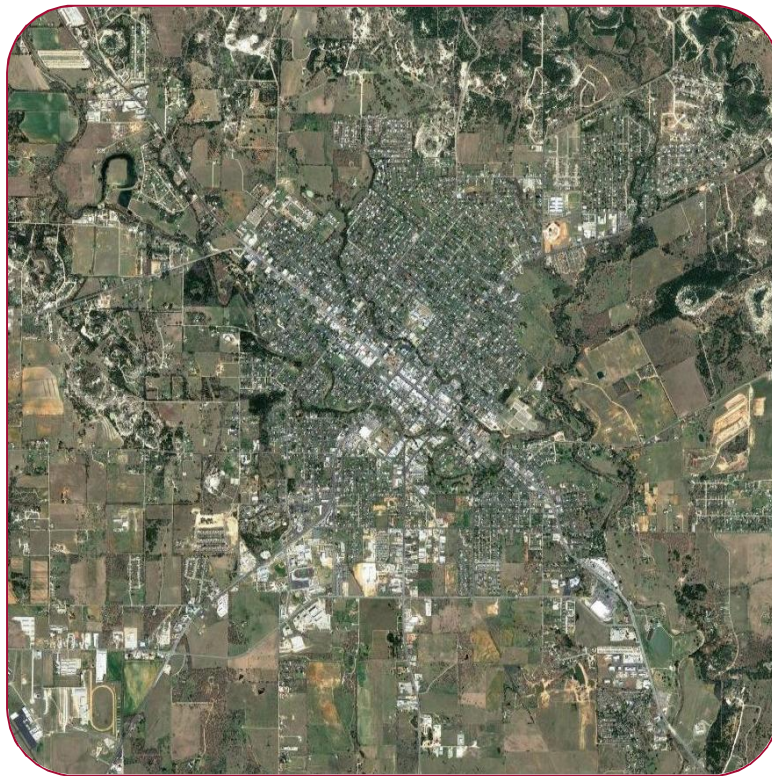


DRAFT
FREDERICKSBURG SHORT TERM
TRANSPORTATION PROJECTS MEMO



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Prepared By:

SHORT TERM PROJECTS SUMMARY

As part of the Transportation Projects Traffic Impact Study (TIS), Kimley-Horn was tasked with identifying, evaluating, and recommending short term projects that can help enhance operations and safety on the transportation system in Fredericksburg. The purpose of this memo is to break out projects by type and assumed need for engineering design. Project types include the following: 1) Minor Pavement Markings & Signs, 2) Signal Timing and Phasing Adjustments, 3) Designed Intersection Improvements, 4) Designed Striping and Signs, 5) Designed Structural Improvements. Generally, project types 1 and 2 should be able to be performed without detailed design and may potentially be done by TxDOT without involvement by the City on existing contracts. Items 3 through 5 will likely require engineered plans and review and approval by TxDOT. Funding of improvements and design is yet to be determined, but this memo helps to identify possible cost sharing measures and responsibilities between the City of Fredericksburg and TxDOT as well as estimated planning level costs of design and construction, which would be adjusted during actual design.

The following Table 1 illustrates each project type with approximate engineering costs (if detailed design is needed) and estimated implementation costs.

Table 1 – Estimated Planning Level Costs by Project Type

Project Type	Project Subtype	Estimated Engineering Costs	Estimated Implementation Costs
1) Minor Pavement Markings & Signs	Stop Bar Relocation	n/a ¹	\$10,000
	Lane Assignment	n/a ¹	\$70,000
2) Signal Timing and Phasing Adjustments	n/a	n/a ¹	\$10,000
3) Designed Intersection Improvements	n/a	\$30,000 to \$40,000	\$85,000 to \$95,000
4) Designed Striping and Signs	n/a	\$35,000	\$150,000
5) Designed Structural Improvements	Operational	\$75,000 to \$90,000	\$355,000 to \$370,000
	TOTAL COSTS	\$140,000 to \$165,000	\$660,000 to \$685,000²
		GRAND TOTAL	\$810,000²

¹To be determined in coordination with TxDOT if design is necessary

²Assumes striping project on US 290 in project Type 4 moves forward, reducing project costs at Olive and Main and US 290 at Highway by \$20,000 combined.

It is assumed that projects would proceed forward as one set of plans to minimize the amount of required TxDOT coordination and approvals for various projects and to minimize engineering costs. The remainder of this memo provides specific detail for location of short-term improvements by project type for further discussion of implementation cost sharing with TxDOT.

1. MINOR PAVEMENT MARKINGS & SIGNS PROJECTS

Generally, projects that are categorized as this project type are minor pavement markings adjustments totaling no more than 200 to 300 linear feet of pavement markings. These may need to be evaluated on a

case-by-case basis if these can be done without design, as some locations may require resurfacing to ensure that pavement scarring from removal of old pavement markings doesn't cause driver confusion.

The following locations include moving stop bars back by up to 30' at the referenced intersections to accommodate turning truck conflicts. These improvements are estimated to cost approximately \$2,500 to implement per approach per location, for a planning level estimated total of **\$10,000**. Intersections recommended for new striping and signs include:

- Main at Milam (x2)
- Main at Adams (x2)

The following locations include adjusting lane assignment striping and centerline striping that repurposes existing pavement space without requiring modification to existing signal head faces but may require a mast arm lane assignment sign associated with the restriping at an existing signal. These improvements are estimated to cost approximately \$5,000 per approach, per location, for a planning level estimated total of **\$70,000**. Intersections recommended for new striping and signs with no signal adjustments include:

- Main at Orange (x2)
- Main at Llano (x2)
- Main at Lincoln (x2)
- US 290 at Friendship
- Llano at Austin (x2)
- Adams at San Antonio (x2)
- Adams at Live Oak
- SH 16 at Milam (x2)

2. SIGNAL TIMING & PHASING ADJUSTMENTS

Generally, projects that are categorized as this project type do not impact existing signal infrastructure and are simply changing existing timing or phasing of signals. Examples of this are utilizing existing signal heads with turn signal indications during a time of day when they are currently turned off or not in use or adjusting minimum green times to better accommodate movements anticipated to have higher demand. This project type could be implemented separately as part of an ongoing program of citywide signal retiming every 3 years based on changes in demand.

The following locations show signal timing adjustments that do not include other design for intersection improvements or structural improvements and are estimated to cost \$2,500 per location for a total of **\$10,000**:

- Main at Milam
- Main at Adams
- Main at Llano
- Main at Lincoln

3. DESIGNED INTERSECTION IMPROVEMENTS

Generally, projects that are categorized as this project type include adjustments to signal equipment as a threshold for inclusion. Intersections that include structural improvements such as new pavement or median design are not included in this project type. Additional striping, signal timing implementation, and any other non-structural improvements are also incorporated in the cost of each intersection. Approximate costs are provided for each intersection below with a brief description of all improvements associated with intersection design.

- Main at Washington – includes adding a right turn lane eastbound in existing pavement space (which may require removal of some parking), making Washington St one way northbound north

of Main Street, removing signal arm in the southbound direction, adding one-way signage at the intersection, and adding a right-turn overlap signal indication and phase eastbound – total cost estimated to be **\$27,500**

- Main at Elk – includes restriping northbound and southbound Elk to include a left turn lane in each direction, and adding a signal head and phase for southbound protected left turns – total cost estimated to be **\$22,500**
- Main at Olive^A - includes restriping of all 4 approaches to the intersection for left turn lanes and lane reassignment and adding a signal head and phase for a protected eastbound left turn – total cost estimated to be **\$30,000**
- Llano at Travis – includes restriping eastbound and westbound approaches for turn lanes and adding a signal head and phase for protected-permissive eastbound left turns – total cost estimated to be **\$20,000**
- Adams at Creek – includes restriping of eastbound and westbound approaches, removal of the westbound traffic signal arm and signage for one-way operation – total cost estimated to be **\$10,000**
- SH 16 at Highway – includes restriping of the westbound Highway Street approach for different lane assignment and adding a signal head and phase for a protected-permissive westbound left turns – total cost estimated to be **\$15,000**

The total cost for engineering design for these projects is estimated to be roughly **\$30,000 to \$40,000**, and total construction implementation cost is estimated to be roughly **\$85,000 to \$95,000** for a total cost of **\$125,000**.

^A **Note:** if the designed striping and signs project on US 290 moves forward, the overall cost for Main at Olive is **reduced by \$10,000** and the total cost for construction implementation is also **reduced by \$10,000**.

4. DESIGNED STRIPING AND SIGNS

This category is reserved for a more substantial signing and markings project that would involve re-striping on US 290 for more than one block length. Two projects are included in this category:

- East of Baron Creek to US 290 at Cristol Dr for a length of approximately 0.75 miles – the existing 62' pavement section would change from a 4-lane undivided roadway to a 5-lane undivided roadway with a center Two-Way Left Turn Lane (TWLTL). The total cost for engineering design on this project is estimated to be roughly **\$20,000** and total construction implementation cost is estimated to be roughly **\$100,000**.
- Milam St to Elk Street for approximately 0.91 miles – the existing pavement section would be restriped to remove the 6' painted median along this stretch of US 290 as contemplated in the Transportation Master Plan from 2017. At a posted speed of 30 mph and with a 5-6' shifting taper, the length for tapers to the center of the roadway could be approximately 40' behind the end of queuing space for left turns off US 290 at signalized intersections. This may further enhance compliance with the posted speed limit through lateral shifts and eliminate perception of the painted median as a center turn lane. Further, by moving the inside lanes further away from angled parking, vehicles in outside lanes can avoid conflict with longer vehicles parked in stalls. The total cost for engineering design on this project is estimated to be roughly **\$15,000** and total construction implementation cost is estimated to be roughly **\$50,000**.

5. DESIGNED STRUCTURAL IMPROVEMENTS

Generally, projects that are categorized as this project type include asphalt or concrete construction at the project location as a threshold for inclusion. Intersections that include signal infrastructure upgrades without structural improvements are not included in this project type. Additional striping, signal timing implementation, and any other non-structural improvements are also incorporated in the cost of each intersection. Approximate costs are provided for each intersection below with a brief description of all improvements associated with intersection design.

- US 290 W at US 87 N (The “Y”) – includes median construction and modification for access control in conjunction with pavement markings for navigation through the intersection. – total cost estimated to be **\$17,500**.
- US 290 at Highway^B – this project includes restriping all 4 approaches to the intersection for new lane assignments, retiming the signal to allow for permissive-protected left turn operations on the northbound and southbound approaches and construction of a “porkchop” median island at the Whataburger driveway to restrict turns to right-in, right-out only – total cost estimated to be **\$27,500**
- SH 16 at Windcrest – this project includes restriping eastbound Windcrest for a left turn lane and adding a signal head that allows for protected left turns eastbound. In addition, this project includes making modifications to the roadway alignment through curb and striping modifications on the westbound Windcrest approach to make the intersection more intuitive to drivers – total cost estimated to be **\$36,000**
- SH at Friendship – this project includes addition of a southbound right turn lane from SH 16 onto Tivydale Rd (FM 2093) – total cost estimated to be **\$120,000**
- Washington (US 87) at Highway – this project includes restriping to add left turn lanes on all approaches to the intersection, updating signal phasing for permissive-protected left turns on northbound and southbound Washington with existing equipment, and adjusting the drainage feature on the east side of the intersection to improve safety for errant vehicles – total cost estimated to be **\$60,000**
- Washington (US 87) at Walnut and Granite – This project is an access management project for approximately 0.15 miles along Washington Ave (US 87) to restripe the roadway as a 5 lane undivided roadway and adjust access from adjacent properties through the use of medians – total cost estimated to be **\$154,000**
- Milam at Austin^C – This project includes installation of an all-way stop, which meets warrants per analysis in the TIS, and addition of high visibility crosswalks, stop bars and a jigsaw curb at intersection corners to guide vehicles around exposed drainage inlets in the roadway – total cost estimated to be **\$30,000**

The total cost for engineering design for these projects is estimated to be roughly **\$75,000 to \$90,000**, and total construction implementation cost is estimated to be roughly **\$355,000 to \$370,000** for a total cost of **\$455,000**.

^B **Note:** if the designed striping and signs project on US 290 moves forward, the overall cost for US 290 at Highway is **reduced by \$10,000** and the total cost for construction implementation is also **reduced by \$10,000**.

^C **Note:** if the jigsaw curbs are removed from this project scope, the overall cost for Milam at Austin is **reduced by \$10,000** and the total cost for construction implementation is also **reduced by \$10,000**. This project would also change types to at Type 1 – Minor Pavement Markings and Signs project.