

FM 76 Feasibility Study Level 2 Screening Matrix

Goals	Objectives	Criteria	Measure & Source	Scoring Points (0 Lowest) to (5 Highest)	Alternative 1 Concept Score	Alternative 2 Concept Score	Alternative 3 Concept Score	Alternative 1 Scoring Explanation	Alternative 2 Scoring Explanation	Alternative 3 Scoring Explanation	Methodology
Roadway Mobility	Improve roadway mobility and increase capacity to accommodate future traffic and incident management plan reworking	Peak Hour Delay	Reduction of Peak Hour Delay in the Travel Model	80% Reduction or More (5 Points) 50% to 79% Reduction (4 Points) 40% to 59% Reduction (3 Points) 20% to 39% Reduction (2 Points) 1% to 19% Reduction (1 Point) No Reduction (0 Points)	5	5	5	84% Total Reduction in Peak Hour Delay.	88% Total Reduction in Peak Hour Delay.	88% Total Reduction in Peak Hour Delay.	The CDM Smith team modeled the no build scenario and each alternative which then allowed the team to calculate the peak hour delay at each intersection, and the average improvements for each alternative were then calculated. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration & Modeling
		I-10 Intersection Linkage Count	Intersection Improvements for I-10 Linkages in Concept	5+ Added Intersection Improvements (5 Points) 2 to 4 Added Intersection Improvements (3 Points) 1 Added Intersection Improvement (1 Point) No Added Intersection Improvements (0 Points)	3	3	3	The intersection improvements present at I-10, Horizon Blvd, Fabens Ave, and Alameda all of which connect to I-10 and have been improved within this alternative.	The intersection improvements present at I-10, Horizon Blvd, Fabens Ave, and Alameda all of which connect to I-10 and have been improved within this alternative.	The intersection improvements present at I-10, Horizon Blvd, Fabens Ave, and Alameda all of which connect to I-10 and have been improved within this alternative.	Each intersection with connections to I-10 within the corridor was examined individually by the CDM Smith team who decided the best course of action for the intersection based upon engineering judgement, modeling efforts, and other studies previously conducted such as the Horizon Blvd feasibility study, and each intersection then had improvements made depending on Peak Hour Delay and Level of Service rating. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts & Configuration
		Roadway Capacity	Volume to Capacity Ratio (V/C) Change within the Travel Model from No Build (2045) to Build (2045)	40% or More Improvement in V/C Ratio (5 Points) 20% to 39% Improvement in V/C Ratio (3 Points) 1% to 19% Improvement in V/C Ratio (1 Point) No Improvement in V/C Ratio (0 Point)	5	5	5	Average of 42.8% Improvement in V/C Ratio	Average of 47.4% Improvement in V/C Ratio	Average of 47.4% Improvement in V/C Ratio	The study team modeled the no build scenario and each alternative which then allowed the team to calculate the V/C Ratio throughout the corridor for each alternative and the no build scenario. Each were then scored. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration & Modeling
Safety & Traffic Operations	Introducing safety improvements including lighting, addressing safety hotspots, and added shoulder improvements	Lighting Improvements	Percentage of Additional Lighting Added in Concept	50% or More Lighting Throughout the Corridor (5 Points) 20% to 50% Lighting Throughout the Corridor (3 Points) 1% to 20% Lighting Throughout the Corridor (1 Point) No Lighting Improvements Throughout the Corridor (0 Points)	1	5	5	Typical Section 4 and Typical Section 5 don't contain lighting improvements within any of their concepts. Typical Section 7 however does, but is only used for a small portion of the corridor in Fabens.	Typical Section 2A, Typical Section 5A and Typical Section 7 all contain lighting within their concept.	Both Typical Section 1 and Typical Section 5B contain lighting and thus lighting would be much more present throughout the corridor.	The typical sections present within each alternative were examined, and the presence of lighting within each alternative were examined and then scored in comparison to the no build scenario. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration & ArcGIS Pro Google Maps Layer
		Safety Improvements	Addressing KAB hotspots & Safety Concerns Identified in Safety Memo	Specific Safety Improvement Applications to KAB Hotspots (5 Points) General Safety Improvements Throughout the Corridor (3 Points) Spot Safety Improvements (1 Point) No Safety Improvements (0 Points)	5	5	5	Specific Safety Improvement Applications to KAB Hotspots are seen within Typical Section 5 addressed the KAB Segment Hotspot surrounding the intersection of Fabens Road / Island Road and Clint Road has an added buffer and lower speed limits. Similarly, Typical Section 5 includes a larger Two Way Left Turn Lane and Shoulders which apply at Hotspots around Furrer Robb Road's intersection. Typical Section 4 addresses KAB Hotspots along Horizon Boulevard, Bauman Road and San Elzario Road through improved shoulders and a Two Way Left Turn Lane.	Typical Section 2A provides improvements along Horizon Boulevard, Bauman Road and San Elzario Road through improved medians, and lighting additions. Similarly, improvements to KAB Hotspots are seen within Typical Section 5A addressed the KAB Segment Hotspot surrounding the intersection of Fabens Road / Island Road and Clint Road has larger shoulders and lower speed limits. Typical Section 7 did not address any KAB hotspots though it was used for a small portion of the road. Source: Concepts & Appendix B - Safety Analysis Memo Figure 14: Roadway Segment KAB Hotspot Map	Typical Section 1 provides improvements along Horizon Boulevard, Bauman Road and San Elzario Road through improved medians. Similarly, improvements to KAB Hotspots are seen within Typical Section 5B addressed the KAB Segment Hotspot surrounding the intersection of Fabens Road / Island Road and Clint Road has larger Two Way Left Turn Lane and lower speed limits. Typical Section 7 did not address any KAB hotspots though it was used for a small portion of the road. Source: Concepts & Appendix B - Safety Analysis Memo Figure 14: Roadway Segment KAB Hotspot Map	The intersections and typical sections present within each alternative were examined, and the presence of improvements to intersections and portions of the corridor with elevated KAB crash rates were examined. Scores were applied based upon where specific safety improvements were made, and their presence throughout typical sections and at intersections. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration & Appendix B - Safety Analysis Memo Figure 14: Roadway Segment KAB Hotspot Map
		Shoulder Width	Shoulder Width Addition and / or Paving Improvements in Concept	10 Feet or More Paved Shoulders (5 Points) Additional Shoulder Width or Paved Shoulders Throughout the Corridor (3 Points) No Change in Shoulders (0 Point)	5	3	3	Alternative 1 utilized Typical section 4 which provides 10-12' shoulders / bar pull outs. Typical section 5, a typical section with 10' shoulders was also utilized with these two sections comprising the entire corridor up to 5th Street and subsequently Fabens. While within Fabens Typical section 7 was used, and it did not have any shoulders, as it was only used between 5th Street and Island Road and Alameda Ave. In for a very short section. Alternative 1 seems to be very cognizant of shoulders.	Typical Section 2A Contains 8' paved shoulders however these are only present on one side and Typical Section 7 did not contain any paved shoulders, thus they aren't present throughout the corridor. While Typical Section 5A contains 10' paved shoulders present on both sides.	Typical Section 1 and Typical Section 7 don't contain paved shoulders, though Typical Section 5B contains 12' shoulders and provides large improvements over the current 4' shoulders present within the current configuration.	The typical sections present within each alternative were examined, and the presence of shoulders, their paving and their width were examined and then scored in comparison to the no build. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration & ArcGIS Pro Google Maps Layer
Access Management	Integrating divided roadway improvements (medians or turning lanes)	Intersection Control Delay Time	Reduction in Intersection Control Delay in Travel Model	40% or Greater Reduction in Control Delay (5 Points) 20% to 39% Reduction Control Delay (3 Points) 1% to 19% Reduction Control Delay (1 Point) No Reduction in Control Delay (0 Points)	5	5	5	43.9% average reduction in delay at six intersections.	63.9% average reduction in delay at six intersections	63.9% average reduction in delay at six intersections	The CDM Smith team modeled the no build scenario and each alternative which then allowed the team to calculate the control delay at each intersection, and the average improvements for each alternative were then calculated. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration & Modeling
		Implementation of Recommended Access Management Strategies	Number of FM 76 Access Management Report Recommended Strategies Implemented in Concept	Number of Improvements Incorporated 11 or More (5 Points) Number of Improvements Incorporated 8 to 10 (4 Points) Number of Improvements Incorporated 6 to 7 (3 Points) Number of Improvements Incorporated 3 to 5 (2 Points) Number of Improvements Incorporated 1 to 2 (1 Point) No Improvements Incorporated (0 Points)	2	3	4	Within Typical Section 4, Typical Section 5, and Typical Section 7 there are a number of improvements: 1. Turn Restrictions, 2. Two-way Left Turn Lanes, 3. Installation of Extension of Left and Right Turn Lanes, 4. Driveway Modifications, and 5. Multimodal Improvements.	Typical Section 2A, Typical Section 5A, and Typical Section 7 implement the following improvements: 1. Median Improvements, 2. Turn Restrictions, 3. Multimodal Improvements, 5. Cross-street Widening, 6. Asisting to improve the supporting street networks through sidewalks, 7. Driveway Modifications, and 8. Shoulder Improvements.	Typical Section 1, Typical Section 5B, and Typical Section 7 implement the following improvements: 1. Median Improvements, 2. Turn Restrictions, 3. Multimodal Improvements, 4. Two-way left turn lanes, 5. Cross-street Widening, 6. Asisting to improve the supporting street networks through sidewalks, 7. Driveway Modifications, and 8. Shoulder Improvements.	The study team examined the Access Management Report and which strategies were recommended within it, the team then graded each alternative individually based upon how many strategies recommended the alternative applied. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration & Appendix A - Access Management Memo
		Additional Median Improvements	Linear Percentage of Additional Median Improvements in Concept	50% or More of Corridor Improves (5 Points) 20% to 50% of Corridor Improves (3 Points) 1% to 19% of Corridor Improves (1 Point) No Corridor Improvements (0 Points)	0	3	3	Typical Section 4, Typical Section 5, and Typical Section 7 don't contain medians within any of their concepts.	5.6 Miles of this corridor are comprised of Typical Section 2A which contains an improved median.	5.6 Miles of this corridor are comprised of Typical Section 1 which contains an improved median.	The typical sections present within each alternative were examined, and the presence of medians and their length were examined and then scored. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration & ArcGIS Pro Google Maps Layer
Active Transportation	Accommodating pedestrians, cyclists and transit	New Turning Lane Improvements	Additional Turning Lanes at Signalized Intersections in Concept	All Signalized Intersections within the Corridor have Turning Lanes (5 Points) Additional Signalized Intersections have Turning Lanes (3 Points) No Signalized Intersections have Turning Lanes (0 Point)	3	3	3	Typical Section 4 and Typical section 5 contain two way left turns which may count towards turn lanes, and Typical section 7 doesn't contain any turning lanes within any of their concepts. Intersections have had improvements added to most of the signalized intersections though currently present at Fabens Road and Alameda Ave. Bauman also has proposed improvements Camp Street and Alameda Ave have no proposed improvements and thus rank as a three.	Intersections have had improvements added to most of the signalized intersections though currently present at Fabens Road and Alameda Ave, but Worsam road will be converted to a four lane signalized junction. Bauman also has a signalized junction proposed to change turning lanes. Camp Street and Alameda Ave have no proposed improvements and thus rank as a three.	Intersections have had improvements added to most of the signalized intersections though currently present at Fabens Road and Alameda Ave.	Each signalized intersection within the corridor was examined individually and Vital and the CDM Smith team decided the best course of action for the intersection based upon engineering judgement, modeling efforts, and other studies previously conducted such as the Horizon Blvd feasibility study, and each intersection then had improvements made depending on Peak Hour Delay and Level of Service rating. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration & Modeling
		Connectivity with Existing Bicycle and Pedestrian Facilities	Additional Connectivity with Regional & Local Bicycle and Pedestrian Plans in Concept	Immediate Connectivity to Bike and Pedestrian Facilities (5 Points) Potential Future Connectivity to Bike and Pedestrian Facilities (3 Points) No Connectivity to Bike and Pedestrian Facilities (0 Points)	3	5	5	There are existing sidewalks at the intersection of Camp Street and Fabens Road / Island Road, and sidewalk along Fabens Road / Island Road through there isn't.	Due to the presence of bike and pedestrian facilities throughout Typical Section 2A, Typical Section 5A and Typical section 7, there is a large degree of immediate connectivity.	Due to the presence of bike and pedestrian facilities throughout the entire corridor, there is a great degree of immediate connectivity.	Current Bike and Pedestrian facilities present within the Fabens TA Project Location Information document (Exhibit A - Map Location Fabens SW.pdf), the El Paso County Transit - Transit Improvements PDF (Pages from 1010 - Transit Improvements.pdf) and other sources of facilities currently present and planned for the future were examined in comparison to the typical sections present throughout each alternative. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration, Fabens TA Project Location Information (Exhibit A - Map Location Fabens SW.pdf) & El Paso County Transit - Transit Improvements (Pages from 1010 - Transit Improvements.pdf)
		Active Transportation Modes	Number of Active Transportation Modes (Bike Lanes, Pedestrian Facilities & Transit) in Concept	3 Active Transportation Modes (5 Points) 2 Active Transportation Modes (3 Points) 1 Active Transportation Mode (1 Point) No Active Transportation Modes (0 Point)	1	3	3	Within Fabens, Typical Section 7 is used which contains both pedestrian and bike facilities, while spot application will be used for Transit, however due to its more minor application it was only rated as a 1. There will however be spot application of Transit and the modes of transportation not being covered throughout the corridor they were not included in the scoring.	Typical Section 7 includes sidewalks and bike lanes, and Typical Sections 2 and 5A include a shared use path though there would also contain spot applications of transit, but due to no bus lane running throughout the corridor, it would be 2 modes of Active Transportation.	Typical Section 1 and Typical Section 7 both include sidewalks and bike lanes, and Typical Section 5B includes a shared use path though there would also contain spot applications of transit, but due to no bus lane running throughout the corridor, it would be 2 modes of Active Transportation, with Bus stops also being implemented throughout the corridor.	The typical sections present within each alternative were examined, and the amount of active transportation modes, i.e. bike lanes, pedestrian facilities and transit that were present throughout a meaningful portion of each alternative were examined and then graded. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts & Configuration
Miles of Bicycle / Pedestrian / Shared Use Paths	Additional Miles of Bicycle / Pedestrian / Shared Use Paths in Concept	5+ Miles (5 Points) 2 to 3 Miles (3 Points) Less than 2 Miles (1 Point) No Additional Miles (0 Points)	1	5	5	Currently, Typical Section 7, the only Typical Section with pedestrian and bike facilities, covers 0.6 miles specifically within Fabens.	Typical Section 7 includes sidewalks and bike lanes, and Typical Sections 2A and 5A include a shared use path as the entire corridor provides options for both pedestrians and bicyclists.	Typical Section 1 and Typical Section 7 both include sidewalks and bike lanes, and Typical Section 5B includes a shared use path meaning that multimodal transportation would be present throughout the entire corridor, and thus over 5 miles.	Each Alternative was broken down into typical sections, and their lengths. The length of each typical section which included additional miles of bicycle, pedestrian or shared use paths were calculated. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration & ArcGIS Pro Google Maps Layer		
Environmental Constraints	Minimizing impacts to natural and cultural resources.	Potential Impacts to Natural Resources	Assessment of Potential Impacts to 100-year Floodplains and Waters of the US, Including Arroyos, Historic Irrigation Canals, & Drainage Ditches	Low Potential (5 Points) Medium Potential (3 Points) High Potential (1 Point)	3	3	3	Potential impacts: 1 arroyo, 4 canal/ditch, 0 ponds, 0.74 acre of NWI features, 21.9 acres of 100-year FEMA floodplain. Based on a combination of potential impacts, this alternative was rated as a medium impact and received a score of 3.	Potential impacts: 1 arroyo, 7 canal/ditch, 0 ponds, 1.07 acre of NWI features, 22.2 acres of 100-year FEMA floodplain. Based on a combination of potential impacts, this alternative was rated as a high impact and received a score of 1.	Potential impacts: 1 arroyo, 8 canal/ditch, 0 ponds, 1.25 acre of NWI features, 26.4 acres of 100-year FEMA floodplain. Based on a combination of potential impacts, this alternative was rated as a high impact and received a score of 1.	The study team pulled database information to create the environmental constraints map, which included 100-year floodplains and waters of the US, including arroyos, historic irrigation canals, and drainage ditch data were gathered from NHD, USFWS NWI, and FEMA. The Alternatives were overlaid on top of the constraints data and the number of acres of impacts were calculated. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration, Linework, ArcGIS Pro, NHD, USFWS NWI, and FEMA
		Potential Impacts to Cultural Resources	Assessment of Potential Impacts to Habitat for Federally listed Threatened / Endangered Species	Low Potential (5 Points) Medium Potential (3 Points) High Potential (1 Point)	5	3	3	Potential impacts: The ICF team pulled database information to create the environmental constraints map. Element of occurrence data for threatened / endangered / rare species were gathered from TAND and mapped within the corridor. Based on these data and a desktop habitat assessment, potential impacts to habitat for federally listed species were described as low for this alternative and received a score of 5.	Potential impacts: The ICF team pulled database information to create the environmental constraints map. Element of occurrence data for threatened / endangered / rare species were gathered from TAND and mapped within the corridor. Based on these data and a desktop habitat assessment, potential impacts to habitat for federally listed species were described as low for this alternative and received a score of 5.	Potential impacts: The ICF team pulled database information to create the environmental constraints map. Element of occurrence data for threatened / endangered / rare species were gathered from TAND, USFWS NWI, and FEMA. The Alternatives were overlaid on top of the constraints data and the number of acres of impacts were calculated. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration, Linework, ArcGIS Pro, NHD, USFWS NWI, and FEMA	The study team pulled database information to create the environmental constraints map, which included waters of the US, including arroyos, historic irrigation canals, and drainage ditch data were gathered from NHD, USFWS NWI, and FEMA. The Alternatives were overlaid on top of the constraints data and the number of acres of impacts were calculated. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration, Linework, ArcGIS Pro, NHD, USFWS NWI, and FEMA
		Potential Impacts to Human Resources	Assessment of Potential Impacts to Archeological Sites and Potential Impacts to Structures, Parcels	Low Potential (5 Points) Medium Potential (3 Points) High Potential (1 Point)	1	1	1	Potential impacts: 1 Historic District (EPCWID #1) and qualitative assessment of potential impact archeological sites. Based on a combination of potential impacts, this alternative was rated as a high impact and received a score of 1.	Potential impacts: 1 Historic District (EPCWID #1) and qualitative assessment of potential impact archeological sites. Based on a combination of potential impacts, this alternative was rated as a high impact and received a score of 1.	Potential impacts: 1 Historic District (EPCWID #1) and qualitative assessment of potential impact archeological sites. Based on a combination of potential impacts, this alternative was rated as a high impact and received a score of 1.	The study team pulled database information to create the environmental constraints map. Element of occurrence data for threatened / endangered / rare species were gathered from TAND and mapped within the corridor. Potential impacts to habitat for federally listed species were described as low, medium, or high probability. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration, Linework, ArcGIS Pro, TAND and TAND
Right of Way (ROW)	Minimizing ROW acquisition	ROW Acreage Acquisition	New ROW Acreage Required by Concept	0 Acres Needed (5 Points) 1 to 23 Acres Needed (3 Points) 24+ Acres Needed (1 Point)	3	1	1	There are 22.8 acres that would need to be acquired for this alternative.	There are 24.2 acres that would need to be acquired for this alternative.	There are 20.8 acres that would need to be acquired for this alternative.	The no build ROW was acquired from TxDOT, and the team drew new polygons of the proposed ROW for each alternative. The no build ROW acreage was then subtracted from the new ROW acreage to find the proposed ROW needed to be acquired. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration, Linework & ArcGIS Pro
		Impact to Hazardous Materials or Water Storage Systems	Number of Petroleum Storage Tanks & Wells Impacted by Concept	0 Impacted (5 Points) 1 to 2 Impacted (3 Points) 3+ Impacted (1 Point)	1	1	1	There are 7 Petroleum Storage Tanks & Wells Impacted by Concept Alternative 1 ROW	There are 9 Petroleum Storage Tanks & Wells Impacted by Concept Alternative 2 ROW	There are 10 Petroleum Storage Tanks & Wells Impacted by Concept Alternative 3 ROW	The Petroleum Storage Tanks & Wells present within the corridor were overlaid on top of the proposed ROW and the number was calculated. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration, Linework, Environmental Constraints Map & ArcGIS Pro
Utilities	Minimizing likelihood of conflict with existing known records of utilities	Existing Utilities Conflict	Known / Mapped Utilities (Water, Sewer, Gas Pipeline & Overhead Power Lines) Overlap with ROW Acquisition in Concept	No Acres of Conflict (5 Points) 1 to 30 Acres of Conflict (3 Points) 31+ Acres Conflict (1 Point)	3	3	3	There are 29 acres in conflict with the existing Utilities.	There are 22.9 acres in conflict with the existing Utilities.	There are 14.7 acres in conflict with the existing Utilities.	The existing utilities provided by Ramon were mapped to every portion of the corridor, and each concept examined how the proposed ROW would conflict with the existing utilities present within the area. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration, Linework, Utilities Maps & ArcGIS Pro
		Emergency Management	Improve emergency management response and compatibility with the Incident Management Plan (IMP)	Estimate of Reduced Travel Delay using Travel Model	10% Improvement (5 Points) 5%-9% Improvement (3 Points) 1%-4% Improvement (1 Point) No Time Reduction or Negative (0 Points)	5	0	0	Average of 52% Improvement in Response Time	Average of 8% Decrease in response time	Average of 8% Decrease in response time
		IMP Compatibility	Team of Experts (TxDOT) Ranking	Team of Experts Ranked as Best (5 Points) Team of Experts Ranked as Second Best (3 Points) Team of Experts Ranked as Worst (1 Point)	1	3	5	Alternative 1 consumes the least ROW but provides the least amount of safety options available, without any median, a lack of larger turning lanes, and less access management solutions at intersections. There are also options such as TWLTL which are excluded from portions of the corridor, and a lack of bike and pedestrian options and refuge.	Alternative 2 contains more access management solutions like medians, lighting throughout the corridor, and many multimodal improvements however not as many improvements as Alternative 3.	Alternative 3 contains more access management solutions like medians, lighting throughout the corridor, and many multimodal improvements however unlike Alternative 2, Alternative 3 includes a TWLTL, thus giving it more options and complying with the IMP more than Alternative 2.	Each Alternative was ranked by the TxDOT team, and they provided insight into each alternative's compatibility with the Integrated Master Plan. Source: Alternatives 1, 2 and 3 Typical Sections, Concepts, Configuration & TxDOT Experts
Scoring Totals					64	69	72				