouri. MoDOT, (2013).
3 Hummer and Rao. Safety Evaluation of a Signalized Restricted Crossing U-Turn. FHWA-HRT-17-082, (2017).
4 Hummer et al. Superstreet Benefits and Capacities. FHWA/NC/2009-06, NC State University, (2010).
5 Synthesis of the Median U-Turn Treatment, Safety, and Operational Benefits, FHWA-HRT-07-033, (2007).

FHWA-SA-21-030

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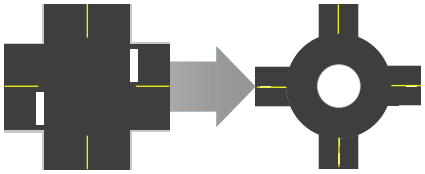
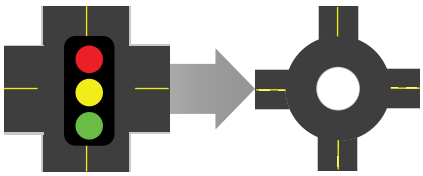
Safety Benefits:

Two-Way Stop-Controlled Intersection to a Roundabout



82%
reduction in fatal and injury crashes.[1]

Signalized Intersection to a Roundabout



78%
reduction in fatal and injury crashes.[1]

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/intersection/roundabouts/index.cfm.

FHWA-SA-21-042

Roundabouts

The modern roundabout is an intersection with a circular configuration that safely and efficiently moves traffic. Roundabouts feature channelized, curved approaches that reduce vehicle speed, entry yield control that gives right-of-way to circulating traffic, and counterclockwise flow around a central island that minimizes conflict points. The net result of lower speeds and reduced conflicts at roundabouts is an environment where crashes that cause injury or fatality are substantially reduced.

Roundabouts are not only a safer type of intersection; they are also efficient in terms of keeping people moving. Even while calming traffic, they can reduce delay and queuing when compared to other intersection alternatives. Furthermore, the lower vehicular speeds and reduced conflict environment can create a more suitable environment for walking and bicycling.

Roundabouts can be implemented in both urban and rural areas under a wide range of traffic conditions. They can replace signals, two-way stop controls, and all-way stop controls. Roundabouts are an effective option for managing speed and transitioning traffic from high-speed to low-speed environments, such as freeway interchange ramp terminals, and rural intersections along high-speed roads.

Illustration of a multilane roundabout. Source: FHWA

Example of a single-lane roundabout. Source: FHWA

1 AASHTO. The Highway Safety Manual, American Association of State Highway Transportation Professionals, Washington, D.C., (2010).

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Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections

This systemic approach to intersection safety involves deploying a package of multiple low-cost countermeasures, including enhanced signing and pavement markings, at a large number of stop-controlled intersections within a jurisdiction. These countermeasures increase driver awareness and recognition of the intersections and potential conflicts.

Safety Benefits:

10%
reduction of fatal and injury crashes at all locations/types/areas.

15%
reduction of nighttime crashes at all locations/types/areas.

27%
reduction of fatal and injury crashes at rural intersections.

19%
reduction of fatal and injury crashes at 2-lane by 2-lane intersections.

Average Benefit-Cost Ratio

12:1

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/intersection/stop/fhwasa18047.pdf.

There are several benefits to systemically applying multiple low-cost countermeasures at stop-controlled intersections, including,

- Resources are maximized because the treatments are low cost.
- A high number of intersections can receive treatment.
- Improvements are highly cost-effective, with an average benefit-cost ratio of 12:1, even assuming a conservative 3-year service life.

Example of countermeasures on the through approach.
Source: South Carolina DOT

Example of countermeasures on the stop approach.
Source: South Carolina DOT

The low-cost countermeasures for stop-controlled intersections generally consist of the following treatments:

On the Through Approach

- Doubled-up (left and right), oversized advance intersection warning signs, with supplemental street name plaques (can also include flashing beacon).
- Retroreflective sheeting on sign posts.
- Enhanced pavement markings that delineate through lane edge lines.

On the Stop Approach

- Doubled-up (left and right), oversized advance "Stop Ahead" intersection warning signs (can also include flashing beacon).
- Doubled-up (left and right), oversized Stop signs.
- Retroreflective sheeting on sign posts.
- Properly placed stop bar.
- Removal of vegetation, parking, or obstructions that limit sight distance.
- Double arrow warning sign at stem of T-intersections.

Source: T. Le et al. "Safety Effects of Low-Cost Systemic Safety Improvements at Signalized and Stop-Controlled Intersections," 96th Annual Meeting of the Transportation Research Board, Paper Number 17-05379, January 2017.

ZERO IS OUR GOAL
A SAFE SYSTEM IS HOW WE GET THERE

FHWA-SA-21-031

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Safety Benefits:

36-50%
reduction in red light running.[2]

8-14%
reduction in total crashes.[2]

12%
reduction in injury crashes.[2]

Yellow Change Intervals

At a signalized intersection, the yellow change interval is the length of time that the yellow signal indication is displayed following a green signal indication. The yellow signal confirms to motorists that the green has ended and that a red will soon follow.

Since red-light running is a leading cause of severe crashes at signalized intersections, it is imperative that the yellow change interval be appropriately timed. Too brief an interval may result in drivers being unable to stop safely and cause unintentional red-light running. Too long of an interval may result in drivers treating the yellow as an extension of the green phase and invite intentional red-light running. Factors such as the speed of approaching and turning vehicles, driver perception-reaction time, vehicle deceleration, and intersection geometry should all be considered in the timing calculation.

Transportation agencies can improve signalized intersection safety and reduce red-light running by reviewing and updating their traffic signal timing policies and procedures concerning the yellow change interval. Agencies should institute regular evaluation and adjustment protocols for existing traffic signal timing. Refer to the *Manual on Uniform Traffic Control Devices* for basic requirements and further recommendations about yellow change interval timing. As part of strategic signal system modernization and updates, incorporating automated traffic signal performance measures (ATSPMs) is a proven approach to improve on traditional retiming processes. ATSPMs provide continuous performance monitoring capability and the ability to modify timing based on actual performance, without requiring expensive modeling or data collection.[1]

Appropriately timed yellow change intervals can reduce red-light running and improve overall intersection safety. Source: FHWA

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/intersection/signal/fhwasa13027.pdf.

FHWA-SA-21-043

1 Federal Highway Administration. "Automated Traffic Signal Performance," (2020).
2 NCHRP Report 731: Guidelines for Timing Yellow and All-Red Intervals at Signalized Intersections, (2011).

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Crosswalk Visibility Enhancements

Poor lighting conditions, obstructions such as parked cars, and horizontal or vertical roadway curvature can reduce visibility at crosswalks, contributing to safety issues. For multilane roadway crossings where vehicle volumes are in excess of 10,000 Average Annual Daily Traffic (AADT), a marked crosswalk alone is typically not sufficient. Under such conditions, more substantial crossing improvements could prevent an increase in pedestrian crash potential.

Three main crosswalk visibility enhancements help make crosswalks and the pedestrians, bicyclists, wheelchair and other mobility device users, and transit users using them more visible to drivers. These include high-visibility crosswalks, lighting, and signing and pavement markings. These enhancements can also assist users in deciding where to cross. Agencies can implement these features as standalone or combination enhancements to indicate the preferred location for users to cross.

Safety Benefits:

High-visibility crosswalks can reduce pedestrian injury crashes up to:

40% [1]

Intersection lighting can reduce pedestrian crashes up to:

42% [2]

Advance yield or stop markings and signs can reduce pedestrian crashes up to:

25% [3]

High-visibility crosswalks

High-visibility crosswalks use patterns (i.e., bar pairs, continental, ladder) that are visible to both the driver and pedestrian from farther away compared to traditional transverse line crosswalks. They should be considered at all midblock pedestrian crossings and uncontrolled intersections. Agencies should use materials such as inlay or thermoplastic tape, instead of paint or brick, for highly reflective crosswalk markings.

Improved Lighting

The goal of crosswalk lighting should be to illuminate with positive contrast to make it easier for a driver to visually identify the pedestrian. This involves carefully placing the luminaires in forward locations to avoid a silhouette effect of the pedestrian.

Enhanced Signing and Pavement Markings

On multilane roadways, agencies can use "YIELD Here to Pedestrians" or "STOP Here for Pedestrians" signs 20 to 50 feet in advance of a marked crosswalk to indicate where a driver should stop or yield to pedestrians, depending on State law. To supplement the signing, agencies can also install a STOP or YIELD bar (commonly referred to as "shark's teeth") pavement markings.

In-street signing, such as "STOP Here for Pedestrians" or "YIELD Here to Pedestrians" may be appropriate on roads with two- or three-lane roads where speed limits are 30 miles per hour or less.

Source: FHWA

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/ped_bike/step/docs/techSheet_VizEnhancemt2018.pdf.

FHWA-SA-21-049

1 Chen, L., C. Chen, and R. Ewing. The Relative Effectiveness of Pedestrian Safety Countermeasures at Urban Intersections - Lessons from a New York City Experience. (2012).
2 Elvik, R. and Vaa, T. Handbook of Road Safety Measures. Oxford, United Kingdom, Elsevier, (2004).
3 Zeeger et al. Development of Crash Modification Factors for Uncontrolled Pedestrian Crossing Treatments, FHWA, (2017).

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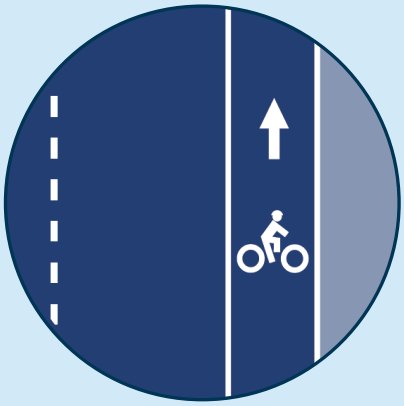

Safety Benefits:

Bicycle Lane Additions can reduce crashes up to:

57%
for total crashes on urban 4-lane undivided collectors and local roads.[6]

30%
for total crashes on urban 2-lane undivided collectors and local roads.[6]

Separated bicycle lane in Washington, DC. Source: Alex Baca, Washington Area Bicyclist Association

Separated bicycle lanes may provide further safety benefits. FHWA is anticipating completion of research in Fall 2022.

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf.

FHWA-SA-21-051

Bicycle Lanes

Most fatal and serious injury bicyclist crashes occur at non-intersection locations. Nearly one-third of these crashes involve overtaking motorists[1]; the speed and size differential between vehicles and bicycles can lead to severe injury. To make bicycling safer and more comfortable for most types of bicyclists, State and local agencies should consider installing bicycle lanes. These dedicated facilities for the use of bicyclists along the roadway can take several forms. Providing bicycle facilities can mitigate or prevent interactions, conflicts, and crashes between bicyclists and motor vehicles, and create a network of safer roadways for bicycling. Bicycle Lanes align with the Safe System Approach principle of recognizing human vulnerability—where separating users in space can enhance safety for all road users.

Applications

FHWA's *Bikeway Selection Guide* and *Incorporating On-Road Bicycle Networks into Resurfacing Projects* assist agencies in determining which facilities provide the most benefit in various contexts. Bicycle lanes can be included on new roadways or created on existing roads by reallocating space in the right-of-way.

In addition to the paint stripe used for a typical bicycle lane, a lateral offset with painted buffer can help to further separate bicyclists from vehicle traffic. State and local agencies may also consider physical separation of the bicycle lane from motorized traffic lanes through the use of vertical elements like posts, curbs, or vegetation.[2] Based on international experience and implementation in the United States, there is potential for further safety benefits associated with separated bicycle lanes. FHWA is conducting research on separated bicycle lanes, which includes the development of crash modification factors, to be completed in 2022 to address significant interest on this topic.

Considerations

- City and State policies may require minimum bicycle lane widths, although these can differ by agency and functional classification of the road.
- Bicycle lane design should vary according to roadway characteristics (e.g., motor vehicle volumes and speed) in order to maximize the facility's suitability for riders of all ages and abilities and should consider the travel needs of low-income populations likely to use bicycles. The *Bikeway Selection Guide* is a useful resource.
- While some in the public may oppose travel lane narrowing if they believe it will slow traffic or increase congestion, studies have found that roadways did not experience an increase in injuries or congestion when travel lane widths were decreased to add a bicycle lane.[3]
- Studies and experience in US cities show that bicycle lanes increase ridership and may help jurisdictions better manage roadway capacity without increased risk.
- In rural areas, rumble strips can negatively impact bicyclists' ability to ride if not properly installed. Agencies should consider the dimensions, placement, and offset of rumble strips when adding a bicycle lane.[4]
- Strategies, practices, and processes can be used by agencies to enhance their ability to address equity in bicycle planning and design.[5]

1 Thomas et al. Bicyclist Crash Types on National, State, and Local Levels: A New Look. Transportation Research Record 673(6), 664-676, (2019).
2 Separated Bike Lane Planning and Design Guide. FHWA-HEP-15-025, (2015).
3 Park and Abdel-Aty. "Evaluation of safety effectiveness of multiple cross sectional features on urban arterials". Accident Analysis and Prevention, Vol. 92, pp. 245-255, (2016).
4 FHWA Tech Advisory Shoulder and Edge Line Rumble Strips, (2011).
5 Sandt et al. Pursuing Equity in Pedestrian and Bicycle Planning. FHWA, (2016).
6 Avelar et al. Development of Crash Modification Factors for Bicycle Lane Additions While Reducing Lane and Shoulder Widths. FHWA, (2021).

ZERO IS OUR GOAL
A SAFE SYSTEM IS HOW WE GET THERE

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Rectangular Rapid Flashing Beacons (RRFB)

A marked crosswalk or pedestrian warning sign can improve safety for pedestrians crossing the road, but at times may not be sufficient for drivers to visibly locate crossing locations and yield to pedestrians. To enhance pedestrian conspicuity and increase driver awareness at uncontrolled, marked crosswalks, transportation agencies can install a pedestrian actuated Rectangular Rapid Flashing Beacon (RRFB) to accompany a pedestrian warning sign. RRFBs consist of two, rectangular- shaped yellow indications, each with a light-emitting diode (LED)-array-based light source.[1] RRFBs flash with an alternating high frequency when activated to enhance conspicuity of pedestrians at the crossing to drivers.

For more information on using RRFBs, see the Interim Approval in the *Manual on Uniform Traffic Control Devices (MUTCD)*.[1]

Safety Benefits:

RRFBs can reduce crashes up to:

47%

for pedestrian crashes.[4]

RRFBs can increase motorist yielding rates up to:

98%

(varies by speed limit, number of lanes, crossing distance, and time of day).[3]

RRFBs used at a trail crossing.
Source: LJB

Applications

The RRFB is applicable to many types of pedestrian crossings but is particularly effective at multilane crossings with speed limits less than 40 miles per hour.[2] Research suggests RRFBs can result in motorist yielding rates as high at 98 percent at marked crosswalks, but varies depending on the location, posted speed limit, pedestrian crossing distance, one- versus two-way road, and the number of travel lanes.[3] RRFBs can also accompany school or trail crossing warning signs.

RRFBs are placed on both sides of a crosswalk below the pedestrian crossing sign and above the diagonal downward arrow plaque pointing at the crossing.[1] The flashing pattern can be activated with pushbuttons or passive (e.g., video or infrared) pedestrian detection, and should be unlit when not activated.

Considerations

Agencies should:[2]

- Install RRFBs in the median rather than the far-side of the roadway if there is a pedestrian refuge or other type of median.
- Use solar-power panels to eliminate the need for a power source.
- Reserve the use of RRFBs for locations with significant pedestrian safety issues, as over-use of RRFB treatments may diminish their effectiveness.

Agencies shall not:[2]

- Use RRFBs without the presence of a pedestrian, school or trail crossing warning sign.
- Use RRFBs for crosswalks across approaches controlled by YIELD signs, STOP signs, traffic control signals, or pedestrian hybrid beacons, except for the approach or egress from a roundabout.

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/ped_bike/step/docs/techSheet_RRFB_2018.pdf.

1 *MUTCD* Interim Approval 21 - RRFBs at Crosswalks.
2 "Rectangular Rapid Flash Beacon" in PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System. FHWA, (2013).
3 Fitzpatrick et al. "Will You Stop for Me? Roadway Design and Traffic Control Device Influences on Drivers Yielding to Pedestrians in a Crosswalk with a Rectangular Rapid-Flashing Beacon." Report No. TTI-CTS-0010. Texas A&M Transportation Institute, (2016).
4 NCHRP Research Report 841 Development of Crash Modification Factors for Uncontrolled Pedestrian Crossing Treatments, (2017).

FHWA-SA-21-053

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Safety Benefits:

13%

reduction in pedestrian-vehicle crashes at intersections.[1]

Leading Pedestrian Interval

A leading pedestrian interval (LPI) gives pedestrians the opportunity to enter the crosswalk at an intersection 3-7 seconds before vehicles are given a green indication. Pedestrians can better establish their presence in the crosswalk before vehicles have priority to turn right or left.

LPIs provide the following benefits:

- Increased visibility of crossing pedestrians.
- Reduced conflicts between pedestrians and vehicles.
- Increased likelihood of motorists yielding to pedestrians.
- Enhanced safety for pedestrians who may be slower to start into the intersection.

FHWA's Handbook for ***Designing Roadways for the Aging Population*** recommends the use of the LPI at intersections with high turning vehicle volumes. Transportation agencies should refer to the ***Manual on Uniform Traffic Control Devices*** for guidance on LPI timing and ensure that pedestrian signals are accessible for all users. Costs for implementing LPIs are very low when only signal timing alteration is required.

An LPI allows a pedestrian to establish a presence in the crosswalk before vehicles are given a green indication. Source: FHWA

LPIs reduce potential conflicts between pedestrians and turning vehicles. Source: FHWA

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/ped_bike/step/resources/docs/fhwasa19040.pdf.

FHWA-SA-21-032

1 Goughnour, E., D. Carter, C. Lyon, B. Persaud, B. Lan, P. Chun, I. Hamilton, and K. Signor. "Safety Evaluation of Protected Left-Turn Phasing and Leading Pedestrian Intervals on Pedestrian Safety." Report No. FHWA-HRT-18-044. Federal Highway Administration. (October 2018)

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Medians and Pedestrian Refuge Islands in Urban and Suburban Areas

A **median** is the area between opposing lanes of traffic, excluding turn lanes. Medians in urban and suburban areas can be defined by pavement markings, raised medians, or islands to separate motorized and non-motorized road users.

A **pedestrian refuge island** (or crossing area) is a median with a refuge area that is intended to help protect pedestrians who are crossing a road.

Safety Benefits:

Median with Marked Crosswalk

46%

reduction in pedestrian crashes.[2]

Pedestrian Refuge Island

56%

reduction in pedestrian crashes.[2]

Pedestrian crashes account for approximately 17 percent of all traffic fatalities annually, and 74 percent of these occur at non-intersection locations.[1] For pedestrians to safely cross a roadway, they must estimate vehicle speeds, determine acceptable gaps in traffic based on their walking speed, and predict vehicle paths. Installing a median or pedestrian refuge island can help improve safety by allowing pedestrians to cross one direction of traffic at a time.

Transportation agencies should consider medians or pedestrian refuge islands in curbed sections of urban and suburban multilane roadways, particularly in areas with a significant mix of pedestrian and vehicle traffic, traffic volumes over 9,000 vehicles per day, and travel speeds 35 mph or greater. Medians/refuge islands should be at least 4-ft wide, but preferably 8 ft for pedestrian comfort. Some example locations that may benefit from medians or pedestrian refuge islands include:

- Mid-block crossings.
- Approaches to multilane intersections.
- Areas near transit stops or other pedestrian-focused sites.

Example of a road with a median and pedestrian refuge islands. Source: City of Charlotte, NC

Median and pedestrian refuge island near a roundabout. Source: www.pedbikeimages.org / Dan Burden

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/ped_bike/step/docs/techSheet_PedRefugeIsland2018.pdf.

1 National Center for Statistics and Analysis. (2020, March). Pedestrians: 2018 data (Traffic Safety Facts. Report No. DOT HS 812 850). National Highway Traffic Safety Administration
2 Desktop Reference for Crash Reduction Factors, FHWA-SA-08-011, September 2008, Table 11.

FHWA-SA-21-044

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Safety Benefits:

55%
reduction in pedestrian crashes.[2]

29%
reduction in total crashes.[3]

15%
reduction in fatal and serious injury crashes.[3]

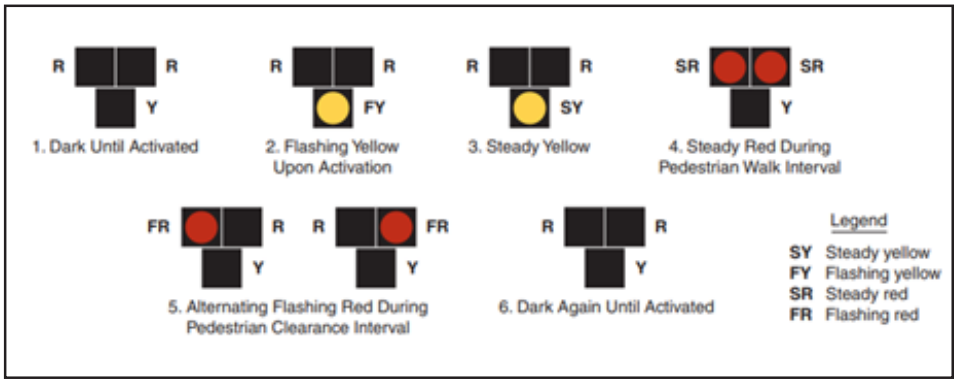
Example of PHBs mounted on a mast arm. Source: FHWA

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/ped_bike/step/resources/docs/fhwasa18064.pdf.

FHWA-SA-21-045

Pedestrian Hybrid Beacons

The pedestrian hybrid beacon (PHB) is a traffic control device designed to help pedestrians safely cross higher-speed roadways at midblock crossings and uncontrolled intersections. The beacon head consists of two red lenses above a single yellow lens. The lenses remain "dark" until a pedestrian desiring to cross the street pushes the call button to activate the beacon, which then initiates a yellow to red lighting sequence consisting of flashing and steady lights that directs motorists to slow and come to a stop, and provides the right-of-way to the pedestrian to safely cross the roadway before going dark again.



Sequence for a PHB. Source: MUTCD 2009 Edition, p. 511, FHWA

Nearly 74 percent of pedestrian fatalities occur at non-intersection locations, and vehicle speeds are often a major contributing factor.[1] As a safety strategy to address this pedestrian crash risk, the PHB is an intermediate option between a flashing beacon and a full pedestrian signal because it assigns right of way and provides positive stop control. It also allows motorists to proceed once the pedestrian has cleared their side of the travel lane(s), reducing vehicle delay.

Transportation agencies should refer to the *Manual on Uniform Traffic Control Devices* (MUTCD) for information on the application of PHBs.

In general, PHBs are used where it is difficult for pedestrians to cross a roadway, such as when gaps in traffic are not sufficient or speed limits exceed 35 miles per hour. They are very effective at locations where three or more lanes will be crossed or traffic volumes are above 9,000 annual average daily traffic. Installation of a PHB must also include a marked crosswalk and pedestrian countdown signal. If PHBs are not already familiar to a community, agencies should conduct appropriate education and outreach as part of implementation.

1 National Center for Statistics and Analysis. (2020, March). Pedestrians: 2018 data (Traffic Safety Facts. Report No. DOT HS 812 850). National Highway Traffic Safety Administration
2 Zegeer et al. NCHRP Report 841: Development of Crash Modification Factors for Uncontrolled Pedestrian Crossing Treatments. TRB, (2017).
3 Fitzpatrick, K. and Park, E.S. Safety Effectiveness of the HAWK Pedestrian Crossing Treatment, FHWA-HRT-10-042, (2010).

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Safety Benefits:

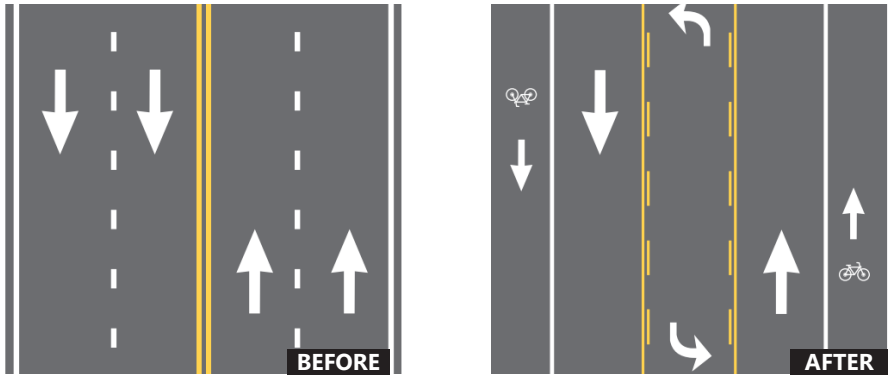
4-Lane to 3-Lane Road Diet Conversions

19-47%

reduction in total crashes.[1]

Road Diets (Roadway Reconfiguration)

A Road Diet, or roadway reconfiguration, can improve safety, calm traffic, provide better mobility and access for all road users, and enhance overall quality of life. A Road Diet typically involves converting an existing four-lane undivided roadway to a three-lane roadway consisting of two through lanes and a center two-way left-turn lane (TWLTL).



Before and after example of a Road Diet. Source: FHWA

Benefits of Road Diet installations may include:

- Reduction of rear-end and left-turn crashes due to the dedicated left-turn lane.
- Reduced right-angle crashes as side street motorists cross three versus four travel lanes.
- Fewer lanes for pedestrians to cross.
- Opportunity to install pedestrian refuge islands, bicycle lanes, on-street parking, or transit stops.
- Traffic calming and more consistent speeds.
- A more community-focused, Complete Streets environment that better accommodates the needs of all road users.

A Road Diet can be a low-cost safety solution when planned in conjunction with a simple pavement overlay, and the reconfiguration can be accomplished at no additional cost. Typically, a Road Diet is implemented on a roadway with a current and future average daily traffic of 25,000 or less.

Road Diet project in Honolulu, Hawaii. Source: Leidos

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/road_diets/.

1 *Evaluation of Lane Reduction "Road Diet" Measures on Crashes*, FHWA-HRT-10-053, (2010).

FHWA-SA-21-046

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Safety Benefits:

Sidewalks

65-89%

reduction in crashes involving pedestrians walking along roadways.[3]

Paved Shoulders

71%

reduction in crashes involving pedestrians walking along roadways.[3]

Walkways

A walkway is any type of defined space or pathway for use by a person traveling by foot or using a wheelchair. These may be pedestrian walkways, shared use paths, sidewalks, or roadway shoulders.

With more than 6,200 pedestrian fatalities and 75,000 pedestrian injuries occurring in roadway crashes annually,[1] it is important for transportation agencies to improve conditions and safety for pedestrians and to integrate walkways more fully into the transportation system. Research shows people living in low-income communities are less likely to encounter walkways and other pedestrian-friendly features.[2]

Well-designed pedestrian walkways, shared use paths, and sidewalks improve the safety and mobility of pedestrians. Pedestrians should have direct and connected network of walking routes to desired destinations without gaps or abrupt changes. In some rural or suburban areas, where these types of walkways are not feasible, roadway shoulders provide an area for pedestrians to walk next to the roadway, although these are not preferable.

Transportation agencies should work towards incorporating pedestrian facilities into all roadway projects unless exceptional circumstances exist. It is important to provide and maintain accessible walkways along both sides of the road in urban areas, particularly near school zones and transit locations, and where there is a large amount of pedestrian activity. Walkable shoulders should also be considered along both sides of rural highways when routinely used by pedestrians.

Example of a sidewalk in a residential area. Source: pedbikeimages.org / Burden

Paved shoulder used as a walkway. Source: pedbikeimages.org / Burden

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=1.

FHWA-SA-21-047

1 National Center for Statistics and Analysis. (2020, March). Pedestrians: 2018 data (Traffic Safety Facts. Report No. DOT HS 812 850). National Highway Traffic Safety Administration.
2 Gibbs, et all. Income Disparities in Street Features that Encourage Walking. Bridging the Gap, (2012, March).
3 Gan et al. Update of Florida Crash Reduction Factors and Countermeasures to Improve the Development of District Safety Improvement Projects. Florida DOT, (2005).

U.S. Department of Transportation
Federal Highway Administration

Safety Benefits:

HFST can reduce crashes up to:

63%
for injury crashes at ramps.[2]

48%
for injury crashes at horizontal curves.[2]

20%
for total crashes at intersections.[3]

Automated application of HFST.
Source: FHWA

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/roadway_dept/pavement_friction/high_friction/.

FHWA-SA-21-052

Pavement Friction Management

Friction is a critical characteristic of a pavement that affects how vehicles interact with the roadway, including the frequency of crashes. Measuring, monitoring, and maintaining pavement friction—especially at locations where vehicles are frequently turning, slowing, and stopping—can prevent many roadway departure, intersection, and pedestrian-related crashes.

Pavement friction treatments, such as High Friction Surface Treatment (HFST), can be better targeted and result in more efficient and effective installations when using continuous pavement friction data along with crash and roadway data.

Continuous Pavement Friction Measurement

Friction data for safety performance is best measured with Continuous Pavement Friction Measurement (CPFM) equipment. Spot friction measurement devices, like locked-wheel skid trailers, cannot safely and accurately collect friction data in curves or intersections, where the pavement polishes more quickly and adequate friction is so much more critical. Without CPFM equipment, agencies will assume the same friction over a mile or more.

CPFM technology measures friction continuously at highway speeds and provides both network and segment level data. Practitioners can analyze the friction, crash, and roadway data to better understand and predict where friction-related crashes will occur to better target locations and more effectively install treatments.[1]

High Friction Surface Treatment

HFST consists of a layer of durable, anti-abrasion, and polish-resistant aggregate over a thermosetting polymer resin binder that locks the aggregate in place to restore or enhance friction and skid resistance. Calcined bauxite is the aggregate shown to yield the best results and should be used with HFST applications.

Applications

HFST should be applied in locations with increased friction demand, including:

- Horizontal curves.
- Interchange ramps.
- Intersection approaches.
  - Higher-speed signalized and stop-controlled intersections.
  - Steep downward grades.
- Locations with a history of rear-end, failure to yield, wet-weather, or red-light-running crashes.
- Crosswalk approaches.

Considerations

- HFST is applied on existing pavement, so no new pavement is added.
- If the underlying pavement structure is unstable, then the HFST life cycle may be shortened, resulting in pre-mature failure.
- The automated installation method is preferred as it minimizes issues often associated with manual installation: human error due to fatigue, inadequate binder mixing, improper and uneven binder thickness, delayed aggregate placement, and inadequate aggregate coverage.
- The cost can be reduced when bundling installations at multiple locations.

1 Izeppi et al. Continuous Friction Measurement Equipment as a Tool for Improving Crash Rate Prediction: A Pilot Study. Virginia Department of Transportation, (2016).
2 Merritt et al. Development of Crash Modification Factors for High Friction Surface Treatments. FHWA, (2020).
3 NCHRP Report 617: Accident Modification Factors for Traffic Engineering and ITS Improvements, (2008).

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OFFICE OF SAFETY

Proven Safety Countermeasures

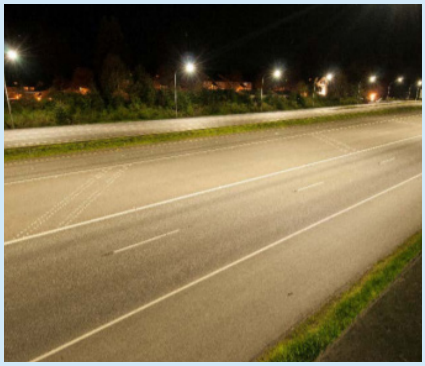
Safety Benefits:

Lighting can reduce crashes up to:

42%
for nighttime injury pedestrian crashes at intersections.[1]

33-38%
for nighttime crashes at rural and urban intersections.[1]

28%
for nighttime injury crashes on rural and urban highways.[1]



Source: WSDOT

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/roadway_dept/night_visib/roadwayresources.cfm.

FHWA-SA-21-050

Lighting

The number of fatal crashes occurring in daylight is about the same as those that occur in darkness. However, the nighttime fatality rate is three times the daytime rate because only 25 percent of vehicle miles traveled (VMT) occur at night. At nighttime, vehicles traveling at higher speeds may not have the ability to stop once a hazard or change in the road ahead becomes visible by the headlights. Therefore, lighting can be applied continuously along segments and at spot locations such as intersections and pedestrian crossings in order to reduce the chances of a crash.

Adequate lighting (i.e., at or above minimum acceptable standards) is based on research recommending horizontal and vertical illuminance levels to provide safety benefits to all users of the roadway environment. Adequate lighting can also provide benefits in terms of personal security for pedestrians, wheelchair and other mobility device users, bicyclists, and transit users as they travel along and across roadways.

Applications

Roadway Segments

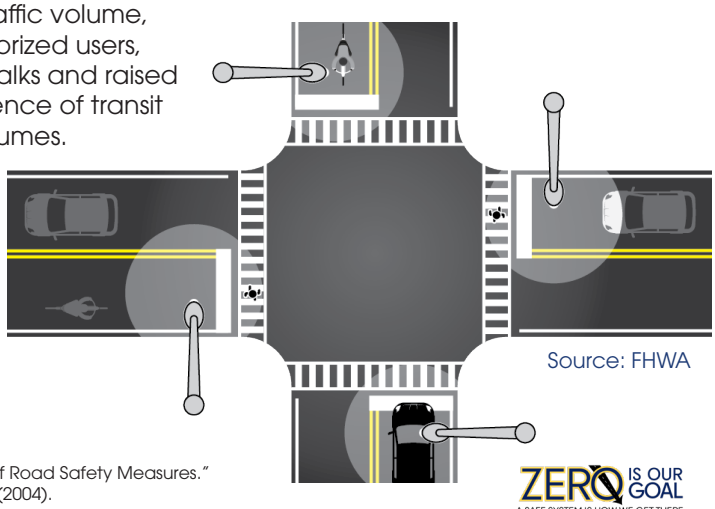
Research indicates that continuous lighting on both rural and urban highways (including freeways) has an established safety benefit for motorized vehicles.[1] Agencies can provide adequate visibility of the roadway and its users through the uniform application of lighting that provides full coverage along the roadway and the strategic placement of lighting where it is needed the most.

Intersections and Pedestrian Crossings

Increased visibility at intersections at nighttime is important since various modes of travel cross paths at these locations. Agencies should consider providing lighting to intersections based on factors such as a history of crashes at nighttime, traffic volume, the volume of non-motorized users, the presence of crosswalks and raised medians, and the presence of transit stops and boarding volumes.

Considerations

Most new lighting installations are made with breakaway features, shielded, or placed far enough from the roadway to reduce the probability and/or severity of fixed-object crashes. Modern lighting technology gives precise control with minimal excessive light affecting the nighttime sky or spilling over to adjacent properties. Agencies can equitably engage with underserved communities to determine where and how new and improved lighting can most benefit the community by considering their priorities, including eliminating crash disparities, connecting to essential neighborhood services, improving active transportation routes, and promoting personal safety.



Source: FHWA

1 Elvik, R. and Vaa, T., "Handbook of Road Safety Measures." Oxford, United Kingdom, Elsevier, (2004).

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Safety Benefits:

Agencies have experienced the following benefits after LRSP implementation:

25%
reduction in county road fatalities in Minnesota.

17%
reduction in fatal and serious injury crashes on county-owned roads in Washington State.

35%
reduction in severe curve crashes in Thurston County, WA.

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/LRSPDIY/.

FHWA-SA-21-033

Local Road Safety Plans

A local road safety plan (LRSP) provides a framework for identifying, analyzing, and prioritizing roadway safety improvements on local roads. The LRSP development process and content are tailored to local issues and needs. The process results in a prioritized list of issues, risks, actions, and improvements that can be used to reduce fatalities and serious injuries on local roads. FHWA has developed several resources including an LRSP Do-It-Yourself website which further explains the process and includes resources local agencies and their partners need to create and implement an LRSP.[1]

Approximately 75 percent of rural roads are owned by local agencies.[2] While local roads are less traveled than State highways, they have a much higher rate of fatal and serious injury crashes.[2] Developing an LRSP is an effective strategy to improve local road safety for all road users and support the goals of a State's overall Strategic Highway Safety Plan (SHSP).

Although the development process and resulting plan can vary depending on the local agency's needs, available resources, and targeted crash types, aspects common to LRSPs include:

- Stakeholder engagement representing the 4E's: engineering, enforcement, education, and emergency medical services.
- Collaboration among municipal, county, Tribal, State, and/or Federal entities to leverage expertise and resources.
- Identification of target crash types and crash risk with corresponding recommended proven safety countermeasures.
- Timeline and goals for implementation and evaluation.

Local road agencies should consider developing an LRSP to be used as a tool for reducing roadway fatalities, injuries, and crashes.[3] LRSPs can help agencies create a prioritized list of improvements. LRSPs are also a proactive risk management technique to demonstrate an agency's responsiveness. The plan should be viewed as a living document that can be updated to reflect changing local needs and priorities.

Infographic showing the LRSP process. Source: FHWA

1 https://safety.fhwa.dot.gov/LRSPDIY/
2 Anderson et al. Noteworthy Practices: Addressing Safety on Locally-Owned and Maintained Roads A Domestic Scan, FHWA-SA-09-019, (2010).
3 Developing Safety Plans: A Manual for Local Rural Road Owners, FHWA-SA-12-017, provides guidance on developing an LRSP.

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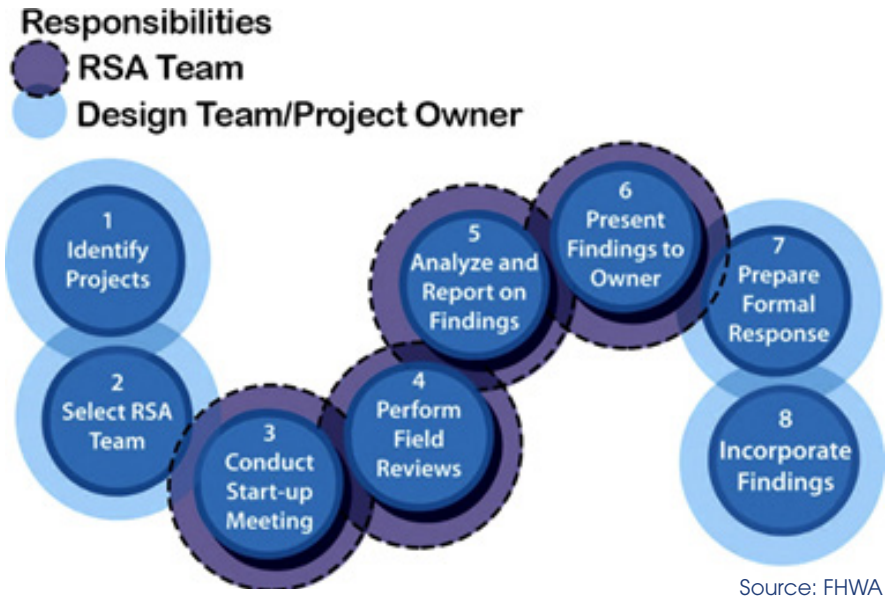
Safety Benefits:

10-60%
reduction in total crashes.[1]

Road Safety Audit

While most transportation agencies have established traditional safety review procedures, a road safety audit (RSA) or assessment is unique. RSAs are performed by a multidisciplinary team independent of the project. RSAs consider all road users, account for human factors and road user capabilities, are documented in a formal report, and require a formal response from the road owner. (See the eight steps for conducting an RSA below.)



Source: FHWA

RSAs provide the following benefits:

- Reduced number and severity of crashes due to safer designs.
- Reduced costs resulting from early identification and mitigation of safety issues before projects are built.
- Increased opportunities to integrate multimodal safety strategies and proven safety countermeasures.
- Expanded ability to consider human factors in all facets of design.
- Increased communication and collaboration among safety stakeholders.
- Objective review by independent multidisciplinary team.

RSAs can be performed in any phase of project development, from planning through construction. Agencies may focus RSAs specifically on motorized vehicles, pedestrians, bicyclists, motorcyclists, or a combination of these roadway users. Agencies are encouraged to conduct an RSA at the earliest stage possible, as all roadway design options and alternatives are being explored.

Multidisciplinary team performs field review during an RSA. Source: FHWA

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures/ and https://safety.fhwa.dot.gov/rsa/.

1 Road Safety Audits: An Evaluation of RSA Programs and Projects, FHWA-SA-12-037; and FHWA Road Safety Audit Guidelines, FHWA-SA-06-06.

FHWA-SA-21-048

https://safety.fhwa.dot.gov/provencountermeasures/

FHWA-SA-21-071

APPENDIX G

Project Prioritization

The list of final priorities for design projects are given in the tables that follow. Prioritization worksheet for each juridisciton is displayed after the final priorities tables.

City of Bellmead

Priority	Project	Score	Normalized Severity Score
1	Bellmead Drive - Corridor Safety Improvement Project	900	113
3	Pedestrian Safety in School Zone	660	18
2	Harrison Street - Multimodal Corridor Project	660	15
4	Concord Road - Corridor Safety Improvement Project	660	13
5	Airbase Road – Intersection Safety Improvement	500	45

City of Hewitt

Priority	Project	Score	Normalized Severity Score
1A	FM-1695 (N Hewitt Drive) – Corridor Safety Improvements	840	147
1B	FM-1695 (S Hewitt Drive) – Corridor Safety Improvements	840	20
1C	FM-1695 (S Hewitt Drive) – Intersection Safety Improvements	840	7
2	School Safety Improvements	660	8
3	Old Temple Road – Corridor Safety Improvements	600	20
4	FM-2063 (Sun Valley Blvd) – Corridor Safety Improvements	550	44
5	Warren Street – Corridor Safety Improvements	360	16

City of Lacy Lakeview

Priority	Project	Score	Normalized Severity Score
1A&B	BU-77 (New Dallas Hwy) – Corridor Safety Improvement	840	42
2	SL-340 (Industrial Blvd) – Corridor Safety Improvement	590	229
3	FM-2417 (E Crest Drive) – Corridor Safety Improvement	560	16
4	E Craven Avenue – Corridor Safety Improvement	410	21
5	Meyers Lane – Corridor Safety Improvement	260	24

City of McGregor

Priority	Project	Score	Normalized Severity Score
1A	Main Street (SH-317) Safety Improvements (US-84 to 11th St)	800	73
1B	Main Street (SH-317) Safety Improvements (11th St to Rachael Rd)	800	27
2	US-84 (McGregor Drive) - Intersection Safety Improvements	590	60
3	W 6th Street Safety Improvements	410	9
4	US-84 (McGregor Drive) Safety Improvements	400	34

City of Robinson

Priority	Project	Score	Normalized Severity Score
1	US-77 (Robinson Drive) – Corridor Safety Improvements	800	60
2	US-77 (Robinson Drive) – Signalized Intersection Safety Improvements	800	44
3	Newland Drive – Corridor Safety Improvements	260	6
4	FM-3148 (W Moonlight Drive) – Corridor Safety Improvements	260	3
5	Greig Drive – Corridor Safety Improvements	100	7

City of Waco

Priority	Safety Project Name	Score	Normalized Severity Score
1	17th and 18th Street Corridor Safety Improvements	900	380
2	N Valley Mills Drive Complete Street Improvements	840	302
3	Hewitt Drive Complete Streets Multimodal Project	750	239
4	Bosque Boulevard Corridor Safety Improvements	660	122
5	FM 1637 Corridor Safety Improvements	660	117
6	S New Road Corridor Safety Improvements	660	101
7A	Lake Shore Dr Corridor Safety Improvements (N 19th St to Mt Carmel Dr)	460	57
7B	Lake Shore Dr Corridor Safety Improvements (Mc Carmet Dr to Bishop Dr)	460	19
8	Sanger Avenue Safety Improvements	450	100

City of Woodway

Priority	Project	Score	Normalized Severity Score
1	Estates Drive – Corridor Safety Improvements	800	20
2	Bosque Blvd – Corridor Safety Improvement	590	15
3	Santa Fe Drive – Corridor Safety Improvements	410	6
4	Ritchie Road and Old McGregor Road – Intersection Safety Improvements	100	0

Unincorporated McLennan County

Priority		Score	Normalized Severity Score
1	Ritchie Road – Pedestrian Connectivity Improvements	560	0
2	Intersection Safety Improvements - Aviation Pkwy and US-84	440	62
3	Intersection Safety Improvements - IH-35 and Ross Road	400	47
4	Intersection Safety Improvements - County List	360	1
5	Mazanec Road – Corridor Safety Improvements	260	3
6	Intersection Safety Improvements - FM 2113 (Spring Valley Road) and FM 2837 (Old Lorena Road)	250	26
7	Rock Creek Road – Corridor Safety Improvements	160	5
8	Speegleville Road – Corridor Safety Improvements	160	3
9	Chapel Road – Corridor Safety Improvements	100	5

Bellmead Prioritization Worksheet

Project Prioritization Scoring

Safety Project Name	Safety Benefits	Benefit for Vulnerable Road Users	School Safety Impact	Equity Impact	Public Engagement	Ease of Implementation	Score
1:Bellmead Drive - Corridor Safety Improvement Project	5	10	10	10	10	5	900
2: Concord Road - Corridor Safety Improvement Project	2	10	10	10	10	5	660
3: Harrison Street - Multimodal Corridor Project	2	10	10	10	10	5	660
7: Pedestrian Safety in School Zone	2	10	10	10	10	5	660
4: Airbase Road – Intersection Safety Improvement	10	0	0	10	0	5	500

Severity Score Calculation

	Fatal	Serious	Minor	Possible	Severity Index	Length of corridor	Normalized Severity	Score
Bellmead Drive - Corridor Safety Improvement Project	8	17	78	95	326	2.89	113	10
Concord Road - Corridor Safety Improvement Project	1	1	5	9	25	1.89	13	2
Harrison Street - Multimodal Corridor Project	0	1	5	5	18	1.19	15	2
Airbase Road – Intersection Safety Improvement	2	2	12	9	45	1.00	45	10
Pedestrian Safety in School Zone	0	2	12	11	41	2.34	18	2

Buckets

Maximum Normalized Severity Score	113
Minimum Normalized Severity Score	13
Group widths	33
Bucket 1 <	46
Bucket 2 <	80
Bucket 3 <=	113

Hewitt Prioritization Worksheet

Project Prioritization Scoring

Safety Project Name	Safety Benefits	Benefit for Vulnerable Road Users	School Safety Impact	Equity Impact	Public Engagement	Ease of Implementation	Score
Project 1	10	10	10	10	10	2	840
2: School Safety Improvements	2	10	10	10	10	5	660
4: Old Temple Road – Corridor Safety Improvements	10	0	0	0	10	10	600
5: FM-2063 (Sun Valley Blvd) – Corridor Safety Improvements	10	10	0	0	0	5	550
3: Warren Street – Corridor Safety Improvements	2	0	0	0	10	10	360

Project 1 Details

	Fatal	Serious	Minor	Possible	Severity Index	Length of corridor	Normalized Severity
1A: FM-1695 (N Hewitt Drive) – Corridor Safety Improvements	2	7	42	58	169	1.46	116
1B: FM-1695 (S Hewitt Drive) – Corridor Safety Improvements	1	4	12	21	60	3.07	20
1C: FM-1695 (S Hewitt Drive) – Intersection Safety Improvements	0	0	2	3	7	1.00	7

Severity Score Calculation

	Fatal	Serious	Minor	Possible	Severity Index	Length of corridor	Normalized Severity	Score
Project 1	3	11	56	82	236	4.53	52	10
2: School Safety Improvements	0	0	6	6	18	2.13	8	2
3: Warren Street – Corridor Safety Improvements	0	0	10	8	28	1.77	16	2
4: Old Temple Road – Corridor Safety Improvements	0	2	12	27	57	2.86	20	10
5: FM-2063 (Sun Valley Blvd) – Corridor Safety Improvements	1	2	19	29	76	1.73	44	10

Buckets Identification

Maximum Normalized Severity Score	57
Minimum Normalized Severity Score	8
Group widths	15
Bucket 1 <	23
Bucket 2 <	38
Bucket 3 <=	52

Lacy Lakeview Prioritization Worksheet

Project Prioritization Scoring

Safety Project Name	Safety Benefits	Benefit for Vulnerable Road Users	School Safety Impact	Equity Impact	Public Engagement	Ease of Implementation	Score
1: BU-77 (New Dallas Hwy) – Corridor Safety Improvement	10	10	10	10	10	2	840
4: FM-2417 (E Crest Drive) – Corridor Safety Improvement	2	10	10	10	0	5	560
2: E Craven Avenue – Corridor Safety Improvement	2	10	0	10	0	5	410
5: SL-340 (Industrial Blvd) – Corridor Safety Improvement	10	10	0	10	0	2	590
3: Meyers Lane – Corridor Safety Improvement	2	0	0	10	0	5	260

Severity Score Calculation

	Fatal	Serious	Minor	Possible	Severity Index	Length of corridor	Normalized Severity	Score
1: BU-77 (New Dallas Hwy) – Corridor Safety Improvement	2	11	25	17	106	2.54	42	10
2: E Craven Avenue – Corridor Safety Improvement	0	2	4	2	16	0.78	21	2
3: Meyers Lane – Corridor Safety Improvement	0	4	6	4	28	1.19	24	2
4: FM-2417 (E Crest Drive) – Corridor Safety Improvement	0	0	2	5	9	0.57	16	2
5: SL-340 (Industrial Blvd) – Corridor Safety Improvement	1	3	14	15	55	0.24	229	10

Buckets

Maximum Normalized Severity Score	229
Minimum Normalized Severity Score	16
Group widths	71
Bucket 1 <	87
Bucket 2 <	158
Bucket 3 <=	229

McGregor Prioritization Worksheet

Project Prioritization Scoring

Safety Project Name	Safety Benefits	Benefit for Vulnerable Road Users	School Safety Impact	Equity Impact	Public Engagement	Ease of Implementation	Score
Project 1	10	10	10	0	10	5	800
3: US-84 (McGregor Drive) - Intersection Safety Improvements	10	10	0	0	10	2	590
4: W 6th Street Safety Improvements	2	0	10	0	0	10	410
2: US-84 (McGregor Drive) Safety Improvements	5	10	0	0	0	5	400

Project 1 Details

	Fatal	Serious	Minor	Possible	Severity Index	Length of corridor	Normalized Severity
Main Street (SH-317) Safety Improvements (US-84 to 11th St)		6	16	19	69	0.95	73
Main Street (SH-317) Safety Improvements (11th St to Rachael Rd)	1	4	1	5	22	0.62	27

Severity Score Calculation

	Fatal	Serious	Minor	Possible	Severity Index	Length of corridor	Normalized Severity	Score
Project 1	1	9	17	22	86	1.57	58	10
2: US-84 (McGregor Drive) Safety Improvements	4	19	64	50	247	7.25	34	5
3: US-84 (McGregor Drive) - Intersection Safety Improvements	0	4	16	16	60	1.00	60	10
4: W 6th Street Safety Improvements	0	1	2	2	9	1.02	9	2

Buckets

Maximum Normalized Severity Score	60
Minimum Normalized Severity Score	9
Group widths	17
Bucket 1 <	27
Bucket 2 <	44
Bucket 3 <=	61

Robinson Prioritization Worksheet

Project Prioritization Scoring

Safety Project Name	Safety Benefits	Benefit for Vulnerable Road Users	School Safety Impact	Equity Impact	Public Engagement	Ease of Implementation	Score
2: US-77 (Robinson Drive) – Corridor Safety Improvements	10	10	10	10	0	5	800
1: US-77 (Robinson Drive) – Signalized Intersection Safety Improvements	10	10	10	10	0	5	800
3: FM-3148 (W Moonlight Drive) – Corridor Safety Improvements	2	0	0	0	0	10	260
4: Newland Drive – Corridor Safety Improvements	2	0	0	0	0	10	260
5: Greig Drive – Corridor Safety Improvements	2	0	0	0	0	2	100

Severity Score Calculation

	Fatal	Serious	Minor	Possible	Severity Index	Length of corridor	Normalized Severity	Score
US-77 (Robinson Drive) – Signalized Intersection Safety Improvements	0	0	10	24	44	1.00	44	10
US-77 (Robinson Drive) – Corridor Safety Improvements	3	10	68	59	234	3.91	60	10
FM-3148 (W Moonlight Drive) – Corridor Safety Improvements	0	0	5	5	15	4.47	3	2
Newland Drive – Corridor Safety Improvements	0	0	3	2	8	1.42	6	2
Greig Drive – Corridor Safety Improvements	0	0	9	2	20	3.02	7	2

Buckets

Maximum Normalized Severity Score	60
Minimum Normalized Severity Score	3
Group widths	19
Bucket 1 <	22
Bucket 2 <	41
Bucket 3 <=	60

Waco Prioritization Worksheet

Project Prioritization Scoring

Safety Project Name	Safety Benefits	Benefit for Vulnerable Road Users	School Safety Impact	Equity Impact	Public Engagement	Ease of Implementation	Score
3: 17th and 18th Street Corridor Safety Improvements	10	10	10	10	10	5	900
2: N Valley Mills Drive Complete Street Improvements	10	10	10	10	10	2	840
6: Hewitt Drive Complete Streets Multimodal Project	5	10	10	10	10	5	750
4: FM 1637 Corridor Safety Improvements	2	10	10	10	10	5	660
5: Bosque Boulevard Corridor Safety Improvements	2	10	10	10	10	5	660
7: S New Road Corridor Safety Improvements	2	10	10	10	10	5	660
Project 1	2	10	10	0	0	5	460
8: Sanger Avenue Safety Improvements	2	0	10	10	10	2	450

Project 1 Details

	Fatal	Serious	Minor	Possible	Severity Index	Length of corridor	Normalized Severity
Lake Shore Dr Corridor Safety Improvements (N 19th St to Mt Carmel Dr)	8	8	41	85	215	3.75	57
Lake Shore Dr Corridor Safety Improvements (Mc Carmet Dr to Bishop Dr)	1	4	23	17	78	4.09	19

Severity Score Calculation

	Fatal	Serious	Minor	Possible	Severity Index	Length of corridor	Normalized Severity	Score
Project 1	9	12	64	102	293	3.75	78	2
2: N Valley Mills Drive Complete Street Improvements	7	44	198	321	870	2.88	302	10
3: 17th and 18th Street Corridor Safety Improvements	4	28	211	281	799	2.10	380	10
4: FM 1637 Corridor Safety Improvements	4	31	146	239	636	5.45	117	2
5: Bosque Boulevard Corridor Safety Improvements	1	20	76	114	329	2.69	122	2
6: Hewitt Drive Complete Streets Multimodal Project	2	12	83	107	315	1.32	239	5
7: S New Road Corridor Safety Improvements	1	17	57	100	268	2.66	101	2
8: Sanger Avenue Safety Improvements	2	12	38	47	165	1.65	100	2

Buckets

Maximum Normalized Severity Score	380
Minimum Normalized Severity Score	78
Group widths	101
Bucket 1 <	179
Bucket 2 <	280
Bucket 3 <=	380

Woodway Prioritization Worksheet

Project Prioritization Scoring

Safety Project Name	Safety Benefits	Benefit for Vulnerable Road Users	School Safety Impact	Equity Impact	Public Engagement	Ease of Implementation	Score
2: Estates Drive – Corridor Safety Improvements	10	10	10	0	10	5	800
1: Bosque Blvd – Corridor Safety Improvement	10	10	0	0	10	2	590
3: Santa Fe Drive – Corridor Safety Improvements	2	10	0	0	10	5	410
4: Ritchie Road and Old McGregor Road – Intersection Safety Improvements	2	0	0	0	0	2	100

Severity Score Calculation

	Fatal	Serious	Minor	Possible	Severity Index	Length of corridor	Normalized Severity	Score
Bosque Blvd – Corridor Safety Improvement	0	3	5	5	24	1	20	10
Estates Drive – Corridor Safety Improvements	0	0	4	7	15	1	15	10
Santa Fe Drive – Corridor Safety Improvements	0	1	1	6	11	2	6	2
Ritchie Road and Old McGregor Road – Intersection Safety Improvements	0	0	0	0	0	2	0	2

Buckets

Maximum Normalized Severity Score	20
Minimum Normalized Severity Score	0
Group widths	7
Bucket 1 <	7
Bucket 2 <	13
Bucket 3 <=	20

Unincorporated McLennan County Prioritization Worksheet

Project Prioritization Scoring

Safety Project Name	Safety Benefits	Benefit for Vulnerable Road Users	School Safety Impact	Equity Impact	Public Engagement	Ease of Implementation	Score
8: Ritchie Road – Pedestrian Connectivity Improvements	2	10	10	0	10	5	560
5: Intersection Safety Improvements - Aviation Pkwy and US-84	10	0	0	10	0	2	440
6: Intersection Safety Improvements - IH-35 and Ross Road	10	0	0	0	0	5	400
11: Intersection Safety Improvements - County List	2	0	0	10	10	5	360
4: Mazanec Road – Corridor Safety Improvements	2	0	0	10	0	5	260
7: Intersection Safety Improvements - FM 2113 (Spring Valley Road) and FM 2837 (Old Lorena Road)	5	0	0	0	0	5	250
2: Speegleville Road – Corridor Safety Improvements	2	0	0	0	0	5	160
3: Rock Creek Road – Corridor Safety Improvements	2	0	0	0	0	5	160
1: Chapel Road – Corridor Safety Improvements	2	0	0	0	0	2	100

Severity Score Calculation

	Fatal	Serious	Minor	Possible	Severity Index	Length of corridor	Normalized Severity	Score
1: Chapel Road – Corridor Safety Improvements	1	2	2	6	19	4	5	2
2: Speegleville Road – Corridor Safety Improvements	0	1	1	2	7	2	3	2
3: Rock Creek Road – Corridor Safety Improvements	0	2	7	8	28	6	5	2
4: Mazanec Road – Corridor Safety Improvements	0	2	3	5	17	6	3	2
5: Intersection Safety Improvements - Aviation Pkwy and US-84	2	6	13	12	62	1	62	10
6: Intersection Safety Improvements - IH-35 and Ross Road	2	5	7	12	47	1	47	10
7: Intersection Safety Improvements - FM 2113 (Spring Valley Road) and FM 2837 (Old Lorena Road)	0	4	6	2	26	1	26	5
8: Ritchie Road – Pedestrian Connectivity Improvements	0	0	0	0	0	0	0	2
11: Intersection Safety Improvements - County List	0	1	1	0	5	9	1	2

Buckets

Maximum Normalized Severity Score	62
Minimum Normalized Severity Score	0
Group widths	21
Bucket 1 <	21
Bucket 2 <	41
Bucket 3 <=	62

APPENDIX H

DETAILED COST ESTIMATES

City of McGregor Cost Estimate

Project 1: Citywide Street Light Inventory

Project Limits: Citywide

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Street Light Inventory and Installation	Upgrade Existing Street Lighting	EA	$1,000.00	443	$443,000	$2,193,000	$2,522,000
	Installing New Street Lighting	EA	$12,000.00	125	$1,500,000		
	Install Service Point	EA	$10,000.00	13	$125,000		
	Install Street Lighting Cable	LF	$5.00	25000	$125,000		
						Project Cost Total	**$2,522,000**
						Contingency Cost(20%)	**$504,400**
						Subtotal	**$3,026,400**
						Engineering Costs(35%)	**$1,059,300**
						Total	**$4,085,700**

City of McGregor Cost Estimate

Project 2: Citywide Sign Inventory

Project Limits: Citywide

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Sign Inventory and Installation	Remove Sign and Post	EA	$200.00	107	$21,400	$77,400	$89,100
	Install Sign and Post	EA	$400.00	140	$56,000		
Pavement Delineation	Remove Striping	LF	$2.50	325078	$812,696	$2,970,426	$3,416,000
	Install Striping	LF	$4.00	508308	$2,033,230		
	Remove Pavement Marking	EA	$200.00	110	$22,000		
	Install Pavement Marking	EA	$250.00	410	$102,500		
						Project Cost Total	**$3,505,100**
						Contingency Cost(20%)	**$701,100**
						Subtotal	**$4,206,200**
						Engineering Costs(25%)	**$1,051,600**
						Total	**$5,257,800**

City of McGregor Cost Estimate

Project 3A: Main Street (SH-317) - Corridor Safety Improvements

Project Limits: Main Street (SH-317) from SR-84 (McGregor Drive) to 11th Street

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Fill Sidewalk Gap	Site Preparation and Removal	SF	$12.00	21600	$259,200	$969,150	$1,114,600
	Install Sidewalk	SF	$20.00	21600	$432,000		
	Install Curb Ramp	EA	$4,000.00	19	$76,000		
	Install Curb and Gutter	LF	$40.00	2020	$80,800		
	Install Driveway	EA	$5,000.00	15	$75,000		
	Allowance for Drainage	LS	$46,150.00	1	$46,150		
Crosswalk Enhancement	Install RRFB System (Per Pole)	EA	$10,000.00	12	$120,000	$296,000	$340,400
	Install High Visibility Crosswalk	EA	$1,000.00	13	$13,000		
	Install Pedestrian Signage	EA	$250.00	52	$13,000		
	Install Bulbout	EA	$15,000.00	10	$150,000		
Install Speed Feedback Sign	Install Dynamic/Variable Speed Warning Sign (Solar-Powered)	EA	$15,000.00	2	$30,000	$30,000	$34,500
Install Street Lighting & Medians	Install Street Light Pole	EA	$17,000.00	8	$136,000	$1,199,000	$1,378,900
	Install Median Concrete	SF	$25.00	35200	$880,000		
	Install Median Curb	LF	$40.00	4400	$176,000		
	Install Pavement Marking	EA	$250.00	28	$7,000		
Signalized Intersection Improvements	Replace Existing Backplate with New Backplate with Yellow Retroreflective Border	EA	$1,500.00	16	$24,000	$24,000	$27,600
Install Pedestrian Hybrid Beacon (PHB)	Install Pedestrian Hybrid Beacon System	LS	$200,000.00	1	$200,000	$201,000	$231,200
	Install High Visibility Crosswalk	EA	$1,000.00	1	$1,000		
					Project Cost Total		**$3,127,200**
					Contingency Cost(20%)		**$625,500**
					Subtotal		**$3,752,700**
					Engineering Costs(35%)		**$1,313,500**
					Total		**$5,066,200**

City of McGregor Cost Estimate

Project 3B: Main Street (SH-317) - Corridor Safety Improvements

Project Limits: Main Street (SH-317) from 11th Street to Rachael Rd

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
New Sidewalk	Site Preparation and Removal	SF	$12.00	31800	$381,600	$1,396,800	$1,606,400
	Install Sidewalk	SF	$20.00	31800	$636,000		
	Install Curb Ramp	EA	$4,000.00	6	$24,000		
	Install Curb and Gutter	LF	$40.00	5200	$208,000		
	Install Driveway	EA	$5,000.00	4	$20,000		
	Allowance for Drainage	LS	$127,200.00	1	$127,200		
Install Speed Feedback Sign	Install Dynamic/Variable Speed Warning Sign (Solar-Powered)	EA	$15,000.00	1	$15,000	$15,000	$17,300
Pedestrian Hybrid Beacon	Install Pedestrian Hybrid Beacon System	LS	$200,000.00	1	$200,000	$201,000	$231,200
	Install High Visibility Crosswalk	EA	$1,000.00	1	$1,000		
Advanced Beacon	Install Flashing Beacon System (per pole)	EA	$15,000.00	1	$15,000	$15,000	$17,300
						Project Cost Total	**$1,872,200**
						Contingency Cost(20%)	**$374,500**
						Subtotal	**$2,246,700**
						Engineering Costs(35%)	**$786,400**
						Total	**$3,033,100**

City of McGregor Cost Estimate

Project 4: US-84 (McGregor Drive) - Intersection Safety Improvements

Project Location: US-84 (McGregor Drive) and Main Street (SH-317)

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Crosswalks and Sidewalks	Install High Visibility Crosswalk	EA	$1,000.00	6	$6,000	$50,000	$667,700
	Install Sidewalk	SF	$20.00	1200	$24,000		
	Install Pedestrian Signal Head	EA	$1,000.00	8	$8,000		
	Install APS Button	EA	$1,500.00	8	$12,000		
Additional Signal Heads and Retroreflective Backplates	Replace Existing Backplate with New Backplate with Yellow Retroreflective Border	EA	$1,500.00	8	$12,000	$12,000	
Install Protected Left	Remove Existing Signal Head	EA	$500.00	4	$2,000	$15,250	
	Furnish and Install New Signal Head Assembly with Backplate with Yellow Retroreflective Border	EA	$1,500.00	8	$12,000		
	Install Pavement Marking	EA	$250.00	5	$1,250		
Install Approach Medians	Install Median Concrete	SF	$25.00	3200	$80,000	$113,200	
	Install Median Curb	LF	$40.00	820	$32,800		
	Install Sign and Post	EA	$200.00	2	$400		
Install Intersection Warning Sign with Flashing Beacon	Install Flashing Beacon System (per pole)	EA	$15,000.00	2	$30,000	$30,000	
Remove Slip Lane going onto US-84 (McGregor Dr.) **NB**	Site Preparation and Removal	SF	$12.00	5260	$63,120	$193,584	
	Install Curb and Gutter	LF	$40.00	225	$9,000		
	Install Sidewalk	SF	$20.00	2960	$59,200		
	Landscaping	LS	$10.00	2300	$23,000		
	Drainage Allowance	LS	$30,864.00	1	$30,864		
	Install Curb Ramp	EA	$4,000.00	2	$8,000		
	Install Sign and Post	EA	$200.00	2	$400		
Remove Slip Lane going onto US-84 (McGregor Dr.) **SB**	Site Preparation and Removal	SF	$12.00	5080	$60,960	$166,488	
	Install Curb and Gutter	LF	$40.00	250	$10,000		
	Install Sidewalk	SF	$20.00	2880	$57,600		
	Landscaping	LS	$10.00	2200	$22,000		
	Drainage Allowance	LS	$7,528.00	1	$7,528		
	Install Curb Ramp	EA	$4,000.00	2	$8,000		
	Install Sign and Post	EA	$200.00	2	$400		

Project Location: US-84 (McGregor Drive) and Johnson Drive							
Install Crosswalks and Sidewalks	Install High Visibility Crosswalk	EA	$1,000.00	5	$5,000	$62,000	$579,300
	Install Sidewalk	SF	$20.00	2100	$42,000		
	Install Pedestrian Signal Head	EA	$1,000.00	6	$6,000		
	Install APS Button	EA	$1,500.00	6	$9,000		
Additional Signal Heads and Retroreflective Backplates	Replace Existing Backplate with New Backplate with Yellow Retroreflective Border	EA	$1,500.00	7	$10,500	$13,500	
	Furnish and Install New Signal Head Assembly with Backplate with Yellow Retroreflective Border	EA	$1,500.00	2	$3,000		
Install Protected Left	Remove Existing Signal Head	EA	$500.00	1	$500	$17,300	
	Remove Sign	EA	$100.00	1	$100		
	Install Sign	EA	$200.00	1	$200		
	Install Signal Pole and Foundation	EA	$13,000.00	1	$13,000		
	Furnish and Install New Signal Head Assembly with Backplate with Yellow Retroreflective Border	EA	$1,500.00	2	$3,000		
	Install Pavement Marking	EA	$250.00	2	$500		
Install Approach Medians	Install Median Concrete	SF	$25.00	4290	$107,250	$148,050	
	Install Median Curb	LF	$40.00	1000	$40,000		
	Install Sign and Post	EA	$200.00	4	$800		
Install Intersection Warning Sign with Flashing Beacon	Install Flashing Beacon System (per pole)	EA	$15,000.00	2	$30,000	$30,000	
Remove Slip Lane going onto US-84 (McGregor Dr.) **NB**	Site Preparation and Removal	SF	$12.00	7880	$94,560	$232,868	
	Install Curb and Gutter	LF	$40.00	300	$12,000		
	Install Sidewalk	SF	$20.00	2880	$57,600		
	Landscaping	SF	$10.00	5000	$50,000		
	Drainage Allowance	LS	$10,708.00	1	$10,708		
	Install Curb Ramp	EA	$4,000.00	2	$8,000		
						Project Cost Total	**$1,247,000**
						Contingency Cost(20%)	**$249,400**
						Subtotal	**$1,496,400**
						Engineering Costs(35%)	**$523,800**
						Total	**$2,020,200**

City of McGregor Cost Estimate

Project 5: W 6th Street - Corridor Safety Improvements

Project Limits: W 6th Street from Washington Ave to Johnson Drive

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Centerline Striping	Install Striping	LF	$4.00	6100	$24,400	$24,400	$28,100
Stop Bar on Minor Streets	Install Stop Bar	LF	$8.00	288	$2,304	$2,304	$2,700
Sign Upgarde	Remove Sign	EA	$100.00	24	$2,400	$12,000	$13,800
	Install Sign	EA	$200.00	24	$4,800		
	Install Sign and Post	EA	$200.00	24	$4,800		
Street Lighting	Install Street Light Pole	EA	$17,000.00	22	$374,000	$394,000	$453,100
	Install Service Point	EA	$10,000.00	2	$20,000		
					Project Cost Total		**$497,700**
					Contingency Cost(20%)		**$99,600**
					Subtotal		**$597,300**
					Engineering Costs(35%)		**$209,100**
					Total		**$806,400**

City of McGregor Cost Estimate

Project 6: US-84 (McGregor Drive) Safety Improvements

Project Limits: US-84 (McGregor Drive) from City Limit E to City Limit W

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Street Lighting	Install Street Light Pole	EA	$17,000.00	46	$782,000	$1,010,750	$1,162,400
	Install Street Lighting Conduit	LF	$75.00	2250	$168,750		
	Install Service Point	EA	$10,000.00	6	$60,000		
Sidewalk	Site Preparation and Removal	SF	$12.00	74700	$896,400	$3,387,858	$3,896,100
	Install Driveway	EA	$5,000.00	34	$170,000		
	Install Sidewalk	SF	$20.00	74700	$1,494,000		
	Install Curb Ramp	EA	$4,000.00	30	$120,000		
	Install Curb and Gutter	LF	$40.00	12450	$498,000		
	Allowance for Drainage	LS	$209,457.50	1	$209,458		
Install Median	Install Median Concrete	SF	$25.00	33480	$837,000	$1,162,000	$1,336,300
	Install Median Curb	LF	$40.00	8000	$320,000		
	Install Pavement Marking	EA	$250.00	20	$5,000		
Install Guardrail	Install Guardrail	LF	$50.00	250	$12,500	$12,500	$14,400
Install Shared Use Path along Railroad	Site Preparation and Removal	SF	$12.00	178000	$2,136,000	$6,958,000	$8,001,700
	Install Shared Use path	SF	$15.00	178000	$2,670,000		
	Install Curb Ramp	EA	$4,000.00	4	$16,000		
	Install Curb and Gutter	LF	$40.00	35600	$1,424,000		
	Install Fencing	LF	$40.00	17800	$712,000		
Install Shared Use Path (Along 2nd and 3rd)	Site Preparation and Removal	SF	$12.00	25600	$307,200	$1,127,500	$1,296,700
	Install Shared Use path	SF	$15.00	25600	$384,000		
	Install Curb Ramp	EA	$4,000.00	15	$60,000		
	Install Curb and Gutter	LF	$40.00	6400	$256,000		
	Install Crosswalk	EA	$500.00	7	$3,500		
	Install Driveway	EA	$5,000.00	8	$40,000		
	Allowance for Drainage	LS	$76,800.00	1	$76,800		
					Project Cost Total		**$15,707,600**
					Contingency Cost(20%)		**$3,141,600**
					Subtotal		**$18,849,200**
					Engineering Costs(35%)		**$6,597,300**
					Total		**$25,446,500**

City of Bellmead Cost Estimate

Project 1: Citywide Street Light Inventory

Project Limits: Citywide

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Street Light Inventory and Installation	Upgrade Existing Street Lighting	EA	$1,000.00	230	$230,000	$4,550,000	$5,232,500
	Installing New Street Lighting	EA	$12,000.00	325	$3,900,000		
	Install Service Point	EA	$10,000.00	33	$325,000		
	Install Street Lighting Cable	LF	$5.00	19000	$95,000		
						Project Cost Total	**$5,232,500**
						Contingency Cost(20%)	**$1,046,500**
						Subtotal	**$6,279,000**
						Engineering Costs(35%)	**$2,197,700**
						Total	**$8,476,700**

City of Bellmead Cost Estimate

Project 2: Citywide Sign Inventory

Project Limits: Citywide

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Sign Inventory and Installation	Remove Sign and Post	EA	$200.00	634	$126,800	$680,160	$782,200
	Install Sign and Post	EA	$400.00	1383	$553,360		
Pavement Delineation	Remove Striping	LF	$2.50	222932	$557,330	$2,415,414	$2,777,800
	Install Striping	LF	$4.00	422646	$1,690,584		
	Remove Pavement marking	EA	$200.00	150	$30,000		
	Install Pavement Marking	EA	$250.00	550	$137,500		
						Project Cost Total	**$3,560,000**
						Contingency Cost(20%)	**$712,000**
						Subtotal	**$4,272,000**
						Engineering Costs(25%)	**$1,068,000**
						Total	**$5,340,000**

City of Bellmead Cost Estimate

Project 3: US-84 (Bellmead Drive) - Corridor Safety Improvements

Project Limits: US-84 (Bellmead Drive) from E 26th Street to City Limit East

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Median and Access Management	Install Median Concrete	SF	$25.00	99480	$2,487,000	$3,717,600	$4,275,300
	Install Median Curb	LF	$40.00	26610	$1,064,400		
	Install Pavement Marking	EA	$250.00	36	$9,000		
	Install Striping	LF	$4.00	1800	$7,200		
	Remove Driveway	EA	$3,000.00	25	$75,000		
	Install Driveway	EA	$5,000.00	15	$75,000		
Street Lighting	Install Street Light Pole	EA	$17,000.00	40	$680,000	$865,000	$994,800
	Install Service Point	EA	$10,000.00	5	$50,000		
	Install Street Lighting Cable	LF	$5.00	8250	$41,250		
	Install Conduit and Cabling	LF	$75.00	1250	$93,750		
Pull-Out Bus Stop	Install Bus Stop Markings	EA	$2,500.00	1	$2,500	$22,500	$25,900
	Install Bus Stop Improvements	LS	$20,000.00	1	$20,000		
Pedestrian Connectivity Improvements (Sidewalk and Crosswalks and PHB at Bellmead/Concord	Site Preparation and Removal	SF	$12.00	124570	$1,494,840	$6,095,033	$7,009,300
	Install Sidewalk	SF	$20.00	124570	$2,491,400		
	Install Curb Ramp	EA	$4,000.00	55	$220,000		
	Install Curb and Gutter	LF	$40.00	22838	$913,513		
	Install Driveway	EA	$5,000.00	55	$275,000		
	Allowance for Drainage	LS	$498,280.00	1	$498,280		
	Install Pedestrian Hybrid Beacon System	LS	$200,000.00	1	$200,000		
	Install High Visibility Crosswalk	EA	$1,000.00	1	$1,000		
	Install Sign and Post	EA	$250.00	4	$1,000		
Speed Feedback Sign	Install Dynamic/Variable Speed Warning Sign (Solar-Powered)	EA	$15,000.00	4	$60,000	$60,000	$69,000
Install Roundabout at US-84 and E 27th Street	Convert Intersection to Roundabout	LS	$750,000.00	1	$750,000	$750,000	$862,500
						Project Cost Total	**$13,236,800**
						Contingency Cost(20%)	**$2,647,400**
						Subtotal	**$15,884,200**
						Engineering Costs(35%)	**$5,559,500**
						Total	**$21,443,700**

City of Bellmead Cost Estimate

Project 4: Pedestrian Safety in School Zone

Project Limits: Wheeler Street, Parish Street, Barlow Street and Hogan Lane

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Sidewalk @Wheeler Street	Install Sign and Post	EA	$250.00	5	$1,250	$866,250	$996,200
	Site Preparation and Removal	SF	$12.00	21000	$252,000		
	Install Sidewalk	SF	$20.00	21000	$420,000		
	Install Curb Ramp	EA	$4,000.00	15	$60,000		
	Install Curb and Gutter	LF	$40.00	250	$10,000		
	Install Driveway	EA	$5,000.00	6	$30,000		
	Install High Visibility Crosswalk	EA	$1,000.00	9	$9,000		
	Allowance for Drainage	LS	$84,000.00	1	$84,000		
Install Sidewalk @Parrish Street	Install Sign and Post	EA	$250.00	7	$1,750	$1,729,350	$1,988,800
	Site Preparation and Removal	SF	$12.00	22200	$266,400		
	Install Sidewalk	SF	$20.00	22200	$444,000		
	Install Curb Ramp	EA	$4,000.00	16	$64,000		
	Install Driveway	EA	$5,000.00	29	$145,000		
	Install High Visibility Crosswalk	EA	$1,000.00	9	$9,000		
	Allowance for Drainage	LS	$88,800.00	9	$799,200		
Install Sidewalk @Barlow Street	Install Sign and Post	EA	$250.00	12	$3,000	$382,000	$439,300
	Site Preparation and Removal	SF	$12.00	9000	$108,000		
	Install Sidewalk	SF	$20.00	9000	$180,000		
	Install Curb Ramp	EA	$4,000.00	10	$40,000		
	Install Curb and Gutter	LF	$40.00	100	$4,000		
	Install Driveway	EA	$5,000.00	1	$5,000		
	Install High Visibility Crosswalk	EA	$1,000.00	6	$6,000		
	Allowance for Drainage	LS	$36,000.00	1	$36,000		
Install Sidewalk @Hogan Ln	Install Sign and Post	EA	$250.00	9	$2,250	$742,650	$854,100
	Site Preparation and Removal	SF	$12.00	17400	$208,800		
	Install Sidewalk	SF	$20.00	17400	$348,000		
	Install Curb Ramp	EA	$4,000.00	8	$32,000		
	Install Driveway	EA	$5,000.00	15	$75,000		
	Install Curb and Gutter	LF	$40.00	50	$2,000		
	Install High Visibility Crosswalk	EA	$1,000.00	5	$5,000		
	Allowance for Drainage	LS	$ 69,600.00	1	$69,600		
					Project Cost Total		**$4,278,400**
					Contingency Cost(20%)		**$855,700**
					Subtotal		**$5,134,100**
					Engineering Costs(35%)		**$1,797,000**
					Total		**$6,931,100**

City of Bellmead Cost Estimate

Project 5: Harrison Street Multimodal Corridor Project

Project Limits: Harrison Street from Hogan Lane to US-84 (East of SL-340)

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Centerline and Edgeline Striping	Install Striping	LF	$4.00	33259	$133,037	$133,037	$153,000
Minor Street Improvements	Install Stop Bar	LF	$8.00	560	$4,480	$15,730	$18,100
	Remove Sign and Post	EA	$125.00	30	$3,750		
	Install Sign and Post	EA	$250.00	30	$7,500		
Improve Sight Distance	Trim Tree	EA	$1,000.00	17	$17,000	$17,000	$19,600
Install Street Light	Install Street Light Pole	EA	$17,000.00	24	$408,000	$428,000	$492,200
	Install Service Point	EA	$10,000.00	2	$20,000		
Install Shared Use Path	Site Preparation and Removal	SF	$12.00	114332	$1,371,984	$4,240,288	$4,876,400
	Install Shared Use path	SF	$15.00	114332	$1,714,980		
	Install Curb Ramp	EA	$4,000.00	32	$128,000		
	Install Curb and Gutter	LF	$40.00	11433	$457,328		
	Install Driveway	EA	$5,000.00	45	$225,000		
	Allowance for Drainage	LS	$342,996.00	1	$342,996		
						Project Cost Total	**$5,559,300**
						Contingency Cost(20%)	**$1,111,900**
						Subtotal	**$6,671,200**
						Engineering Costs(35%)	**$2,335,000**
						Total	**$9,006,200**

City of Bellmead Cost Estimate

Project 6: Concord Road - Corridor Safety Improvements

Project Limits: Concord Road from US-84 (Bellmead Drive) to Aviation Pkwy

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Pedestrian Connectivity Improvements	Site Preparation and Removal	SF	$12.00	55440	$665,280	$2,662,940	$3,062,400
	Install Sidewalk	SF	$20.00	55440	$1,108,800		
	Install Driveway	EA	$5,000.00	41	$205,000		
	Install Curb Ramp	EA	$4,000.00	22	$88,000		
	Install Curb and Gutter	LF	$40.00	9240	$369,600		
	Install Crosswalk	EA	$500.00	9	$4,500		
	Allowance for Drainage	LS	$221,760.00	1	$221,760		
Install Speed Feedback Sign	Install Dynamic/Variable Speed Warning Sign (Solar-Powered)	EA	$15,000.00	2	$30,000	$30,000	$34,500
Install Street Light	Install Street Light Pole	EA	$17,000.00	32	$544,000	$564,000	$648,600
	Install Service Point	EA	$10,000.00	2	$20,000		
Striping and Pavement Marking Upgrades	Install Striping	LF	$4.00	27720	$110,880	$113,360	$130,400
	Install Stop bar	LF	$8.00	310	$2,480		
						Project Cost Total	**$3,875,900**
						Contingency Cost(20%)	**$775,200**
						Subtotal	**$4,651,100**
						Engineering Costs(35%)	**$1,627,900**
						Total	**$6,279,000**

City of Bellmead Cost Estimate

Project 7: Airbase Road - Intersection Safety Improvements

Project Location 1: Airbase Road and Meyer Lane
Project Location 2: Airbase Road and Pecan Lane

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Roundabout	Roundabout Improvements	LS	$750,000.00	2	$1,500,000	$1,500,000	$1,725,000
Install Street Lighting	Install Street Light Pole	EA	$17,000.00	4	$68,000	$98,000	$112,700
	Install Street Lighting Conduit	LF	$75.00	400	$30,000		
						Project Cost Total	**$1,837,700**
						Contingency Cost(20%)	**$367,600**
						Subtotal	**$2,205,300**
						Engineering Costs(35%)	**$771,900**
						Total	**$2,977,200**

City of Robinson Cost Estimate

Project 1: Citywide Street Light Inventory

Project Limits: Citywide

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Street Light Inventory and Installation	Upgrade Existing Street Lighting	EA	$1,000.00	135	$135,000	$80,575	$92,700
	Installing New Street Lighting	EA	$12,000.00	400	$4,800,000		
	Install Service Point	EA	$10,000.00	40	$400,000		
	Install Street Lighting Cable	LF	$5.00	80000	$400,000		
						Project Cost Total	**$92,700**
						Contingency Cost(20%)	**$18,600**
						Subtotal	**$111,300**
						Engineering Costs(35%)	**$39,000**
						Total	**$150,300**

City of Robinson Cost Estimate

Project 2: Citywide Sign and Pavement Delineation

Project Limits: Citywide

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Sign Inventory and Installation	Remove Sign and Post	EA	$200.00	660	$132,000	$501,600	$576,900
	Install Sign and Post	EA	$400.00	924	$369,600		
Pavement Delineation	Remove Striping	LF	$2.50	474672	$1,186,680	$4,626,452	$5,320,500
	Install Striping	LF	$4.00	773837	$3,095,347		
	Remove Pavement Marking	EA	$200.00	599	$119,800		
	Install Pavement Marking	EA	$250.00	899	$224,625		
					Project Cost Total		**$5,897,400**
					Contingency Cost(20%)		**$1,179,500**
					Subtotal		**$7,076,900**
					Engineering Costs(35%)		**$1,769,300**
					Total		**$8,846,200**

City of Robinson Cost Estimate

Project 3: US-77 (Robinson Drive) - Corridor Safety Improvements

Project Limits: US-77 (Robinson Drive) from City Limit N to City Limit S

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Median and Access Management	Install Median Concrete	SF	$25.00	210000	$5,250,000	$6,060,500	$6,969,600
	Install Median Curb	LF	$40.00	20000	$800,000		
	Install Pavement Marking	EA	$250.00	42	$10,500		
Fill Street Light Gaps	Install Street Light Pole	EA	$17,000.00	46	$782,000	$832,000	$956,800
	Install Service Point	EA	$10,000.00	5	$50,000		
Install Sidewalk	Site Preparation and Removal	SF	$12.00	213600	$2,563,200	$9,842,600	$11,319,000
	Install Sidewalk	SF	$20.00	213600	$4,272,000		
	Install Curb and Gutter	LF	$40.00	35600	$1,424,000		
	Install Curb Ramp	EA	$4,000.00	66	$264,000		
	Remove Driveway	EA	$1,500.00	30	$45,000		
	Install Driveway	EA	$3,000.00	140	$420,000		
	Drainage Allowance	LS	$854,400.00	1	$854,400		
Install Speed Feedback Sign	Install Dynamic/Variable Speed Warning Sign (Solar-Powered)	EA	$15,000.00	4	$60,000	$60,000	$69,000
Install Pedestrian Hybrid Beacon	Install Pedestrian Hybrid Beacon System	LS	$200,000.00	2	$400,000	$402,000	$462,300
	Install High Visibility Crosswalk	EA	$1,000.00	2	$2,000		
Shoulder Rumble Striping	Install Rumble Stripe	LF	$3.00	25000	$75,000	$75,000	$86,300
						Project Cost Total	**$19,863,000**
						Contingency Cost(20%)	**$3,972,600**
						Subtotal	**$23,835,600**
						Engineering Costs(35%)	**$8,342,500**
						Total	**$32,178,100**

City of Robinson Cost Estimate

Project 4: US-77 (Robinson Drive) - Signalized Intersection Improvements

Project Locations: US-77 and Moonlight Drive, US-77 and E Lyndale Drive, US-77 and Peplow Drive/Chado Lane, US-77 and Newland Drive

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Street Lighting	Install Street Light Pole	EA	$17,000.00	6	$102,000	$374,000	$430,100
Install Medians	Install Median Concrete	SF	$25.00	7800	$195,000	$794,750	$914,000
	Install Median Curb	LF	$40.00	1000	$40,000		
	Install Pavement Marking	EA	$250.00	6	$1,500		
	Remove Striping	LF	$2.50	2400	$6,000		
	Install Striping	LF	$4.00	3500	$14,000		
Signalized Intersection Improvements	Replace Existing Backplate with New Backplate with Yellow Retroreflective Border	EA	$1,500.00	4	$6,000	$30,000	$34,500
Pedestrian Safety Enhancement	Install High Visibility Crosswalk	EA	$1,000.00	4	$4,000	$410,160	$471,700
	Install Curb Ramp	EA	$4,000.00	9	$36,000		
	Install Bulbout	EA	$10,000.00	1	$10,000		
	Site Preparation and Removal	SF	$12.00	2670	$32,040		
	Install Sidewalk	SF	$20.00	2670	$53,400		
	Install Pedestrian Signal Head	EA	$1,000.00	8	$8,000		
	Install APS Button	EA	$1,500.00	8	$12,000		
	Install Cabling	LF	$2.00	2800	$5,600		
Install Protected Left	Remove Existing Signal Head	EA	$500.00	2	$1,000	$36,100	$41,600
	Remove Sign	EA	$100.00	2	$200		
	Install Sign	EA	$200.00	2	$400		
	Furnish and Install New Signal Head Assembly with Backplate with Yellow Retroreflective Border	EA	$1,500.00	2	$3,000		
	Improve Signal Timing	LS	$5,000.00	1	$5,000		
Advance Warning Flashing Beacon	Install Flashing Beacon System (per pole)	EA	$15,000.00	2	$30,000	$120,000	$138,000
						Project Cost Total	**$2,029,900**
						Contingency Cost(20%)	**$406,000**
						Subtotal	**$2,435,900**
						Engineering Costs(35%)	**$852,600**
						Total	**$3,288,500**

Project 4 US-77 (Robinson Drive) Signalized Intersection Improvements - Intersection Breakdown

Project Intersection: US-77 (Robinson Drive) and E/W Moonlight Drive

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Street Lighting	Install Street Light Pole	EA	$17,000.00	6	$102,000	$102,000	$117,300
Install Medians	Install Median Concrete	SF	$25.00	7800	$195,000	$256,500	$294,975
	Install Median Curb	LF	$40.00	1000	$40,000		
	Install Bulbout	EA	$10,000.00	1	$10,000		
	Install Pavement Marking	EA	$250.00	6	$1,500		
	Remove Striping	LF	$2.50	2400	$6,000		
	Install Striping	LF	$4.00	3500	$14,000		
Signalized Intersection Improvements	Replace Existing Backplate with New Backplate with Yellow Retroreflective Border	EA	$1,500.00	4	$6,000	$6,000	$6,900
Pedestrian Safety Enhancement	Install High Visibility Crosswalk	EA	$1,000.00	4	$4,000	$161,040	$185,196
	Install Curb Ramp	EA	$4,000.00	9	$36,000		
	Site Preparation and Removal	SF	$12.00	2670	$32,040		
	Install Sidewalk	SF	$20.00	2670	$53,400		
	Install Pedestrian Signal Head	EA	$1,000.00	8	$8,000		
	Install APS Button	EA	$1,500.00	8	$12,000		
	Install Cabling	LF	$2.00	2800	$5,600		
Install Protected Left	Remove Existing Signal Head	EA	$500.00	2	$1,000	$9,600	$11,040
	Remove Sign	EA	$100.00	2	$200		
	Install Sign	EA	$200.00	2	$400		
	Furnish and Install New Signal Head Assembly with Backplate with	EA	$1,500.00	2	$3,000		
	Improve Signal Timing	LS	$5,000.00	1	$5,000		
Advance Warning Flashing Beacon	Install Flashing Beacon System (per pole)	EA	$15,000.00	2	$30,000	$30,000	$34,500

Project Intersection: US-77 (Robinson Drive) and E Lyndale Drive

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Street Lighting	Install Street Light Pole	EA	$17,000.00	6	$102,000	$102,000	$117,300
Install Medians	Install Median Concrete	SF	$25.00	6000	$150,000	$195,750	$225,113
	Install Median Curb	LF	$40.00	1100	$44,000		
	Install Pavement Marking	EA	$250.00	7	$1,750		
	Remove Striping	LF	$2.50	1600	$4,000		
	Install Striping	LF	$4.00	4950	$19,800		
Signalized Intersection Improvements	Replace Existing Backplate with New Backplate with Yellow Retroreflective Border	EA	$1,500.00	2	$3,000	$3,000	$3,450
Pedestrian Safety Enhancement	Install High Visibility Crosswalk	EA	$1,000.00	4	$4,000	$122,320	$140,668
	Install Curb Ramp	EA	$4,000.00	8	$32,000		
	Site Preparation and Removal	SF	$12.00	2310	$27,720		
	Install Sidewalk	SF	$20.00	2310	$46,200		
	Install Pedestrian Signal Head	EA	$1,000.00	4	$4,000		
	Install APS Button	EA	$1,500.00	4	$6,000		
	Install Cabling	LF	$2.00	1200	$2,400		
Install Protected Left	Remove Existing Signal Head	EA	$500.00	2	$1,000	$9,600	$11,040
	Remove Sign	EA	$100.00	2	$200		
	Install Sign	EA	$200.00	2	$400		
	Furnish and Install New Signal Head Assembly with Backplate with Yellow Retroreflective Border	EA	$1,500.00	2	$3,000		
	Improve Signal Timing	LS	$5,000.00	1	$5,000		
Advance Warning Flashing Beacon	Install Flashing Beacon System (per pole)	EA	$15,000.00	2	$30,000	$30,000	$34,500

Project Intersection: US-77 (Robinson Drive) and Peplow Drive/Chado Lane

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Street Lighting	Install Street Light Pole	EA	$17,000.00	6	$102,000	$102,000	$117,300
Install Medians	Install Median Concrete	SF	$25.00	5400	$135,000	$160,250	$184,288
	Install Median Curb	LF	$40.00	600	$24,000		
	Install Pavement Marking	EA	$250.00	5	$1,250		
	Remove Striping	LF	$2.50	1800	$4,500		
	Install Striping	LF	$4.00	1654	$6,616		
Signalized Intersection Improvements	Replace Existing Backplate with New Backplate with Yellow Retroreflective Border	EA	$1,500.00	8	$12,000	$12,000	$13,800
Pedestrian Safety Enhancement	Install High Visibility Crosswalk	EA	$1,000.00	4	$4,000	$65,800	$75,670
	Install Curb Ramp	EA	$4,000.00	4	$16,000		
	Site Preparation and Removal	SF	$12.00	1200	$14,400		
	Install Sidewalk	SF	$20.00	1200	$24,000		
	Install Pedestrian Signal Head	EA	$1,000.00	2	$2,000		
	Install APS Button	EA	$1,500.00	2	$3,000		
	Install Cabling	LF	$2.00	1200	$2,400		
Install Protected Left	Remove Existing Signal Head	EA	$500.00	2	$1,000	$9,600	$11,040
	Remove Sign	EA	$100.00	2	$200		
	Install Sign	EA	$200.00	2	$400		
	Furnish and Install New Signal Head Assembly with Backplate with Yellow Retroreflective Border	EA	$1,500.00	2	$3,000		
	Improve Signal Timing	LS	$5,000.00	1	$5,000		
Advance Warning Flashing Beacon	Install Flashing Beacon System (per pole)	EA	$15,000.00	2	$30,000	$30,000	$34,500

Project Intersection: US-77 (Robinson Drive) and Newland Drive

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Street Lighting	Install Street Light Pole	EA	$17,000.00	4	$68,000	$68,000	$78,200
Install Medians	Install Median Concrete	SF	$25.00	6300	$157,500	$182,250	$209,588
	Install Median Curb	LF	$40.00	600	$24,000		
	Install Pavement Marking	EA	$250.00	3	$750		
	Remove Striping	LF	$2.50	1200	$3,000		
	Install Striping	LF	$4.00	1400	$5,600		
Signalized Intersection Improvements	Replace Existing Backplate with New Backplate with Yellow Retroreflective Border	EA	$1,500.00	6	$9,000	$9,000	$10,350
Pedestrian Safety Enhancement	Install High Visibility Crosswalk	EA	$1,000.00	3	$3,000	$61,000	$70,150
	Install Curb Ramp	EA	$4,000.00	6	$24,000		
	Site Preparation and Removal	SF	$12.00	600	$7,200		
	Install Sidewalk	SF	$20.00	600	$12,000		
	Install Pedestrian Signal Head	EA	$1,000.00	4	$4,000		
	Install APS Button	EA	$1,500.00	4	$6,000		
	Install Cabling	LF	$2.00	2400	$4,800		
Install Protected Left	Remove Existing Signal Head	EA	$500.00	1	$500	$7,300	$8,395
	Remove Sign	EA	$100.00	1	$100		
	Install Sign	EA	$200.00	1	$200		
	Furnish and Install New Signal Head Assembly with Backplate with Yellow Retroreflective Border	EA	$1,500.00	1	$1,500		
	Improve Signal Timing	LS	$5,000.00	1	$5,000		
Advance Warning Flashing Beacon	Install Flashing Beacon System (per pole)	EA	$15,000.00	2	$30,000	$30,000	$34,500

City of Robinson Cost Estimate

Project 5: Newland Drive - Corridor Safety Improvemeants

Project Limits: Newland Drive from US-77 (Robinson Drive) to S 12th Street Road

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Clear Recovery Zone	Trim Tree	EA	$1,000.00	11	$11,000	$38,000	$43,700
	Relocate Object	EA	$1,000.00	27	$27,000		
Install Striping	Install Centerline	LF	$4.00	7450	$29,800	$89,400	$102,900
	Install Edge Line	LF	$4.00	14900	$59,600		
Sign Upgrade	Remove Sign	EA	$100.00	12	$1,200	$5,600	$6,500
	Install Sign	EA	$200.00	12	$2,400		
	Install Sign and Post	EA	$200.00	10	$2,000		
						Project Cost Total	**$153,100**
						Contingency Cost(20%)	**$30,700**
						Subtotal	**$183,800**
						Engineering Costs(35%)	**$64,400**
						Total	**$248,200**

City of Robinson Cost Estimate

Project 6: FM-3148 (W Moonlight Drive) - Corridor Safety Improvements							
Project Limits: FM-3148 (W Moonlight Drive) from US-77 (Robinson Drive) to City Limit W							
CM	**Description**	**Unit**	**Unit Cost**	**Quantity**	**Subtotal**	**Total**	**Total with Traffic Control and Mobilization**
Install Speed Feedback Signs	Install Dynamic/Variable Speed Warning Sign (Solar-Powered)	EA	$15,000.00	2	$30,000	$30,000	$34,500
Speed Reduction Marking	Install Speed Reduction Marking	LF	$4.00	1800	$7,200	$7,200	$8,300
Shoulder Rumble Stripe	Install Rumble Stripe	LF	$3.00	20000	$60,000	$60,000	$69,000
						Project Cost Total	**$111,800**
						Contingency Cost(20%)	**$22,400**
						Subtotal	**$134,200**
						Engineering Costs(35%)	**$47,000**
						Total	**$181,200**

City of Robinson Cost Estimate

Project 7: Greig Drive - Corridor Safety Improvements

Project Limits: Greig Drive from N Old Robinson Road to I-35 N Frontage Road

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Widen Road/Add Shoulder	Site Preparation and Removal	SF	$12.00	5702	$68,428.80	$367,805	$423,000
	Allowance for Drainage	LS	$14,256.00	1	$14,256.00		
	Install Paved Shoulder	CF	$10.00	28512	$285,120.00		
Install Striping	Install Centerline	LF	$4.00	15900	$63,600.00	$190,800	$219,500
	Install Edgeline	LF	$4.00	31800	$127,200.00		
Install Signs	Install Sign and Post	EA	$200.00	15	$3,000.00	$3,000	$3,500
Install Street Lighting	Install Street Light Pole	EA	$17,000.00	23	$396,666.67	$426,667	$490,700
	Install Service Point	EA	$10,000.00	3	$30,000.00		
						Project Cost Total	**$1,136,700**
						Contingency Cost(20%)	**$227,400**
						Subtotal	**$1,364,100**
						Engineering Costs(35%)	**$477,500**
						Total	**$1,841,600**

City of Hewitt Cost Estimate

Project 1: Citywide Street Light Inventory

Project Limits: Citywide

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Street Light Inventory and Installation	Upgrade Existing Street Lighting	EA	$1,000.00	275	$275,000	$9,445,000	$10,861,800
	Installing New Street Lighting	EA	$12,000.00	655	$7,860,000		
	Install Service Point	EA	$10,000.00	66	$655,000		
	Install Street Lighting Cable	LF	$5.00	131000	$655,000		
						Total	**$10,861,800**
						Contingency(20%)	**$2,172,360**
						Subtotal	**$13,034,160**
						PS&E(20%)Construction(15%) Engineering Cost	**$4,562,000**
						Total	**$17,596,160**

City of Hewitt Cost Estimate

Project 2: Citywide Sign and Pavement Delineation

Project Limits: Citywide

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Sign Inventory and Installation	Remove Sign and Post	EA	$200.00	572	$114,400	$494,720	$569,000
	Install Sign and Post	EA	$400.00	951	$380,320		
Pavement Delineation	Remove Striping	LF	$2.50	236386	$590,964	$2,678,062	$3,079,800
	Install Striping	LF	$4.00	468024	$1,872,098		
	Remove Pavement Marking	EA	$200.00	200	$40,000		
	Install Pavement Marking	EA	$250.00	700	$175,000		
						Total	**$3,648,800**
						Contingency(20%)	**$729,800**
						Subtotal	**$4,378,600**
						PS&E(15%) Construction(10%) Engineering Cost	**$1,094,700**
						Total	**$5,473,300**

City of Hewitt Cost Estimate

Project 3: FM-1695 (N Hewitt Drive) - Corridor Safty Improvements

Project Limits: FM-1695 (N Hewitt Drive) from Panther Way to Warren Street

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Median and Access Management	Install Median Concrete	SF	$25.00	84900	$2,122,500	$2,900,800	$3,336,000
	Install Median Curb	LF	$40.00	17250	$690,000		
	Install Pavement Marking	EA	$250.00	50	$12,500		
	Remove Striping	LF	$2.50	5200	$13,000		
	Install Striping	LF	$4.00	5200	$20,800		
	Remove Driveway	EA	$3,000.00	14	$42,000		
Street Lighting	Install Street Light Pole	EA	$17,000.00	18	$306,000	$326,000	$374,900
	Install Service Point	EA	$10,000.00	2	$20,000		
School Zone Speed Limit Reduction	Remove Sign	EA	$100.00	4	$400	$1,200	$1,400
	Install Sign	EA	$200.00	4	$800		
Pedestrian Connectivity Improvements (Sidewalk and Crosswalks)	Site Preparation and Removal	SF	$12.00	67800	$813,600	$3,300,800	$3,796,000
	Install Sidewalk	SF	$20.00	67800	$1,356,000		
	Install Curb Ramp	EA	$4,000.00	32	$128,000		
	Install Curb and Gutter	LF	$40.00	11300	$452,000		
	Install Driveway	EA	$5,000.00	56	$280,000		
	Allowance for Drainage	LS	$271,200.00	1	$271,200		
PHB at Jim Dr and Laredo Dr	Install Pedestrian Hybrid Beacon System	LS	$200,000.00	2	$400,000	$402,000	$462,300
	Install High Visibility Crosswalk	EA	$1,000.00	2	$2,000		
Signalized Intersection Improvements	Remove Existing Signal Head	EA	$500.00	10	$5,000	$30,600	$35,200
	Remove Sign	EA	$100.00	2	$200		
	Install Sign	EA	$200.00	2	$400		
	Furnish and Install New Signal Head Assembly with	EA	$1,500.00	10	$15,000		
	Improve Signal Timing	LS	$10,000.00	1	$10,000		
Speed Feedback Sign	Install Dynamic/Variable Speed Warning Sign (Solar-Powered)	EA	$15,000.00	4	$60,000	$60,000	$69,000
Complete Streets with Multimodal Access	Complete Streets Project	LS	$7,500,000.00	1	$7,500,000	$7,500,000	$8,625,000
						Total	**$16,699,800**
						Contingency(20%)	**$3,340,000**
						Subtotal	**$20,039,800**
						PS&E(20%) Construction(15%) Engineering Cost	**$7,014,000**
						Total	**$27,053,800**

City of Hewitt Cost Estimate

Project 3B: FM-1695 (S Hewitt Drive) - Corridor Safety Improvements

Project Limits: FM-1695 (S Hewitt Drive) from Warren Street to I-35

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Median	Install Median Concrete	SF	$25.00	190200	$4,755,000	$6,045,375	$6,952,200
	Install Median Curb	LF	$40.00	31700	$1,268,000		
	Install Pavement Marking	EA	$250.00	30	$7,500		
	Remove Striping	LF	$2.50	750	$1,875		
	Install Striping	LF	$4.00	3250	$13,000		
Street Lighting	Install Street Light Pole	EA	$17,000.00	8	$136,000	$156,000	$179,400
	Install Service Point	EA	$10,000.00	2	$20,000		
Sign Upgrades	Remove Sign	EA	$100.00	15	$1,500	$4,500	$5,200
	Install Sign	EA	$200.00	15	$3,000		
Speed Limit Reduction	Remove Sign	EA	$100.00	10	$1,000	$3,000	$3,500
	Install Sign	EA	$200.00	10	$2,000		
Speed Feedback Sign	Install Dynamic/Variable Speed Warning Sign (Solar-Powered)	EA	$15,000.00	2	$30,000	$30,000	$34,500
Complete Streets with Multimodal Access	Complete Streets Project	LS	$5,700,000.00	1	$5,700,000	$5,700,000	$6,555,000
						Total	**$13,729,800**
						Contingency(20%)	**$2,746,000**
						Subtotal	**$16,475,800**
						PS&E(20%) Construction(15%) Engineering Cost	**$5,766,600**
						Total	**$22,242,400**

City of Hewitt Cost Estimate

Project 3C: FM-1695 (S Hewitt Drive) - Intersection Safety Improvements

Project Location: FM 1695 (S Hewitt Drive) and Ritchie Road

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Signal	Install New Signal	LS	$750,000.00	1	$750,000	$750,000	$862,500
Revise Lane Geometry and Upgrade Striping	Install Bulbout	EA	$15,000.00	2	$30,000	$30,000	$34,500
Install Approach Median	Install Median Concrete	SF	$25.00	3000	$75,000	$126,250	$145,200
	Install Median Curb	LF	$40.00	830	$33,200		
	Install Pavement Marking	EA	$250.00	2	$500		
	Remove Striping	LF	$2.50	2700	$6,750		
	Install Striping	LF	$4.00	2700	$10,800		
Street Lighting	Install Street Light Pole	EA	$17,000.00	6	$102,000	$168,250	$193,500
	Install Service Point	EA	$10,000.00	1	$10,000		
	Install Conduit and Cabling	LF	$75.00	750	$56,250		
Pedestrian Connectivity Improvements	Site Preparation and Removal	SF	$12.00	3000	$36,000	$132,000	$151,800
	Install Sidewalk	SF	$20.00	3000	$60,000		
	Install Curb Ramp	EA	$4,000.00	6	$24,000		
	Allowance for Drainage	LS	$12,000.00	1	$12,000		
						Total	**$1,387,500**
						Contingency(20%)	**$277,500**
						Subtotal	**$1,665,000**
						PS&E(20%) Construction(15%) Engineering Cost	**$582,800**
						Total	**$2,247,800**

City of Hewitt Cost Estimate

Project 4: School Safety Improvements

Project Location 1: S Hewitt Drive (From Kiowa Trail to Ritchie Road), Ritchie Road (From Hewitt Drive to Park Place Drive), Park Place Drive

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Pedestrian Connectivity Improvements S Hewitt Drive	Site Preparation and Removal	SF	$12.00	6600	$79,200	$299,600	$344,600
	Install Sidewalk	SF	$20.00	6600	$132,000		
	Install Driveway	EA	$5,000.00	1	$5,000		
	Install Curb Ramp	EA	$4,000.00	3	$12,000		
	Install Curb and Gutter	LF	$40.00	1100	$44,000		
	Install Crosswalk	EA	$500.00	2	$1,000		
	Allowance for Drainage	LS	$26,400.00	1	$26,400		
Pedestrian Connectivity Improvements Ritchie Road	Site Preparation and Removal	SF	$12.00	19200	$230,400	$960,700	$1,104,900
	Install Sidewalk	SF	$20.00	19200	$384,000		
	Install Driveway	EA	$5,000.00	8	$40,000		
	Install Curb Ramp	EA	$4,000.00	24	$96,000		
	Install Curb and Gutter	LF	$40.00	3200	$128,000		
	Install Crosswalk	EA	$500.00	11	$5,500		
	Allowance for Drainage	LS	$76,800.00	1	$76,800		
Pedestrian Connectivity Improvements Park Place Drive	Site Preparation and Removal	SF	$12.00	42000	$504,000	$1,840,500	$2,116,600
	Install Sidewalk	SF	$20.00	42000	$840,000		
	Install Driveway	EA	$5,000.00	35	$175,000		
	Install Curb Ramp	EA	$4,000.00	36	$144,000		
	Install Crosswalk	EA	$500.00	19	$9,500		
	Allowance for Drainage	LS	$168,000.00	1	$168,000		
						Total	**$3,566,100**
						Contingency(20%)	**$713,300**
						Subtotal	**$4,279,400**
						PS&E(20%) Construction(15%) Engineering Cost	**$1,497,800**
						Total	**$5,777,200**

City of Hewitt Cost Estimate

Project 5: Old Temple Road - Corridor Safety Project

Project Limits: Old Temple Road from FM-1695 (S Hewitt Drive) to FM-2063 (Sun Valley Blvd)

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Striping	Install Striping	LF	$4.00	32280	$129,120	$129,120	$148,500
Sign Upgrades	Install Stop Bar	LF	$8.00	660	$5,280	$18,655	$21,500
	Remove Sign and Post	EA	$125.00	33	$4,125		
	Install Sign and Post	EA	$250.00	37	$9,250		
Install Street Light	Install Street Light Pole	EA	$17,000.00	25	$425,000	$455,000	$523,300
	Install Service Point	EA	$10,000.00	3	$30,000		
Speed Feedback Sign	Install Dynamic/Variable Speed Warning Sign (Solar-Powered)	EA	$15,000.00	4	$60,000	$60,000	$69,000
						Total	**$762,300**
						Contingency(20%)	**$152,500**
						Subtotal	**$914,800**
						PS&E(20%) Construction(15%) Engineering Cost	**$320,200**
						Total	**$1,235,000**

City of Hewitt Cost Estimate

Project 6: FM-2063 (Sun Valley Blvd) - Corridor Safety Improvements

Project Limits: FM-2063 (Sun Valley Blvd) from FM-1695 (N Hewitt Drive) to FM-2113 (Spring Valley Road)

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Median	Install Median Concrete	SF	$25.00	44400	$1,110,000	$1,280,750	$1,472,900
	Install Median Curb	LF	$40.00	3900	$156,000		
	Install Pavement Marking	EA	$250.00	35	$8,750		
	Install Striping	LF	$4.00	1500	$6,000		
Upgrade Striping	Remove Striping	LF	$2.50	16000	$40,000	$104,000	$119,600
	Install Striping	LF	$4.00	16000	$64,000		
Street Lighting	Install Street Light Pole	EA	$17,000.00	23	$391,000	$411,000	$472,700
	Install Service Point	EA	$10,000.00	2	$20,000		
Minor Street Stop Improvements	Install Stop Bar	LF	$8.00	240	$1,920	$7,420	$8,600
	Remove Sign and Post	EA	$125.00	12	$1,500		
	Install Sign and Post	EA	$250.00	16	$4,000		
Signalized Intersection Improvements	Remove Existing Signal Head	EA	$500.00	8	$4,000	$26,000	$29,900
	Furnish and Install New Signal Head Assembly with Backplate	EA	$1,500.00	8	$12,000		
	Improve Signal Timing	LS	$10,000.00	1	$10,000		
Pedestrian Connectivity Improvements (Sidewalk and Crosswalks)	Site Preparation and Removal	SF	$12.00	47520	$570,240	$1,968,720	$2,264,100
	Install Sidewalk	SF	$20.00	47520	$950,400		
	Install Curb Ramp	EA	$4,000.00	22	$88,000		
	Install Curb and Gutter	LF	$40.00	0	$0		
	Install Driveway	EA	$5,000.00	32	$160,000		
	Allowance for Drainage	LS	$190,080.00	1	$190,080		
	Install High Visibility Crosswalk	EA	$1,000.00	10	$10,000		
Protected Left Turn improvements	Remove Existing Signal Head	EA	$500.00	4	$2,000	$19,200	$22,100
	Remove Sign	EA	$100.00	4	$400		
	Install Sign	EA	$200.00	4	$800		
	Furnish and Install New Signal Head Assembly with Backplate	EA	$1,500.00	4	$6,000		
	Improve Signal Timing	LS	$10,000.00	1	$10,000		
Speed Feedback Sign	Install Dynamic/Variable Speed Warning Sign (Solar-Powered)	EA	$15,000.00	2	$30,000	$30,000	$34,500
						Total	**$4,424,400**
						Contingency(20%)	**$884,900**
						Subtotal	**$5,309,300**
						PS&E(20%) Construction(15%) Engineering Cost	**$1,858,300**
						Total	**$7,167,600**

City of Hewitt Cost Estimate

Project 7: Warren Street - Corridor Safety Improvements

Project Limits: Warren Street from Ritchie Road to FM 2063 (Sun Valley Blvd)

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Striping	Install Striping	LF	$4.00	15600	$62,400	$62,400	$71,800
Install Street Light	Install Street Light Pole	EA	$17,000.00	14	$238,000	$258,000	$296,700
	Install Service Point	EA	$10,000.00	2	$20,000		
Minor Street Stop Improvements	Install Stop Bar	LF	$8.00	300	$2,400	$8,025	$9,300
	Remove Sign and Post	EA	$125.00	15	$1,875		
	Install Sign and Post	EA	$250.00	15	$3,750		
						Total	**$377,800**
						Contingency(20%)	**$75,600**
						Subtotal	**$453,400**
						PS&E(20%) Construction(15%) Engineering Cost	**$158,700**
						Total	**$612,100**

City of Woodway Cost Estimate

Project 1: Citywide Street Light Inventory

Project Limits: Citywide

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Street Light Inventory and Installation	Upgrade Existing Street Lighting	EA	$1,000.00	150	$150,000	$6,100,000	$7,015,000
	Installing New Street Lighting	EA	$12,000.00	425	$5,100,000		
	Install Service Point	EA	$10,000.00	43	$425,000		
	Install Street Lighting Cable	LF	$5.00	85000	$425,000		
						Project Cost Total	**$7,015,000**
						Contingency Cost(20%)	**$1,403,000**
						Subtotal	**$8,418,000**
						Engineering Costs(35%)	**$2,946,300**
						Total	**$11,364,300**

City of Woodway Cost Estimate

Project 2: Citywide Sign Inventory and Pavement Delineation

Project Limits: Citywide

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Sign Inventory and Installation	Remove Sign and Post	EA	$200.00	942	$188,400	$659,400	$758,400
	Install Sign and Post	EA	$400.00	1178	$471,000		
Pavement Delineation	Remove Striping	LF	$2.50	534880	$1,337,200	$3,798,519	$4,368,300
	Install Striping	LF	$4.00	542736	$2,170,944		
	Remove Pavement Marking	EA	$200.00	505	$101,000		
	Install Pavement Marking	EA	$250.00	758	$189,375		
						Project Cost Total	**$5,126,700**
						Contingency Cost(20%)	**$1,025,400**
						Subtotal	**$6,152,100**
						Engineering Costs(25%)	**$1,538,100**
						Total	**$7,690,200**

City of Woodway Cost Estimate

Project 3: Estates Drive - Corridor Safety Improvements

Project Limits: Estates Drive from Midway Drive to US-84

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Fill Sidewalk Gaps	Site Preparation and Removal	SF	$12.00	6600	$79,200	$285,600	$328,500
	Install Sidewalk	SF	$20.00	6600	$132,000		
	Install Curb Ramp	EA	$4,000.00	11	$44,000		
	Allowance for Drainage	LS	$26,400.00	1	$26,400		
	Install High Visibility Crosswalk	EA	$1,000.00	4	$4,000		
Speed Feedback Sign	Install Dynamic/Variable Speed Warning Sign (Solar-Powered)	EA	$15,000.00	1	$15,000	$15,000	$17,300
Install Bike Lane	Remove Striping	LF	$2.50	5600	$14,000	$37,400	$43,100
	Install Striping	LF	$4.00	5600	$22,400		
	Install Pavement Marking	EA	$250.00	4	$1,000		
						Project Cost Total	**$388,900**
						Contingency Cost(20%)	**$77,800**
						Subtotal	**$466,700**
						Engineering Costs(35%)	**$163,400**
						Total	**$630,100**

City of Woodway Cost Estimate

Project 4: Bosque Blvd - Corridor Safety Improvements

Project Limits: Bosque Blvd from Southwood Drive to Estates Drive

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Speed Feedback Sign	Install Dynamic/Variable Speed Warning Sign (Solar-Powered)	EA	$15,000.00	2	$30,000	$30,000	$34,500
Minor Street Stop Improvements	Remove Striping	LF	$2.50	135	$338	$24,078	$27,700
	Install Stop Bar	LF	$8.00	180	$1,440		
	Install Striping	LF	$4.00	700	$2,800		
	Remove Sign and Post	EA	$125.00	20	$2,500		
	Install Sign and Post	EA	$250.00	24	$6,000		
	Trim Tree	EA	$1,000.00	11	$11,000		
Install Roundabout	Install Roundabout	LS	$400,000.00	1	$400,000	$400,000	$460,000
Pedestrian Connectivity Improvements (Sidewalk and Crosswalks at Bosque and Estates)	Site Preparation and Removal	SF	$12.00	1110	$13,320	$56,960	$65,600
	Install Sidewalk	SF	$20.00	1110	$22,200		
	Install Curb Ramp	EA	$4,000.00	4	$16,000		
	Allowance for Drainage	LS	$4,440.00	1	$4,440		
	Install High Visibility Crosswalk	EA	$1,000.00	1	$1,000		
Road Diet project	Remove Striping	LS	$2.50	15840	$39,600	$142,830	$164,300
	Install Striping	LS	$4.00	21120	$84,480		
	Install Pavement Marking	LS	$250.00	75	$18,750		
						Project Cost Total	**$752,100**
						Contingency Cost(20%)	**$150,500**
						Subtotal	**$902,600**
						Engineering Costs(35%)	**$316,000**
						Total	**$1,218,600**

City of Woodway Cost Estimate

Project 5: Santa Fe Drive - Corridor Safety Improvements

Project Limits: Santa Fe Drive from Fairway Road to Woodway Drive

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Striping	Install Striping	LF	$4.00	3555	$14,220	$14,220	$16,400
Minor Street Stop Improvements	Remove Striping	LF	$2.50	75	$188	$13,538	$15,600
	Install Stop Bar	LF	$8.00	75	$600		
	Remove Sign and Post	EA	$125.00	14	$1,750		
	Install Sign and Post	EA	$250.00	16	$4,000		
	Trim Tree	EA	$1,000.00	7	$7,000		
Bike Lane	Install Striping	LF	$4.00	3500	$14,000	$17,750	$20,500
	Install Pavement Marking	EA	$250.00	15	$3,750		
						Project Cost Total	**$52,500**
						Contingency Cost(20%)	**$10,500**
						Subtotal	**$63,000**
						Engineering Costs(35%)	**$22,100**
						Total	**$85,100**

City of Woodway Cost Estimate

Project 6: Ritchie Road and Old McGregor Road - Intersection Safety Improvements

Project Location: Ritchie Road and Old McGregor Road

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Clear Sight Triangles	Trim Tree	EA	$1,000.00	5	$5,000	$5,000	$5,800
Install Curb	Install Curb and Gutter	LF	$40.00	325	$13,000	$13,000	$15,000
Sign Upgrades	Remove Sign	EA	$100.00	8	$800	$3,200	$3,700
	Install Sign	EA	$200.00	12	$2,400		
Reduce Curb Radius	Install Bulbout	EA	$15,000.00	2	$30,000	$30,000	$34,500
Upgrade Striping	Install Striping	LF	$4.00	100	$400	$1,400	$1,700
	Install Pavement Marking	EA	$250.00	4	$1,000		
						Project Cost Total	**$60,700**
						Contingency Cost(20%)	**$12,200**
						Subtotal	**$72,900**
						Engineering Costs(35%)	**$25,600**
						Total	**$98,500**

City of Lacy Lakeview Cost Estimate

Project 1: Citywide Street Light Inventory

Project Limits: Citywide

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Street Light Inventory and Installation	Upgrade Existing Street Lighting	EA	$1,000.00	120	$120,000	$3,500,000	$4,025,000
	Installing New Street Lighting	EA	$12,000.00	250	$3,000,000		
	Install Service Point	EA	$10,000.00	25	$250,000		
	Install Street Lighting Cable	LF	$5.00	26000	$130,000		
					Project Cost Total		**$4,025,000**
					Contingency Cost(20%)		**$805,000**
					Subtotal		**$4,830,000**
					Engineering Costs(35%)		**$1,690,500**
					Total		**$6,520,500**

City of Lacy Lakeview Cost Estimate

Project 2: Citywide Sign Inventory and Pavement Delineation

Project Limits: Citywide

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Sign Inventory and Installation	Remove Sign and Post	EA	$200.00	450	$90,000	$354,000	$407,100
	Install Sign and Post	EA	$400.00	660	$264,000		
Pavement Delineation	Remove Striping	LF	$2.50	183115	$457,788	$1,923,296	$2,211,800
	Install Striping	LF	$4.00	333877	$1,335,508		
	Remove Pavement Marking	EA	$200.00	50	$10,000		
	Install Pavement Marking	EA	$250.00	480	$120,000		
						Project Cost Total	**$2,618,900**
						Contingency Cost(20%)	**$523,800**
						Subtotal	**$3,142,700**
						Engineering Costs(25%)	**$785,700**
						Total	**$3,928,400**

City of Lacy Lakeview Cost Estimate

Project 3A: BU-77 (New Dallas Highway) - Corridor Safety Improvements

Project Limits: BU-77 (New Dallas Highway) from James Blvd to SL-340 (Industrial Blvd)

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Improvement Limits: BU-77 (New Dallas Highway) from James Blvd to Avenue C							
Install Sidewalk	Site Preparation and Removal	SF	$12.00	31200	$374,400	$1,428,400	$1,642,700
	Install Sidewalk	SF	$20.00	31200	$624,000		
	Install Curb Ramp	EA	$4,000.00	18	$72,000		
	Install Curb and Gutter	LF	$40.00	5200	$208,000		
	Install Driveway	EA	$5,000.00	30	$150,000		
Install Street Light	Install Street Light Pole	EA	$17,000.00	26	$442,000	$482,000	$554,300
	Install Service Point	EA	$10,000.00	4	$40,000		
Improvement Limits: BU-77 (New Dallas Highway) from Avenue C to 1200' N of Meyers Lane							
Install Sidewalk	Site Preparation and Removal	SF	$12.00	69600	$835,200	$2,867,200	$3,297,300
	Install Sidewalk	SF	$20.00	69600	$1,392,000		
	Install Curb Ramp	EA	$4,000.00	14	$56,000		
	Install Curb and Gutter	LF	$40.00	11600	$464,000		
	Install Driveway	EA	$5,000.00	24	$120,000		
Install Street Light	Install Street Light Pole	EA	$17,000.00	29	$493,000	$523,000	$601,500
	Install Service Point	EA	$10,000.00	3	$30,000		
Install Median	Install Median Concrete	SF	$25.00	70200	$1,755,000	$2,151,750	$2,474,600
	Install Median Curb	LF	$40.00	9900	$396,000		
	Install Pavement Marking	EA	$250.00	3	$750		
Improvement Limits: BU-77 (Ne Dallas Highway) from1200' N of Meyers Lane to SL-340 (Industrial Blvd)							
Install Sidewalk	Site Preparation and Removal	SF	$12.00	14400	$172,800	$582,800	$670,300
	Install Sidewalk	SF	$20.00	14400	$288,000		
	Install Curb Ramp	EA	$4,000.00	4	$16,000		
	Install Curb and Gutter	LF	$40.00	2400	$96,000		
	Install Driveway	EA	$5,000.00	2	$10,000		
Install Street Light	Install Street Light Pole	EA	$17,000.00	6	$102,000	$112,000	$128,800
	Install Service Point	EA	$10,000.00	1	$10,000		
						Project Cost Total	**$9,369,500**
						Contingency Cost(20%)	**$1,873,900**
						Subtotal	**$11,243,400**
						Engineering Costs(35%)	**$3,935,200**
						Total	**$15,178,600**

City of Lacy Lakeview Cost Estimate

Project 3B: BU-77 (New Dallas Highway) - Corridor Safety Improvements							
Project Limits: BU-77 (New Dallas Highway) from James Blvd to SL-340 (Industrial Blvd)							
CM	**Description**	**Unit**	**Unit Cost**	**Quantity**	**Subtotal**	**Total**	**Total with Traffic Control and Mobilization**
Improvement Limits: BU-77 from James Blvd to Avenue C							
Complete Streets	Complete Streets	LS	$6,000,000.00	1	$6,000,000	$6,000,000	$6,900,000
Improvement Limits: BU-77 from Avenue C to 1200' N of Meyers Lane							
Complete Streets	Complete Streets	LS	$7,680,000.00	1	$7,680,000	$7,680,000	$8,832,000
Improvement Limits: BU-77 from 1200' N of Meyers Lane to SL-340 (Industrial Blvd)							
Complete Streets	Complete Streets	LS	$1,100,000.00	1	$1,100,000	$1,100,000	$1,265,000
Improvement Location: BU-77 and E Crest Drive							
Install Roundabout	Convert Intersection to Roundabout	LS	$1,000,000.00	1	$1,000,000	$1,000,000	$1,150,000
Improvement Location: BU-77 and E Craven Avenue							
Install Roundabout	Convert Intersection to Roundabout	LS	$1,000,000.00	1	$1,000,000	$1,000,000	$1,150,000
						Project Cost Total	**$19,297,000**
						Contingency Cost(20%)	**$3,859,400**
						Subtotal	**$23,156,400**
						Engineering Costs(35%)	**$8,104,800**
						Total	**$31,261,200**

City of Lacy Lakeview Cost Estimate

Project 4: FM-2417 (E Crest Drive) - Corridor Safety Improvements

Project Limits: FM-2417 (E Crest Drive) from BU-77 (New Dallas Highway) to I-35 Frontage Road

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Speed Feedback Sign	Install Dynamic/Variable Speed Warning Sign (Solar-Powered)	EA	$15,000.00	2	$30,000	$30,000	$34,500
Install Street Lighting	Install Street Light Pole	EA	$17,000.00	12	$204,000	$214,000	$246,100
	Install Service Point	EA	$10,000.00	1	$10,000		
Sign Upgrade	Remove Sign	EA	$100.00	29	$2,900	$8,700	$10,100
	Install Sign	EA	$200.00	29	$5,800		
Clear Sight Triangles	Trim Tree	EA	$1,000.00	3	$3,000	$3,000	$3,500
Install Sidewalk	Site Preparation and Removal	SF	$12.00	32400	$388,800	$1,600,400	$1,840,500
	Allowance for Drainage	LS	$129,600.00	1	$129,600		
	Install Sidewalk	SF	$20.00	32400	$648,000		
	Install Driveway	EA	$5,000.00	13	$65,000		
	Install Curb Ramp	EA	$4,000.00	36	$144,000		
	Install Curb and Gutter	LF	$40.00	5400	$216,000		
	Install Crosswalk	EA	$500.00	18	$9,000		
Crosswalk Installation with Enhancement	Install High Visibility Crosswalk	EA	$1,000.00	1	$1,000	$21,000	$24,200
	Install RRFB System (Per Pole)	EA	$10,000.00	2	$20,000		
						Project Cost Total	**$2,158,900**
						Contingency Cost(20%)	**$431,800**
						Subtotal	**$2,590,700**
						Engineering Costs(35%)	**$906,800**
						Total	**$3,497,500**

City of Lacy Lakeview Cost Estimate

Project 5: E Craven Avenue - Corrodir Safety Improvements

Project Limits: E Craven Avenue from BU-77 (New Dallas Highway) to I-35 Frontage Road

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Pedestrian Connectivity Improvements	Site Preparation and Removal	SF	$12.00	49200	$590,400	$2,353,900	$2,707,000
	Install Sidewalk	SF	$20.00	49200	$984,000		
	Install Curb Ramp	EA	$4,000.00	32	$128,000		
	Install Curb and Gutter	LF	$40.00	8200	$328,000		
	Install Driveway	EA	$5,000.00	63	$315,000		
	Install Crosswalk	EA	$500.00	17	$8,500		
Install Striping	Install Centerline	LF	$4.00	4000	$16,000	$46,040	$53,000
	Install Edge line	LF	$4.00	7510	$30,040		
Install Street Light	Install Street Light Pole	EA	$17,000.00	14	$238,000	$258,000	$296,700
	Install Service Point	EA	$10,000.00	2	$20,000		
Minor Street Striping and Sign Upgrades	Install Stop Bar	LF	$8.00	225	$1,800	$9,800	$11,300
	Install Centerline	LF	$4.00	700	$2,800		
	Remove Sign	EA	$100.00	16	$1,600		
	Install Sign	EA	$200.00	18	$3,600		
Install Speed Feedback Sign	Install Dynamic/Variable Speed Warning Sign (Solar-Powered)	EA	$15,000.00	2	$30,000	$30,000	$34,500
						Project Cost Total	**$3,102,500**
						Contingency Cost(20%)	**$620,500**
						Subtotal	**$3,723,000**
						Engineering Costs(35%)	**$1,303,100**
						Total	**$5,026,100**

City of Lacy Lakeview Cost Estimate

Project 6: SL-340 (Industrial Blvd) - Corridor Safety Improvements

Project Limits: SL-340 (Industrial Blvd) from BU-77 (New Dallas Highway) to I-35

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Pedestrian Connectivity Improvements	Site Preparation and Removal	SF	$12.00	13350	$160,200	$631,200	$725,900
	Install Sidewalk	SF	$20.00	13350	$267,000		
	Install Curb Ramp	EA	$4,000.00	24	$96,000		
	Install Curb and Gutter	LF	$40.00	2425	$97,000		
	Install High Visibility Crosswalk	EA	$1,000.00	11	$11,000		
Add Street Lighting	Install Street Light Pole	EA	$17,000.00	7	$119,000	$119,000	$136,900
Dedicated Left Turn	Site Preparation and Removal	SF	$12.00	2700	$32,400	$70,350	$81,000
	Install Pavement	SF	$10.00	2700	$27,000		
	Remove Striping	LF	$2.50	2400	$6,000		
	Install Striping	LF	$4.00	1050	$4,200		
	Install Pavement Marking	EA	$250.00	3	$750		
Sign Upgrade	Remove Sign	EA	$100.00	15	$1,500	$6,250	$7,200
	Install Sign	EA	$200.00	15	$3,000		
	Install Sign and Post	EA	$250.00	7	$1,750		
Revise Lane Configuration	Remove Striping	LF	$2.50	860	$2,150	$6,390	$7,400
	Install Striping	LF	$4.00	1060	$4,240		
Project Location: BU-77 (New Dallas Highway) and SL-340 (Industrial Blvd)							
Pedestrian Connectivity Improvements	Site Preparation and Removal	SF	$12.00	6210	$74,520	$378,960	$435,900
	Install Sidewalk	SF	$20.00	6210	$124,200		
	Drainage Allowance	LS	$24,840.00	1	$24,840		
	Install Curb Ramp	EA	$4,000.00	16	$64,000		
	Install Curb and Gutter	LF	$40.00	1035	$41,400		
	Remove Median	SF	$15.00	200	$3,000		
	Install High Visibility Crosswalk	EA	$1,000.00	7	$7,000		
	Install Pedestrian Signal Head	EA	$1,000.00	8	$8,000		
	Install Push Button	EA	$1,500.00	8	$12,000		
	Install Pedestrian Pole	EA	$10,000.00	2	$20,000		
Signal Hardware Upgrade	Furnish and Install New Signal Head Assembly with Backplate	EA	$1,500.00	14	$21,000	$21,000	$24,200
						Project Cost Total	**$1,418,500**
						Contingency Cost(20%)	**$283,700**
						Subtotal	**$1,702,200**
						Engineering Costs(35%)	**$595,800**
						Total	**$2,298,000**

City of Lacy Lakeview Cost Estimate

Project 7: Meyers Lane - Corridor Safety Improvements

Project Limits: Meyers Lane from BU-77 (New Dallas Highway) to Airbase Road

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Striping	Install Centerline	LF	$4.00	3800	$15,200	$43,200	$49,700
	Install Edge line	LF	$4.00	7000	$28,000		
Install Street Light	Install Street Light Pole	EA	$17,000.00	16	$272,000	$292,000	$335,800
	Install Service Point	EA	$10,000.00	2	$20,000		
Install Safety Edge	Install Safety Edge	LF	$10.00	7600	$76,000	$76,000	$87,400
Sign Upgrade	Remove Sign	EA	$100.00	21	$2,100	$7,800	$9,000
	Install Sign	EA	$200.00	21	$4,200		
	Install Sign and Post	EA	$250.00	6	$1,500		
Advance Warning Flashing Beacon	Install Flashing Beacon System (per pole)	EA	$15,000.00	1	$15,000	$15,000	$17,300
						Project Cost Total	**$499,200**
						Contingency Cost(20%)	**$99,900**
						Subtotal	**$599,100**
						Engineering Costs(35%)	**$209,700**
						Total	**$808,800**

City of Waco Cost Estimate

Project 1: 17th and 18th Street - Corridor Safety Improvements

Project Limits: State Loop 2 (17th & 18th Street) from Colcord Drive to IH 35 SB Frontage Road

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Buffered Bike Lane 17th Bosque to IH 35	Remove Striping	LF	$2.50	25626	$64,064	$185,366	$213,200
	Install Striping	LF	$4.00	27826	$111,302		
	Install Pavement Marking	EA	$250.00	40	$10,000		
Pedestrian Connectivity Improvements (Sidewalk and Crosswalks) 17th Bosque to IH35	Site Preparation and Removal	SF	$12.00	87180	$1,046,160	$4,487,680	$5,160,900
	Install Sidewalk	SF	$20.00	87180	$1,743,600		
	Install Curb Ramp	EA	$4,000.00	82	$328,000		
	Install Curb and Gutter	LF	$40.00	14530	$581,200		
	Install Driveway	EA	$5,000.00	77	$385,000		
	Allowance for Drainage	LS	$348,720.00	1	$348,720		
	Install High Visibility Crosswalk	EA	$1,000.00	55	$55,000		
Street Lighting 17th and 18th Colcord to IH 35	Install Street Light Pole	EA	$15,000.00	42	$630,000	$1,174,000	$1,350,100
	Install Service Point	EA	$10,000.00	4	$40,000		
	Install Conduit and Cabling	LF	$40.00	12600	$504,000		
Road Diet 18th - Homan to Colcord	Install Striping	LF	$4.00	3600	$14,400	$21,150	$24,400
	Remove Striping	LF	$2.50	2700	$6,750		
Pedestrian Connectivity Improvements (Sidewalk and Crosswalks) 18th from Homan to Colcord	Site Preparation and Removal	SF	$12.00	9000	$108,000	$511,000	$587,700
	Install Sidewalk	SF	$20.00	9000	$180,000		
	Install Curb Ramp	EA	$4,000.00	11	$44,000		
	Install Curb and Gutter	LF	$40.00	1500	$60,000		
	Install Driveway	EA	$5,000.00	15	$75,000		
	Allowance for Drainage	LS	$36,000.00	1	$36,000		
	Install High Visibility Crosswalk	EA	$1,000.00	8	$8,000		
						Project Cost Total	**$7,336,300**
						Contingency Cost(20%)	**$1,467,300**
						Subtotal	**$8,803,600**
						Engineering Costs(35%)	**$3,081,300**
						Total	**$11,884,900**

City of Waco Cost Estimate

Project 2: FM 1637 - Corridor Safety Improvements

Project Limits: FM 1637 (China Spring Rd and N 19th St) from Steinbeck Bend Dr to US-84 (Waco Dr)

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Steinbeck Bend Dr to Lake Shore Dr							
Street Lighting	Install Street Light Pole	EA	$15,000.00	15	$225,000	$425,000	$488,800
	Install Service Point	EA	$10,000.00	2	$20,000		
	Install Conduit and Cabling	LF	$40.00	4500	$180,000		
Install Median and Access Management	Install Median Concrete	SF	$25.00	80800	$2,020,000	$2,592,000	$2,980,800
	Install Median Curb	LF	$40.00	14000	$560,000		
	Install Pavement Marking	EA	$250.00	16	$4,000		
	Install Striping	LF	$4.00	2000	$8,000		
19th St and 18th St from Lake Shore Dr to Herring Ave							
Street Lighting	Install Street Light Pole	EA	$15,000.00	20	$300,000	$540,000	$621,000
	Install Service Point	EA	$10,000.00	4	$40,000		
	Install Conduit and Cabling	LF	$40.00	5000	$200,000		
Install Median	Install Median Concrete	SF	$25.00	14000	$350,000	$3,788,000	$4,356,200
	Install Median Curb	LF	$40.00	84000	$3,360,000		
	Install Pavement Marking	EA	$250.00	120	$30,000		
	Install Striping	LF	$4.00	12000	$48,000		
Pedestrian Connectivity Improvements (Sidewalk and Crosswalks)	Site Preparation and Removal	SF	$12.00	104400	$1,252,800	$4,734,400	$5,461,900
	Install Sidewalk	SF	$20.00	104400	$2,088,000		
	Install Curb Ramp	EA	$4,000.00	82	$328,000		
	Install Curb and Gutter	LF	$40.00	500	$20,000		
	Install Driveway	EA	$5,000.00	116	$580,000		
	Allowance for Drainage	LS	$417,600.00	1	$417,600		
	Install High Visibility Crosswalk	EA	$1,000.00	48	$48,000		
Install Speed Feedback Sign	Install Dynamic/Variable Speed Warning Sign (Solar-Powered)	EA	$15,000.00	1	$15,000	$15,000	
Herring Ave from 18th to 4th St							
Pedestrian Connectivity Improvements (Sidewalk and Crosswalks)	Site Preparation and Removal	SF	$12.00	29400	$352,800	$1,398,400	$1,860,100
	Install Sidewalk	SF	$20.00	29400	$588,000		
	Install Curb Ramp	EA	$4,000.00	30	$120,000		
	Install Curb and Gutter	LF	$40.00	0	$0		
	Install Driveway	EA	$5,000.00	40	$200,000		
	Allowance for Drainage	LS	$117,600.00	1	$117,600		
	Install High Visibility Crosswalk	EA	$1,000.00	20	$20,000		
Street Lighting	Install Street Light Pole	EA	$15,000.00	11	$165,000	$219,000	
	Install Service Point	EA	$10,000.00	1	$10,000		
	Install Conduit and Cabling	LF	$40.00	1100	$44,000		

4th St from Herring Ave to US 84 (Waco Dr)							
Install Bike Lane	Install Striping	LF	$4.00	10400	$41,600	$60,850	$70,000
	Remove Striping	LF	$2.50	5200	$13,000		
	Install Pavement Marking	EA	$250.00	25	$6,250		
4th St and 5th St from Herring Ave to US 84 (Waco Dr)							
Pedestrian Connectivity Improvements (Sidewalk and Crosswalks)	Site Preparation and Removal	SF	$12.00	82200	$986,400	$3,614,200	$4,532,800
	Install Sidewalk	SF	$20.00	82200	$1,644,000		
	Install Curb Ramp	EA	$4,000.00	75	$300,000		
	Install Curb and Gutter	LF	$40.00	0	$0		
	Install Driveway	EA	$5,000.00	60	$300,000		
	Allowance for Drainage	LS	$328,800.00	1	$328,800		
	Install High Visibility Crosswalk	EA	$1,000.00	55	$55,000		
Street Lighting	Install Street Light Pole	EA	$15,000.00	10	$150,000	$250,000	
	Install Service Point	EA	$10,000.00	2	$20,000		
	Install Conduit and Cabling	LF	$40.00	2000	$80,000		
Install Parking Striping	Install Striping	LF	$4.00	11900	$47,600	$77,350	
	Remove Striping	LF	$2.50	11900	$29,750		
						Project Cost Total	**$20,371,600**
						Contingency Cost(20%)	**$4,074,400**
						Subtotal	**$24,446,000**
						Engineering Costs(35%)	**$8,556,100**
						Total	**$33,002,100**

City of Waco Cost Estimate

Project 3: Hewitt Drive - Complete Streets Multimodal Project

Project Limits: Hewitt Drive within City Limits

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Median	Install Median Concrete	SF	$25.00	70440	$1,761,000	$2,101,000	$2,416,200
	Install Median Curb	LF	$40.00	7070	$282,800		
	Install Pavement Marking	EA	$250.00	56	$14,000		
	Install Striping	LF	$4.00	10800	$43,200		
Install Speed Feedback Sign	Install Dynamic/Variable Speed Warning Sign (Solar-Powered)	EA	$15,000.00	2	$30,000	$30,000	$34,500
Street Lighting	Install Street Light Pole	EA	$15,000.00	22	$330,000	$590,000	$678,500
	Install Service Point	EA	$10,000.00	4	$40,000		
	Install Conduit and Cabling	LF	$40.00	5500	$220,000		
Install Sidewalk	Site Preparation and Removal	SF	$12.00	48600	$583,200	$2,497,600	$2,872,300
	Install Sidewalk	SF	$20.00	48600	$972,000		
	Install Curb Ramp	EA	$4,000.00	21	$84,000		
	Install Curb and Gutter	LF	$40.00	11600	$464,000		
	Install Driveway	EA	$5,000.00	40	$200,000		
	Allowance for Drainage	LS	$194,400.00	1	$194,400		
Complete Streets Multimodal Project	Complete Streets	LS	$6,850,000.00	1	$6,850,000	$6,850,000	$7,877,500
						Project Cost Total	**$13,879,000**
						Contingency Cost(20%)	**$2,775,800**
						Subtotal	**$16,654,800**
						Engineering Costs(35%)	**$5,829,200**
						Total	**$22,484,000**

City of Waco Cost Estimate

Project 4: Bosque Boulevard - Corridor Safety Improvements

Project Limits: Bosque Blvd from Parkdale Dr to Colonial Dr

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Median and Access Management Fish Pond Dr to Colonial Ave	Install Median Concrete	SF	$25.00	124382	$3,109,540	$4,036,084	$4,641,500
	Install Median Curb	LF	$40.00	22114	$884,544		
	Install Pavement Marking	EA	$250.00	72	$18,000		
	Install Striping	LF	$4.00	6000	$24,000		
Fill Sidewalk Gaps Valley Mills Dr to Colonial Ave	Site Preparation and Removal	SF	$12.00	25500	$306,000	$1,343,000	$1,544,500
	Install Sidewalk	SF	$20.00	25500	$510,000		
	Install Curb Ramp	EA	$4,000.00	70	$280,000		
	Install Driveway	EA	$5,000.00	25	$125,000		
	Allowance for Drainage	LS	$102,000.00	1	$102,000		
	Install High Visibility Crosswalk	EA	$1,000.00	20	$20,000		
Fill Sidewalk Gaps Valley Mills Dr to Rambler Dr	Site Preparation and Removal	SF	$12.00	39000	$468,000	$2,006,000	$2,306,900
	Install Sidewalk	SF	$20.00	39000	$780,000		
	Install Curb Ramp	EA	$4,000.00	50	$200,000		
	Install Curb and Gutter	LF	$40.00	6800	$272,000		
	Install Driveway	EA	$5,000.00	22	$110,000		
	Allowance for Drainage	LS	$156,000.00	1	$156,000		
	Install High Visibility Crosswalk	EA	$1,000.00	20	$20,000		
						Project Cost Total	**$8,492,900**
						Contingency Cost(20%)	**$1,698,600**
						Subtotal	**$10,191,500**
						Engineering Costs(35%)	**$3,567,100**
						Total	**$13,758,600**

City of Waco Cost Estimate

Project 5: S New Road Corridor Safety Improvements

Project Limits: S New Rd from Franklin Ave to Old Robinson Rd

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Pedestrian Connectivity Improvements (Sidewalk and Crosswalks) Add Beverly Dr and New Rd	Site Preparation and Removal	SF	$12.00	92220	$1,106,640	$3,961,920	$4,556,300
	Install Sidewalk	SF	$20.00	92220	$1,844,400		
	Install Curb Ramp	EA	$4,000.00	39	$156,000		
	Install Curb and Gutter	LF	$40.00	8000	$320,000		
	Install Driveway	EA	$5,000.00	30	$150,000		
	Allowance for Drainage	LS	$368,880.00	1	$368,880		
	Install High Visibility Crosswalk	EA	$1,000.00	16	$16,000		
Install Median	Install Median Concrete	SF	$25.00	131640	$3,291,000	$4,307,400	$4,953,600
	Install Median Curb	LF	$40.00	24340	$973,600		
	Install Pavement Marking	EA	$250.00	56	$14,000		
	Install Striping	LF	$4.00	7200	$28,800		
Install Striping Upgrades	Install Striping	LF	$4.00	25200	$100,800	$132,300	$152,200
	Remove Striping	LF	$2.50	12600	$31,500		
Street Lighting	Install Street Light Pole	EA	$15,000.00	5	$75,000	$125,000	$143,800
	Install Conduit and Cabling	LF	$40.00	1250	$50,000		
						Project Cost Total	**$9,805,900**
						Contingency Cost(20%)	**$1,961,200**
						Subtotal	**$11,767,100**
						Engineering Costs(35%)	**$4,118,500**
						Total	**$15,885,600**

City of Waco Cost Estimate

Project 6: Name N Valley Mills - Complete Street Improvements

Project Limits: N Valley Mills Dr from Bishop Dr to Franklin Ave

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Road Diet	Install Striping	LF	$4.00	74765	$299,059	$485,971	$558,900
	Remove Striping	LF	$2.50	74765	$186,912		
Install Median and Access Management	Install Median Concrete	SF	$25.00	89640	$2,241,000	$3,258,832	$3,747,700
	Install Median Curb	LF	$40.00	23021	$920,832		
	Install Pavement Marking	EA	$250.00	80	$20,000		
	Install Striping	LF	$4.00	5000	$20,000		
	Remove Driveway	EA	$3,000.00	19	$57,000		
Street Lighting	Install Street Light Pole	EA	$15,000.00	30	$450,000	$930,000	$1,069,500
	Install Service Point	EA	$10,000.00	6	$60,000		
	Install Conduit and Cabling	LF	$40.00	10500	$420,000		
Speed Limit Reduction	Remove Sign and Post	EA	$125.00	6	$750	$3,250	$3,800
	Install Sign and Post	EA	$250.00	10	$2,500		
Pedestrian Connectivity Improvements (Sidewalk and Crosswalks)	Site Preparation and Removal	SF	$12.00	98040	$1,176,480	$4,121,440	$4,739,700
	Install Sidewalk	SF	$20.00	98040	$1,960,800		
	Install Curb Ramp	EA	$4,000.00	51	$204,000		
	Install Curb and Gutter	LF	$40.00	2250	$90,000		
	Install Driveway	EA	$3,000.00	86	$258,000		
	Allowance for Drainage	LS	$392,160.00	1	$392,160		
	Install High Visibility Crosswalk	EA	$1,000.00	40	$40,000		
					Project Cost Total		**$10,119,600**
					Contingency Cost(20%)		**$2,024,000**
					Subtotal		**$12,143,600**
					Engineering Costs(35%)		**$4,250,300**
					Total		**$16,393,900**

City of Waco Cost Estimate

Project 7A: Lake Shore Dr - Corridor Safety Improvements

Project Limits: Lake Shore Dr from 19th St to Mt Carmel Drive

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Shared Use Path	Site Preparation and Removal	SF	$12.00	82200	$986,400	$3,136,300	$3,606,800
	Install Shared Use Path	SF	$20.00	82200	$1,644,000		
	Install Striping	LF	$4.00	10275	$41,100		
	Install Curb Ramp	EA	$4,000.00	34	$136,000		
	Allowance for Drainage	LS	$328,800.00	1	$328,800		
Bridge Improved Pedestrian Access	Site Preparation and Removal	SF	$8.00	3000	$24,000	$96,000	$110,400
	Install Sidewalk	SF	$20.00	3000	$60,000		
	Allowance for Drainage	LS	$12,000.00	$1.0	$12,000		
Install Median	Install Median Concrete	SF	$25.00	218236	$5,455,900	$7,169,532	$8,245,000
	Install Median Curb	LF	$40.00	38128	$1,525,120		
	Install Pavement Marking	EA	$250.00	80	$20,000		
	Install Striping	LF	$4.00	42128	$168,512		
Street Lighting	Install Street Light Pole	EA	$15,000.00	48	$720,000	$1,346,000	$1,547,900
	Install Service Point	EA	$10,000.00	5	$50,000		
	Install Conduit and Cabling	LF	$40.00	14400	$576,000		
Improved Sight Distance	Trim Tree	EA	$1,000.00	27	$27,000	$27,000	$31,100
						Project Cost Total	**$9,792,900**
						Contingency Cost(20%)	**$1,958,600**
						Subtotal	**$11,751,500**
						Engineering Costs(35%)	**$4,113,100**
						Total	**$15,864,600**

City of Waco Cost Estimate

Project 7B: Lake Shore Dr/N Valley Mills Dr - Corridor Safety Improvements

Project Limits: Lake Shore Dr/N Valley Mills Dr from Mt Carmel Dr to Bishop Dr

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Street Light	Install Street Light Pole	EA	$15,000.00	7	$105,000	$175,000	$201,300
	Install Conduit and Cabling	LF	$40.00	1750	$70,000		
Minor Street Sight Distance Improvements	Trim Tree	EA	$1,000.00	13	$13,000	$13,000	$15,000
Install Speed Feedback Sign	Install Dynamic/Variable Speed Warning Sign (Solar-Powered)	EA	$15,000.00	2	$30,000	$30,000	$34,500
						Project Cost Total	**$250,800**
						Contingency Cost(20%)	**$50,200**
						Subtotal	**$301,000**
						Engineering Costs(35%)	**$105,400**
						Total	**$406,400**

City of Waco Cost Estimate

Project 8: Sanger Avenue Safety Improvements

Project Limits: Sanger Avenue from Highway 6 to N Valley Mills Dr

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Road Diet	Install Striping	LF	$4.00	34400	$137,600	$202,100	$232,500
	Remove Striping	LF	$2.50	25800	$64,500		
Pedestrian Connectivity Improvements (Sidewalk and Crosswalks)	Site Preparation and Removal	SF	$12.00	73200	$878,400	$3,258,200	$3,747,000
	Install Sidewalk	SF	$20.00	73200	$1,464,000		
	Install Curb Ramp	EA	$4,000.00	67	$268,000		
	Install Driveway	EA	$5,000.00	65	$325,000		
	Allowance for Drainage	LS	$292,800.00	1	$292,800		
	Install High Visibility Crosswalk	EA	$1,000.00	30	$30,000		
Install Speed Feedback Sign	Install Dynamic/Variable Speed Warning Sign (Solar-Powered)	EA	$15,000.00	2	$30,000	$30,000	$34,500
Access Management	Install Median Concrete	SF	$25.00	95040	$2,376,000	$3,025,600	$3,479,500
	Install Median Curb	LF	$40.00	15840	$633,600		
	Install Pavement Marking	EA	$250.00	64	$16,000		
Street Lighting	Install Street Light Pole	EA	$15,000.00	14	$210,000	$342,000	$393,300
	Install Service Point	EA	$10,000.00	2	$20,000		
	Install Conduit and Cabling	LF	$40.00	2800	$112,000		
						Project Cost Total	**$7,886,800**
						Contingency Cost(20%)	**$1,577,400**
						Subtotal	**$9,464,200**
						Engineering Costs(35%)	**$3,312,500**
						Total	**$12,776,700**

McLennan County Cost Estimate

Project 1: Countywide Street Light Inventory							
Project Limits: Countywide							
CM	**Description**	**Unit**	**Unit Cost**	**Quantity**	**Subtotal**	**Total**	**Total with Traffic Control and Mobilization**
Street Light Inventory and Installation	Upgrade Existing Street Lighting	EA	$1,000.00	813	$812,500	$12,427,083	$14,291,200
	Installing New Street Lighting	EA	$12,000.00	625	$7,500,000		
	Install Service Point	EA	$10,000.00	208	$2,083,333		
	Install Street Lighting Cable	LF	$5.00	406250	$2,031,250		
						Project Cost Total	**$14,291,200**
						Contingency Cost(20%)	**$2,858,240**
						Subtotal	**$17,149,500**
						Engineering Costs(35%)	**$6,002,400**
						Total	**$23,151,900**

McLennan County Cost Estimate

Project 2: Countywide Sign Inventory

Project Limits: Countywide

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Sign Inventory and Installation	Remove Sign and Post	EA	$200.00	4803	$960,600	$3,842,400	$4,418,800
	Install Sign and Post	EA	$400.00	7205	$2,881,800		
					Project Cost Total		**$4,418,800**
					Contingency Cost(20%)		**$883,800**
					Subtotal		**$5,302,600**
					Engineering Costs(25%)		**$1,325,700**
					Total		**$6,628,300**

McLennan County Cost Estimate

Project 3: Ritchie Road - Pedestrian Connectivity Improvements

Project Limits: Ritchie Road from Warren Road to Park Place Drive

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Sidewalk	Site Preparation and Removal	SF	$12.00	10800	$129,600	$531,800	$611,600
	Install Sidewalk	SF	$20.00	10800	$216,000		
	Install Curb Ramp	EA	$4,000.00	7	$28,000		
	Install Driveway	EA	$5,000.00	7	$35,000		
	Install Curb and Gutter	LF	$40.00	2000	$80,000		
	Allowance for Drainage	LS	$43,200.00	1	$43,200		
Install Crosswalk	Install High Visibility Crosswalk	EA	$1,000.00	2	$2,000	$2,000	$2,300
Install RRFB	Install RRFB System (Per Pole)	EA	$10,000.00	2	$20,000	$20,000	$23,000
						Total	**$636,900**
						Contingency Cost	**$127,400**
						Subtotal	**$764,300**
						Engineering Cost	**$267,600**
						Total	**$1,031,900**

McLennan County Cost Estimate

Project 4: Intersection Safety Improvements - Aviation Parkway and US-84

Project Location: Aviation Parkway and US-84

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Dilemma Zone Detection	Install Dilemma Zone Detection	EA	$5,000.00	2	$10,000	$10,000	$11,500
High Friction Surface Treatment	Install High Friction Surface Treatment	SF	$8.00	25000	$200,000	$213,500	$245,600
	Install Pavement Marking	EA	$250.00	14	$3,500		
	Install Striping	LF	$4.00	2500	$10,000		
Upgrade Striping	Install Striping	LF	$4.00	800	$10,000	$10,000	$11,500
Install Street Lighting	Install Street Light Pole	EA	$17,000.00	5	$85,000	$115,000	$132,300
	Install Conduit and Cabling	LF	$40.00	750	$30,000		
Upgrade Pavement Marking	Install Pavement Marking	EA	$250.00	5	$1,250	$1,250	$1,500
Signal Hardware Upgrade	Furnish and Install New Signal Head Assembly with Backplate	EA	$1,500.00	9	$13,500	$13,500	$15,600
						Total	**$418,000**
						Contingency Cost	**$83,600**
						Subtotal	**$501,600**
						Engineering Cost	**$175,600**
						Total	**$677,200**

McLennan County Cost Estimate

Project 5: Intersection Safety Improvements - IH-35 and Ross Road							
Project Location: IH-35 and Ross Road							
CM	**Description**	**Unit**	**Unit Cost**	**Quantity**	**Subtotal**	**Total**	**Total with Traffic Control and Mobilization**
Convert to All Way Stop	Install Sign and Post	EA	$250.00	4	$1,000	$1,000	$1,200
Sign Upgrades	Remove Sign	EA	$100.00	16	$1,600	$4,400	$5,100
	Install Sign	EA	$200.00	14	$2,800		
Striping Upgrades	Install Stop Bar	LF	$8.00	50	$400	$400	$500
Install Warning Flashing Beacons	Install Flashing Beacon System (per pole)	EA	$10,000.00	4	$40,000	$40,000	$46,000
						Total	**$52,800**
						Contingency Cost	**$10,600**
						Subtotal	**$63,400**
						Engineering Cost	**$22,200**
						Total	**$85,600**

McLennan County Cost Estimate

Project 6: Countywide Intersection Improvements

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Rogers Hill Spur and Fort Graham Road							
Sign and Pavement Delineation Upgrades	Remove Sign	EA	$100.00	2	$200	$6,320	$87,800
	Install Sign	EA	$200.00	2	$400		
	Relocate Sign and Post	EA	$500.00	1	$500		
	Install Centerline	LF	$4.00	300	$1,200		
	Install Edge Line	LF	$4.00	800	$3,200		
	Install Stop Bar	LF	$8.00	40	$320		
	Install Sign and Post	EA	$250.00	2	$500		
Install or Upgrade Intersection Lighting	Install Street Light Pole	EA	$17,000.00	4	$68,000	$70,000	
	Install Street Lighting Cable	LF	$5.00	400	$2,000		
Hlavenka Road and E County Line East							
Sign and Pavement Delineation Upgrades	Install Centerline	LF	$4.00	250	$1,000	$3,260	$61,300
	Install Edge Line	LF	$4.00	400	$1,600		
	Install Stop Bar	LF	$8.00	20	$160		
	Install Sign and Post	EA	$250.00	2	$500		
Install Object Marker	Install Object Marker	EA	$250.00	4	$1,000	$1,000	
Sight Distance	Trim Tree	EA	$1,000.00	3	$3,000	$3,000	
Install or Upgrade Intersection Lighting	Install Street Light Pole	EA	$17,000.00	2	$34,000	$46,000	
	Install Service Point	EA	$10,000.00	1	$10,000		
	Install Street Lighting Cable	LF	$5.00	400	$2,000		
Beheler Road and N Katy Road							
Sign and Pavement Delineation Upgrades	Install Centerline	LF	$4.00	250	$1,000	$3,360	$49,300
	Install Edge Line	LF	$4.00	400	$1,600		
	Install Stop Bar	LF	$8.00	20	$160		
	Remove Sign	EA	$100.00	2	$200		
	Install Sign	EA	$200.00	2	$400		
	Install Sign and Post	EA	$250.00	4	$1,000		
Install Object Marker	Install Object Marker	EA	$250.00	6	$1,500	$1,500	
Clear Sight Triangles	Trim Tree	EA	$1,000.00	2	$2,000	$2,000	
Install or Upgrade Intersection Lighting	Install Street Light Pole	EA	$17,000.00	2	$34,000	$36,000	
	Install Street Lighting Cable	LF	$5.00	400	$2,000		
E Hilltop Drive and N Katy Road							
Sign and Pavement Delineation Upgrades	Install Centerline	LF	$4.00	250	$1,000	$4,360	$61,400
	Install Edge Line	LF	$4.00	400	$1,600		
	Install Stop Bar	LF	$8.00	20	$160		
	Remove Sign	EA	$100.00	2	$200		
	Install Sign	EA	$200.00	2	$400		
	Install Sign and Post	EA	$250.00	4	$1,000		
Install Object Maker	Install Object Marker	EA	$250.00	4	$1,000	$1,000	
Trim Tree	Trim Tree	EA	$1,000.00	2	$2,000	$2,000	
Install or Upgrade Intersection Lighting	Install Street Light Pole	EA	$17,000.00	2	$34,000	$46,000	
	Install Service Point	EA	$10,000.00	1	$10,000		
	Install Street Lighting Cable	LF	$5.00	400	$2,000		

E Rainer Lane and Fort Graham Road							
Sign and Pavement Delineation Upgrades	Install Centerline	LF	$4.00	200	$800	$3,700	$50,300
	Install Edge Line	LF	$4.00	400	$1,600		
	Install Stop Bar	LF	$8.00	0	$0		
	Remove Sign	EA	$100.00	1	$100		
	Install Sign	EA	$200.00	1	$200		
	Install Sign and Post	EA	$250.00	4	$1,000		
Install Object Maker	Install Object Marker	EA	$250.00	4	$1,000	$1,000	
Clear Sight Triangles	Trim Tree	EA	$1,000.00	3	$3,000	$3,000	
Install or Upgrade Intersection Lighting	Install Street Light Pole	EA	$17,000.00	2	$34,000	$36,000	
	Install Street Lighting Cable	LF	$5.00	400	$2,000		
Meixner Road and Shepperd Road							
Sign and Pavement Delineation Upgrades	Install Centerline	LF	$4.00	250	$1,000	$4,360	$64,300
	Install Edge Line	LF	$4.00	400	$1,600		
	Install Stop Bar	LF	$8.00	20	$160		
	Remove Sign	EA	$100.00	2	$200		
	Install Sign	EA	$200.00	2	$400		
	Install Sign and Post	EA	$250.00	4	$1,000		
Install Object Maker	Install Object Marker	EA	$250.00	6	$1,500	$1,500	
Clear Sight Triangles	Trim Tree	EA	$1,000.00	4	$4,000	$4,000	
Install or Upgrade Intersection Lighting	Install Street Light Pole	EA	$17,000.00	2	$34,000	$46,000	
	Install Service Point	EA	$10,000.00	1	$10,000		
	Install Street Lighting Cable	LF	$5.00	400	$2,000		
A J Muska Road and E Weinberger Road							
Sign and Pavement Delineation Upgrades	Install Centerline	LF	$4.00	250	$1,000	$4,010	$61,600
	Install Edge Line	LF	$4.00	400	$1,600		
	Install Stop Bar	LF	$8.00	20	$160		
	Install Sign and Post	EA	$250.00	5	$1,250		
Install Object Maker	Install Object Marker	EA	$250.00	6	$1,500	$1,500	
Clear Sight Triangles	Trim Tree	EA	$1,000.00	2	$2,000	$2,000	
Install or Upgrade Intersection Lighting	Install Street Light Pole	EA	$17,000.00	2	$34,000	$46,000	
	Install Service Point	EA	$10,000.00	1	$10,000		
	Install Street Lighting Cable	LF	$5.00	400	$2,000		
Chudej Spur and Old Railroad Road							
Sign and Pavement Delineation Upgrades	Install Centerline	LF	$4.00	300	$1,200	$5,500	$75,900
	Install Edge Line	LF	$4.00	600	$2,400		
	Remove Sign	EA	$100.00	2	$200		
	Install Sign	EA	$200.00	2	$400		
	Install Yield Line	SF	$10.00	30	$300		
	Install Sign and Post	EA	$250.00	4	$1,000		
Install Object Maker	Install Object Marker	EA	$250.00	6	$1,500	$1,500	
Clear Sight Triangles	Trim Tree	EA	$1,000.00	3	$3,000	$3,000	
Install or Upgrade Intersection Lighting	Install Street Light Pole	EA	$17,000.00	2	$34,000	$56,000	
	Install Service Point	EA	$20,000.00	1	$20,000		
	Install Street Lighting Cable	LF	$5.00	400	$2,000		

Harrison Road and Trading Post Road							
Install Roundabout	Install Roundaboout	LS	$500,000.00	1	$500,000	$500,000	$668,200
Install or Upgrade Intersection Lighting	Install Street Light Pole	EA	$17,000.00	4	$68,000	$81,000	
	Install Service Point	EA	$10,000.00	1	$10,000		
	Install Street Lighting Cable	LF	$5.00	600	$3,000		
						Total	**$1,180,100**
						Contingency(20%)	**$236,100**
						Subtotal	**$1,416,200**
						PS&E(20%) Construction(15%) Engineering Cost	**$495,700**
						Total	**$1,911,900**

McLennan County Cost Estimate

Project 7: Mazanec Road - Corridor Safety Improvements

Project Limits: Mazanec Road from Solitude Lane to Mesquite Tree Road

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Paved Shoulder and Safety Edge	Site Preparation and Removal	SF	$6.00	120000	$720,000	$1,920,000	$2,208,000
	Widen Road	SF	$10.00	120000	$1,200,000		
Install Striping	Install Centerline	LF	$4.00	29500	$118,000	$354,000	$407,100
	Install Edge Line	LF	$4.00	59000	$236,000		
Install Guard Rail	Install Guardrail	LF	$50.00	880	$44,000	$44,000	$50,600
Clear Recovery Zone	Remove Tree	EA	$2,500.00	7	$17,500	$17,500	$20,200
						Total	**$2,685,900**
						Contingency Cost	**$537,200**
						Subtotal	**$3,223,100**
						Engineering Cost	**$1,128,100**
						Total	**$4,351,200**

McLennan County Cost Estimate

Project 8: Intersection Safety Improvements - FM 2113 (Spring Valley Road) and FM 2837 (Old Lorena Road)

Project Location: FM 2113 (Spring Valley Road) and FM 2837 (Old Lorena Road)

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Approach Median	Install Median Concrete	SF	$25.00	6750	$168,750	$231,850	$266,700
	Install Median Curb	LF	$40.00	1250	$50,000		
	Install Sign	EA	$200.00	8	$1,600		
	Install Pavement Marking	EA	$250.00	6	$1,500		
	Install Striping	LF	$4.00	2500	$10,000		
Signal Hardware Upgrade	Replace Existing Backplate with New Backplate with Yellow Retroreflective Border	EA	$1,500.00	8	$12,000	$12,000	$13,800
Upgrade to Protected Left Turn	Remove Existing Signal Head	EA	$500.00	4	$2,000	$8,400	$9,700
	Remove Sign	EA	$100.00	4	$400		
	Furnish and Install New Signal Head Assembly with Backplate with Yellow Retroreflective Border	EA	$1,500.00	4	$6,000		
						Total	**$290,200**
						Contingency Cost	**$58,100**
						Subtotal	**$348,300**
						Engineering Cost	**$122,000**
						Total	**$470,300**

McLennan County Cost Estimate

Project 9: Rock Creek Road - Corridor Safety Improvements

Project Limits: Rock Creek Road from Rock Creek Loop to Waco City Limit

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Install Striping	Install Centerline	LF	$4.00	29000	$116,000	$348,000	$400,200
	Install Edge Line	LF	$4.00	58000	$232,000		
Install Guard Rail	Install Guardrail	LF	$50.00	400	$20,000	$20,000	$23,000
Install Paved Shoulder/ Safety Edge	Site Preparation and Removal	SF	$6.00	16632	$99,792	$350,112	$402,700
	Widen Road	SF	$10.00	16632	$166,320		
	Install Safety Edge	LF	$20.00	4200	$84,000		
Object Maker	Install Object Marker	EA	$250.00	8	$2,000	$6,000	$6,900
	Install Sign and Post	EA	$250.00	16	$4,000		
Minor Street Sign and Striping Improvements	Remove Sign	EA	$100.00	15	$1,500	$9,020	$10,400
	Install Sign	EA	$200.00	15	$3,000		
	Install Stop Bar	LF	$8.00	165	$1,320		
	Install Striping	LF	$4.00	800	$3,200		
Install Intersection Lighting	Install Street Light Pole	EA	$17,000.00	13	$221,000	$247,500	$284,700
	Install Service Point	EA	$10,000.00	2	$20,000		
	Install Street Lighting Cable	LF	$5.00	1300	$6,500		
						Total	**$1,127,900**
						Contingency Cost	**$225,600**
						Subtotal	**$1,353,500**
						Engineering Cost	**$473,800**
						Total	**$1,827,300**

McLennan County Cost Estimate

Project 10: Speegleville Road - Corridor Safety Improvements

Project Limits: Speegleville Road from Highway 6 to Classic Drive

CM	Description	Unit	Unit Cost	Quantity	Subtotal	Total	Total with Traffic Control and Mobilization
Object Markers	Install Object Marker	EA	$250.00	13	$3,250	$3,250	$3,800
Sign and Striping Upgrades for Curves	Install Sign and Post	EA	$250.00	8	$2,000	$18,400	$21,200
	Install Sign	EA	$200.00	4	$800		
	Install Centerline	LF	$4.00	1300	$5,200		
	Install Edge Line	LF	$4.00	2600	$10,400		
Install Centerline Striping	Install Centerline	LF	$4.00	9800	$39,200	$117,600	$135,300
	Install Edge Line	LF	$4.00	19600	$78,400		
Install Safety Edge	Install Safety Edge	LF	$20.00	10000	$200,000	$200,000	$230,000
Widen Road	Site Preparation and Removal	SF	$6.00	52500	$315,000	$840,000	$966,000
	Widen Road	SF	$10.00	52500	$525,000		
						Total	**$1,356,300**
						Contingency Cost	**$271,300**
						Subtotal	**$1,627,600**
						Engineering Cost	**$569,700**
						Total	**$2,197,300**

McLennan County Cost Estimate

Project 11: Chapel Road - Corridor Safety Improvements							
Project Limits: Chapel Road from FM-2837 (Old Lorena Road) to FM-2113 (Spring Valley Road)							
CM	**Description**	**Unit**	**Unit Cost**	**Quantity**	**Subtotal**	**Total**	**Total with Traffic Control and Mobilization**
Install Striping	Install Centerline	LF	$4.00	22000	$88,000	$264,000	$303,600
	Install Edge Line	LF	$4.00	44000	$176,000		
Install Safety Edge	Install Safety Edge	LF	$14.00	44000	$616,000	$616,000	$708,400
Sign Upgrades	Remove Sign	EA	$100.00	12	$1,200	$3,600	$4,200
	Install Sign	EA	$200.00	12	$2,400		
Widen Road	Site Preparation and Removal	SF	$6.00	88000	$528,000	$1,848,000	$2,125,200
	Widen Road	SF	$10.00	132000	$1,320,000		
Project Location: Neal-Trice Lane and Chapel Road							
Advance Warning Flashing Beacon	Install Flashing Beacon System (per pole)	EA	$10,000.00	2	$20,000	$20,000	$23,000
Clear Sight Triangle	Trim Tree	EA	$1,000.00	4	$4,000	$4,000	$4,600
Curve Delineation and Sign Upgrade	Install Sign and Post	EA	$250.00	8	$2,000	$2,000	$2,300
						Total	**$3,171,300**
						Contingency Cost	**$634,300**
						Subtotal	**$3,805,600**
						Engineering Cost	**$1,332,000**
						Total	**$5,137,600**

APPENDIX I

McLENNAN COUNTY EQUITY DATA

Data Source: USDOT Equitable Transportation Community (ETC) Explorer

Remarks: Census tract-wise data was downloaded from the explorer from the National Results section. Relevant columns have been retained in the table presented below.

Census Tract with FIPS code 48309980000 represents the Waco Airport, with population of zero. It has been assigned disadvantage indicator 0.

Census Tract FIPS Code (2020)	Location	Transportation Insecurity Percentile Rank	Health Vulnerability Percentile Rank	Environmental Burden Percentile Rank	Social Vulnerability Percentile Rank	Climate & Disaster Risk Burden Percentile Rank	Disadvantaged Communities Index Score	Disadvantaged Communities Index Percentile Rank	Disadvantaged Communities Indicator
48309000100	Census Tract 1, McLennan County, Texas	29.8619144	70.33291293	76.6369952	93.15625149	97.14847474	3.969984632	94.98746867	1
48309000200	Census Tract 2, McLennan County, Texas	23.7071043	64.50158247	57.85340626	84.22946756	67.28193518	3.212806001	64.45199537	0
48309000300	Census Tract 3, McLennan County, Texas	96.28638905	14.85020108	62.38873199	24.88559989	58.93469971	3.536320108	81.29940235	1
48309000401	Census Tract 4.01, McLennan County, Texas	63.27477347	40.89665183	65.44763403	94.41226941	67.73832221	3.950444244	94.60188934	1
48309000402	Census Tract 4.02, McLennan County, Texas	43.30176403	29.09002213	57.77952549	88.89842223	80.69351764	3.430650155	76.28807596	1
48309000598	Census Tract 5.98, McLennan County, Texas	57.44168113	43.2727316	71.03993136	89.87201487	63.63918017	3.827072203	91.70763447	1
48309000700	Census Tract 7, McLennan County, Texas	22.73351648	77.25412274	63.30270856	79.09576243	92.18064824	3.573002749	82.87907268	1
48309000800	Census Tract 8, McLennan County, Texas	36.01431463	87.21652428	65.04724794	89.96973164	74.70209724	3.889642304	93.28850974	1
48309000900	Census Tract 9, McLennan County, Texas	31.54882398	92.40653928	39.43445465	75.41350875	75.47545281	3.458276035	77.67736649	1
48309001000	Census Tract 10, McLennan County, Texas	28.62083092	94.84686957	35.30666476	95.65756232	79.50309819	3.625558567	84.98288992	1
48309001100	Census Tract 11, McLennan County, Texas	33.1622325	88.92511244	33.65507215	93.58286858	73.55219256	3.560397107	82.36577019	1
48309001200	Census Tract 12, McLennan County, Texas	27.96655099	97.98919639	51.6938953	96.70861338	73.09103908	3.754158461	89.53995566	1
48309001300	Census Tract 13, McLennan County, Texas	42.01609794	90.59919568	37.08456964	81.68644835	58.17206864	3.515744782	80.36316753	1
48309001401	Census Tract 14.01, McLennan County, Texas	82.93690958	7.707683887	67.81062691	91.74412508	21.98403241	3.551202875	81.96693657	1
48309001402	Census Tract 14.02, McLennan County, Texas	71.2984384	95.76303453	60.4404247	94.21206921	49.935653	4.429480582	99.46741855	1
48309001500	Census Tract 15, McLennan County, Texas	33.91652207	98.60195607	80.10343307	94.84603651	75.43017159	4.168146414	97.90220744	1
48309001600	Census Tract 16, McLennan County, Texas	56.82354926	87.21890393	68.45767943	91.47123314	75.9485224	4.367434374	99.25896472	1
48309001700	Census Tract 17, McLennan County, Texas	62.19635628	91.67479713	43.16900821	91.94670861	53.22092469	4.044041512	96.3153075	1
48309001800	Census Tract 18, McLennan County, Texas	60.56487372	80.5237608	45.94549506	53.77758711	47.12583413	3.485024245	78.91363023	1
48309001900	Census Tract 19, McLennan County, Texas	47.3599865	81.99200438	41.80102241	94.07383574	55.30386082	3.678906964	86.99874687	1
48309002000	Census Tract 20, McLennan County, Texas	41.10516676	73.3277015	22.82319856	28.16030316	54.51024786	2.610317846	26.21577983	0
48309002100	Census Tract 21, McLennan County, Texas	36.0167245	88.93701068	34.24611828	87.3683207	66.32268827	3.489075869	79.14979757	1
48309002302	Census Tract 23.02, McLennan County, Texas	49.14088105	22.25566951	71.57616273	88.58263025	78.10891325	3.588051378	83.52130326	1
48309002498	Census Tract 24.98, McLennan County, Texas	25.17471564	76.2273041	63.90090444	71.6001716	85.71020019	3.477880116	78.59191247	1
48309002501	Census Tract 25.01, McLennan County, Texas	50.14579719	43.05856317	44.79915156	61.85828686	45.51239276	2.955199887	48.48419125	0
48309002503	Census Tract 25.03, McLennan County, Texas	32.73448043	85.21285962	55.24970507	28.20439487	69.12416587	3.032600863	53.55696935	0
48309002504	Census Tract 25.04, McLennan County, Texas	28.05692115	74.01779978	47.92240136	14.82077315	61.12726406	2.540020807	22.04308849	0
48309002600	Census Tract 26, McLennan County, Texas	32.46577983	87.92565976	51.1040408	36.70694504	66.7242612	3.073924665	56.19577791	0
48309002700	Census Tract 27, McLennan County, Texas	23.46491228	95.20738643	37.89368319	95.34534535	81.4442326	3.568204721	82.68628302	1

Census Tract FIPS Code (2020)	Location	Transportation Insecurity Percentile Rank	Health Vulnerability Percentile Rank	Environmental Burden Percentile Rank	Social Vulnerability Percentile Rank	Climate & Disaster Risk Burden Percentile Rank	Disadvantaged Communities Index Score	Disadvantaged Communities Index Percentile Rank	Disadvantaged Communities Indicator
48309002800	Census Tract 28, McLennan County, Texas	35.03952188	83.3995669	37.39796709	63.65174699	57.24261201	3.117709368	58.88880856	0
48309002900	Census Tract 29, McLennan County, Texas	46.97440717	72.52694953	14.24468833	36.62114495	43.98951382	2.61331111	26.38085599	0
48309003000	Census Tract 30, McLennan County, Texas	47.01898978	92.20307927	40.50453413	85.40445207	54.20638704	3.663564321	86.41555813	1
48309003200	Census Tract 32, McLennan County, Texas	70.04651051	42.27684839	41.46498409	80.88088088	24.72116301	3.294368974	69.00544631	1
48309003300	Census Tract 33, McLennan County, Texas	35.17808945	68.47797635	44.16163205	77.55851089	64.17540515	3.247297033	66.37627723	1
48309003401	Census Tract 34.01, McLennan County, Texas	75.19278967	38.96913595	11.01895876	56.86162353	14.64370829	2.718790059	33.04053403	0
48309003402	Census Tract 34.02, McLennan County, Texas	86.6119626	42.55526735	12.39290268	48.24705658	17.21758818	2.9363674	47.23708309	0
48309003500	Census Tract 35, McLennan County, Texas	92.28600347	86.60138496	4.888046807	54.26974594	40.42778837	3.70758973	87.99402352	1
48309003601	Census Tract 36.01, McLennan County, Texas	71.99489107	90.16134022	2.100835329	68.60670194	41.55862726	3.464172869	77.97860035	1
48309003602	Census Tract 36.02, McLennan County, Texas	67.47879314	84.13725817	10.14668907	56.34682301	42.7585796	3.283469361	68.37285521	1
48309003701	Census Tract 37.01, McLennan County, Texas	71.28879892	81.87540157	9.566367569	55.04194671	43.51406101	3.325753747	70.72127434	1
48309003703	Census Tract 37.03, McLennan County, Texas	53.02318296	75.20167527	17.93872663	30.25525526	49.01215443	2.784541775	37.29034124	0
48309003708	Census Tract 37.08, McLennan County, Texas	36.00949489	64.25766842	24.55224681	20.45974546	56.40490944	2.376935599	13.33261037	0
48309003709	Census Tract 37.09, McLennan County, Texas	63.46756314	17.04185803	52.97131758	37.90695457	36.52407054	2.71379327	32.71520147	0
48309003710	Census Tract 37.10, McLennan County, Texas	64.3917486	17.75694263	37.62437589	21.7967968	27.93612965	2.338977422	11.65052053	0
48309003711	Census Tract 37.11, McLennan County, Texas	77.95570657	3.702734217	71.45461695	67.78921779	45.21687321	3.440748553	76.78932909	1
48309003712	Census Tract 37.12, McLennan County, Texas	52.41348564	38.5027247	54.06642119	29.60937128	28.71663489	2.557221233	22.98775786	0
48309003801	Census Tract 38.01, McLennan County, Texas	64.10497397	70.38050591	7.969589723	17.37690071	47.01858913	2.709555334	32.48746867	0
48309003802	Census Tract 38.02, McLennan County, Texas	78.04246192	81.80282226	8.143567011	58.68368368	44.80100095	3.495159978	79.40644881	1
48309003901	Census Tract 39.01, McLennan County, Texas	72.45035666	12.2171192	16.79357476	11.77367844	5.962821735	1.916479075	1.206140351	0
48309003902	Census Tract 39.02, McLennan County, Texas	67.66676306	52.61523451	16.78046688	46.55846323	28.78455672	2.800722475	38.33502024	0
48309004000	Census Tract 40, McLennan County, Texas	79.82215153	75.29805107	11.61119651	18.62934363	40.98546235	3.061683566	55.39449586	0
48309004102	Census Tract 41.02, McLennan County, Texas	87.06742819	37.18558884	8.872841669	26.09514276	15.44089609	2.617293257	26.6194332	0
48309004104	Census Tract 41.04, McLennan County, Texas	60.14314633	47.38595531	13.73705597	38.42413842	25.21210677	2.450455491	16.97994987	0
48309004105	Census Tract 41.05, McLennan County, Texas	72.3768556	13.13804345	10.30755848	16.13041613	9.584127741	1.93913857	1.389290534	0
48309004201	Census Tract 42.01, McLennan County, Texas	47.75038558	87.23913095	17.95064288	58.14266648	44.22902765	3.030622391	53.41840177	0
48309004202	Census Tract 42.02, McLennan County, Texas	90.47257567	38.82873664	11.39908722	53.42008675	14.71043851	2.993035005	51.03985926	0
48309004300	Census Tract 43, McLennan County, Texas	31.86210719	82.93315565	69.18576246	75.00595834	76.02836034	3.668774512	86.61557741	1
48309980000	Census Tract 9800, McLennan County, Texas								0

APPENDIX J

AVERAGE ANNUAL FATALITY RATE WORKSHEETS

Average Annual Fatality Rate and Average Crash per Year

City	Total Fatalities	Population	Percentage of Disadvantaged census tracts	Average Annual Fatality Rate	Average Crash Per Year
Texas	19375	28600000	44%	13.55	3875
McLennan County	187	254000	57%	14.72	37.4
Bellmead	13	20100	100%	12.94	2.6
Hewitt	3	37300	17%	1.61	0.6
Lacy Lakeview	5	31300	71%	3.19	1
McGregor	4	10700	0%	7.48	0.8
Robinson	8	30400	33%	5.26	1.6
Waco	74	229400	58%	6.45	14.8
Woodway	2	18800	25%	2.13	0.4

Data	2017-2021, NHTSA Persons Killed in Fatal Crashes	https://cdan.dot.gov/query
Population Data	USDOT ETC Explorer National Results	https://experience.arcgis.com/experience/0920984aa80a4362b8778d779b090723/page/ETC-
Methodology	SS4A Calculation Methodology	https://www.transportation.gov/sites/dot.gov/files/2024-02/SS4A-FY24-Calculate-Fatality-
Percentage of Disadvantaged census tracts	USDOT ETC Explorer National Results	

Safe Streets and Roads for All

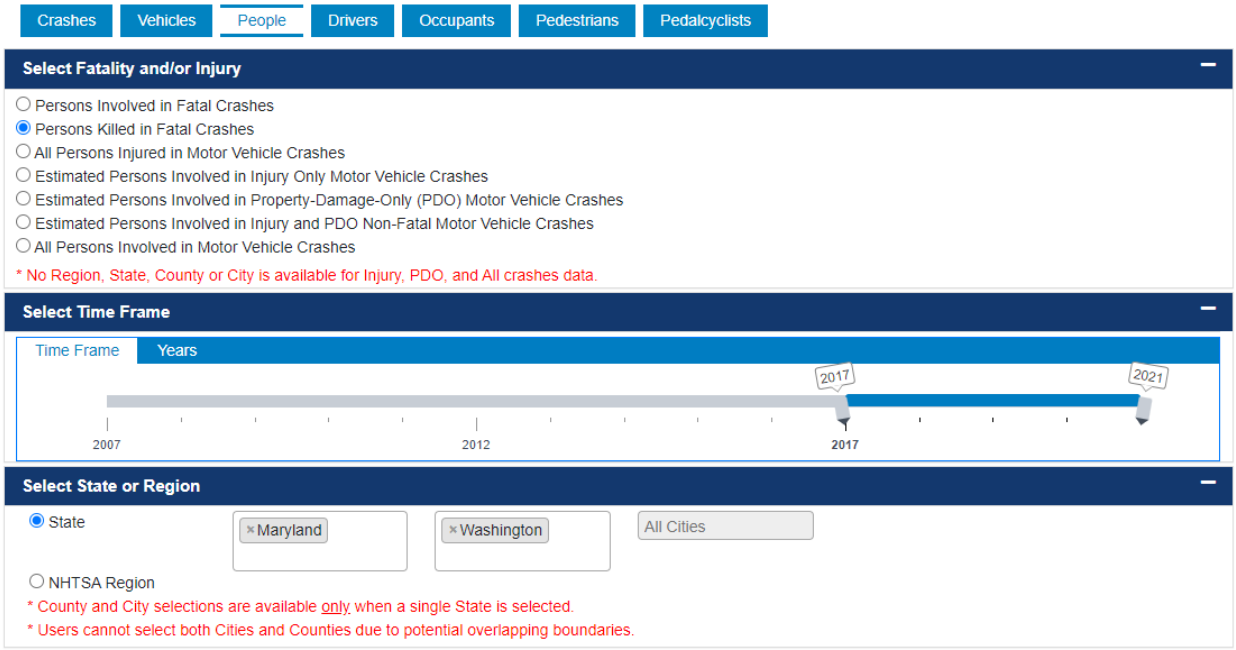
Average Annual Fatality Rate

This document provides instructions on how to obtain the necessary data and calculate the Average Annual Motor Vehicle-Involved Roadway Fatalities for inclusion in a Safe Streets and Roads for All (SS4A) grant application. The SS4A Notice of Funding Opportunity (NOFO) requires that applicants use the most recent five years of data available in the Fatality Analysis Reporting System (FARS). **FARS data** from **2017-2021 should be used**.

This document uses an example of **Washington County, Maryland** for collecting and calculating the data.

Retrieving Fatality Data from FARS

1. Go to the Fatality and Injury Reporting System Tool (FIRST) website to view the FARS data. At the top of the screen, select the tab for "**People**." Under "Select Fatality and/or Injury," select "**Persons Killed in Fatal Crashes**" and select **2017-2021** under "Time Frame."
2. To select a county or city, first select "State" and type in or select the state. Type in or select the county OR city in the appropriate box. Note: Users cannot select both cities and counties due to potential overlapping boundaries. In the example below, Maryland is selected as the state and Washington is selected as the county.



3. Click Submit.
4. The output will resemble the table below. The TOTAL number of Persons Killed in Fatal Crashes over the five-year period (**78**) is located in the bottom right cell of the table, highlighted in the table below.

Persons Killed in Fatal Crashes

Year*	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
2017	3	0	1	3	1	1	1	2	0	1	1	0	14
2018	2	0	2	2	0	0	1	3	1	1	2	2	14
2019	4	1	2	0	2	2	1	1	3	7	4	1	28
2020	0	1	0	0	0	0	0	1	2	4	2	0	10
2021	1	1	1	1	0	2	1	2	1	0	2	0	12
Total	**10**	**3**	**6**	**6**	**3**	**5**	**4**	**9**	**7**	**13**	**9**	**3**	**78**

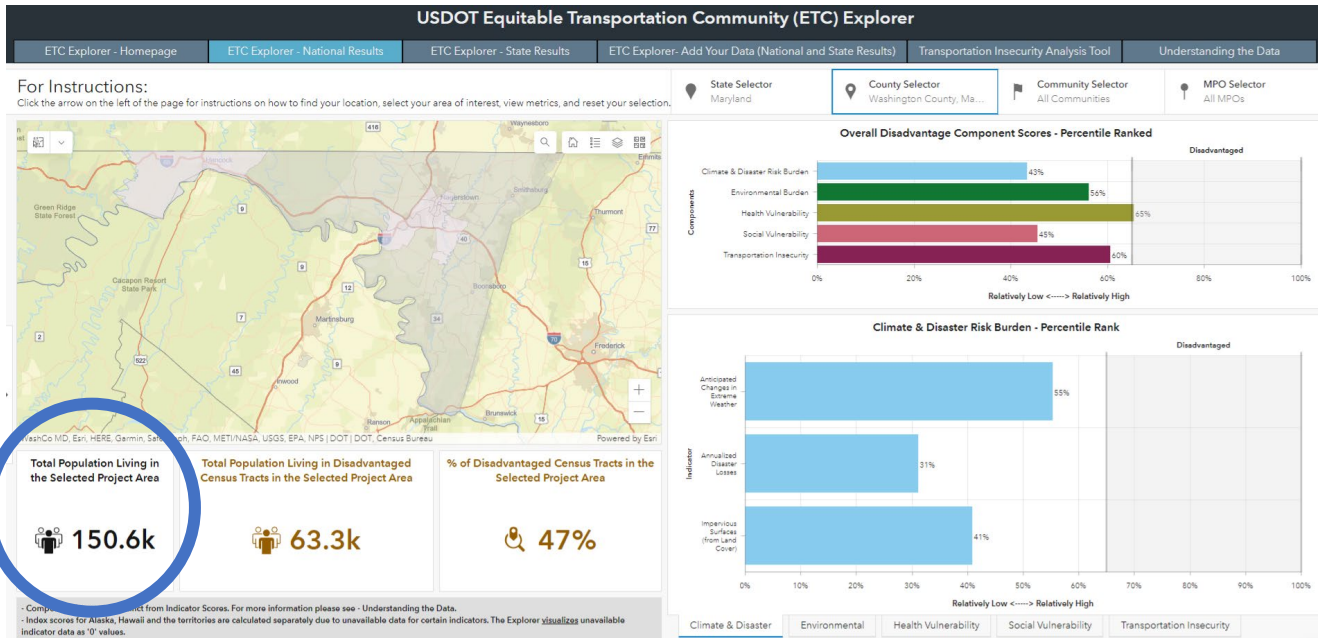
*Note that if there were no fatalities in the jurisdiction during one or more of the years, no row for that year will be shown.

Calculating Fatality Rate per 100,000 Population

Jurisdiction Population

For purposes of the FY24 SS4A application, you must use the 2020 U.S. Census American Community Survey (ACS) 5-year population estimate. The SS4A program recommends using the U.S. Department of Transportation (USDOT) Equitable Transportation Community (ETC) Explorer tool to obtain the population to use for the fatality rate calculation. For the purposes of this calculation, please include the entire Census tracts that are partially located in the jurisdiction selected in FIRST. Please refer to SS4A Calculating Percentage of Population in Underserved Communities fact sheet for more information on obtaining population estimates.

- According to the ETC Explorer tool, the **jurisdiction population** for Washington County, Maryland is **150,600.**



Average Annual Fatality Rate (per 100,000 population)

To calculate the Average Annual Fatality Rate (per 100,000 population), use the following equation:

$$\left(\frac{Total\ Number\ of\ Vehicle\ Crashes/5}{Jurisdiction\ Population\ \#}\right) * 100{,}000 = \left(\frac{\frac{78}{5}}{150{,}600}\right) * 100{,}000 = 10.4$$

National Highway Traffic Safety Administration (NHTSA) Motor Vehicle Crash Data Querying and Reporting
Persons Killed in Fatal Crashes
Filter Selected: Person Injury Type: Fatal
State: Texas and City: Bellmead
Years: 2017-2021

Persons Killed in Fatal Crashes[1]

Crash Date (Year)	Crash Date (Month)									
	January	April	May	June	July	September	October	November	December	Total
2017	0	0	1	0	1	0	0	0	0	2
2018	0	1	0	0	0	0	0	0	0	1
2019	1	2	0	0	0	0	0	0	0	3
2020	0	0	0	1	0	0	0	1	0	2
2021	0	1	1	0	0	1	1	0	1	5
Total	1	4	2	1	1	1	1	1	1	13

Data Sources:
[1]Fatality Analysis Reporting System (FARS): 2017-2021 Final File
Report Generated: Tuesday, April 9, 2024 (3:27:39 PM)
VERSION 7.2, RELEASED APR 01, 2024

National Highway Traffic Safety Administration (NHTSA) Motor Vehicle Crash Data Querying and Reporting
Persons Killed in Fatal Crashes
Filter Selected: Person Injury Type: Fatal
State: Texas and City: Hewitt
Years: 2017-2021

Persons Killed in Fatal Crashes[1]

Crash Date (Year)	Crash Date (Month)		
	June	August	Total
2017	1	0	1
2018	1	0	1
2020	0	1	1
Total	2	1	3

Data Sources:
[1]Fatality Analysis Reporting System (FARS): 2017-2021 Final File
Report Generated: Tuesday, April 9, 2024 (3:29:51 PM)
VERSION 7.2, RELEASED APR 01, 2024

National Highway Traffic Safety Administration (NHTSA) Motor Vehicle Crash Data Querying and Reporting
Persons Killed in Fatal Crashes
Filter Selected: Person Injury Type: Fatal
State: Texas and City: Lacy-Lakeview
Years: 2017-2021

Persons Killed in Fatal Crashes[1]

Crash Date (Year)	Crash Date (Month)				
	April	May	August	November	Total
2017	0	1	0	0	1
2018	1	0	0	0	1
2019	0	0	1	0	1
2020	0	0	0	1	1
2021	0	0	0	1	1
Total	1	1	1	2	5

Data Sources:
[1]Fatality Analysis Reporting System (FARS): 2017-2021 Final File
Report Generated: Tuesday, April 9, 2024 (3:30:36 PM)
VERSION 7.2, RELEASED APR 01, 2024

National Highway Traffic Safety Administration (NHTSA) Motor Vehicle Crash Data Querying and Reporting
Persons Killed in Fatal Crashes
Filter Selected: Person Injury Type: Fatal
State: Texas and City: Mcgregor
Years: 2017-2021

Persons Killed in Fatal Crashes[1]

Crash Date (Year)	Crash Date (Month)				
	June	July	September	November	Total
2017	0	1	0	0	1
2019	1	0	1	0	2
2021	0	0	0	1	1
Total	1	1	1	1	4

Data Sources:
[1]Fatality Analysis Reporting System (FARS): 2017-2021 Final File
Report Generated: Tuesday, April 9, 2024 (3:31:29 PM)
VERSION 7.2, RELEASED APR 01, 2024

National Highway Traffic Safety Administration (NHTSA) Motor Vehicle Crash Data Querying and Reporting
Persons Killed in Fatal Crashes
Filter Selected: Person Injury Type: Fatal
State: Texas and County: McLennan
Years: 2017-2021

Persons Killed in Fatal Crashes[1]

Crash Date (Year)	Crash Date (Month)												
	January	February	March	April	May	June	July	August	September	October	November	December	Total
2017	1	1	7	4	4	1	10	1	4	2	6	3	44
2018	1	1	3	3	4	7	4	4	1	2	2	1	33
2019	3	2	3	8	2	3	3	5	3	5	0	3	40
2020	3	5	1	3	4	3	2	5	2	2	2	1	33
2021	2	0	3	2	3	6	5	2	5	1	3	5	37
Total	10	9	17	20	17	20	24	17	15	12	13	13	187

Data Sources:
[1]Fatality Analysis Reporting System (FARS): 2017-2021 Final File
Report Generated: Tuesday, April 9, 2024 (3:26:51 PM)
VERSION 7.2, RELEASED APR 01, 2024

National Highway Traffic Safety Administration (NHTSA) Motor Vehicle Crash Data Querying and Reporting
Persons Killed in Fatal Crashes
Filter Selected: Person Injury Type: Fatal
State: Texas and City: Robinson
Years: 2017-2021

Persons Killed in Fatal Crashes[1]

Crash Date (Year)	Crash Date (Month)						
	February	April	July	August	September	December	Total
2017	0	1	1	0	0	1	3
2018	0	0	0	1	0	0	1
2019	0	0	0	0	1	0	1
2020	1	0	0	0	0	0	1
2021	0	0	0	1	0	1	2
Total	1	1	1	2	1	2	8

Data Sources:
[1]Fatality Analysis Reporting System (FARS): 2017-2021 Final File
Report Generated: Tuesday, April 9, 2024 (3:32:26 PM)
VERSION 7.2, RELEASED APR 01, 2024

National Highway Traffic Safety Administration (NHTSA) Motor Vehicle Crash Data Querying and Reporting
Persons Killed in Fatal Crashes
Filter Selected: Person Injury Type: Fatal
State: Texas
Years: 2017-2021

Persons Killed in Fatal Crashes[1]

Crash Date (Year)	Crash Date (Month)												
	January	February	March	April	May	June	July	August	September	October	November	December	Total
2017	293	258	332	287	302	287	352	306	296	338	351	330	3,732
2018	323	280	310	288	321	313	319	280	264	332	332	286	3,648
2019	279	240	304	312	294	299	314	304	305	314	319	335	3,619
2020	299	301	253	239	329	344	327	354	317	378	358	377	3,876
2021	357	270	380	364	359	357	395	419	402	417	373	407	4,500
Total	1,551	1,349	1,579	1,490	1,605	1,600	1,707	1,663	1,584	1,779	1,733	1,735	19,375

Data Sources:
[1]Fatality Analysis Reporting System (FARS): 2017-2021 Final File
Report Generated: Thursday, April 11, 2024 (3:05:31 PM)
VERSION 7.2, RELEASED APR 01, 2024

National Highway Traffic Safety Administration (NHTSA) Motor Vehicle Crash Data Querying and Reporting
Persons Killed in Fatal Crashes
Filter Selected: Person Injury Type: Fatal
State: Texas and City: Waco
Years: 2017-2021

Persons Killed in Fatal Crashes[1]

Crash Date (Year)	Crash Date (Month)												
	January	February	March	April	May	June	July	August	September	October	November	December	Total
2017	0	1	4	1	2	0	6	1	2	0	1	1	19
2018	0	0	1	0	0	3	1	1	0	0	2	1	9
2019	1	2	1	2	1	0	1	1	1	2	0	2	14
2020	2	1	0	2	3	1	1	3	1	2	0	0	16
2021	2	0	3	0	1	3	2	1	2	0	1	1	16
Total	5	4	9	5	7	7	11	7	6	4	4	5	74

Data Sources:
[1]Fatality Analysis Reporting System (FARS): 2017-2021 Final File
Report Generated: Tuesday, April 9, 2024 (3:32:56 PM)
VERSION 7.2, RELEASED APR 01, 2024

National Highway Traffic Safety Administration (NHTSA) Motor Vehicle Crash Data Querying and Reporting
Persons Killed in Fatal Crashes
Filter Selected: Person Injury Type: Fatal
State: Texas and City: Woodway
Years: 2017-2021

Persons Killed in Fatal Crashes[1]

Crash Date (Year)	Crash Date (Month)		
	July	October	Total
2019	0	1	1
2021	1	0	1
Total	1	1	2

Data Sources:
[1]Fatality Analysis Reporting System (FARS): 2017-2021 Final File
Report Generated: Tuesday, April 9, 2024 (3:32:50 PM)
VERSION 7.2, RELEASED APR 01, 2024

USDOT Equitable Transportation Community (ETC) Explorer

ETC Explorer - Homepage | ETC Explorer - National Results | ETC Explorer - State Results | ETC Explorer- Add Your Data (National and State Results) | Transportation Insecurity Analysis Tool | Understanding the Data

To start use selectors, search, or zoom

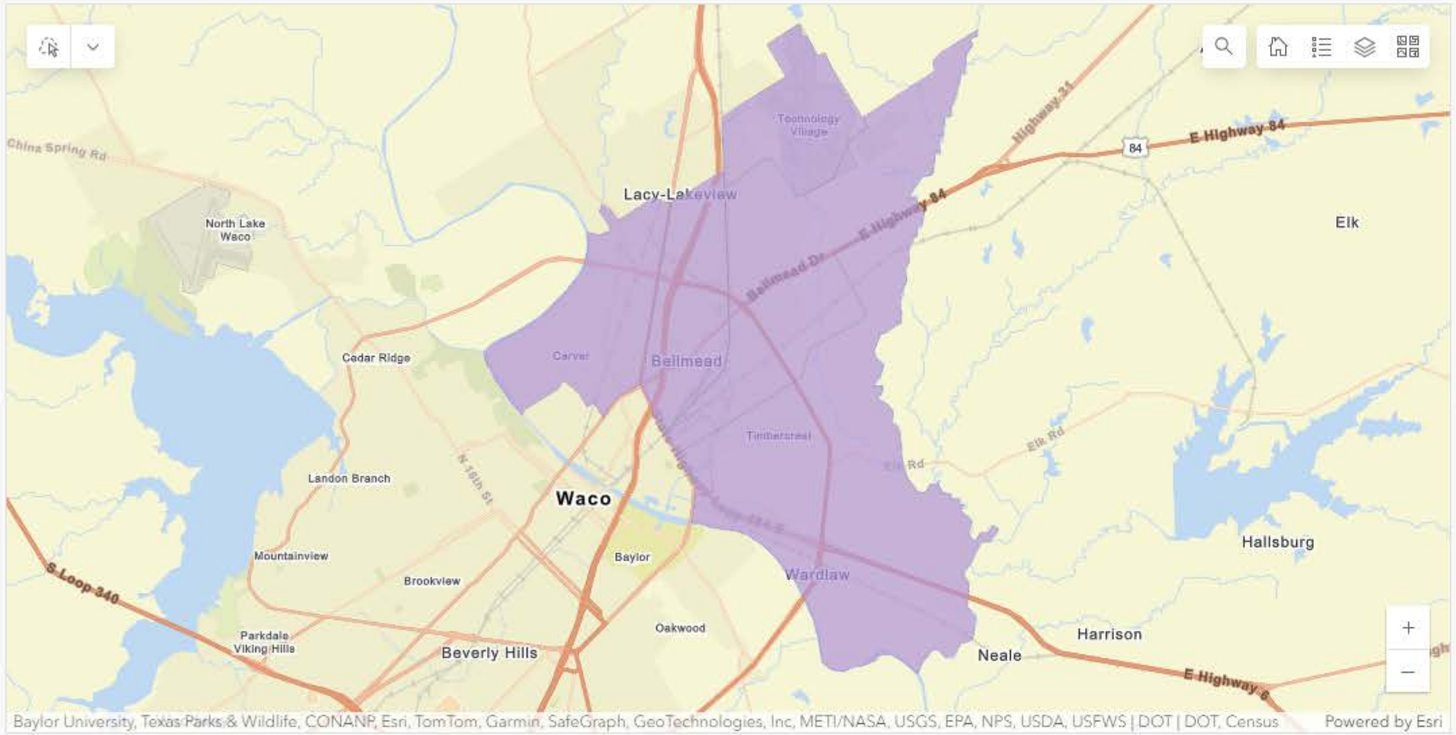
For additional instructions click the arrow on the left side of the page

State Selector: Texas

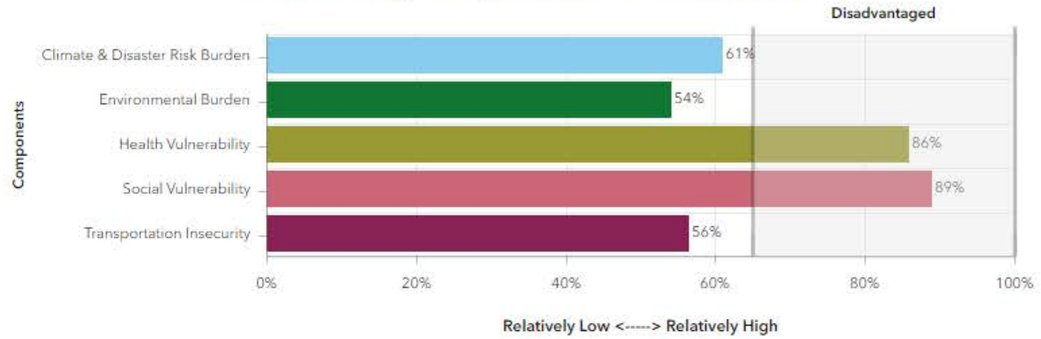
County Selector: McLennan County, Texas

Community Selector: Bellmead, City of (TX)

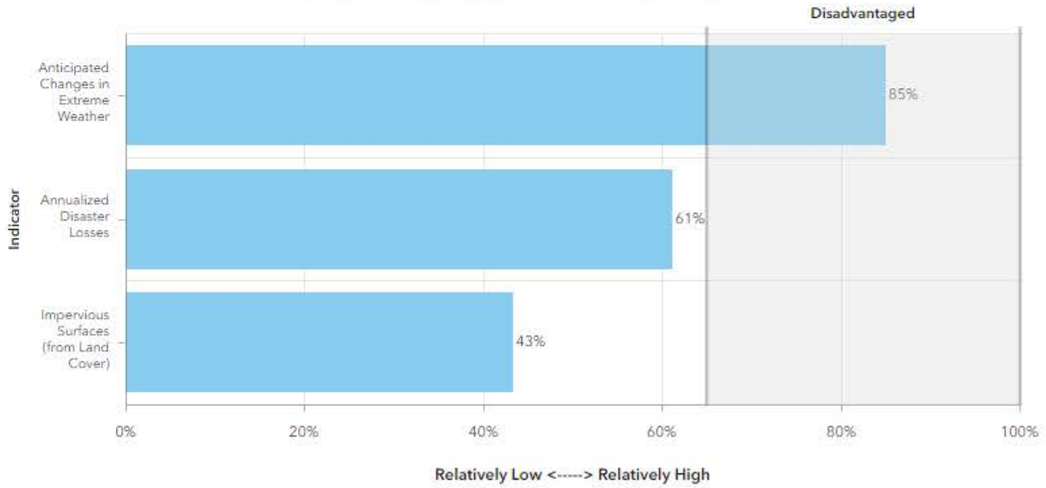
MPO Selector: All MPOs



Overall Disadvantage Component Scores - Percentile Ranked



Climate & Disaster Risk Burden - Percentile Rank



Climate & Disaster

Total Population Living in the Selected Project Area

20.1k

Total Population Living in Disadvantaged Census Tracts in the Selected Project Area

20.1k

% of Disadvantaged Census Tracts in the Selected Project Area

100%

- Component Scores are distinct from Indicator Scores. For more information please see - Understanding the Data.
- Index scores for Alaska, Hawaii and the territories are calculated separately due to unavailable data for certain indicators. The Explorer visualizes unavailable indicator data as '0' values.
- If viewing on a laptop and the dashboard does not display properly- right click on your desktop, select display options, and adjust the zoom to an appropriate resolution (usually 100%).

Click on the tab above to change component category. Once selectors are used, click button to reset map ----->

USDOT Equitable Transportation Community (ETC) Explorer

To start use selectors, search, or zoom

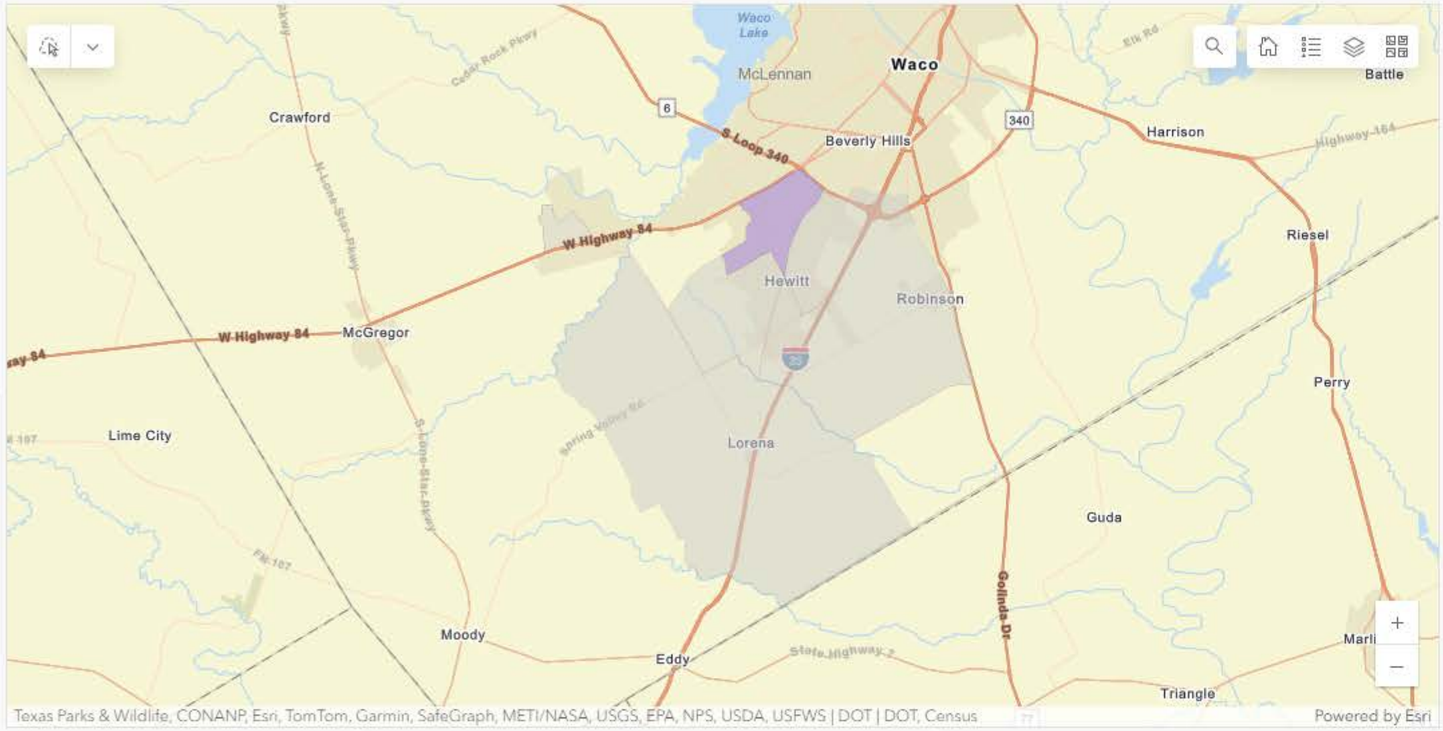
For additional instructions click the arrow on the left side of the page

State Selector: Texas

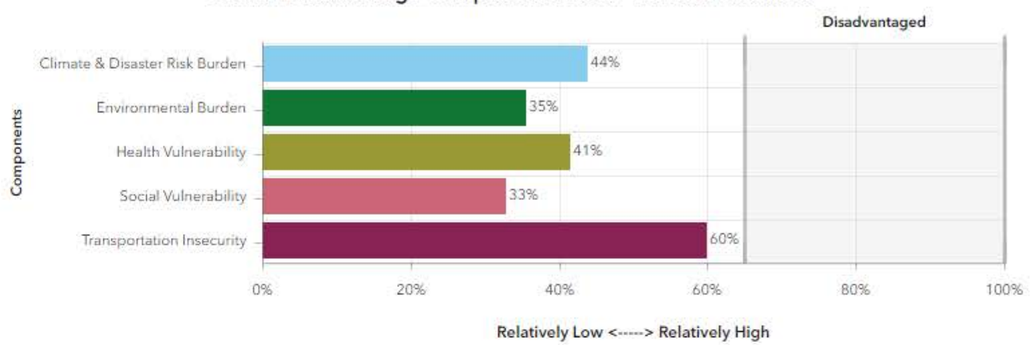
County Selector: McLennan County, Texas

Community Selector: Hewitt, City of (TX)

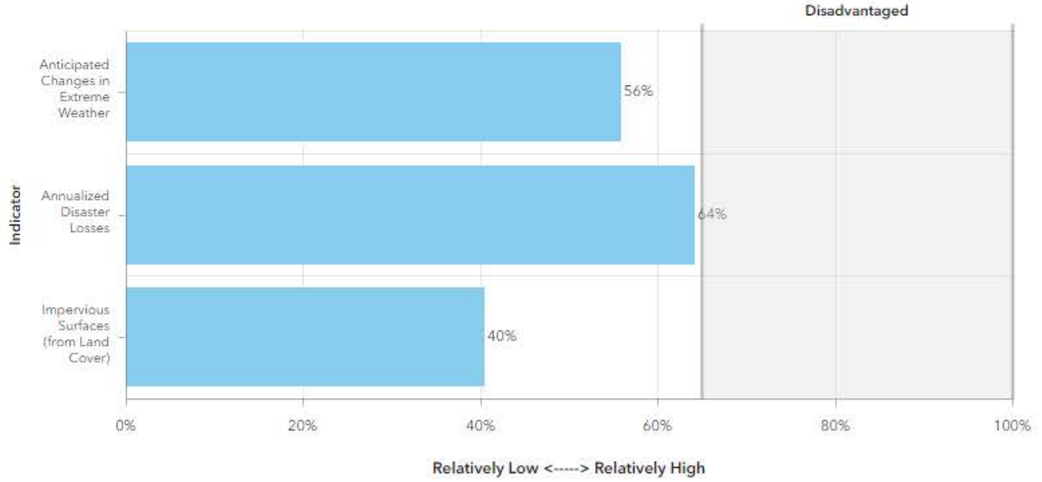
MPO Selector: All MPOs



Overall Disadvantage Component Scores - Percentile Ranked



Climate & Disaster Risk Burden - Percentile Rank



Climate & Disaster

Total Population Living in the Selected Project Area

37.3k

Total Population Living in Disadvantaged Census Tracts in the Selected Project Area

6.1k

% of Disadvantaged Census Tracts in the Selected Project Area

17%

- Component Scores are distinct from Indicator Scores. For more information please see - Understanding the Data.
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- If viewing on a laptop and the dashboard does not display properly- right click on your desktop, select display options, and adjust the zoom to an appropriate resolution (usually 100%).

Click on the tab above to change component category. Once selectors are used, click button to reset map ----->

USDOT Equitable Transportation Community (ETC) Explorer

ETC Explorer - Homepage | ETC Explorer - National Results | ETC Explorer - State Results | ETC Explorer- Add Your Data (National and State Results) | Transportation Insecurity Analysis Tool | Understanding the Data

To start use selectors, search, or zoom

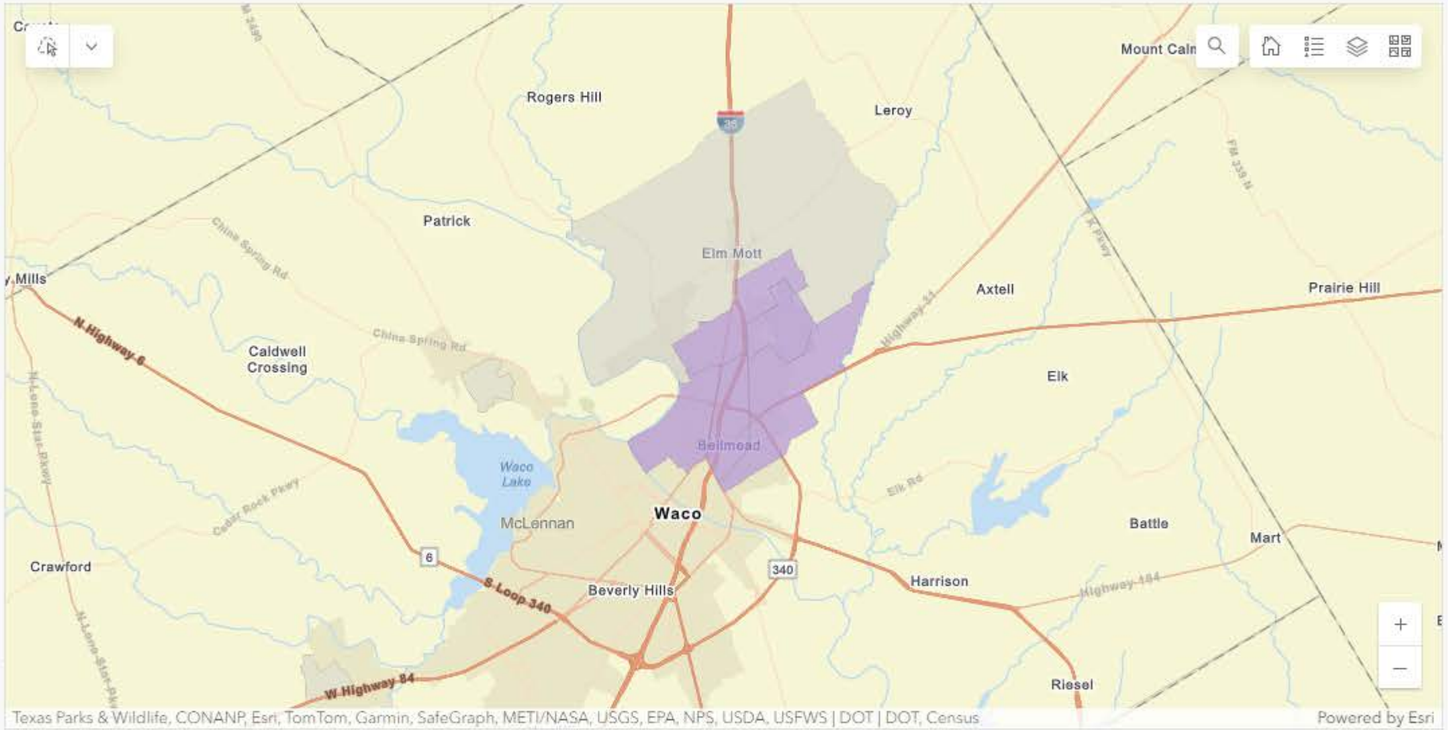
For additional instructions click the arrow on the left side of the page

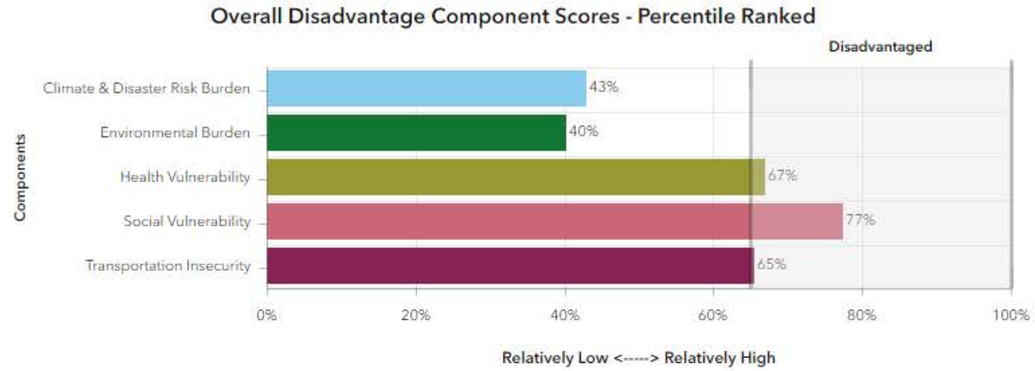
State Selector: Texas

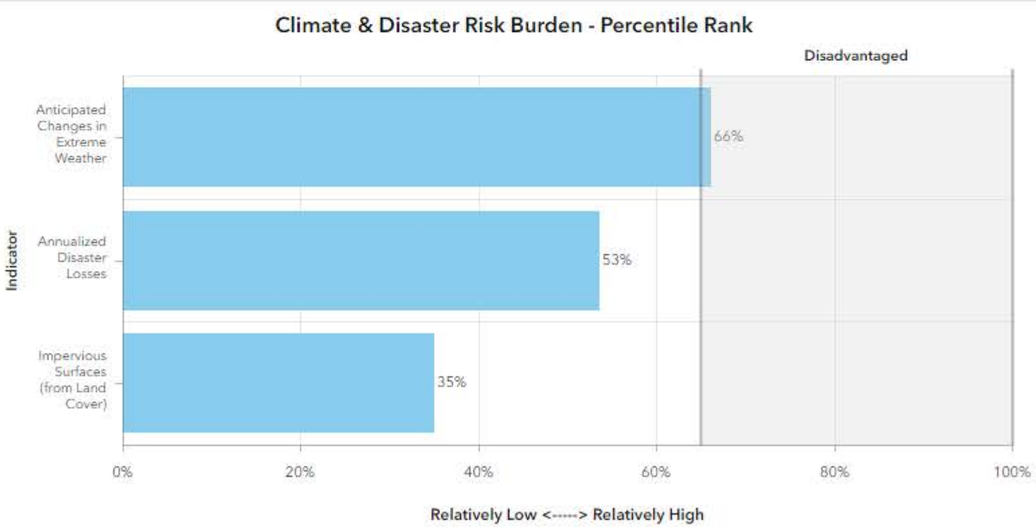
County Selector: McLennan County, Texas

Community Selector: Lacy-Lakeview, City of (TX)

MPO Selector: All MPOs







Climate & Disaster

Total Population Living in the Selected Project Area

31.3k

Total Population Living in Disadvantaged Census Tracts in the Selected Project Area

24.6k

% of Disadvantaged Census Tracts in the Selected Project Area

71%

- Component Scores are distinct from Indicator Scores. For more information please see - Understanding the Data.
- Index scores for Alaska, Hawaii and the territories are calculated separately due to unavailable data for certain indicators. The Explorer visualizes unavailable indicator data as '0' values.
- If viewing on a laptop and the dashboard does not display properly- right click on your desktop, select display options, and adjust the zoom to an appropriate resolution (usually 100%).

Click on the tab above to change component category. Once selectors are used, click button to reset map ----->

USDOT Equitable Transportation Community (ETC) Explorer

To start use selectors, search, or zoom

For additional instructions click the arrow on the left side of the page

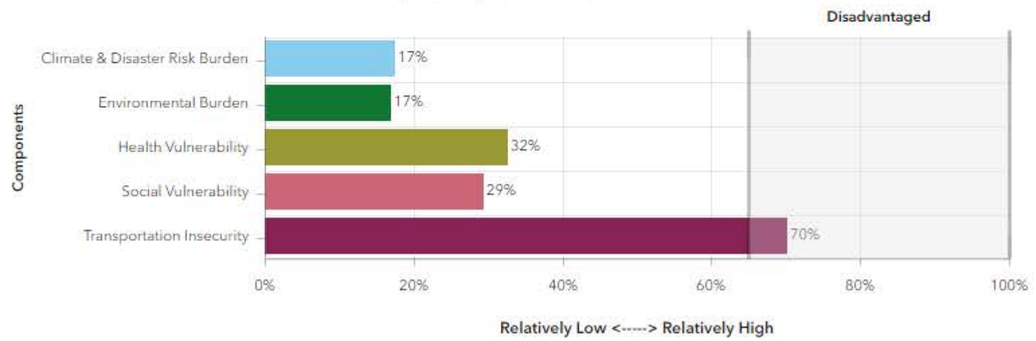
State Selector: Texas

County Selector: McLennan County, Texas

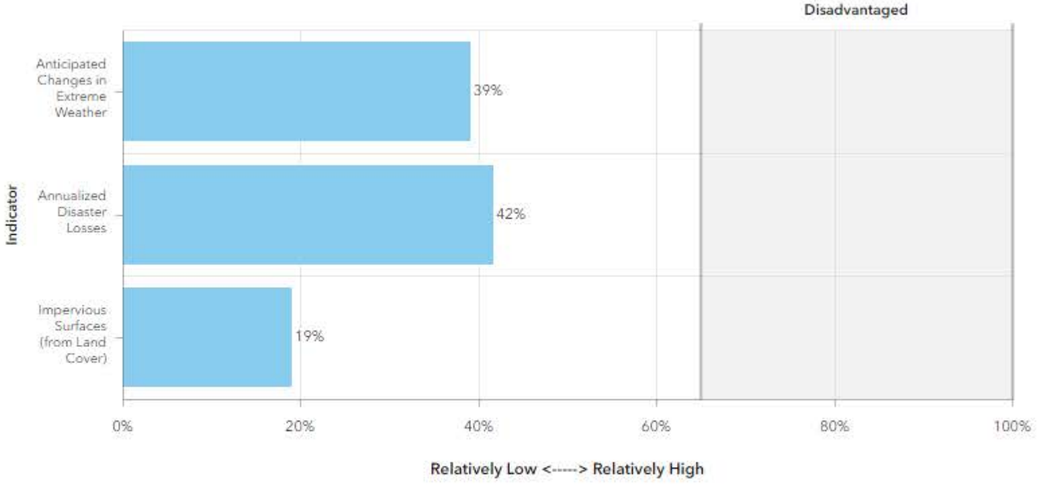
Community Selector: McGregor, City of (TX)

MPO Selector: All MPOs

Overall Disadvantage Component Scores - Percentile Ranked



Climate & Disaster Risk Burden - Percentile Rank



Climate & Disaster

Total Population Living in the Selected Project Area

10.7k

Total Population Living in Disadvantaged Census Tracts in the Selected Project Area

No Disadvantaged Tract Selected

% of Disadvantaged Census Tracts in the Selected Project Area

0%

- Component Scores are distinct from Indicator Scores. For more information please see - Understanding the Data.
- Index scores for Alaska, Hawaii and the territories are calculated separately due to unavailable data for certain indicators. The Explorer visualizes unavailable indicator data as '0' values.
- If viewing on a laptop and the dashboard does not display properly- right click on your desktop, select display options, and adjust the zoom to an appropriate resolution (usually 100%).

Click on the tab above to change component category. Once selectors are used, click button to reset map ----->

USDOT Equitable Transportation Community (ETC) Explorer

To start use selectors, search, or zoom

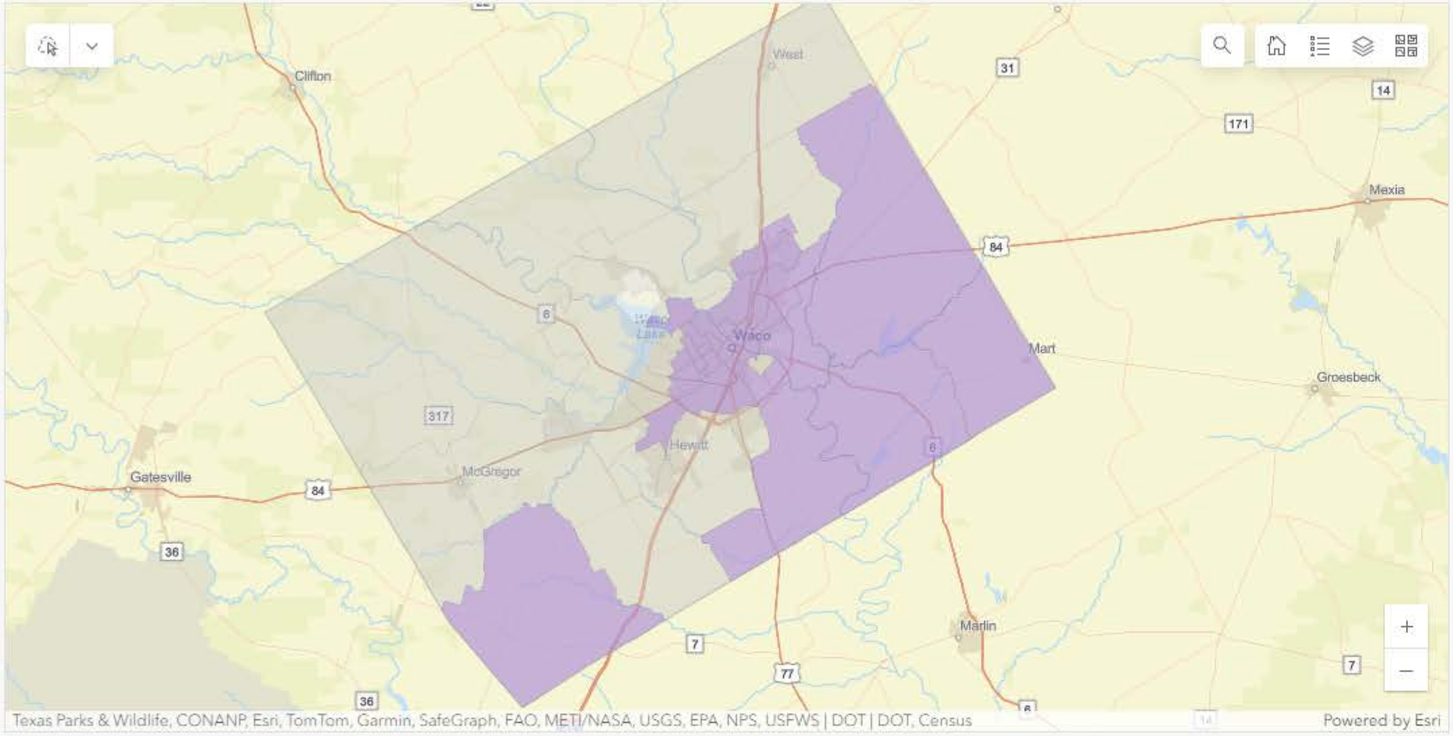
For additional instructions click the arrow on the left side of the page

State Selector: Texas

County Selector: McLennan County, Texas

Community Selector: All Communities

MPO Selector: All MPOs



Total Population Living in the Selected Project Area

254k

Total Population Living in Disadvantaged Census Tracts in the Selected Project Area

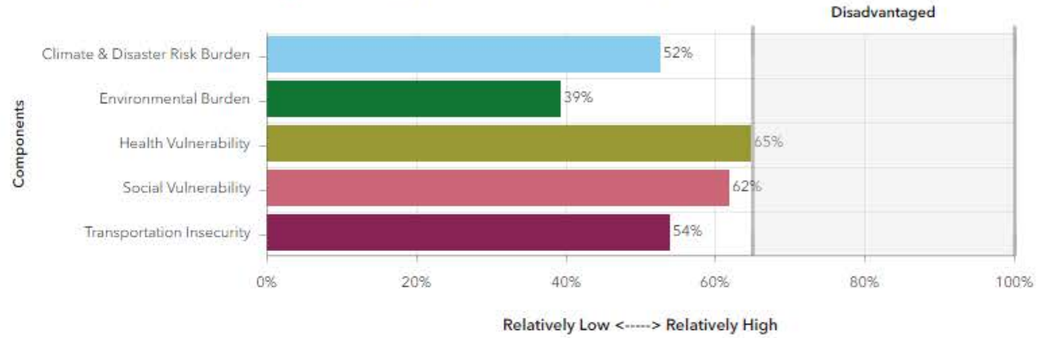
138.1k

% of Disadvantaged Census Tracts in the Selected Project Area

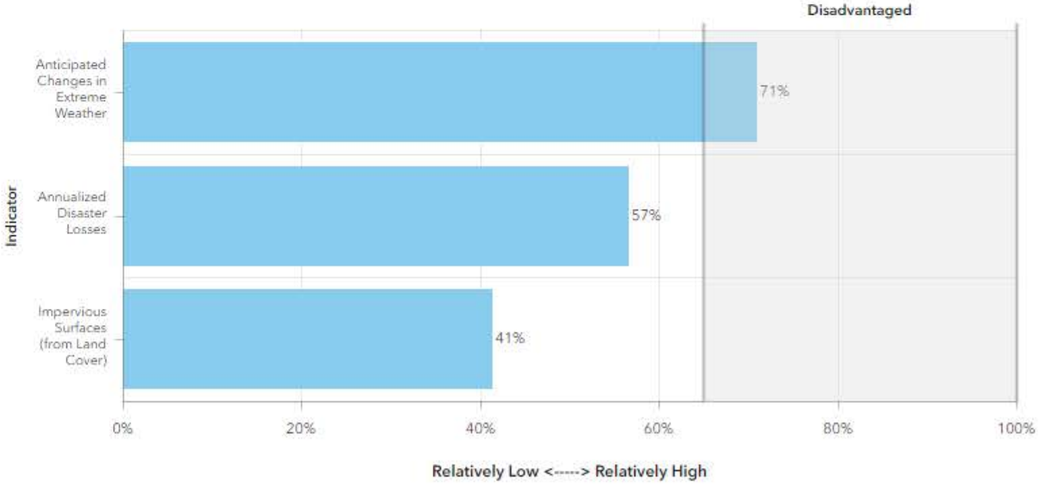
57%

- Component Scores are distinct from Indicator Scores. For more information please see - Understanding the Data.
- Index scores for Alaska, Hawaii and the territories are calculated separately due to unavailable data for certain indicators. The Explorer visualizes unavailable indicator data as '0' values.
- If viewing on a laptop and the dashboard does not display properly- right click on your desktop, select display options, and adjust the zoom to an appropriate resolution (usually 100%).

Overall Disadvantage Component Scores - Percentile Ranked



Climate & Disaster Risk Burden - Percentile Rank



Climate & Disaster

Click on the tab above to change component category. Once selectors are used, click button to reset map ----->

USDOT Equitable Transportation Community (ETC) Explorer

To start use selectors, search, or zoom

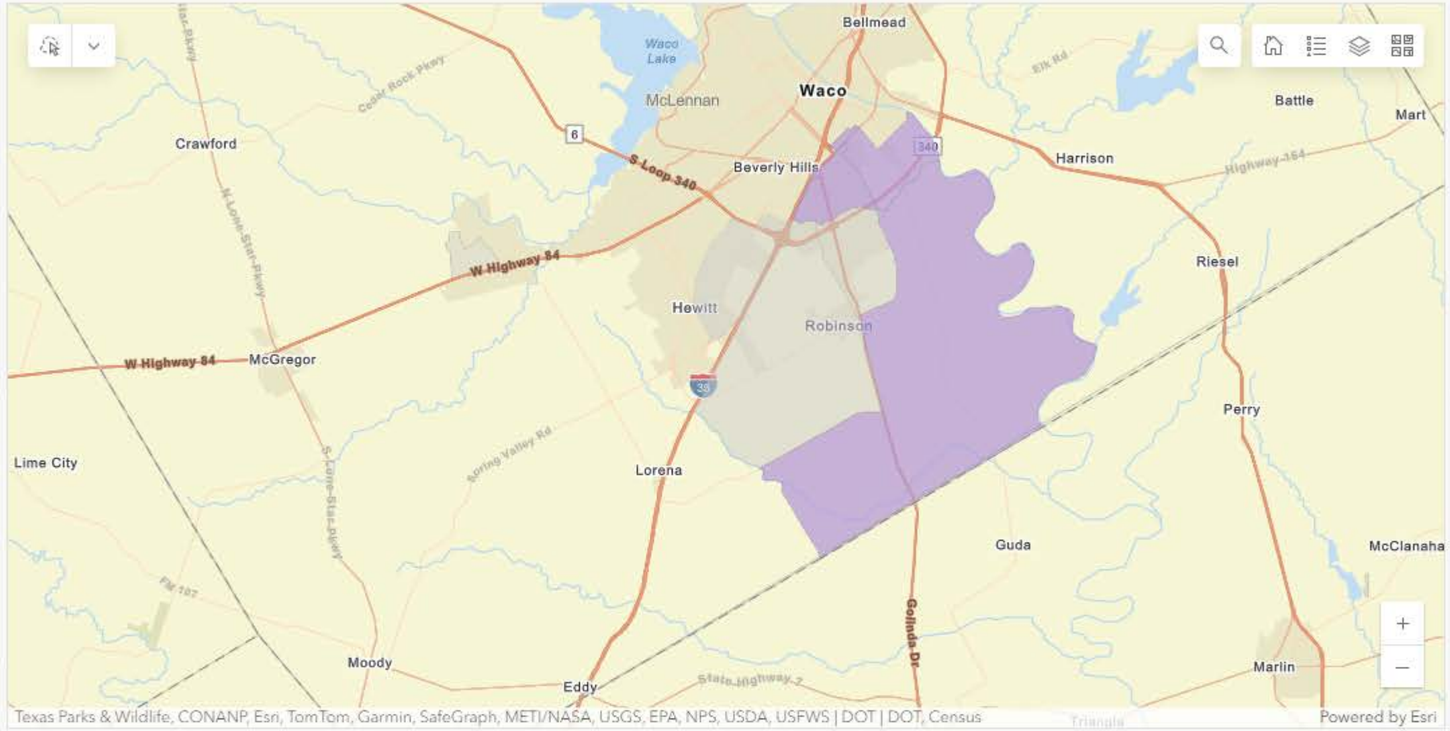
For additional instructions click the arrow on the left side of the page

State Selector: Texas

County Selector: McLennan County, Texas

Community Selector: Robinson, City of (TX)

MPO Selector: All MPOs



Total Population Living in the Selected Project Area

30.4k

Total Population Living in Disadvantaged Census Tracts in the Selected Project Area

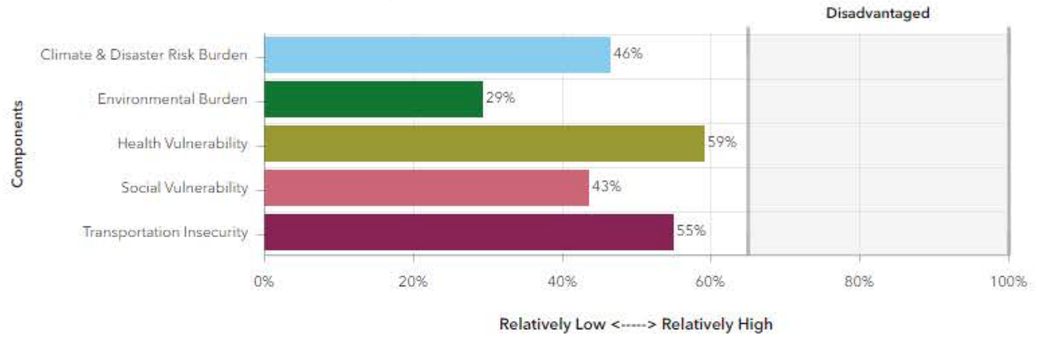
8.7k

% of Disadvantaged Census Tracts in the Selected Project Area

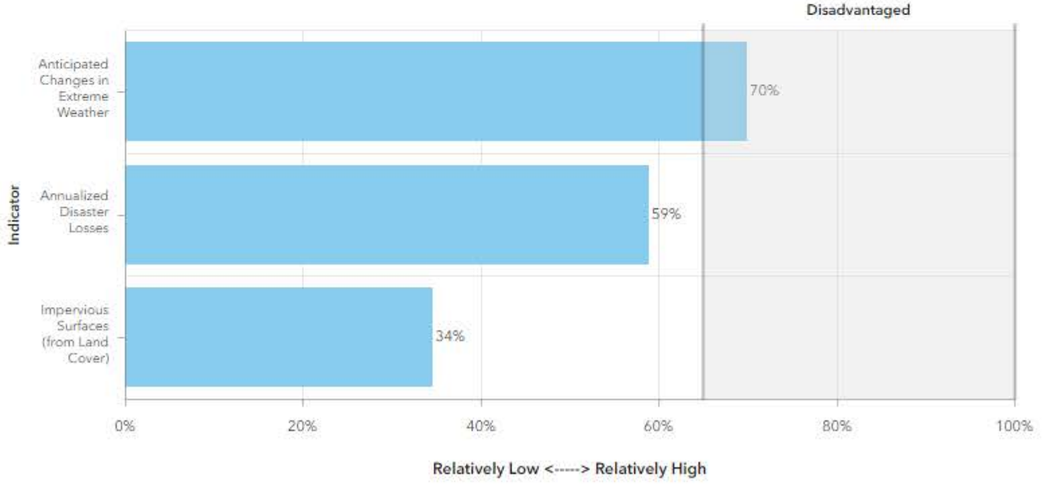
33%

- Component Scores are distinct from Indicator Scores. For more information please see - Understanding the Data.
- Index scores for Alaska, Hawaii and the territories are calculated separately due to unavailable data for certain indicators. The Explorer visualizes unavailable indicator data as '0' values.
- If viewing on a laptop and the dashboard does not display properly- right click on your desktop, select display options, and adjust the zoom to an appropriate resolution (usually 100%).

Overall Disadvantage Component Scores - Percentile Ranked



Climate & Disaster Risk Burden - Percentile Rank



Climate & Disaster

Click on the tab above to change component category. Once selectors are used, click button to reset map ----->

USDOT Equitable Transportation Community (ETC) Explorer

To start use selectors, search, or zoom

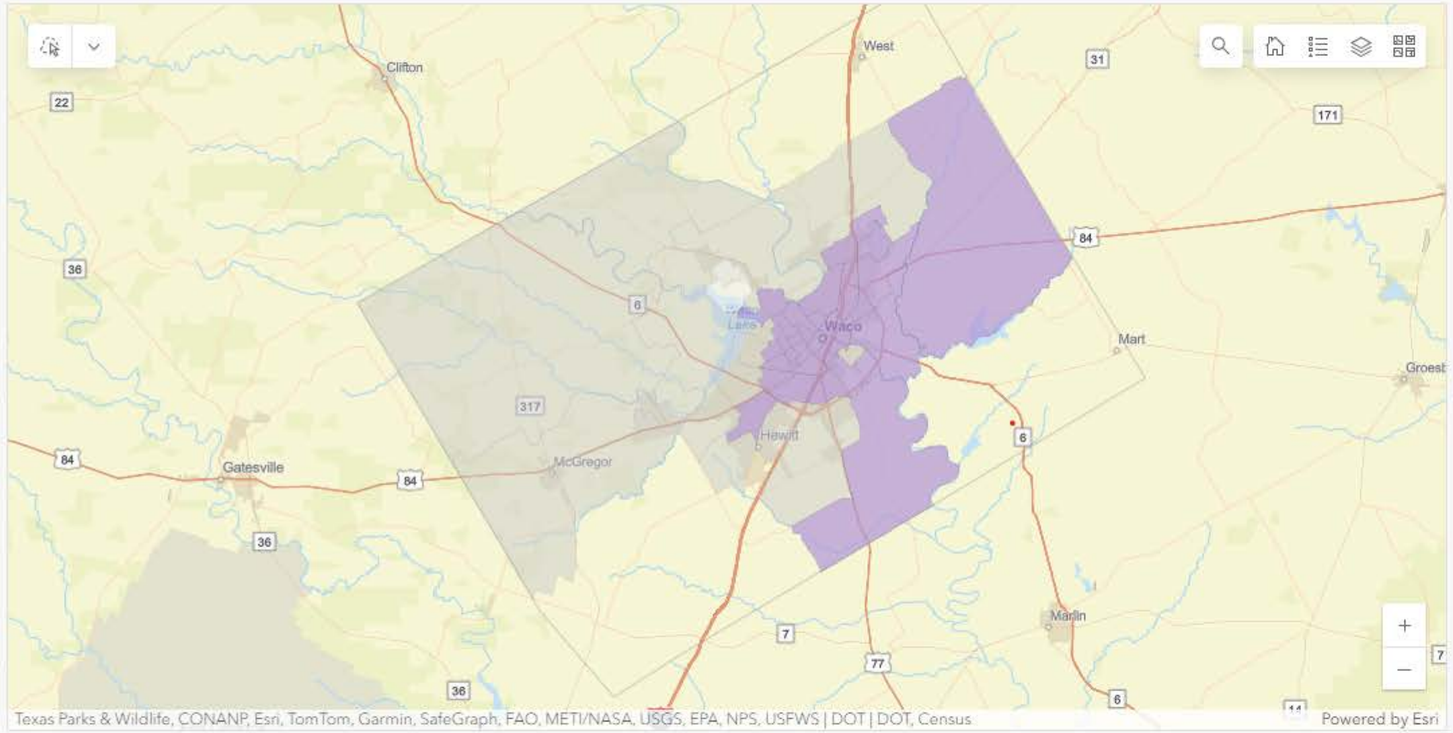
For additional instructions click the arrow on the left side of the page

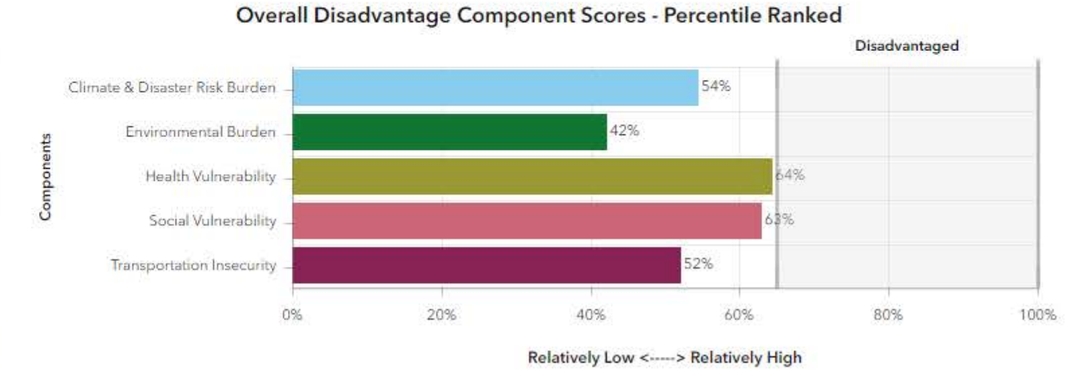
State Selector: Texas

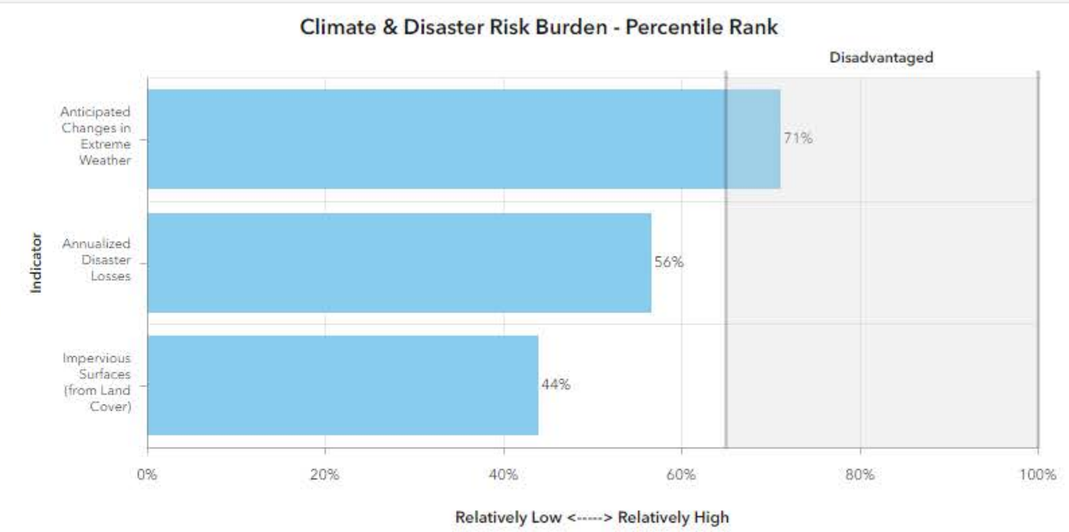
County Selector: McLennan County, Texas

Community Selector: Waco, City of (TX)

MPO Selector: All MPOs







Climate & Disaster

Total Population Living in the Selected Project Area

229.4k

Total Population Living in Disadvantaged Census Tracts in the Selected Project Area

125.7k

% of Disadvantaged Census Tracts in the Selected Project Area

58%

- Component Scores are distinct from Indicator Scores. For more information please see - Understanding the Data.
- Index scores for Alaska, Hawaii and the territories are calculated separately due to unavailable data for certain indicators. The Explorer visualizes unavailable indicator data as '0' values.
- If viewing on a laptop and the dashboard does not display properly- right click on your desktop, select display options, and adjust the zoom to an appropriate resolution (usually 100%).

Click on the tab above to change component category. Once selectors are used, click button to reset map ----->

USDOT Equitable Transportation Community (ETC) Explorer

To start use selectors, search, or zoom

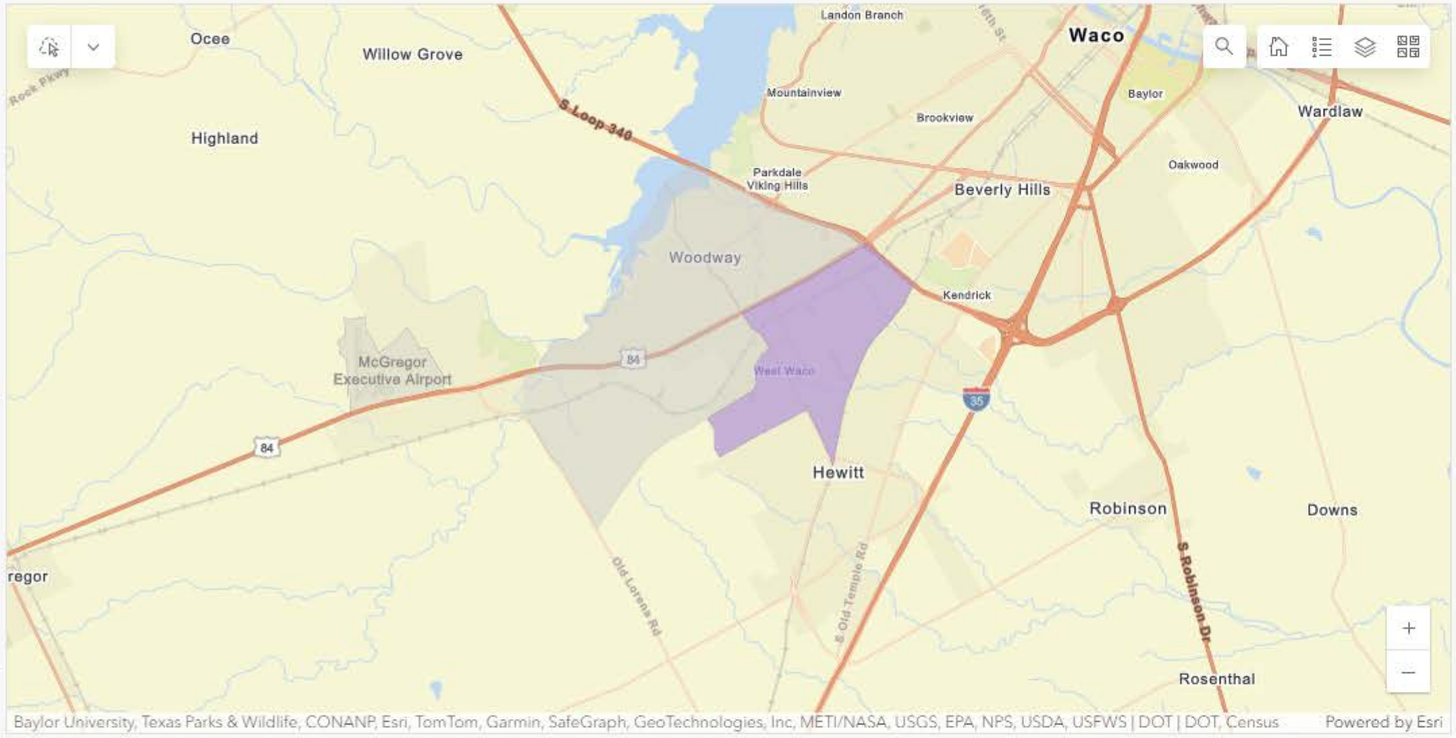
For additional instructions click the arrow on the left side of the page

State Selector: Texas

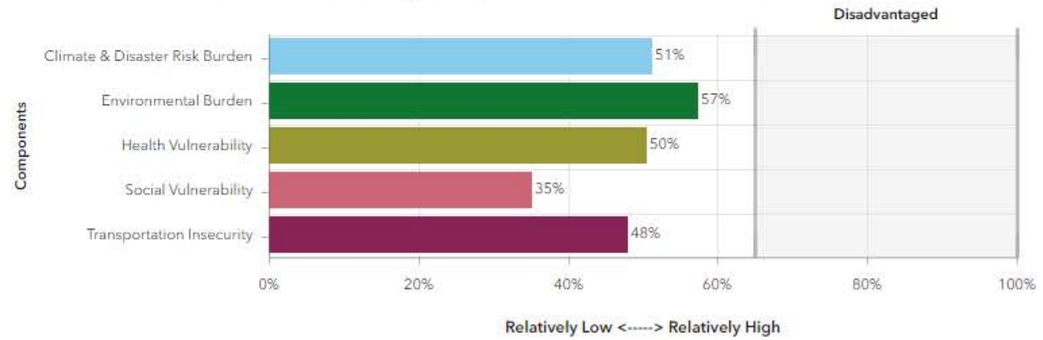
County Selector: McLennan County, Texas

Community Selector: Woodway, City of (TX)

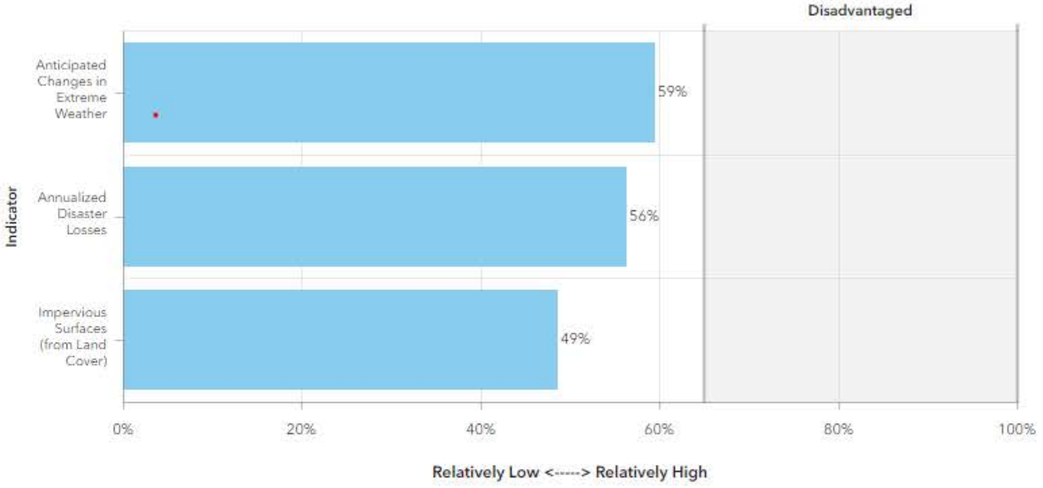
MPO Selector: All MPOs



Overall Disadvantage Component Scores - Percentile Ranked



Climate & Disaster Risk Burden - Percentile Rank



Climate & Disaster

Total Population Living in the Selected Project Area

18.8k

Total Population Living in Disadvantaged Census Tracts in the Selected Project Area

6.1k

% of Disadvantaged Census Tracts in the Selected Project Area

25%

- Component Scores are distinct from Indicator Scores. For more information please see - Understanding the Data.
- Index scores for Alaska, Hawaii and the territories are calculated separately due to unavailable data for certain indicators. The Explorer visualizes unavailable indicator data as '0' values.
- If viewing on a laptop and the dashboard does not display properly- right click on your desktop, select display options, and adjust the zoom to an appropriate resolution (usually 100%).

Click on the tab above to change component category. Once selectors are used, click button to reset map ----->

APPENDIX K

EQUITY COST SHARE ANALYSIS

Bellmead

Priority Project	Project Details	Total Cost	Cost of Improvements in Equity Area	Cost of Improvements in non-Equity Area
1	Citywide Streetlight	$8,476,700	$8,476,700	$0
2	Citywide Sign and Pavement Delineation	$5,340,000	$5,340,000	$0
1	Bellmead Drive - Corridor Safety Improvement Project	$21,443,700	$21,443,700	$0
3	Pedestrian Safety in School Zone	$6,931,100	$6,931,100	$0
2	Harrison Street - Multimodal Corridor Project	$9,006,200	$9,006,200	$0
4	Concord Road - Corridor Safety Improvement Project	$6,279,000	$6,279,000	$0
5	Airbase Road – Intersection Safety Improvement	$2,977,200	$2,977,200	$0
TOTAL		**$60,453,900**	**$60,453,900**	**$0**
Percentage Share			**100%**	**0%**

Hewitt

Priority Project	Project Details	Total Cost	Cost of Improvements in Equity Area	Cost of Improvements in non-Equity Area
1	Citywide Streetlight	$17,596,160	$540,300	$17,055,860
2	Citywide Sign and Pavement Delineation	$5,473,300	$420,500	$5,052,800
3	FM-1695 (N Hewitt Drive) – Corridor Safety Improvements	$27,053,800	$27,053,800	$0
4	FM-1695 (S Hewitt Drive) – Corridor Safety Improvements	$22,242,400	$0	$22,242,400
5	FM-1695 (S Hewitt Drive) – Intersection Safety Improvements	$2,247,800	$0	$2,247,800
6	School Safety Improvements	$5,777,200	$0	$5,777,200
7	Old Temple Road – Corridor Safety Improvements	$1,235,000	$0	$1,235,000
8	FM-2063 (Sun Valley Blvd) – Corridor Safety Improvements	$7,167,600	$0	$7,167,600
9	Warren Street – Corridor Safety Improvements	$612,100	$0	$612,100
TOTAL		**$89,405,360**	**$28,014,600**	**$61,390,760**
Percentage Share			**31%**	**69%**

Lacy Lakeview

Priority Project	Project Details	Total Cost	Cost of Improvements in Equity Area	Cost of Improvements in non-Equity Area
1	Citywide Streetlight	$6,520,500	$6,520,500	$0
2	Citywide Sign and Pavement Delineation	$3,928,400	$3,928,400	$0
3A	BU-77 (New Dallas Hwy) – Corridor Safety Improvement	$15,178,600	$15,178,600	$0
3B	BU-77 (New Dallas Hwy) – Complete Streets Project	$31,261,200	$31,261,200	$0
4	SL-340 (Industrial Blvd) – Corridor Safety Improvement	$2,298,000	$2,298,000	$0
5	FM-2417 (E Crest Drive) – Corridor Safety Improvement	$3,497,500	$3,497,500	$0
6	E Craven Avenue – Corridor Safety Improvement	$5,026,100	$5,026,050	$50
7	Meyers Lane – Corridor Safety Improvement	$808,800	$808,800	$0
TOTAL		**$68,519,100**	**$68,519,050**	**$50**
Percentage Share			**100%**	**0%**

McGregor

Priority Project	Project Details	Total Cost	Cost of Improvements in Equity Area	Cost of Improvements in non-Equity Area
1	Citywide Streetlight	$4,085,700	$0	$4,085,700
2	Citywide Sign and Pavement Delineation	$5,257,800	$0	$5,257,800
3A	Main Street (SH-317) Safety Improvements	$5,066,200	$0	$5,066,200
3B	Main Street (SH-317) Safety Improvements	$3,033,100	$0	$3,033,100
4	US-84 (McGregor Drive) - Intersection Safety Improvements	$2,020,200	$0	$2,020,200
5	W 6th Street Safety Improvements	$806,400	$0	$806,400
6	US-84 (McGregor Drive) Safety Improvements	$10,383,000	$0	$10,383,000
TOTAL		**$30,652,400**	**$0**	**$30,652,400**
Percentage Share			**0%**	**100%**

Robinson

Priority Project	Project Details	Total Cost	Cost of Improvements in Equity Area	Cost of Improvements in non-Equity Area
1	Citywide Streetlight	$10,684,500	$931,500	$9,753,000
2	Citywide Sign and Pavement Delineation	$8,846,200	$1,823,900	$7,022,300
3	US-77 (Robinson Drive) – Corridor Safety Improvements	$32,178,100	$6,900,740	$25,277,360
4	US-77 (Robinson Drive) – Signalized Intersection Safety Improvements	$3,288,500	$565,140	$2,723,360
5	Newland Drive – Corridor Safety Improvements	$248,200	$0	$248,200
6	FM-3148 (W Moonlight Drive) – Corridor Safety Improvements	$181,200	$0	$181,200
7	Greig Drive – Corridor Safety Improvements	$1,841,600	$0	$1,841,600
TOTAL		**$57,268,300**	**$10,221,280**	**$47,047,020**
Percentage Share			**18%**	**82%**

Waco

Priority Project	Project Details	Total Cost	Cost of Improvements in Equity Area	Cost of Improvements in non-Equity Area
1	17th and 18th Street Corridor Safety Improvements	$11,884,900	$11,884,900	$0
2	N Valley Mills Drive Complete Street Improvements	$16,393,900	$5,919,400	$10,474,500
3	Hewitt Drive Complete Streets Multimodal Project	$22,484,000	$22,484,000	$0
4	Bosque Boulevard Corridor Safety Improvements	$13,758,600	$10,021,400	$3,737,200
5	FM 1637 Corridor Safety Improvements	$33,002,100	$27,080,200	$5,921,900
6	S New Road Corridor Safety Improvements	$15,885,600	$15,885,600	$0
7A	Lake Shore Dr Corridor Safety Improvements (N 19th St to Mt Carmel Dr)	$15,864,600	$8,463,500	$7,401,100
7B	Lake Shore Dr Corridor Safety Improvements (Mt Carmel Dr to Bishop Dr)	$406,400	$0	$406,400
8	Sanger Avenue Safety Improvements	$12,776,700	$2,446,100	$10,330,600
TOTAL		**$135,744,400**	**$142,456,800**	**$104,185,100**
Percentage Share			**73%**	**27%**

Woodway

Priority Project	Project Details	Total Cost	Cost of Improvements in Equity Area	Cost of Improvements in non-Equity Area
1	Citywide Streetlight	$11,364,300	$279,500	$11,084,800
2	Citywide Sign and Pavement Delineation	$7,690,200	$203,900	$7,486,300
3	Estates Drive – Corridor Safety Improvements	$630,100	$0	$630,100
4	Bosque Blvd – Corridor Safety Improvement	$1,218,600	$0	$1,218,600
5	Santa Fe Drive – Corridor Safety Improvements	$85,100	$0	$85,100
6	Ritchie Road and Old McGregor Road – Intersection Safety Improvements	$98,500	$0	$98,500
TOTAL		**$21,086,800**	**$483,400**	**$20,603,400**
Percentage Share			**2%**	**98%**

Unincorporated McLennan County

Priority Project	Project Details	Total Cost	Cost of Improvements in Equity Area	Cost of Improvements in non-Equity Area
1	Countywide Streetlight	$23,151,900	$8,897,900	$14,254,000
2	Countywide Sign Inventory	$6,628,300	$2,651,420	$3,976,880
1	Ritchie Road – Pedestrian Connectivity Improvements	$1,031,900	$0	$1,031,900
2	Intersection Safety Improvements - Aviation Pkwy and US-84	$677,200	$677,200	$0
3	Intersection Safety Improvements - IH-35 and Ross Road	$85,600	$0	$85,600
4	Intersection Safety Improvements - County List	$1,911,900	$838,700	$1,073,200
5	Mazanec Road – Corridor Safety Improvements	$4,351,200	$1,901,900	$2,449,300
6	Intersection Safety Improvements - FM 2113 (Spring Valley Road) and FM 2837 (Old Lorena Road)	$470,300	$0	$470,300
7	Rock Creek Road – Corridor Safety Improvements	$1,827,300	$0	$1,827,300
8	Speegleville Road – Corridor Safety Improvements	$2,197,300	$0	$2,197,300
9	Chapel Road – Corridor Safety Improvements	$5,137,600	$0	$5,137,600
TOTAL		**$47,470,500**	**$14,967,120**	**$32,503,380**
Percentage Share			**32%**	**68%**

APPENDIX L

COLLISION CATEGORY GROUPING

Contributing Factors (TxDOT CRIS Categories)	Contributing Factors (Categories used in Waco CSAP)
FAILED TO CONTROL SPEED	Unsafe Speed
FAILED TO DRIVE IN SINGLE LANE	Other Improper Driving
NONE	Unknown
DRIVER INATTENTION	Distracted Driving
DISTRACTION IN VEHICLE	Distracted Driving
DISREGARD STOP AND GO SIGNAL	Traffic Signals and Signs
TURNED IMPROPERLY - WIDE RIGHT	Improper Turning
FOLLOWED TOO CLOSELY	Following Too Closely
DISREGARD STOP SIGN OR LIGHT	Traffic Signals and Signs
UNDER INFLUENCE - ALCOHOL	Driving or Bicycling Under the Influence of Alcohol or Drug
FAILED TO YIELD RIGHT OF WAY - TURNING LEFT	Automobile Right of Way
FAILED TO YIELD RIGHT OF WAY - STOP SIGN	Automobile Right of Way
FAULTY EVASIVE ACTION	Other Improper Driving
FAILED TO STOP AT PROPER PLACE	Traffic Signals and Signs
BACKED WITHOUT SAFETY	Unsafe Starting or Backing
FAILED TO YIELD RIGHT OF WAY - PRIVATE DRIVE	Automobile Right of Way
DISABLED IN TRAFFIC LANE	Impeding Traffic
OTHER (EXPLAIN IN NARRATIVE)	Other Unforeseen Reasons
CHANGED LANE WHEN UNSAFE	Unsafe Lane Change
UNSAFE SPEED	Unsafe Speed
IMPAIRED VISIBILITY (EXPLAIN IN NARRATIVE)	Impaired Visibility
TURNED IMPROPERLY - WRONG LANE	Improper Turning
HAD BEEN DRINKING	Driving or Bicycling Under the Influence of Alcohol or Drug
TURNED IMPROPERLY - CUT CORNER ON LEFT	Improper Turning
TURNED WHEN UNSAFE	Improper Turning
FATIGUED OR ASLEEP	Driver Condition
WRONG SIDE - APPROACH OR INTERSECTION	Wrong Side of Road
ANIMAL ON ROAD - DOMESTIC	Other Unforeseen Reasons
UNDER INFLUENCE - DRUG	Driving or Bicycling Under the Influence of Alcohol or Drug
ILL (EXPLAIN IN NARRATIVE)	Driver Condition
FLEEING OR EVADING POLICE	Other Unforeseen Reasons
FAILED TO YIELD RIGHT OF WAY - TURN ON RED	Automobile Right of Way
ROAD RAGE	Other Unforeseen Reasons
DISREGARD TURN MARKS AT INTERSECTION	Traffic Signals and Signs
OVERSIZED VEHICLE OR LOAD	Other Unforeseen Reasons
FAILED TO YIELD RIGHT OF WAY - YIELD SIGN	Automobile Right of Way
ANIMAL ON ROAD - WILD	Other Unforeseen Reasons
FAILED TO YIELD RIGHT OF WAY - OPEN INTERSECTION	Automobile Right of Way

FAILED TO YIELD RIGHT OF WAY - TO PEDESTRIAN	Automobile Right of Way
WRONG WAY - ONE WAY ROAD	Wrong Side of Road
CELL/MOBILE PHONE USE	Due to Use Of Phone
FAILED TO PASS TO LEFT SAFELY	Improper Passing
FAILED TO PASS TO RIGHT SAFELY	Improper Passing
TAKING MEDICATION (EXPLAIN IN NARRATIVE)	Driving or Bicycling Under the Influence of Alcohol or Drug
CELL/MOBILE DEVICE USE - OTHER	Due to Use Of Phone
PEDESTRIAN FAILED TO YIELD RIGHT OF WAY TO VEHICLE	Pedestrian Right of Way
PASSED ON RIGHT SHOULDER	Improper Passing
PARKED IN TRAFFIC LANE	Improper Parking
SPEEDING - (OVERLIMIT)	Unsafe Speed
WRONG SIDE - NOT PASSING	Wrong Side of Road
FAILED TO YIELD RIGHT OF WAY - EMERGENCY VEHICLE	Automobile Right of Way
OVERTAKE AND PASS INSUFFICIENT CLEARANCE	Improper Passing
DROVE WITHOUT HEADLIGHTS	Lights
CELL/MOBILE DEVICE USE - UNKNOWN	Due to Use Of Phone
LOAD NOT SECURED	Other Unforeseen Reasons
FAILED TO HEED WARNING SIGN	Traffic Signals and Signs
HANDICAPPED DRIVER (EXPLAIN IN NARRATIVE)	Driver Condition
FAILED TO GIVE HALF OF ROADWAY	Automobile Right of Way
DISREGARD WARNING SIGN AT CONSTRUCTION	Traffic Signals and Signs
FAILED TO SIGNAL OR GAVE WRONG SIGNAL	Traffic Signals and Signs
PASSED IN NO PASSING LANE	Improper Passing
IMPROPER START FROM PARKED POSITION	Unsafe Starting or Backing
FAILED TO STOP FOR TRAIN	Traffic Signals and Signs
CELL/MOBILE DEVICE USE - TEXTING	Due to Use Of Phone
PARKED AND FAILED TO SET BRAKES	Improper Parking
FIRE IN VEHICLE	Other Unforeseen Reasons
OPENED DOOR INTO TRAFFIC LANE	Impeding Traffic
CELL/MOBILE DEVICE USE - TALKING	Due to Use Of Phone
FAILED TO STOP FOR SCHOOL BUS	Traffic Signals and Signs
FAILED TO SLOW OR MOVE OVER FOR VEHICLES DISPLAYING EMERGENCY LIGHTS	Traffic Signals and Signs
PARKED WITHOUT LIGHTS	Improper Parking

Manner of Collision (TxDOT CRIS Categories)	Manner of Collision (Categories used in Waco CSAP)
ANGLE - BOTH GOING STRAIGHT	D - Broadside
ANGLE - BOTH LEFT TURN	B - Sideswipe
ANGLE - BOTH RIGHT TURN	B - Sideswipe
ANGLE - ONE LEFT TURN-ONE STOPPED	D - Broadside
ANGLE - ONE RIGHT TURN-ONE LEFT TURN	B - Sideswipe
ANGLE - ONE RIGHT TURN-ONE STOPPED	D - Broadside
ANGLE - ONE STRAIGHT-ONE BACKING	D - Broadside
ANGLE - ONE STRAIGHT-ONE LEFT TURN	D - Broadside
ANGLE - ONE STRAIGHT-ONE RIGHT TURN	D - Broadside
ANGLE - ONE STRAIGHT-ONE STOPPED	D - Broadside
ONE MOTOR VEHICLE - BACKING	E - Hit Object
ONE MOTOR VEHICLE - GOING STRAIGHT	E - Hit Object
ONE MOTOR VEHICLE - OTHER	E - Hit Object
ONE MOTOR VEHICLE - TURNING LEFT	E - Hit Object
ONE MOTOR VEHICLE - TURNING RIGHT	E - Hit Object
OPPOSITE DIRECTION - BOTH GOING STRAIGHT	A - Head-On
OPPOSITE DIRECTION - BOTH LEFT TURNS	A - Head-On
OPPOSITE DIRECTION - ONE BACKING-ONE STOPPED	A - Head-On
OPPOSITE DIRECTION - ONE LEFT TURN-ONE STOPPED	A - Head-On
OPPOSITE DIRECTION - ONE RIGHT TURN-ONE LEFT TURN	A - Head-On
OPPOSITE DIRECTION - ONE RIGHT TURN-ONE STOPPED	A - Head-On
OPPOSITE DIRECTION - ONE STRAIGHT-ONE BACKING	A - Head-On
OPPOSITE DIRECTION - ONE STRAIGHT-ONE LEFT TURN	D - Broadside
OPPOSITE DIRECTION - ONE STRAIGHT-ONE RIGHT TURN	A - Head-On
OPPOSITE DIRECTION - ONE STRAIGHT-ONE STOPPED	A - Head-On
OTHER	H - Other
OTHER - BOTH BACKING	H - Other
OTHER - BOTH ENTERING OR LEAVING A PARKING SPACE	H - Other
OTHER - ONE ENTERING OR LEAVING PARKING SPACE-ONE STOPPED	H - Other
OTHER - ONE LEFT TURN-ONE ENTERING OR LEAVING PARKING SPACE	H - Other
OTHER - ONE RIGHT TURN-ONE ENTERING OR LEAVING PARKING SPACE	H - Other
OTHER - ONE STRAIGHT-ONE ENTERING OR LEAVING PARKING SPACE	H - Other
SAME DIRECTION - BOTH GOING STRAIGHT-REAR END	C - Rear End
SAME DIRECTION - BOTH GOING STRAIGHT-SIDESWIPE	B - Sideswipe
SAME DIRECTION - BOTH LEFT TURN	B - Sideswipe
SAME DIRECTION - BOTH RIGHT TURN	B - Sideswipe
SAME DIRECTION - ONE LEFT TURN-ONE STOPPED	D - Broadside
SAME DIRECTION - ONE RIGHT TURN-ONE LEFT TURN	D - Broadside
SAME DIRECTION - ONE RIGHT TURN-ONE STOPPED	D - Broadside
SAME DIRECTION - ONE STRAIGHT-ONE LEFT TURN	D - Broadside
SAME DIRECTION - ONE STRAIGHT-ONE RIGHT TURN	D - Broadside
SAME DIRECTION - ONE STRAIGHT-ONE STOPPED	C - Rear End