Santa Fe Screening Matrix

QUANTITATIVE SCREENING ANALYSIS

Santa Fe Interchange Alternatives

Goals/Objectives	Unit of Measure		No Action			Single Point Urban with One Flyover			Southwest Parclo			Improved Diamond with One Flyover			3-Level Diamond (Option B)	
Traffic Operations																
Optimize interchange traffic operations.	Level of Service - Ramp Intersections		AM LOS	PM LOS		AM LOS	PM LOS		AM LOS	PM LOS		AM LOS	PM LOS		AM LOS	PM LOS
	1) Eastbound Ramp Intersection w/ Santa Fe	●	F	F	○	N/A	N/A	○	B	B	○	C	D	○	D	D
	2) Westbound Ramp Intersection w/ Santa Fe		F	F		C	D		C	D		C	C		D	D
Optimize adjacent intersection traffic operations.	Level of Service - Local Roadway Intersection		AM LOS	PM LOS		AM LOS	PM LOS		AM LOS	PM LOS		AM LOS	PM LOS		AM LOS	PM LOS
	1) Santa Fe and County Line	●	F	F	◒	C	D/E *	◒	C	E *	◒	C	D /E *	○	B	D
	2) Santa Fe and Blakeland		C	D		C	C		C	C *		C	C		C	C
						* *Note:* through vehicle queues extend past adjacent off ramp			* *Note:* through vehicle queues extend past adjacent off ramp			* *Note:* through vehicle queues extend past adjacent off ramp				
Reliability																
Reduce signalized intersections or signal phases.	Reduction in signalized intersection.	●	no reduction		○	eliminates 1 signal		◒	eliminates 1 signal phase		●	no reduction		●	no reduction	
Accommodate higher ramp volumes at interchange.	Number of free ramp movements.	●	0 free movements		◒	1 free movement		◒	1 free movement		◒	1 free movement		○	0 free movements ; however, elevated thru traffic provides best access to C-470 ramps for others	
Implementation																
Minimize project costs.	Raw construction cost range.	○	$0		◒	$40 M - $45 M		○	$27 M - $32 M		◒	$40 M - $45 M		●	$46 M - $51 M	
	Right of Way acquisition cost range.	○	$0		○	$1.9 M - $2.4 M		●	$6 M - $7 M		○	$1.3 M - $1.8 M		◒	$3.8 M - $4.3 M	
Provide a constructible solution.	Relative simplicity in construction phasing and method of handling traffic.	○	no construction		●	SPUI bridge difficult to construct under traffic ; flyover can be constructed outside of traffic		◒	loop and EB off can be constructed outside of existing traffic ; Santa Fe bridge over C-470 same width as existing (difficult if bridge is reconstructed)		○	flyover can be constructed outside of traffic ; wider Santa Fe bridge over C-470 will ease traffic control during construction		◒	third level thru's can be constructed completely outside of existing traffic ; Santa Fe bridge width over C-470 will require difficult traffic control under construction	
Provide long-term phasability/implementation.	Relative ability to implement individual elements in phases (construction packages) as traffic demand increases and/or funding is available.	○	no implementation		○	flyover can be implemented first, or in future		●	loop and EB off needs immediate implementation		○	flyover can be implemented first, or in future		◒	third level can be implemented in future provided it is from the outside edge of pavement	
Environment																
Note: *Values listed are for the interchange concepts only.*																
Minimize impacts to adjacent bicycle and pedestrian trail system.	Linear miles trail relocation necessary.	○	0 miles		◒	0.7 miles		◒	0.8 miles		◒	0.7 miles		◒	0.7 miles	
Minimize noise impacts to the built environment.	Number of receptors that exceed the threshold, amount threshold is exceeded.	○	no impact		◒	3 areas ; all over threshold		◒	3 areas ; all over threshold		◒	3 areas ; all over threshold		◒	2 areas ; both over threshold	
Ensure compatibility with local land use plans.	Does the alternative support land use patterns that are compatible with local land use plans?	○	yes		○	yes		○	yes		○	yes		○	yes	
Minimize visual impacts to neighboring communities.	Relative degree of visual impact.	○	none		●	more impacts ; additional signage ; elevated structure + 1 flyover ramp		◒	some impacts ; additional signage		●	more impacts ; additional signage ; 1 flyover ramp		●	more impacts ; additional signage ; large elevated structure	
Minimize acquisition of additional Right of Way.	Number of parcels impacted; acres of additional Right of Way.	○	0 parcels ; 0 acres		◒	14 partial parcels ; 5.4 acres		◒	14 partial parcels ; 2.9 acres		◒	14 partial parcels ; 4.0 acres		◒	14 partial parcels ; 6.2 acres	
Minimize floodplain impacts.	Is 100-year floodplain impacted, location of impact?	○	meets FEMA floodplain regulations (no increase in 100 year flood elevation)		○	meets FEMA floodplain regulations (under 1 ft. increase in 100 year flood elevation)		○	meets FEMA floodplain regulations (under 1 ft. increase in 100 year flood elevation)		○	meets FEMA floodplain regulations (under 1 ft. increase in 100 year flood elevation)		○	meets FEMA floodplain regulations (under 1 ft. increase in 100 year flood elevation)	
Minimize impacts to wetlands and Waters of the U.S.	Acres of wetlands impacted.	○	0 acres connected to Waters of U.S. ; 0 acres not connected to Waters of U.S.		◒	0.4 acres connected to Waters of the U.S. ; 0.5 acres not connected to Waters of the U.S.		◒	0.4 acres connected to Waters of the U.S. ; 0.5 acres not connected to Waters of the U.S.		◒	0.4 acres connected to Waters of the U.S. ; 0.5 acres not connected to Waters of the U.S.		◒	0.3 acres connected to Waters of the U.S. ; 0.5 acres not connected to Waters of the U.S.	
	Acres of Waters of the U.S. impacted.	○	0 acres		○	0 acres		○	0 acres		○	0 acres		○	0 acres	
Minimize impacts to critical water sources that degrade surface and ground water quantity and quality.	Acres of impervious surface area of alternative.	○	21.0 acres		○	23.2 acres		○	18.8 acres		○	22.0 acres		○	23.4 acres	
Minimize impact to potential Threatened or Endangered habitat.	Acres of Threatened or Endangered species habitat impacted, number of raptor nests impacted.	○	0 acres ; 0 nests		○	0 acres ; 0 nests		○	0 acres ; 0 nests		○	0 acres ; 0 nests		○	0 acres ; 0 nests	
	Acres of Colorado Species of Special Concern habitat impacted.	○	0 acres		◒	2.7 acres of Black-tailed prairie dog habitat		◒	2.4 acres of Black-tailed prairie dog habitat		◒	2.7 acres of Black-tailed prairie dog habitat		◒	2.4 acres of Black-tailed prairie dog habitat	
Minimize encroachment on hazardous material sites.	Number of haz-mat sites impacted, type, and severity of site impacts.	○	0 sites		○	4 sites (underground storage tanks, low potential for impact)		○	4 sites (underground storage tanks, low potential for impact)		○	4 sites (underground storage tanks, low potential for impact)		○	4 sites (underground storage tanks, low potential for impact)	
Minimize impacts to cultural resources. (historical, archaeological, and paleontological)	Number, type and severity of cultural sites impacted.	○	no adverse impacts		○	no adverse impacts		○	no adverse impacts		○	no adverse impacts		○	no adverse impacts	
Minimize impacts to recreation and parkland resources.	Acres of recreation areas or parklands impacted.	○	0 acres of parkland impacted		○	0.6 acres of parkland impacted		●	9.6 acres of parkland impacted		○	0 acres of parkland impacted		◒	1.4 acres of parkland impacted	
Minimize impacts to riparian habitat.	Acres of riparian habitat impacted.	○	0 acres connected to Waters of U.S. ; 0 acres not connected to Waters of U.S.		○	0.6 acres connected to Waters of the U.S. ; 1.8 acres not connected to Waters of the U.S.		◒	2.5 acres connected to Waters of the U.S. ; 0.5 acres not connected to Waters of the U.S.		○	0.5 acres connected to Waters of the U.S. ; 0.8 acres not connected to Waters of the U.S.		○	0.5 acres connected to Waters of the U.S. ; 0.8 acres not connected to Waters of the U.S.	
Enhance the opportunity for wildlife movement across the corridor.	Does the alternative provide additional opportunity for, or more restrictions to, wildlife movement?	◒	no additional opportunity or restrictions		◒	no additional opportunity or restrictions		◒	no additional opportunity or restrictions		◒	no additional opportunity or restrictions		◒	no additional opportunity or restrictions	
Minimize impacts to minority and low-income populations.	Number and type of population impacted, type and quantity of impact.	○	0 communities impacted		◒	1 community impacted (Wolhurst) ; noise and visual impact		◒	1 community impacted (Wolhurst) ; noise and visual impact		◒	1 community impacted (Wolhurst) ; noise and visual impact		◒	1 community impacted (Wolhurst) ; noise and visual impact	
Minimize economic impacts to local businesses and residencies.	Net loss to businesses, relocation costs.	○	0 impacts		○	0 impacts		○	0 impacts		○	0 impacts		○	0 impacts	
Ease of Movement																
Integrate multi-modal solutions.	Provides ease of movement for transit options / does not preclude or alter transit options considered or planned.	○	does not preclude planned multi-modal improvements		○	does not preclude planned multi-modal improvements		○	does not preclude planned multi-modal improvements		○	does not preclude planned multi-modal improvements		○	does not preclude planned multi-modal improvements	
	Number or length of structures required to fully grade-separate trail through Santa Fe Interchange. (ALL SANTA FE ALTERNATIVES WILL BE GRADE SEPARATED EXCEPT THE NO ACTION.)	●	trail will remain at-grade		○	requires 1 grade-separation (Santa Fe)		○	requires 1 grade-separation (loop/ramp)		○	requires 1 grade-separation (Santa Fe)		○	requires 1 grade-separation (Santa Fe)	
Provide a high degree of driver expectancy.	Degree to which traffic movements into/out of the interchange are easily understood and maneuvered by the traveling public.	○	existing condition is known to users		◒	advance signage required for 1 movement		◒	advance signage required for 1 movement		◒	advance signage required for 1 movement		●	advance signage required for 4 movements	
Safety																
Address existing interchange safety issues.	Does the alternative meet all/desirable/minimum project design criteria at selected locations?	●	currently does not meet criteria		○	will meet all project design criteria		○	will meet all project design criteria		○	will meet all project design criteria		○	will meet all project design criteria	
Reduce conflicting vehicular movements.	Number of conflicting movements eliminated.	●	no elimination		◒	no elimination ; however, elevated SB to EB traffic eliminates much of the conflicting traffic on the bridge and at the County Line / C-470 intersection		◒	eliminates 1 conflicting movement		◒	no elimination ; however, elevated SB to EB traffic eliminates much of the conflicting traffic on the bridge and at the County Line / C-470 intersection		◒	no elimination ; however, elevated thru traffic eliminates much of the conflicting traffic on the bridge	
Summary																
Summary of each alternative:			Poor level of service for ramp intersections and poor level of service for local roadway intersections ; no increase in reliability ; no implementation costs ; no construction issues ; no environmental impacts ; poor ease of movement within corridor ; no increase of safety within corridor.			Average level of service for ramp intersections and average level of service for local roadway intersections ; best increase in reliability ; medium implementation costs ; some construction issues ; some environmental impacts ; better ease of movement within corridor ; some increase of safety within corridor.			Average level of service for ramp intersections and average level of service for local roadway intersections ; some increase in reliability ; high implementation costs ; some construction issues ; highest environmental impacts ; better ease of movement within corridor ; some increase of safety within corridor.			Average level of service for ramp intersections and average level of service for local roadway intersections ; some increase in reliability ; medium implementation costs ; minor construction issues ; lowest environmental impacts ; only alternative with no parkland impacts ; better ease of movement within corridor ; most increase of safety within corridor.			Acceptable level of service for ramp intersections and average level of service for local roadway intersections ; no increase in reliability ; high implementation costs ; some construction issues ; some environmental impacts ; better ease of movement within corridor ; some increase of safety within corridor.	
Disposition:			ELIMINATED			ELIMINATED			ELIMINATED			CARRIED FORWARD			ELIMINATED	

LEGEND

○ Most Desirable ◒ → ● Least Desirable

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