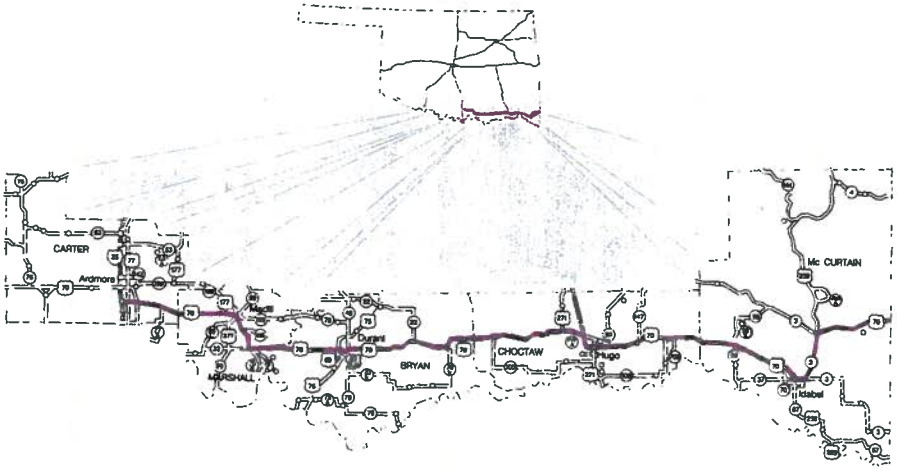
US 70 FEASIBILITY STUDY

for

Oklahoma Department of Transportation



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Prepared By:

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US 70 – part, Ch 6, 7, 8
Traffic analysis, Public Involv, Recommendations

VI TRAFFIC ANALYSIS

Future Travel Demand in the US 70 Corridor

Introduction: Essential to the development of alternate scenarios for the improvement of US 70 is the assessment of the need for highway bypass construction in more heavily traveled small urban areas within the corridor. In the case of US 70, the urban areas in question are Ardmore, Durant, and Madill. For that reason, level of service, origin-destination, and future travel demand analyses were performed for five alternative scenarios to estimate the traffic impacts of various possible improvements. This section provides the results of these analyses.

Methodology: Traffic forecasts for the year 2020 were developed for each of five alternatives proposed for the US 70 corridor. These trend line forecasts were based on review and analysis of existing traffic data and historical traffic trends in the region documented by ODOT. Documented sources included *1991 Oklahoma Traffic Historical, Oklahoma Traffic Characteristics 1991*, and numerous traffic data collection efforts and planning reports for facilities within the US 70 corridor (Appendix D). Future traffic was projected for a total of 34 existing and proposed segments of US 70. Not all of these segments are included in every alternative since the particular facilities they represent may not be a part of each scenario. Table 2-5 and Figure 2-7 describe the location of each of the segments. The forecasts consist of estimated 24-hour average daily traffic (ADT) volumes for the year 2020 and the percent of 2020 ADT that is truck traffic.

The five 2020 alternatives for which future traffic forecasts are provided are:

1. No build
2. Improvement of US 70 to four lanes along the existing alignment
3. Alternative alignment with an alternate facility, (SH199/SH78 alignment) extending from east of Durant to north of Madill
4. Alternative alignment with bypasses around Durant, Kingston, and Madill
5. Bypass southwest of Ardmore, plus improvement of remainder of US 70 to four lanes along existing alignment.

Seventeen segments comprise Alternatives 1 and 2. These are segments 1 through 17 and include none of the segments designated with letter-numeral combinations (such as 2A, 6B, 12E, etc.). In Alternatives 3 and 4, segment 6 is replaced with segments 6A and 6B. In addition, Alternative 3 includes segments 7A, 7B, 12A, 12B, 12C, 12D, and 12E. Alternative 4 replaces segment 8 with segments 8A, 8B, 8C, and 8D, and adds segments 7A, 7B, 7C, 10A, and 11A. Alternative 5 adds only segment 2A. Segments are described earlier in Chapter 2.

Tables 6-1 and 6-2, respectively, list average daily traffic volumes and average daily truck traffic volumes for all segments included in the various US 70 corridor alternatives for 2020. In each table, projected 2020 volumes are compared with estimated 1995 volumes based on actual traffic counts on existing facilities. Table 6-3 displays the percentage of ADT that comprises truck traffic for each segment in each alternative.

Analysis: Not surprisingly, Alternative 2, which upgrades US 70 from a mostly two-lane facility to a four-lane facility, results in consistently higher ADT for all segments than Alternative 1, the no-build option, due to the expanded capacity of the roadway. Truck traffic is also higher for all segments, both in projected actual numbers and as a percentage of total volume for each segment.

Alternative 3 includes an alternate facility along SH 199 and SH 78 with the potential of diverting through traffic from existing US 70 between Madill and Durant. This would result in considerable reductions in total ADT and truck volumes along existing US 70 from US 377 at Madill east to where the proposed alternate facility rejoins US 70 east of Durant. The proportion of trucks to total traffic volume would also decline considerably with truck percentages on that same stretch of US 70 ranging from 2.3 percent to 12.8 percent for various segments, compared with 12.0 percent to 19.6 percent for those same segments under Alternative 2. Truck traffic is projected to be diverted primarily to the alternate route, with some segments of that facility exhibiting more than 20 percent truck traffic.

Alternative 4, which includes local bypasses around Madill, Durant, and Kingston, would result in similar though less dramatic diversions of traffic from US 70. Total traffic volumes on existing US 70 in Madill would be somewhat lower than under Alternative 3, although truck traffic would remain approximately the same in actual volumes, and slightly higher in proportion to total volumes. The bypass around Kingston would have essentially the same effect on total traffic volume on existing US 70 in Kingston as Alternative 3, although truck traffic would be less, both in projected volume and as a percentage of the total volume. Like Alternative 3, the Durant bypass would reduce total and truck ADT and truck percentages on US 70 through Durant, but the decrease would not be as great as in Alternative 3.

The Ardmore bypass in Alternative 5 would result in a considerable diversion of traffic from US 70 through the town, especially in truck traffic. Truck volume on the bypass would comprise 30 percent of total ADT, while the percentage of trucks on US 70 in Ardmore would be only 5.2 percent of the total volume, compared with 11 percent under the other build alternatives.

Table 6-1
Projected Average Daily Traffic Volumes on US Highway 70, by Segment and Alternative

Segment	1995 Existing	2020 Alternatives				
		1	2	3	4	5
1	6,800	11,500	12,100	12,100	12,100	12,100
2	11,400	19,800	22,700	22,700	22,700	17,300
2A						5,900
3	4,300	8,800	10,600	10,600	10,600	10,600
4	4,100	6,600	7,900	7,900	7,900	7,900
5	3,900	6,200	7,500	7,500	7,500	7,500
6	8,500	13,600	15,800			15,800
6A				9,600	9,600	
6B				16,200	15,300	
7	6,800	10,900	12,800	9,300	8,800	12,800
7A				4,200	5,400	
7B				3,800	4,800	
7C					4,200	
8	5,200	7,800	9,300	6,000		9,300
8A					8,200	
8B					9,300	
8C					6,000	
8D					9,300	
9	4,700	7,500	8,900	5,000	8,900	8,900
10	10,200	16,300	18,900	13,900	13,400	18,900
10A					6,000	
11	5,600	9,000	10,700	7,300	6,800	10,700
11A					5,000	
12	3,700	5,900	7,100	7,100	7,100	7,100
12A				4,000		
12B				10,300		
12C				5,800		
12D				4,900		
12E				4,900		
13	3,300	5,300	6,600	6,600	6,600	6,600
14	5,400	8,600	10,300	10,300	10,300	10,300
15	6,000	9,600	11,000	11,000	11,000	11,000
16	8,900	14,200	16,100	16,100	16,100	16,100
17	4,500	7,000	8,200	8,200	8,200	8,200

Source: Parsons Brinckerhoff analysis, 1997

Table 6-2
Projected Average Daily Truck Volumes on US Highway 70, by Segment and Alternative

Segment	1995 Existing	2020 Alternatives				
		1	2	3	4	5
1	900	1,500	1,680	1,680	1,680	1,680
2	1,200	2,080	2,500	2,500	2,500	900
2A						1,770
3	516	1,030	1,360	1,360	1,360	1,360
4	490	792	1,020	1,020	1,020	1,020
5	470	744	980	980	980	980
6	850	1,360	1,710			1,710
6A				1,110	1,110	
6B				325	320	
7	820	1,310	1,570	350	530	1,570
7A				1,050	1,300	
7B				950	1,150	
7C					1,110	
8	800	1,210	1,420	570		1,420
8A					1,220	
8B					1,460	
8C					320	
8D					1,420	
9	900	1,450	1,740	640	1,740	1,740
10	1,220	1,950	2,270	320	670	2,270
10A					1,500	
11	650	1,150	1,300	550	530	1,300
11A					750	
12	540	950	1,100	1,100	1,100	1,100
12A				730		
12B				1,200		
12C				1,140		
12D				1,050		
12E				1,050		
13	490	800	830	830	830	830
14	1,000	1,600	1,880	1,880	1,880	1,880
15	1,100	1,700	1,980	1,980	1,980	1,980
16	1,140	1,800	2,060	2,060	2,060	2,060
17	900	1,500	1,580	1,580	1,580	1,580

Source: Parsons Brinckerhoff analysis, 1997

Table 6-3
Projected Average Daily Truck Traffic as Percent of Total Volume on US 70, by Segment and Alternative

Segment	1995 Existing	2020 Alternatives				
		1	2	3	4	5
1	13.2	13.0	13.9	13.9	13.9	13.9
2	10.5	10.5	11.0	11.0	11.0	5.2
2A						30.0
3	12.0	11.7	12.8	12.8	12.8	12.8
4	12.0	12.0	12.9	12.9	12.9	12.9
5	12.1	12.0	13.1	13.1	13.1	13.1
6	10.0	10.0	10.8			10.8
6A				11.6	11.6	
6B				2.0	2.1	
7	12.1	12.0	12.3	3.8	6.0	12.3
7A				25.0	24.1	
7B				25.0	24.0	
7C					26.4	
8	15.4	15.5	15.3	9.5		15.3
8A					14.9	
8B					15.7	
8C					5.3	
8D					15.3	
9	19.2	19.3	19.6	12.8	19.6	19.6
10	12.0	12.0	12.0	2.3	5.0	12.0
10A					25.0	
11	11.6	12.8	12.2	7.5	7.8	12.2
11A					9.2	
12	14.6	16.1	15.5	15.5	15.5	15.5
12A				18.3		
12B				11.7		
12C				19.7		
12D				21.4		
12E				21.4		
13	14.9	15.1	12.6	12.6	12.6	12.6
14	18.5	18.6	18.3	18.3	18.3	18.3
15	18.3	17.7	18.0	18.0	18.0	18.0
16	12.8	12.7	12.8	12.8	12.8	12.8
17	20.0	21.4	19.3	19.3	19.3	19.3

Source: Parsons Brinckerhoff analysis, 1997

Level of Service: 1995 and 2020

Methodology: Determination of capacity and level of service along the US 70 corridor was based on existing and future ADT figures previously developed. Existing ADT and percentage share of truck traffic were used to determine the current level of service along the existing two-lane facility. The 2020 projections of ADT and truck traffic were used to estimate future levels of service for the five designated alternative scenarios.

Capacity and level of service were developed for each of the highway segments, which, for the no-build and all build alternatives, comprise a total of 34 existing and proposed segments along US 70. Not all of these segments are included in every alternative since the particular facilities they represent may not be a part of each scenario. Table 2-5 describes the location of each of the segments. For the no-build alternative, the methodology used was based on the operational analysis for rural two-lane highways presented in the *1994 Highway Capacity Manual*. The methodology used for the build alternatives was based on the planning analysis for multi-lane rural and suburban highways also presented in the *1994 Highway Capacity Manual*.

The five levels of service used in this analysis are defined as follows:

- Level A: Free flow. Individual drivers are free to select desired speeds, a high degree of maneuverability is present within the traffic stream, and drivers are generally unaffected by the presence of other vehicles. The general level of comfort and convenience is excellent.
- Level B: Low-density stable flow. Drivers remain free to select desired speeds but a slight decline in maneuverability occurs compared with Level A and the presence of other vehicles becomes noticeable. The level of comfort and convenience is somewhat less than at Level A.
- Level C: Medium-density stable flow. Selection of speed is affected by the presence of other vehicles, maneuvering within the traffic stream requires substantial driver vigilance, and driver operations are affected significantly by others in the traffic stream. The general level of comfort and convenience is noticeably less at this level than at Levels A or B.
- Level D: High-density stable flow. Selection of speed and freedom to maneuver are severely restricted and small increases in traffic flow will generally cause operational problems. The level of comfort and convenience is generally poor.
- Level E: Unstable flow. Speed is reduced to a low, relatively uniform value and freedom to maneuver is extremely difficult. Operating conditions are at or near the capacity level. Comfort and convenience levels are extremely poor, and driver frustration is generally high.
- Level F: Forced/breakdown flow. Operations are extremely unstable. The amount of traffic approaching a point exceeds the amount that can traverse the point and

arrival flow exceeds discharge flow. Queues form behind such locations and operations within the queue are characterized by stop-and-go waves.

The five 2020 alternatives for which level of service estimates for 1995 and 2020 are provided have been described on p. 6-1.

Analysis: As shown in Table 6-4 , level of service (LOS) ranged from LOS A to LOS E on the existing facility in 1995. Only segment 10, in the Durant area, was as low as LOS E. Three segments--segments 1 and 2 at Ardmore and segment 16 between Idabel and Broken Bow--were actually four-lane segments operating at LOS A. Three segments along rural areas of the corridor (5, 12, and 13) rated LOS B, and three segments--segments 6 and 7 in the Madill area, and segment 15 west of Idabel--rated LOS D. All others were estimated at LOS C. Projections for 2020 indicate that, under a no-build scenario (Alternative 1), LOS for all segments would deteriorate (Table 6-5 and Figure 6-1). No segments would remain at LOS A, and only two four-lane segments--segment 1 west of Ardmore and segment 16 east of Idabel would rate LOS B. Segment 10 at Durant would decline to LOS F, and segments 6 and 7 at Madill and segments 14 and 15 between Hugo and Idabel would decline to LOS E, while the remaining segments would operate at LOS C or D.

Had a four-lane facility been in place in 1995, estimates indicate that all segments except segment 2 at Ardmore would have rated LOS A (Table 6-6). Based on projections for a four-lane facility in 2020 (Alternative 2), most segments are estimated at LOS A. However, six segments--1 (Ardmore), 6 and 7 (Madill), 10 (Durant), and 15 and 16 (Hugo-Idabel) would operate at LOS B (Table 6-7). Only segment 2 at Ardmore would decline to LOS C.

If Alternative 3, which includes an alternate facility between Durant and Madill, had been in place in 1995, those two-lane facilities from which traffic would have been diverted to the alternate facility (segments 7-11) would generally have operated at improved LOS as compared to existing operations (Table 6-8). Projections for 2020 find those same segments generally rated at one LOS lower (from B to C, or C to D) than in 1995, but one LOS higher (from D to C, or E to D) than under the 2020 no-build scenario (Table 6-9).

Under Alternative 4, with local bypasses at Madill, Kingston, and Durant, estimates generally produce the same results as under Alternative 2 for both years (Tables 6-10 and 6-11). The additional bypass segments all receive ratings of LOS A for both years. Likewise, under Alternative 5, with a local bypass at Ardmore, all highway segments receive the same LOS as in Alternative 2 for both 1995 and 2020, except that segment 2 at Ardmore operates at the higher LOS B rather than LOS C.

Table 6-4
Alternative 1 (No-Build): Existing Two-Lane Facility
1995 Traffic

SEGMENT	1995 ADT	% TRUCKS	f_{HV}	CAPACITY (SF_E) (vph)	K	DESIGN HOURLY VOLUME (vph)	V/C RATIO	LEVEL OF SERVICE
1*	6800	13.2	-	-	0.1	286	-	A
2*	11400	10.5	-	-	0.1	479	-	A
3	4300	12.0	0.64	1510	0.1	430	0.28	C
4	4100	12.0	0.64	1510	0.1	410	0.27	C
5	3900	12.0	0.64	1510	0.1	390	0.26	B
6	8500	10.0	0.67	1591	0.1	850	0.53	D
7	6800	12.1	0.63	1507	0.1	680	0.45	D
8	5200	15.4	0.59	1390	0.1	520	0.37	C
9	4700	19.2	0.54	1277	0.1	470	0.37	C
10	10200	12.0	0.64	1510	0.1	1020	0.68	E
11	5600	11.6	0.64	1526	0.1	560	0.37	C
12	3700	14.6	0.60	1417	0.1	370	0.26	B
13	3300	14.9	0.59	1407	0.1	330	0.23	B
14	5400	18.5	0.55	1296	0.1	540	0.42	C
15	6000	18.3	0.55	1302	0.1	600	0.46	D
16*	8900	12.8	-	-	0.1	374	-	A
17	4500	20.0	0.53	1255	0.1	450	0.36	C

Source: Parsons Brinckerhoff, 1997

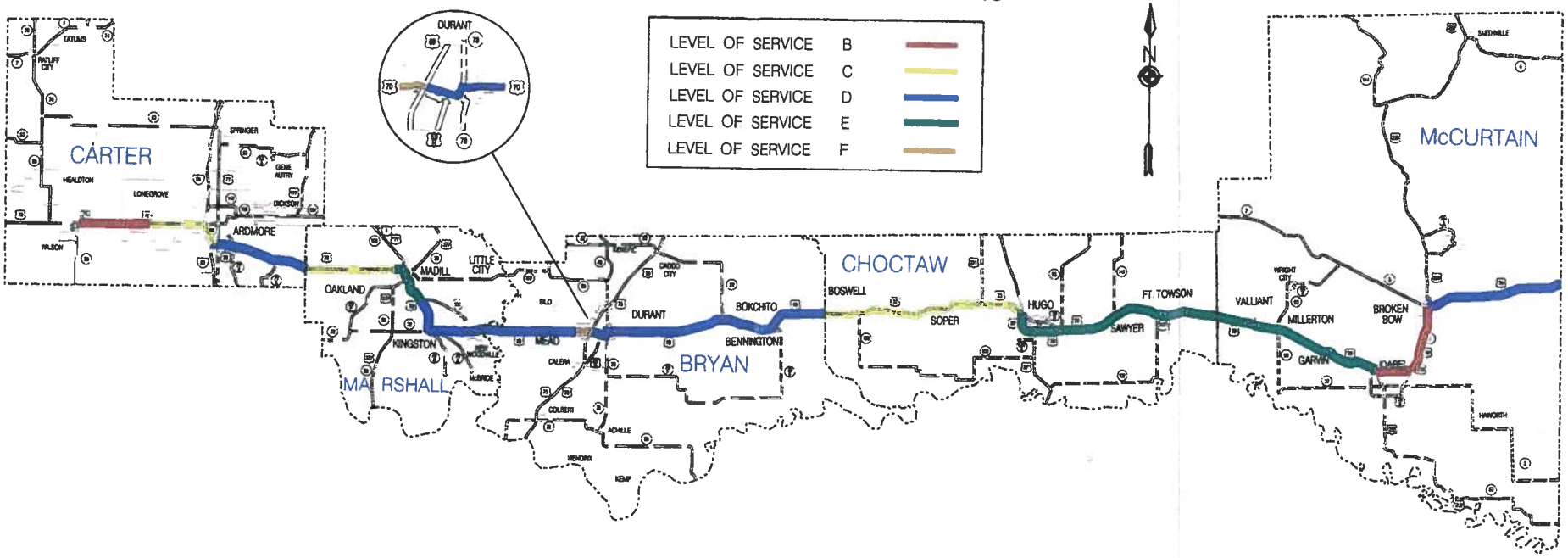
* Existing segment is four-lane. Flow rate = 70%DDHV where directional DHV = ADT(K)(.6)

Incorporated Factors

(v/c)E =	0.97	v/c ratio at LOS E from Table 8-1, 1994 HCM
PR =	0.04	Proportion of RV's
PB =	0	Proportion of buses
ET =	5.0	Passenger-car equivalent for trucks from Table 8-6, 1994 HCM
ER =	3.3	Passenger-car equivalent for RV's from Table 8-6, 1994 HCM
EB =	2.9	Passenger-car equivalent for buses from Table 8-6, 1994 HCM
fd =	0.94	Adjustment factor for directional distribution from Table 8-4, 1994 HCM
fw =	0.93	Adjustment factor for lane and shoulder width from Table 8-5, 1994 HCM
fHV		Adjustment factor for heavy vehicles by segment
K =	0.1	Design hour factor based on historical counts and counts from Task 3.1

Note

The factors incorporated into the calculations are based on roadway and traffic characteristics which include rolling terrain, zero percent no passing zones, twelve foot lanes, two foot shoulders, directional distribution of 60/40, and default values of four and zero percent RV's and buses respectively.



US 70 Feasibility Study

LEVEL OF SERVICE: 2020

Figure 6 – 1

Table 6-5
Alternative 1 (No-Build): Existing Two-Lane Facility
2020 Traffic

SEGMENT	2020 ADT	% TRUCKS	f_{HV}	CAPACITY (SF_E) (vph)	K	DESIGN HOURLY VOLUME (vph)	V/C RATIO	LEVEL OF SERVICE
1*	11500	13.0	-	-	0.1	483	-	B
2*	19800	10.5	-	-	0.1	832	-	C
3	8800	11.7	0.64	1522	0.1	880	0.58	D
4	6600	12.0	0.64	1510	0.1	660	0.44	D
5	6200	12.0	0.64	1510	0.1	620	0.41	C
6	13600	10.0	0.67	1591	0.1	1360	0.85	E
7	10900	12.0	0.64	1510	0.1	1090	0.72	E
8	7800	15.5	0.58	1387	0.1	780	0.56	D
9	7500	19.3	0.54	1274	0.1	750	0.59	D
10	16300	12.0	0.64	1510	0.1	1630	1.08	F
11	9000	12.8	0.62	1480	0.1	900	0.61	D
12	5900	16.1	0.58	1368	0.1	590	0.43	D
13	5300	15.1	0.59	1400	0.1	530	0.38	C
14	8600	18.6	0.54	1293	0.1	860	0.67	E
15	9600	17.7	0.56	1319	0.1	960	0.73	E
16*	14200	12.7	-	-	0.1	596	-	B
17	7000	21.4	0.51	1219	0.1	700	0.57	D

Source: Parsons Brinckerhoff, 1997

* Existing segment is four-lane. Flow rate = 70%DDHV where directional DHV = ADT(K)(.6)

Incorporated Factors

(v/c)E =	0.97	v/c ratio at LOS E from Table 8-1, 1994 HCM
PR =	0.04	Proportion of RV's
PB =	0	Proportion of buses
ET =	5.0	Passenger-car equivalent for trucks from Table 8-6, 1994 HCM
ER =	3.3	Passenger-car equivalent for RV's from Table 8-6, 1994 HCM
EB =	2.9	Passenger-car equivalent for buses from Table 8-6, 1994 HCM
fd =	0.94	Adjustment factor for directional distribution from Table 8-4, 1994 HCM
fw =	0.93	Adjustment factor for lane and shoulder width from Table 8-5, 1994 HCM
fHV		Adjustment factor for heavy vehicles by segment
K =	0.1	Design hour factor based on historical counts and counts from Task 3.1

Note

The factors incorporated into the calculations are based on roadway and traffic characteristics which include rolling terrain, zero percent no passing zones, twelve foot lanes, two foot shoulders, directional distribution of 60/40, and default values of four and zero percent RV's and buses respectively.

Table 6-6
Alternative 2: Four-Lane Facility
1995 Traffic

SEGMENT	Estimated 1995 ADT (based on 4 lanes)	% TRUCKS	K	D	DIRECTIONAL DESIGN HOURLY VOLUME (vph)	SERVICE FLOW RATE (70%DHV) (vphpl)	LEVEL OF SERVICE
1	7200	13.9	0.1	0.60	432	302	A
2	11800	11.0	0.1	0.60	708	496	B
3	4700	12.8	0.1	0.60	282	197	A
4	4500	12.9	0.1	0.60	270	189	A
5	4300	13.0	0.1	0.60	258	181	A
6	9000	10.8	0.1	0.60	540	378	A
7	7300	12.3	0.1	0.60	438	307	A
8	5700	15.4	0.1	0.60	342	239	A
9	5100	19.6	0.1	0.60	306	214	A
10	10800	12.0	0.1	0.60	648	454	A
11	6100	11.5	0.1	0.60	366	256	A
12	4100	14.6	0.1	0.60	246	172	A
13	3700	14.3	0.1	0.60	222	155	A
14	5800	18.5	0.1	0.60	348	244	A
15	6400	18.0	0.1	0.60	384	269	A
16	9200	12.8	0.1	0.60	552	386	A
17	4800	19.4	0.1	0.60	288	202	A

Source: Parsons Brinckerhoff, 1997

Incorporated Factors

K Design hour factor based on historical counts and counts from Task 3.1

D Directional distribution

Note

The factors incorporated into the calculations are based on roadway and traffic characteristics which include rolling terrain, twelve foot lanes, six foot clearance, divided highway, number of access points per mile = 20, and free-flow speed of 60 mph.

Table 6-7
Alternative 2: Four-Lane Facility
2020 Traffic

SEGMENT	Estimated 2020 ADT (based on 4 lanes)	% TRUCKS	K	D	DIRECTIONAL DESIGN HOURLY VOLUME (vph)	SERVICE FLOW RATE (70%DHV) (vphpl)	LEVEL OF SERVICE
1	12100	13.9	0.1	0.60	726	508	B
2	22700	11.0	0.1	0.60	1362	953	C
3	10600	12.8	0.1	0.60	636	445	A
4	7900	12.9	0.1	0.60	474	332	A
5	7500	13.1	0.1	0.60	450	315	A
6	15800	10.8	0.1	0.60	948	664	B
7	12800	12.3	0.1	0.60	768	538	B
8	9300	15.3	0.1	0.60	558	391	A
9	8900	19.6	0.1	0.60	534	374	A
10	18900	12.0	0.1	0.60	1134	794	B
11	10700	12.2	0.1	0.60	642	449	A
12	7100	15.5	0.1	0.60	426	298	A
13	6600	12.6	0.1	0.60	396	277	A
14	10300	18.3	0.1	0.60	618	433	A
15	11000	18.0	0.1	0.60	660	462	B
16	16100	12.8	0.1	0.60	966	676	B
17	8200	19.3	0.1	0.60	492	344	A

Source: Parsons Brinckerhoff, 1997

Incorporated Factors

K Design hour factor based on historical counts and counts from Task 3.1
D Directional distribution

Note

The factors incorporated into the calculations are based on roadway and traffic characteristics which include rolling terrain, twelve foot lanes, six foot clearance, divided highway, number of access points per mile = 20, and free-flow speed of 60 mph.

Table 6-8
Alternative 3 (Madill-Durant Alternative): Four-Lane Facility
1995 Traffic

SEGMENT	Estimated 1995 ADT	% TRUCKS	K	D	DIRECTIONAL DESIGN HOURLY VOLUME (vph)	SERVICE FLOW RATE (70%DHV) (vphpl)	LEVEL OF SERVICE
1	7200	13.9	0.1	0.60	432	302	A
2	11800	11.0	0.1	0.60	708	496	B
3	4700	12.8	0.1	0.60	282	197	A
4	4500	12.9	0.1	0.60	270	189	A
5	4300	13.0	0.1	0.60	258	181	A
6a	5500	11.6	0.1	0.60	330	231	A
6b*	10000	2.0	0.1	0.60	600	-	D
7*	5300	3.8	0.1	0.60	318	-	C
7a	2200	25.0	0.1	0.60	132	92	A
7b	2000	25.0	0.1	0.60	120	84	A
8*	3700	9.5	0.1	0.60	222	-	B
9*	3100	12.9	0.1	0.60	186	-	B
10*	8700	2.3	0.1	0.60	522	-	D
11*	4500	6.0	0.1	0.60	270	-	B
12	4100	14.6	0.1	0.60	246	172	A
12a	2000	17.5	0.1	0.60	120	84	A
12b	6000	10.0	0.1	0.60	360	252	A
12c	3300	19.7	0.1	0.60	198	139	A
12d	2800	21.4	0.1	0.60	168	118	A
12e	2800	21.4	0.1	0.60	168	118	A
13	3700	14.3	0.1	0.60	222	155	A
14	5800	18.5	0.1	0.60	348	244	A
15	6400	18.0	0.1	0.60	384	269	A
16	9200	12.8	0.1	0.60	552	386	A
17	4800	19.4	0.1	0.60	288	202	A

Source: Parsons Brinckerhoff, 1997

* Level of service based on existing US 70 remaining two-lane between Durant and Madill.

Incorporated Factors

K Design hour factor based on historical counts and counts from Task 3.1

D Directional distribution

Note

The factors incorporated into the calculations are based on roadway and traffic characteristics which include rolling terrain, twelve foot lanes, six foot clearance, divided highway, number of access points per mile = 20, and free-flow speed of 60 mph.

Table 6-9
Alternative 3 (Madill-Durant Alternate): Four-Lane Facility
2020 Traffic

SEGMENT	Estimated 2020 ADT	% TRUCKS	K	D	DIRECTIONAL DESIGN HOURLY VOLUME (vph)	SERVICE FLOW RATE (70%DHV) (vphpl)	LEVEL OF SERVICE
1	12100	13.9	0.1	0.60	726	508	B
2	22700	11.0	0.1	0.60	1362	953	C
3	10600	12.8	0.1	0.60	636	445	A
4	7900	12.9	0.1	0.60	474	332	A
5	7500	13.1	0.1	0.60	450	315	A
6a	9600	11.6	0.1	0.60	576	403	A
6b*	16200	2.0	0.1	0.60	972	-	E
7*	9300	3.8	0.1	0.60	558	-	D
7a	4200	25.0	0.1	0.60	252	176	A
7b	3800	25.0	0.1	0.60	228	160	A
8*	6000	9.5	0.1	0.60	360	-	C
9*	5000	12.8	0.1	0.60	300	-	C
10*	13900	2.3	0.1	0.60	834	-	E
11*	7300	7.5	0.1	0.60	438	-	D
12	7100	15.5	0.1	0.60	426	298	A
12a	4000	18.3	0.1	0.60	240	168	A
12b	10300	11.7	0.1	0.60	618	433	A
12c	5800	19.7	0.1	0.60	348	244	A
12d	4900	21.4	0.1	0.60	294	206	A
12e	4900	21.4	0.1	0.60	294	206	A
13	6600	12.6	0.1	0.60	396	277	A
14	10300	18.3	0.1	0.60	618	433	A
15	11000	18.0	0.1	0.60	660	462	B
16	16100	12.8	0.1	0.60	966	676	B
17	8200	19.3	0.1	0.60	492	344	A

Source: Parsons Brinckerhoff, 1997

* Level of service based on existing US 70 remaining two-lane between Durant and Madill.

Incorporated Factors

K Design hour factor based on historical counts and counts from Task 3.1

D Directional distribution

Note

The factors incorporated into the calculations are based on roadway and traffic characteristics which include rolling terrain, twelve foot lanes, six foot clearance, divided highway, number of access points per mile = 20, and free-flow speed of 60 mph.

Table 6-10
Alternative 4(Local Bypasses): Four-Lane Facility
1995 Traffic

SEGMENT	Estimated 1995 ADT (based on 4 lanes)	% TRUCKS	K	D	DIRECTIONAL DESIGN HOURLY VOLUME (vph)	SERVICE FLOW RATE (70%DHV) (vphpl)	LEVEL OF SERVICE
1	7200	13.9	0.1	0.60	432	302	A
2	11800	11.0	0.1	0.60	708	496	B
3	4700	12.8	0.1	0.60	282	197	A
4	4500	12.9	0.1	0.60	270	189	A
5	4300	13.0	0.1	0.60	258	181	A
6a	5500	11.6	0.1	0.60	330	231	A
6b	9400	2.1	0.1	0.60	564	395	A
7	5000	6.0	0.1	0.60	300	210	A
7a	2800	24.1	0.1	0.60	168	118	A
7b	2500	24.0	0.1	0.60	150	105	A
7c	2200	26.4	0.1	0.60	132	92	A
8a	4700	14.9	0.1	0.60	282	197	A
8b	5600	15.7	0.1	0.60	336	235	A
8c	3700	5.4	0.1	0.60	222	155	A
8d	5700	15.4	0.1	0.60	342	239	A
9	5100	19.6	0.1	0.60	306	214	A
10	8300	5.0	0.1	0.60	498	349	A
10a	3000	25.0	0.1	0.60	180	126	A
11	4200	7.1	0.1	0.60	252	176	A
11a	2500	14.0	0.1	0.60	150	105	A
12	4100	14.6	0.1	0.60	246	172	A
13	3700	14.3	0.1	0.60	222	155	A
14	5800	18.5	0.1	0.60	348	244	A
15	6400	18.0	0.1	0.60	384	269	A
16	9200	12.8	0.1	0.60	552	386	A
17	4800	19.4	0.1	0.60	288	202	A

Source: Parsons Brinckerhoff, 1997

Incorporated Factors

K Design hour factor based on historical counts and counts from Task 3.1

D Directional distribution

Note

The factors incorporated into the calculations are based on roadway and traffic characteristics which include rolling terrain, twelve foot lanes, six foot clearance, divided highway, number of access points per mile = 20, and free-flow speed of 60 mph.

Table 6-11
Alternative 4(Local Bypasses): Four-Lane Facility
2020 Traffic

SEGMENT	Estimated 2020 ADT (based on 4 lanes)	% TRUCKS	K	D	DIRECTIONAL DESIGN HOURLY VOLUME (vph)	SERVICE FLOW RATE (70%DHV) (vphpl)	LEVEL OF SERVICE
1	12100	13.9	0.1	0.60	726	508	B
2	22700	11.0	0.1	0.60	1362	953	C
3	10600	12.8	0.1	0.60	636	445	A
4	7900	12.9	0.1	0.60	474	332	A
5	7500	13.1	0.1	0.60	450	315	A
6a	9600	11.6	0.1	0.60	576	403	A
6b	15300	2.1	0.1	0.60	918	643	B
7	8800	6.0	0.1	0.60	528	370	A
7a	5400	24.1	0.1	0.60	324	227	A
7b	4800	24.0	0.1	0.60	288	202	A
7c	4200	26.4	0.1	0.60	252	176	A
8a	8200	14.9	0.1	0.60	492	344	A
8b	9300	15.7	0.1	0.60	558	391	A
8c	6000	5.3	0.1	0.60	360	252	A
8d	9300	15.3	0.1	0.60	558	391	A
9	8900	19.6	0.1	0.60	534	374	A
10	13400	5.0	0.1	0.60	804	563	B
10a	6000	25.0	0.1	0.60	360	252	A
11	6800	7.8	0.1	0.60	408	286	A
11a	5000	15.0	0.1	0.60	300	210	A
12	7100	15.5	0.1	0.60	426	298	A
13	6600	12.6	0.1	0.60	396	277	A
14	10300	18.3	0.1	0.60	618	433	A
15	11000	18.0	0.1	0.60	660	462	B
16	16100	12.8	0.1	0.60	966	676	B
17	8200	19.3	0.1	0.60	492	344	A

Source: Parsons Brinckerhoff, 1997

Incorporated Factors

K Design hour factor based on historical counts and counts from Task 3.1
D Directional distribution

Note

The factors incorporated into the calculations are based on roadway and traffic characteristics which include rolling terrain, twelve foot lanes, six foot clearance, divided highway, number of access points per mile = 20, and free-flow speed of 60 mph.

Table 6-12
Alternative 5(Ardmore Bypass): Four-Lane Facility
1995 Traffic

SEGMENT	Estimated 1995 ADT (based on 4 lanes)	% TRUCKS	K	D	DIRECTIONAL DESIGN HOURLY VOLUME (vph)	SERVICE FLOW RATE (70%DHV) (vphpl)	LEVEL OF SERVICE
1	7200	13.9	0.1	0.60	432	302	A
2	9000	6.0	0.1	0.60	540	378	A
2a	3000	30.0	0.1	0.60	180	126	A
3	4700	12.8	0.1	0.60	282	197	A
4	4500	12.9	0.1	0.60	270	189	A
5	4300	13.0	0.1	0.60	258	181	A
6	9000	10.8	0.1	0.60	540	378	A
7	7300	12.3	0.1	0.60	438	307	A
8	5700	15.4	0.1	0.60	342	239	A
9	5100	19.6	0.1	0.60	306	214	A
10	10800	12.0	0.1	0.60	648	454	A
11	6100	11.5	0.1	0.60	366	256	A
12	4100	14.6	0.1	0.60	246	172	A
13	3700	14.3	0.1	0.60	222	155	A
14	5800	18.5	0.1	0.60	348	244	A
15	6400	18.0	0.1	0.60	384	269	A
16	9200	12.8	0.1	0.60	552	386	A
17	4800	19.4	0.1	0.60	288	202	A

Source: Parsons Brinckerhoff, 1997

Incorporated Factors

K Design hour factor based on historical counts and counts from Task 3.1
D Directional distribution

Note

The factors incorporated into the calculations are based on roadway and traffic characteristics which include rolling terrain, twelve foot lanes, six foot clearance, divided highway, number of access points per mile = 20, and free-flow speed of 60 mph.

Table 6-13
Alternative 5: Four-Lane Facility
2020 Traffic

SEGMENT	Estimated 2020 ADT (based on 4 lanes)	% TRUCKS	K	D	DIRECTIONAL DESIGN HOURLY VOLUME (vph)	SERVICE FLOW RATE (70%DHV) (vphpl)	LEVEL OF SERVICE
1	12100	13.9	0.1	0.60	726	508	B
2	17300	5.2	0.1	0.60	1038	727	B
2a	5900	30.0	0.1	0.60	354	248	A
3	10600	12.8	0.1	0.60	636	445	A
4	7900	12.9	0.1	0.60	474	332	A
5	7500	13.1	0.1	0.60	450	315	A
6	15800	10.8	0.1	0.60	948	664	B
7	12800	12.3	0.1	0.60	768	538	B
8	9300	15.3	0.1	0.60	558	391	A
9	8900	19.6	0.1	0.60	534	374	A
10	18900	12.0	0.1	0.60	1134	794	B
11	10700	12.2	0.1	0.60	642	449	A
12	7100	15.5	0.1	0.60	426	298	A
13	6600	12.6	0.1	0.60	396	277	A
14	10300	18.3	0.1	0.60	618	433	A
15	11000	18.0	0.1	0.60	660	462	B
16	16100	12.8	0.1	0.60	966	676	B
17	8200	19.3	0.1	0.60	492	344	A

Source: Parsons Brinckerhoff, 1997

Incorporated Factors

K Design hour factor based on historical counts and counts from Task 3.1
D Directional distribution

Note

The factors incorporated into the calculations are based on roadway and traffic characteristics which include rolling terrain, twelve foot lanes, six foot clearance, divided highway, number of access points per mile = 20, and free-flow speed of 60 mph.

VII PUBLIC INVOLVEMENT

Public Involvement Program

The public involvement program for the US 70 Feasibility Study included two series of public meetings at multiple locations throughout the corridor, plus several informal workshops to discuss project issues at particular locations. Minutes of these meetings plus a summary of citizen comments are included in Appendix G and H.

Public Meetings - May 1996

An initial series of public involvement in the study occurred in early May. Meetings were held in three towns along the corridor - Hugo, Ardmore, and Durant. The first of the three was held May 7 at the Kiamichi Vo-Tech Seminar Room in Hugo. The next night in Ardmore, a meeting was held at the Southern Vo-Tech Seminar Center. The final meeting occurred on May 9 at the Bryan County Kiamichi Vo-Tech Seminar Room in Durant.

All three meetings followed the same agenda. After welcoming the citizens, an explanation as to the purpose of the U.S. 70 feasibility study and how it correlated to ODOT's Statewide Transportation Plan was given. Information gathered to date on the study corridor was given via a slide presentation. Data presented included the following:

- Number of existing traffic lanes.
- Existing right-of-way.
- Sufficiency ratings.
- Traffic volumes for years 1995 and 2020.
- Level of service of the existing facility for year 2020 traffic.
- Proposed typical sections and right-of-way requirements for improvements.
- Potential bypass routes for Ardmore, Madill, Kingston, Durant, Bokchito, Boswell, Soper, Fort Towson, Valliant and Idabel.
- Route alternatives for US 70 between Madill and Durant.
- Environmental conditions along the corridor.

After the slide presentation questions and comments from the citizens regarding the study were received.

At the Hugo meeting opinions were expressed in favor of improving US 70 to four lanes. Some concern was expressed as to the negative impact bypasses may have on some of the small towns. Locations of potential hazardous environmental sites were also supplied by the

citizens. Requests were made to assign high priority to future projects along US 70 in the unsafe areas of the corridor.

Input received at the Ardmore meeting supported a bypass around the southwest quadrant of town. The Ardmore Mayor, Henry Roberts, read a prepared letter from the City Commission supporting a bypass. A terminus at either Jay Norman Road or Kings Road with existing US 70 was acceptable. Some citizens felt one of the Ardmore bypass routes came to close to Plainview School located at the corner of Myall and Plainview Road. The route also interfered with a proposed residential development near the same intersection. An alternate route of US 70 between Ardmore and Durant was also suggested. The suggested route incorporated sections of SH 142, SH 199 and SH 78 between the two towns.

Most questions received at the meeting in Durant were related to project costs. Cost estimates would be prepared in the latter stages of the study, and would be presented at the next series of public meetings scheduled for the fall. Information was received on one of the south bypasses in Durant. The south route nearest town passed through a landfill and was located too close to a residential development.

In general, comments were favorable toward the study. Most of the citizens were eager to start four laning US 70 in southeast Oklahoma. Reaction to the bypass alternatives was limited but mostly favorable.

Alignment Workshops - July 1996

As a follow up to the initial public meetings held in May, alignment workshops were held in Ardmore, Durant and Madill to further discuss the alternatives for US 70 in these towns. The meetings were attended by various city officials and invited citizens. Bypass routes which had been refined due to previous public comments were presented at each location. Discussion at each meeting centered around the impact of the proposed routes on the community and the future growth pattern of the city.

Ardmore: Attendees at a July 1 afternoon meeting at Ardmore City Hall included representatives from the City of Ardmore, Ardmore Chamber of Commerce, ODOT Field Division 2, and a group of concerned property owners in the area of the bypass. Proposed residential development in the southwest portion of Ardmore conflicted with a portion of the bypass route shown at the public meeting held in May. Specifically, in the vicinity of Myall and Plainview Road, the bypass needed to be moved to the west to avoid the proposed developments. A north terminus of the bypass at Kings Road or Jay Norman Road was acceptable to the Ardmore officials.

The landowners were concerned about the alignment splitting their property. They preferred to have an alignment which proceeded around the edges of their land. At the conclusion of

the discussion two alternatives were chosen for further study. An alternative having a north terminus at Jay Norman Road and one ending at Kings Road were to be analyzed.

Durant: The alignment workshop in Durant was held the evening of July 1 in the City Hall Council Chambers. Members of the Municipal Planning Commission as well as the Community Development Director attended. Bypass alternatives in Durant as well as route alternatives between Madill and Durant were presented.

The Planning Commission preferred a bypass route around southern Durant. Service to the airport and industrial park were cited as the reasons for this preference. A south bypass would be practical if either the existing US 70 or new alignment route alternative is chosen between Madill and Durant. If the SH 199/SH 78 alternative was selected, they requested the north bypass routes be modified to a northeast route. The northwest portion of Durant is a developing residential area of town and no benefits were seen from routing US 70 through it. Two bypass routes, south and northeast, were recommended for final analysis. The south bypass alignment was definitely preferred, but it was recognized that the northeast bypass was a more logical choice if the SH 199/SH 78 alternative was selected between Madill and Durant.

Madill: Three alignments for US 70 at Madill and the three Madill to Durant route alternatives were presented at the Madill meeting, July 2. City officials invited by the City Manager were present. State Representative Fred Stanley also attended. A fourth alternative at Madill was added at the request of the city. This fourth alternative became known at the east bypass, which included an extension of existing US 70 east from its existing intersection with SH 199 and bypassing Madill to the east (detailed description in Chapter V).

The attendees agreed a southwest bypass was the least desirable. Impacts due to the widening of the existing route through town were discussed. The north bypass around Oakland and Madill received some support. The potential of the requested east route to serve US 70 traffic without completely bypassing Madill was recognized. No consensus as to the preferred bypass alternative or route alternative was reached by the end of the meeting. The three original alternatives plus the east route would be considered in the final analysis of Madill.

Public Meetings - October 1996

The final public meetings on the US 70 feasibility study were held between October 21-24. Meetings were again conducted in Ardmore, Hugo and Durant, and a fourth meeting was also held in Madill. At each meeting a short presentation featured data gathered about and along the corridor and the findings of the initial analysis of project priorities and alignment alternatives. A detailed list of improvement projects and suggested priorities throughout the entire corridor, including the three Madill to Durant route alternatives was also presented.

The four bypass alignments at Madill were shown without a preference.

The formal presentation included the following information:

- Number of existing traffic lanes.
- Sufficiency ratings.
- Projected traffic volumes for the year 2020.
- Level of service of the existing facility for year 2020 traffic.
- Criteria for ranking of corridor priority projects.
- Map illustrating locations of priority projects.
- Towns considered for bypass.
- Existing route vs. bypass rating criteria.
- Potential bypass routes for Ardmore, Madill, Kingston, Durant, Bokchito, Boswell, Soper, Fort Townson, Valliant, and Idabel.
- Route alternatives for US 70 between Madill and Durant.
- Environmental considerations for Madill-Durant route alternatives.

An update was given on the progress of the study since the first series of public meetings. Revised bypass route alternatives were shown as well as the original alignments discussed at the first meetings held in May. In all towns except Madill and Bokchito, a preferred bypass alternative was noted. At the end of the presentation a question and answer session with the citizens was conducted.

In addition to the above corridor information, bypass alternatives for Ardmore, Madill, Kingston and Durant were presented and discussed at the Ardmore public meeting. During the question and answer session, local residents primarily from southwest Ardmore and Lone Grove presented signed petitions opposing a bypass in southwest Ardmore. Considerable verbal opposition to a bypass was also expressed. They felt the existing US 70 alignment utilizing a segment of I-35 was adequate. Opinions on the negative impacts to existing residences and the town of Lone Grove were expressed. Due to the comments received at the meeting, the feasibility of an Ardmore bypass was to be reevaluated.

At the Hugo meeting, Durant, Bokchito, Boswell, Soper, Fort Towson and Valliant bypass alternatives were highlighted. The proposed bypass around north Idabel, soon to be under construction, was also discussed. Comments received during the open forum were strongly in favor of four laning US 70 throughout southeast Oklahoma. Numerous civic representatives presented letters of support to the study team from area businesses, Chambers of Commerce and other agencies.

The cities and their bypass alternatives discussed at the meeting in Madill City Hall were identical to the ones presented at the Ardmore meeting. Because no preferred bypass alternative had been chosen for Madill the alignments were discussed in detail. Cost

estimates for each of the four choices were presented in addition to the environmental issues associated with each. The correlation between a Madill bypass and the route alternatives between Madill and Durant was illustrated. No consensus on a preferred bypass alternative was reached by the conclusion of the public meeting. City officials decided to meet at a later date and discuss the bypass alternatives and reach a consensus.

The final public meeting was held at the Bryan County Fairgrounds in Durant. Bypass alternatives were discussed for Ardmore, Madill, Kingston, Durant, and Bokchito. Cost information for the bypass and route alternatives was also presented. Citizens attending voiced their support for keeping US 70 on its present alignment between Madill and Durant. They were also in favor of a south bypass around Durant and the northern bypass around Bokchito.

On October 31, 1996 in Madill, city officials conducted an open public meeting to discuss the alternatives for US 70. Representatives from the study team or ODOT were not present at this meeting. The consensus gathered from the city council members and citizens of Madill attending the meeting was that the east route was the preferred bypass alternative. The southwest route was considered the least desirable bypass route by all of the attendees. The Madill Housing Authority agreed to the east route provided all its housing units were taken by ODOT. If the east bypass alignment would not require the removal of all the housing units, the Authority requested the route be realigned to the north. The City is willing to sell the wastewater plant if its location conflicts with the east bypass alignment. Citizens from Oakland attending the meeting preferred for US 70 to continue on its present route through their community, which would be compatible with the east bypass route. A majority of the attendees preferred the SH 199/SH 78 route alternative as the preferred alignment of US 70 between Madill and Durant. ODOT received a letter summarizing the meeting discussion from the City of Madill.

VIII RECOMMENDATIONS

Madill to Durant Route

The preferred route alternative for US 70 between Madill and Durant is the existing US 70 route between the two towns as shown in Figure 8-1. Upgrading the existing route would best serve the residents and businesses in the Lake Texoma area. Table 8-1 contains the results of the analysis of the three options. Projects comprising the Existing Route alternative are shown in Figure 8-2. Figures 8-3 and 8-4 illustrate the components of the SH 199/SH 78 alternative and New Alignment alternative, respectively.

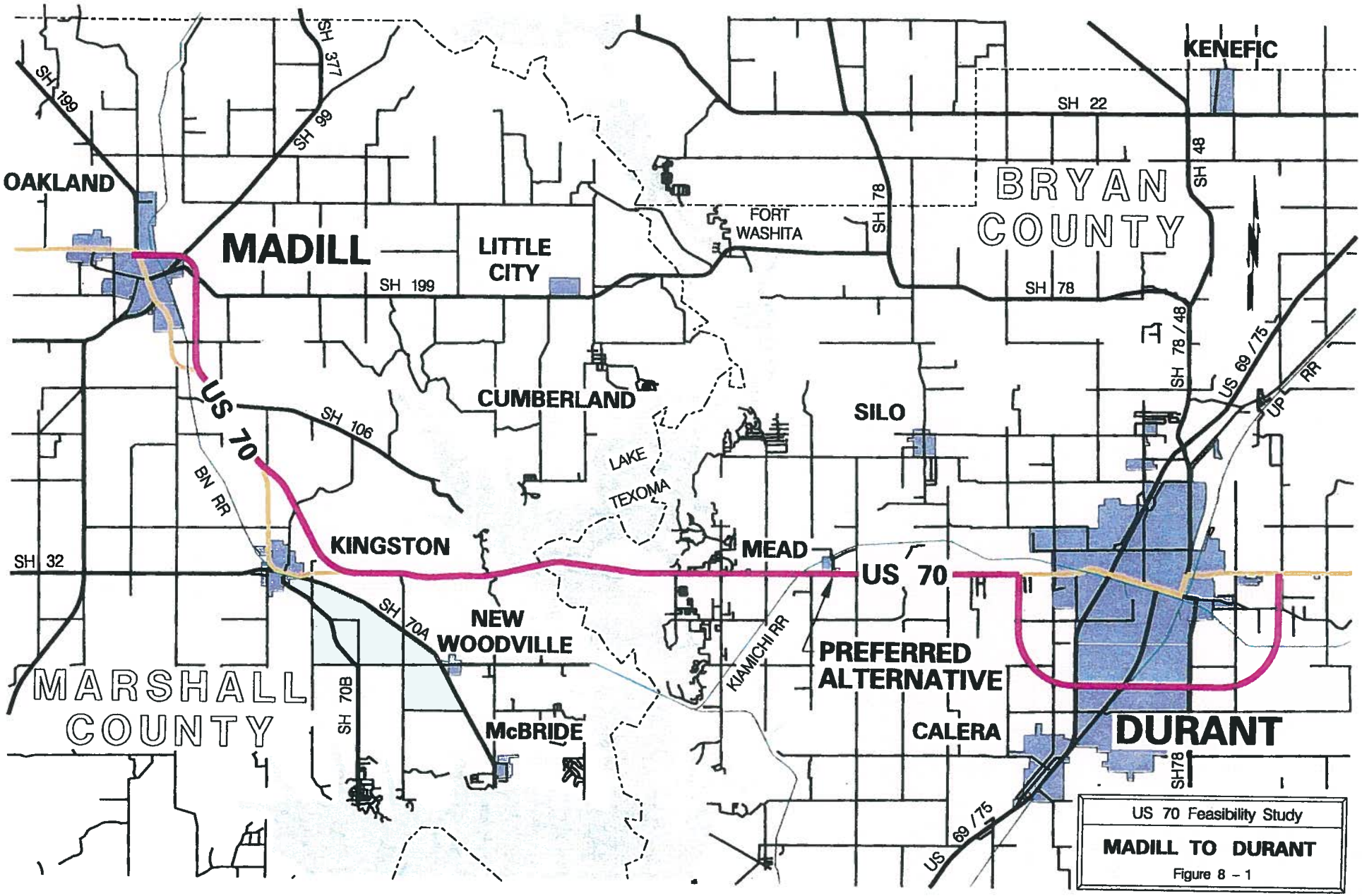
ODOT policy is to not add roadway mileage to the state highway system. If either the SH 199/SH 78 or the New Alignment alternative had been chosen, existing US 70 between Madill and Durant might have been removed from the state highway system. Environmentally, the existing route presents less impacts than the others. The total cost for improving the existing route was slightly more expensive than the SH 199/SH78 option. The total cost of the Existing Route shown in Table 8-1 includes costs for the preferred bypasses routes at Madill, Kingston and Durant. Costs for the other route alternatives were estimated using a compatible version of the preferred bypass route at Madill.

OPTION	TOTAL COST	RANKING
Existing Route	$103,720,138	1
SH 199/SH 78	$100,474,714	2
New Alignment	$127,612,094	3

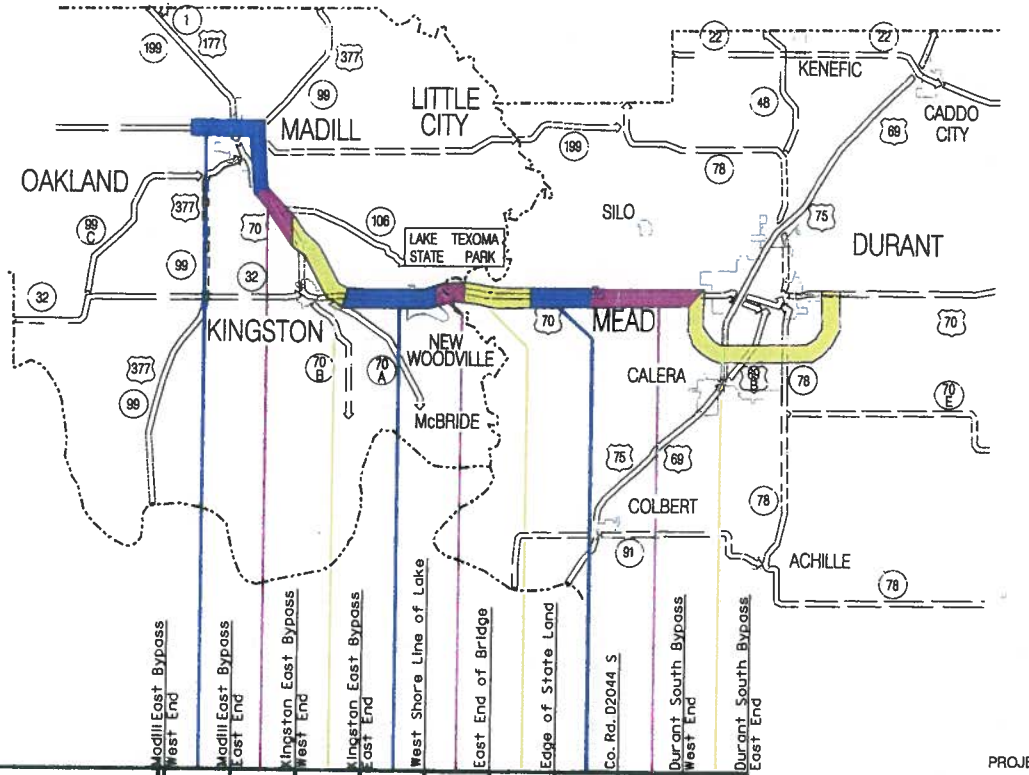
Table 8-1

Municipal Bypass Routes

Madill: The East bypass was chosen as the recommended alternative in Madill. Input received from the City of Madill and the citizens in the Madill/Oakland area indicated they were in agreement the East Route was their preference. Even though the East bypass was not the least costly of the four alternatives, it was chosen because it would serve both the local community and the US 70 traffic better than the other alternatives.


KENEFIC
SH 22
SH 199
SH 377
SH 99
OAKLAND
MADILL
LITTLE CITY
SH 199
FORT WASHITA
SH 78
BRYAN COUNTY
SH 48
SH 78
SH 78 / 48
US 69 / 75
UP RR
CUMBERLAND
SILO
US 70
SH 106
BN RR
LAKE TEXOMA
KINGSTON
MEAD
US 70
SH 32
SH 70A
NEW WOODVILLE
KIAMICHI RR
PREFERRED ALTERNATIVE
MARSHALL COUNTY
SH 70B
McBRIDE
CALERA
DURANT
SH78
US 69 / 75
US 70 Feasibility Study
MADILL TO DURANT
Figure 8 - 1

MADILL TO DURANT: EXISTING ROUTE



PROJECT IDENTIFICATION	48 III	48 IV	48 V	48 VI	07 I	07 II	07 III	07 IV	07 V
PROJECT LENGTH (MILES)	5.68	2.60	3.36	3.60	0.94	3.88	2.71	4.73	9.28
TYPE OF IMPROVEMENT	AA / BB	CC	BB	DD	DD	CC	CC	CC	BB
PROJECT COST ($ MILLION)	17.69	5.01	6.89	5.12	25.00	4.24	3.31	5.55	24.88
PRIORITY GROUP	H	H	H	H	H	H	H	H	H

Madill East Bypass (Multiple Projects)

Kingston East Bypass

Lake Texoma Roosevelt Bridge

Durant South Bypass (Multiple Projects)

LEGEND

PROJECT IDENTIFICATION
- XX COUNTY CODE
- NN SECTION NUMBER

TYPE OF IMPROVEMENT
- AA 5 - LANE SECTION, CONSTRUCT ALONG EXISTING ALIGNMENT
- BB 4 NEW LANES, CONSTRUCT ALONG NEW ALIGNMENT
- CC ADD 2 NEW LANES, NO IMPROVEMENT TO EXISTING LANES
- DD ADD 2 NEW LANES, WIDEN & RESURFACE EXISTING LANES
- EE ADD 2 NEW LANES, MAJOR IMPROVEMENTS TO EXISTING LANES

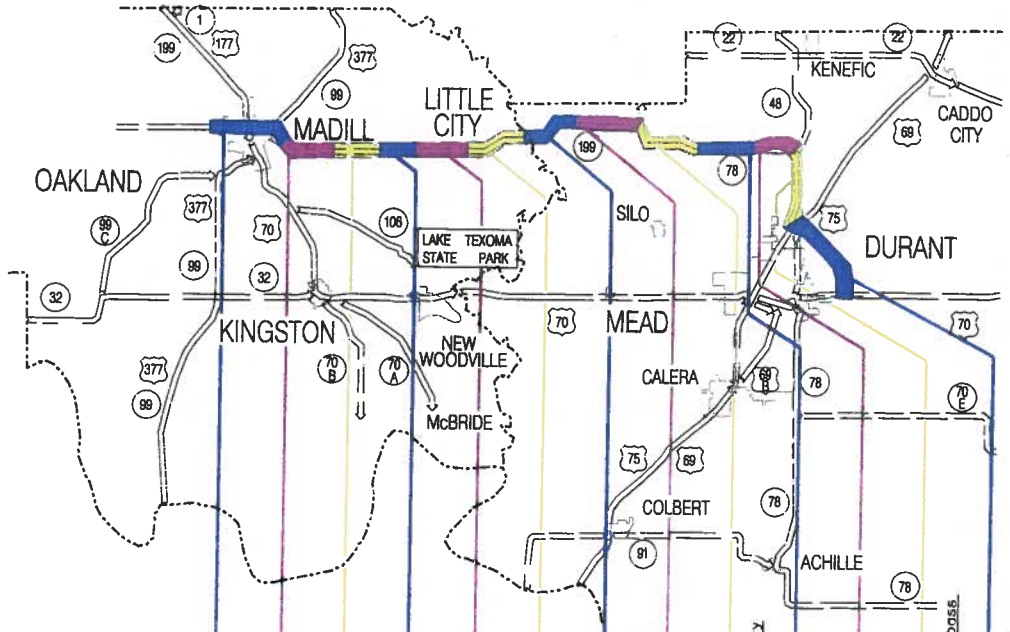
PRIORITY GROUP
- H HIGH PRIORITY
- M MODERATE PRIORITY
- L LOW PRIORITY

US 70 Feasibility Study

MADILL-DURANT ALTERNATIVES: EXISTING ROUTE

Figure 8 – 2

MADILL TO DURANT: S.H.199 / S.H.78



PROJECT IDENTIFICATION	48 LI	48 LII	48 LIII	48 LIV	48 LV	48 LVI	07 LVII	07 LVIII	07 LIX	07 LX	07 LXI	07 LXII	07 LXIII
PROJECT LENGTH (MILES)	3.41	2.37	1.80	1.60	2.60	2.25	2.40	2.53	3.16	2.00	2.18	3.79	3.13
TYPE OF IMPROVEMENT	AA / BB	EE	EE	EE	EE	EE	EE	EE	EE	EE	EE	EE	BB
PROJECT COST ($ MILLION)	11.34	4.44	3.15	2.92	4.32	4.09	6.48	5.27	5.31	3.36	4.10	5.86	9.13
PRIORITY GROUP	H	H	H	H	H	H	H	H	H	H	H	H	H

Madill East Bypass

Durant Northeast Bypass

LEGEND

PROJECT IDENTIFICATION
10 COUNTY CODE
IV SECTION NUMBER

TYPE OF IMPROVEMENT
AA 5 – LANE SECTION, CONSTRUCT ALONG EXISTING ALIGNMENT
BB 4 NEW LANES, CONSTRUCT ALONG NEW ALIGNMENT
CC ADD 2 NEW LANES, NO IMPROVEMENT TO EXISTING LANES
DD ADD 2 NEW LANES, WIDEN & RESURFACE EXISTING LANES
EE ADD 2 NEW LANES, MAJOR IMPROVEMENTS TO EXISTING LANES

PRIORITY GROUP
H HIGH PRIORITY
M MODERATE PRIORITY
L LOW PRIORITY

US 70 Feasibility Study

MADILL-DURANT ALTERNATIVES: SH199 / SH78

Figure 8 – 3

Kingston: The route for US 70 chosen as the recommended alternative in Kingston was the East Bypass. Not only was the cost of the east route approximately half the existing route alternative, it was superior in its ability to serve US 70 traffic. The East Bypass also causes fewer displacements and has less severe environmental issues.

Durant: At Durant, the recommended alignment of US 70 is the South Bypass. This route was chosen because it connects to the existing route of US 70, the preferred route alternative between Madill and Durant. Because its total cost is approximately 25 million dollars, the bypass should be divided into multiple projects. Suggested project limits are: west terminus to US 69, US 69 to SH 78 and SH 78 to east terminus.

Bokchito: The North Bypass is the recommended alternative for the routing of US 70 in Bokchito. In the final analysis the North and South Routes were considered to be approximately equal in merit. Although responses were very limited, the North Bypass received more support from the citizens of Bokchito than the other two alternatives. The cost of the North Bypass was also less than either the South or Existing Route.

Boswell: The alignment for US 70 chosen as the recommended alternative in Boswell was the North Bypass. Even though it was the longest of the three options, it was estimated to be the least expensive. Fewer displacements and environmental problems are associated with the North Bypass.

Soper: At Soper, the recommended alignment of US 70 is the North Bypass. Compared to the existing alignment, the bypass better serves US 70 traffic, results in fewer relocations and displacements, and has no apparent environmental constraints. It is estimated to be about half the cost of improving along the existing route.

Fort Towson: Improving US 70 on its existing alignment through town is recommended over the North Bypass at Fort Towson. After the two alternatives were compared using the five criteria, they were essentially equal. Since the new route, the bypass, was considered no better than the existing route, the decision was made to stay with the current alignment. The North Bypass was the less expensive alternative, but its environmental issues were more complex.

Valliant: The North Bypass is the preferred alternative in Valliant. The bypass would serve motorists traveling along US 70 better than the existing alignment. Fewer environmental issues would have to be mediated along the North Bypass. In

addition, its construction cost is considerably less then the amount to widen the existing route.

Ardmore: A US 70 Bypass of Ardmore is not recommended. Future traffic volumes and the projected level of service along the existing route for Year 2020 along the existing alignment do not warrant improvements be made. Opinions received from the residents of the area were unanimously opposed to the proposed alignments.

Table 8-2 summarizes the results of the analysis of the municipal route alternatives. The preferred alternative for the municipal routes in Madill, Kingston, Durant, Bokchito, Boswell, Soper, Fort Towson and Valliant are shown in Figures 8-5 through 8-12. Appendix E contains the detailed analysis for each town.

Priority Projects

The entire study corridor between I-35 and the Arkansas State Line was divided into 48 projects. These projects include all proposed bypasses, the recommended route between Madill and Durant, and improvements to existing US 70 throughout the rest of the corridor. The 48 projects were broken into three project priority groups: high, moderate, and low, to create logical sections for improvements. Each project's length, total cost and priority category are listed in Table 8-3. A map of the corridor, illustrating the location and priority of each project is shown in Figure 8-13 A table at the bottom of Figure 8-13 contains each project's identification, length, improvement type, cost and priority group. The total estimated cost to upgrade the corridor is over 275 million dollars.

High priority projects are located in three areas:

- Between Madill and Durant.
- From the east edge of Hugo to west of Fort Towson.
- From the Mountain Fork River to the Arkansas State Line.

Included in the high priority projects are the bypasses at Madill, Kingston, and Durant.

Segments of moderate priority projects are:

- Between Durant and Bokchito.
- Near the Bryan/Choctaw County Line.
- Between Soper and Hugo.
- From Fort Towson to Idabel.

Preferred municipal routes for Fort Towson and Valliant are part of this category.

U.S. HIGHWAY 70 FEASIBILITY STUDY
MUNICIPAL ROUTE OPTIONS
PROJECT PRIORITIZATION

City or Town	Route	Project Length (Mi.)	Total Project Cost ($)[1]	Ranking
Madill	East	5.68	17,687,363	1
	Southwest	4.45	8,996,623	2
	North	6.06	18,761,696	3
	Existing	4.83	17,033,734	4
Kingston	East	3.36	6,885,320	1
	Existing	4.12	11,969,240	2
Durant	South	9.28	24,884,855	1
	Northeast	3.13	9,128,413	2
Bokchito	North	4.29	9,413,919	1
	South	3.60	11,383,848	2
	Existing	3.82	15,384,814	3
Boswell	North	3.11	5,058,104	1
	Existing	2.89	8,197,358	2
	South	2.89	9,320,638	3
Soper	North	2.14	3,703,940	1
	Existing	2.18	7,206,060	2
Fort Towson	Existing	3.14	9,873,296	1
	North	3.17	7,345,894	2
Valliant	North	3.32	6,838,048	1
	Existing	2.98	13,347,337	2
TOTALS of highest ranking options:		34.32	84,344,845	

[1] Costs are based on 1994 dollars.

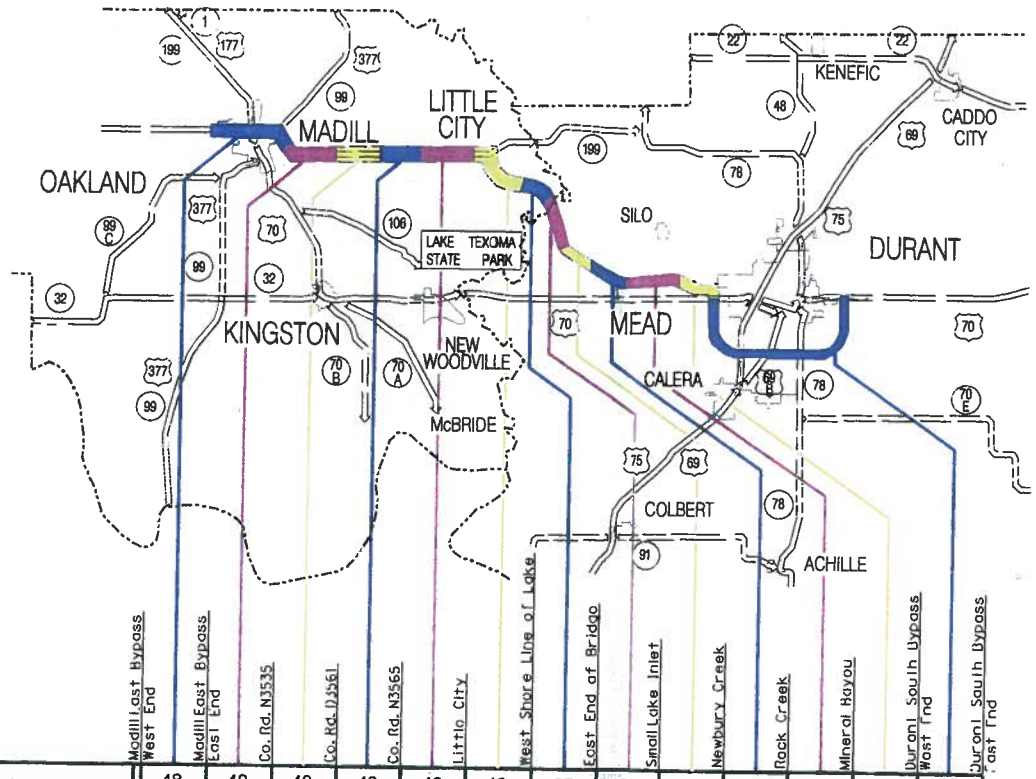
Table 8 - 2

U.S. HIGHWAY 70 FEASIBILITY STUDY
RURAL, MUNICIPAL, & BYPASS SECTIONS
PROJECT PRIORITIZATION

Project Description				Project Length (Mi.)	Total Project Cost ($)[1]	Project Priority
Project #	County	From	To			
10-I	Carter	1 mi. E. of I-35	Ardmore Limits	3.89	4,864,478	Low
10-II	Carter	Ardmore Limits	S.H. 77 S	2.83	3,363,518	Low
10-III	Carter	S.H. 77 S	County Line	3.77	4,230,634	Low
48-I	Marshall	County Line	Co. Rd. D3430	4.56	4,825,741	Low
48-II	Marshall	Co. Rd. D3430	Madill Bypass	4.72	4,802,394	Low
48-III	Marshall	Madill East Bypass		5.68	17,687,363	High
48-IV	Marshall	Madill Bypass	Kingston Bypass	2.60	5,007,443	High
48-V	Marshall	Kingston East Bypass		3.36	6,885,320	High
48-VI	Marshall	Kingston Bypass	W. Lake Shore	3.60	5,124,160	High
07-I	Bryan	Lake Texoma Bridge		0.94	25,000,000	High
07-II	Bryan	W. Lake Shore	Edge State Land	3.88	4,237,348	High
07-III	Bryan	Edge State Land	Co.Rd.D2044 S	2.71	3,311,575	High
07-IV	Bryan	Co.Rd.D2044 S	Durant Bypass	4.73	5,551,074	High
07-V	Bryan	Durant South Bypass		9.28	24,884,855	High
07-VI	Bryan	Durant Bypass	Sec.Rd @Kanola	3.00	4,792,837	Moderate
07-VII	Bryan	Sec.Rd @Kanola	W. side of Blue	2.80	5,271,264	Moderate
07-VIII	Bryan	W. side of Blue	Caddo Creek	2.68	4,057,435	Moderate
07-IX	Bryan	Caddo Creek	Bokchito Bypass	1.60	3,261,945	Moderate
07-X	Bryan	Bokchito North Bypass		4.29	9,413,919	Low
07-XI	Bryan	Bokchito Bypass	W. Bennington	4.17	5,056,798	Low
07-XII	Bryan	W. Bennington	Co. Rd. N3957	3.63	4,129,662	Moderate
07-XIII	Bryan	Co. Rd. N3957	County Line	3.04	3,185,239	Moderate
12-I	Choctaw	County Line	Boswell Bypass	2.79	4,012,578	Moderate
12-II	Choctaw	Boswell North Bypass		3.11	5,058,104	Low
12-III	Choctaw	Boswell Bypass	Rd. W of Unger	2.55	3,667,410	Low
12-IV	Choctaw	Rd. W of Unger	N. Frontage Rd.	2.06	2,962,692	Low
12-V	Choctaw	N. Frontage Rd.	Soper Bypass	2.89	4,532,811	Low
12-VI	Choctaw	Soper North Bypass		2.14	3,703,940	Low
12-VII	Choctaw	Soper Bypass	U.S. 271	2.66	4,154,800	Moderate
12-VIII	Choctaw	U.S. 271	I.N. Turnpike	4.57	5,808,048	Moderate
12-IX	Choctaw	Hugo	Hugo	1.75	2,575,825	Low
12-X	Choctaw	S.H. 93 (Hugo)	Fallon	3.00	4,314,600	High
12-XI	Choctaw	Fallon	Kiamichi River	2.17	3,120,894	High
12-XII	Choctaw	Kiamichi River	W side of Sawyer	0.31	4,488,493	High
12-XIII	Choctaw	W side of Sawyer	S.H. 147	0.90	3,527,280	High
12-XIV	Choctaw	S.H. 147	Bird Creek	3.20	4,331,088	High
12-XV	Choctaw	Bird Creek	Fort Towson	2.15	3,151,605	Moderate
12-XVI	Choctaw	Through Fort Towson		1.52	7,074,086	Moderate
12-XVII	Choctaw	Fort Towson	Doaksville Creek	2.50	3,550,978	Moderate
12-XVIII	Choctaw	Doaksville Creek	County Line	3.35	4,514,309	Moderate
45-I	McCurtain	County Line	Valliant Bypass	2.79	3,384,276	Moderate
45-II	McCurtain	Valliant North Bypass		3.32	6,838,048	Moderate
45-III	McCurtain	Valliant Bypass	E. side Millerton	3.60	5,033,160	Moderate
45-IV	McCurtain	E. side Millerton	E. side of Garvin	3.58	4,386,288	Moderate
45-V	McCurtain	E. side of Garvin	Idabel	7.14	6,237,504	Moderate
45-VI	McCurtain	Mt. Fork River	Co. Rd. N4752	1.17	4,421,830	High
45-VII	McCurtain	Co. Rd. N4752	Co. Rd. N4775	3.10	4,952,374	High
45-VIII	McCurtain	Co. Rd. N4775	State Line	4.43	6,276,151	High
TOTALS:				154.51	275,024,174	

[1] Costs are based on 1994 dollars

MADILL TO DURANT: NEW ALIGNMENT



PROJECT IDENTIFICATION	48 MI	48 MII	48 MIII	48 MIV	48 MV	48 MVI	07 MVII	07 MVIII	07 MIX	07 MX	07 MXI	07 MXII	07 MXIII
PROJECT LENGTH (MILES)	3.41	2.37	1.80	1.60	2.60	2.97	1.14	2.46	2.00	2.34	2.00	0.76	9.28
TYPE OF IMPROVEMENT	AA /BB	EE	EE	EE	EE	BB	BB	BB	BB	BB	BB	BB	BB
PROJECT COST ($ MILLION)	11.34	4.44	3.15	2.92	4.32	6.38	14.62	5.98	5.80	4.96	4.80	3.31	24.88
PRIORITY GROUP	H	H	H	H	H	H	H	H	H	H	H	H	H

Madill East Bypass

New Lake Texoma Bridge

Durant South Bypass (Multiple Projects)

LEGEND

PROJECT IDENTIFICATION
- 10 COUNTY CODE
- IV SECTION NUMBER

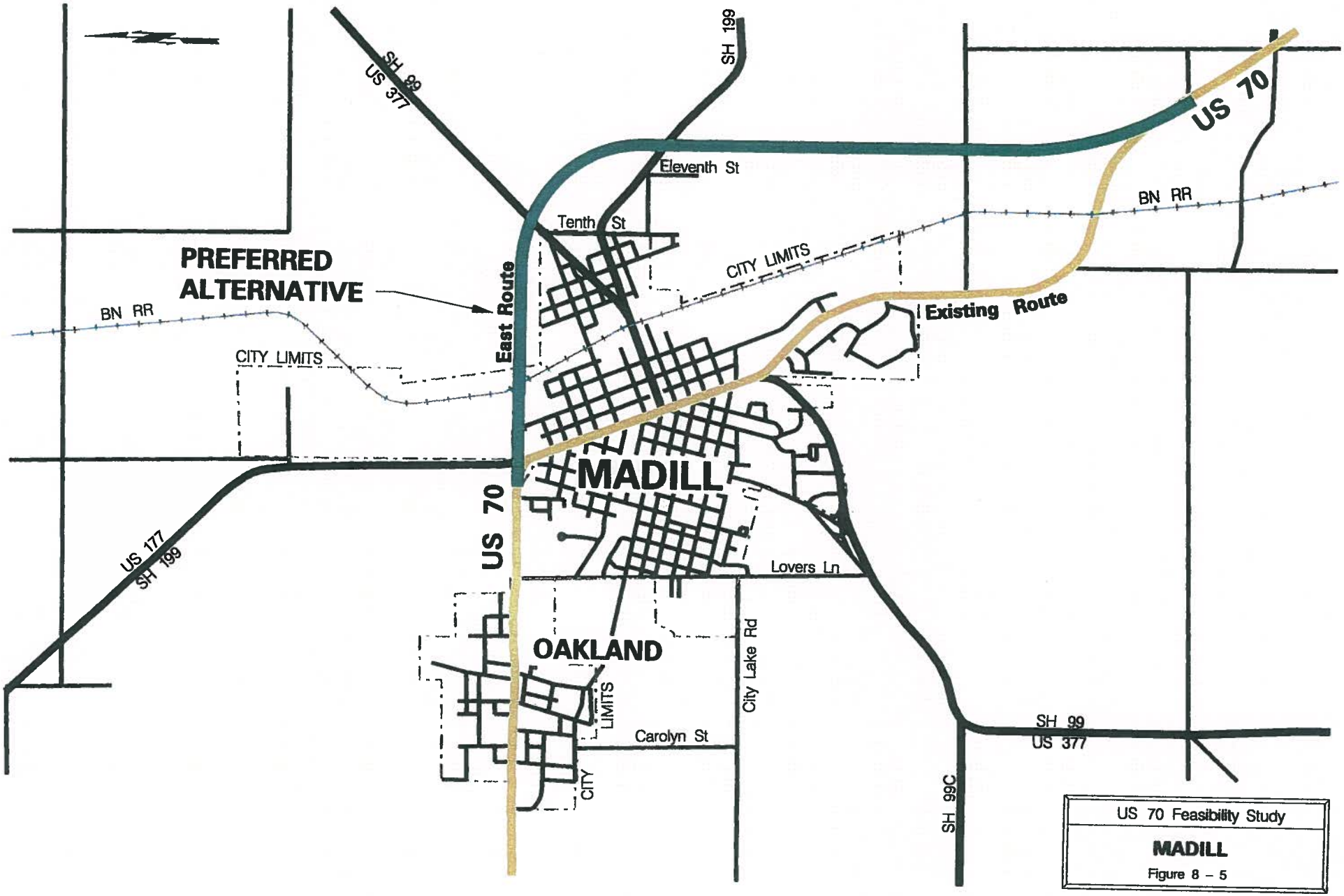
TYPE OF IMPROVEMENT
- AA 5 - LANE SECTION, CONSTRUCT ALONG EXISTING ALIGNMENT
- BB 4 NEW LANES, CONSTRUCT ALONG NEW ALIGNMENT
- CC ADD 2 NEW LANES, NO IMPROVEMENT TO EXISTING LANES
- DD ADD 2 NEW LANES, WIDEN & RESURFACE EXISTING LANES
- EE ADD 2 NEW LANES, MAJOR IMPROVEMENTS TO EXISTING LANES

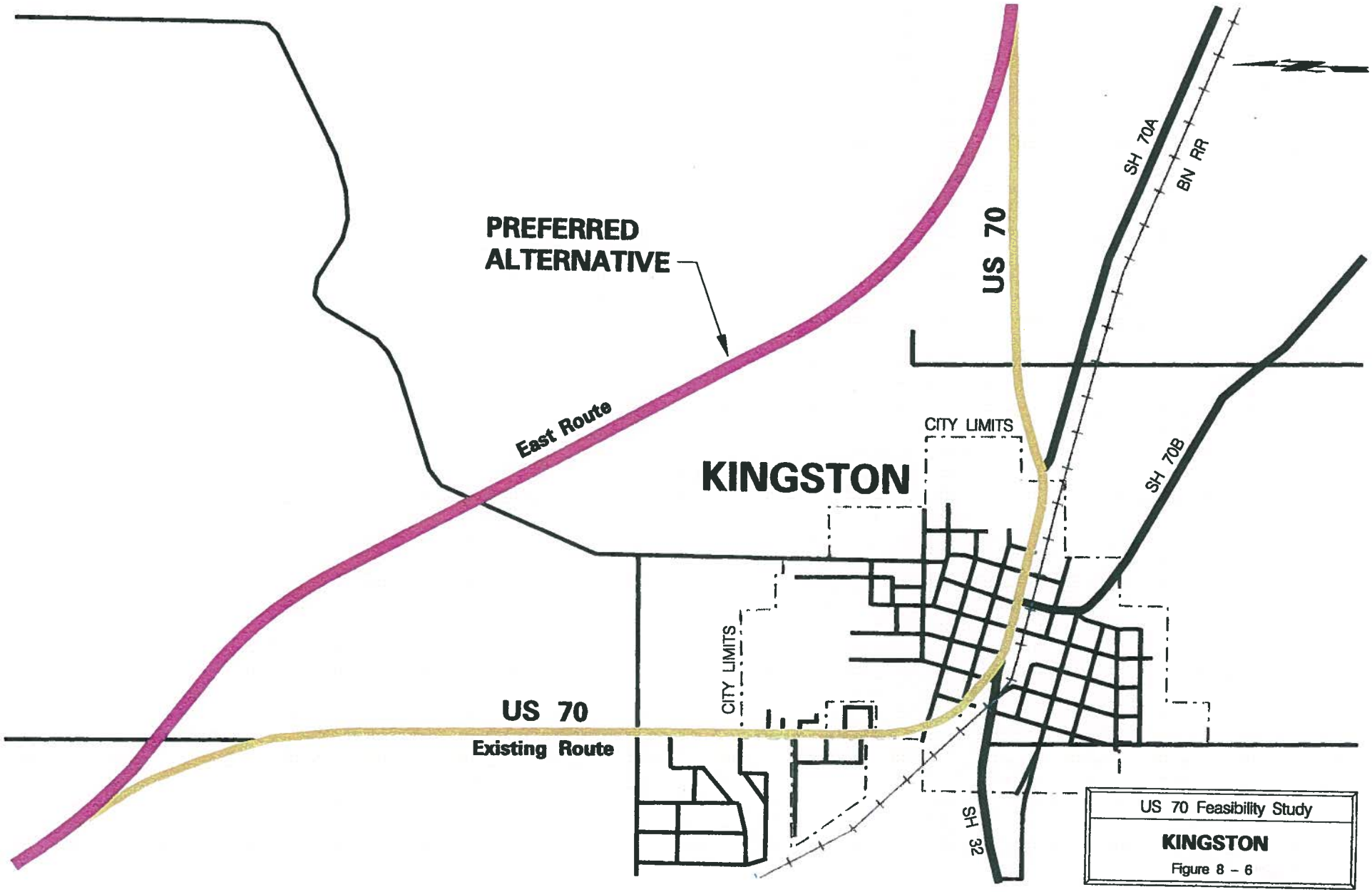
PRIORITY GROUP
- H HIGH PRIORITY
- M MODERATE PRIORITY
- L LOW PRIORITY

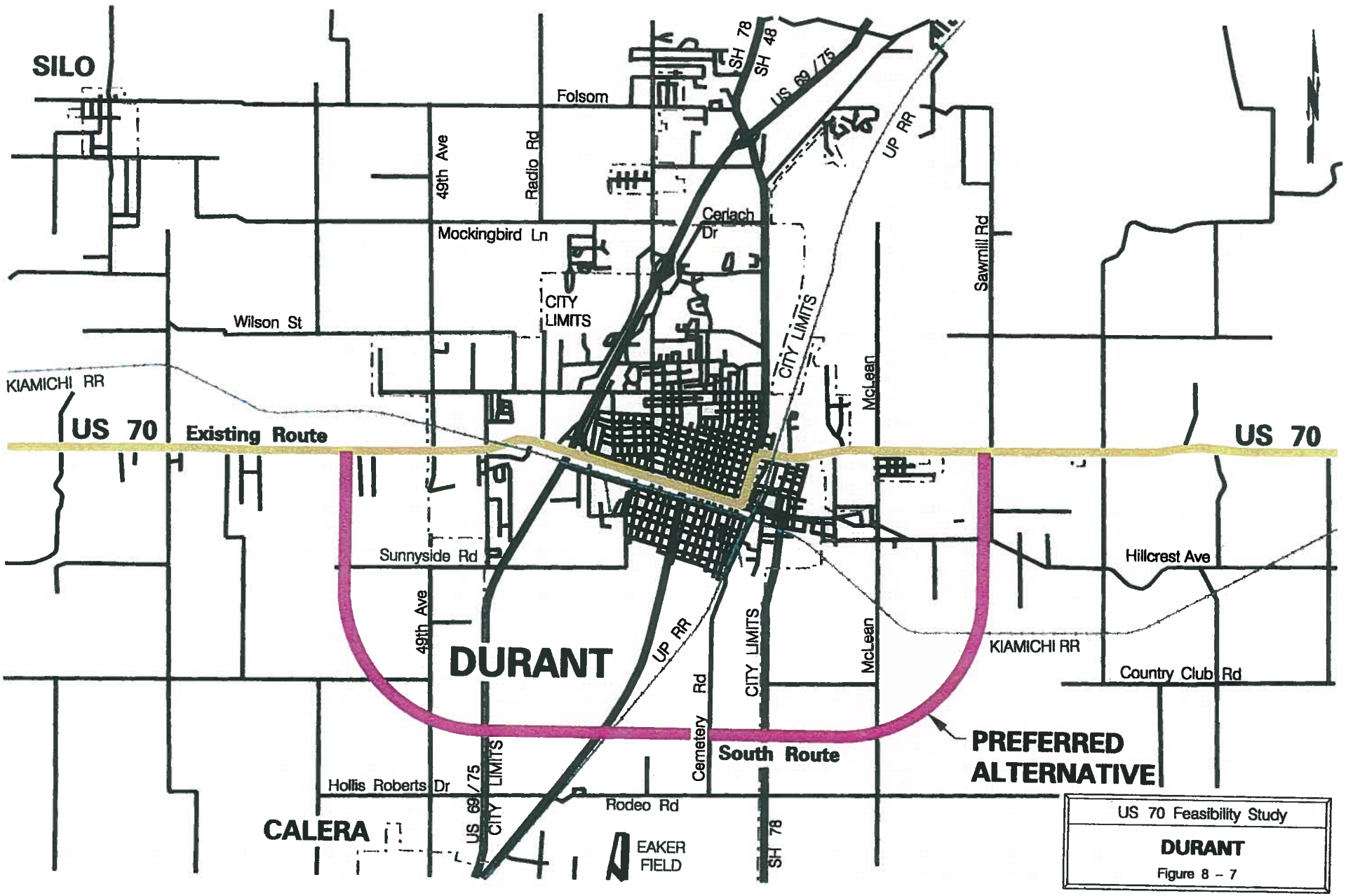
US 70 Feasibility Study

MADILL-DURANT ALTERNATIVES: NEW ALIGNMENT

Figure 8 – 4


PREFERRED ALTERNATIVE
East Route
Existing Route
MADILL
OAKLAND
US 70
US 177
SH 199
SH 99
US 377
SH 99C
BN RR
CITY LIMITS
Eleventh St
Tenth St
Lovers Ln
City Lake Rd
Carolyn St
CITY LIMITS
US 70 Feasibility Study
MADILL
Figure 8 – 5

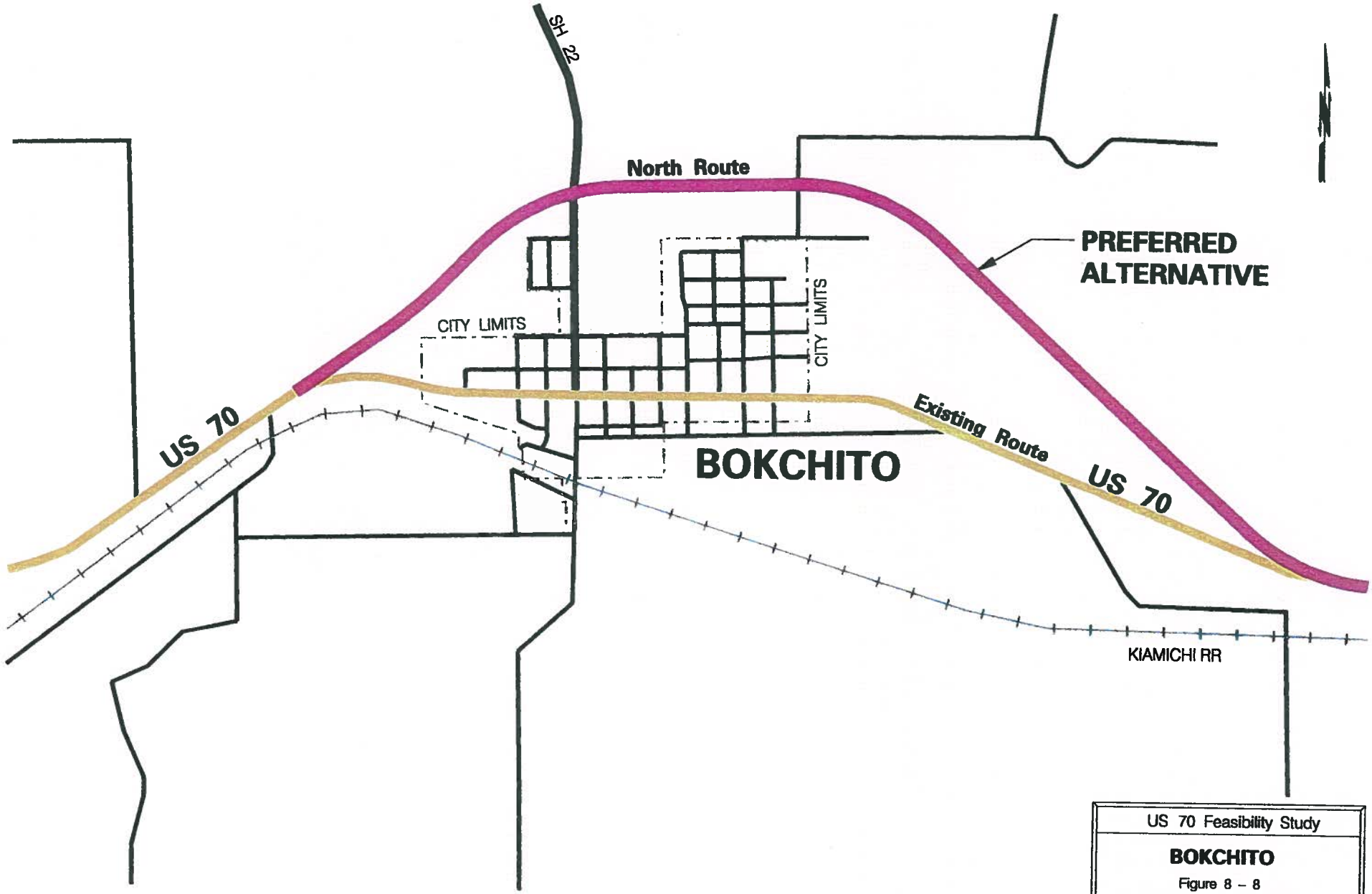

PREFERRED
ALTERNATIVE
East Route
US 70
SH 70A
BN RR
CITY LIMITS
KINGSTON
SH 70B
CITY LIMITS
US 70
Existing Route
SH 32
US 70 Feasibility Study
KINGSTON
Figure 8 - 6



US 70 Feasibility Study

DURANT

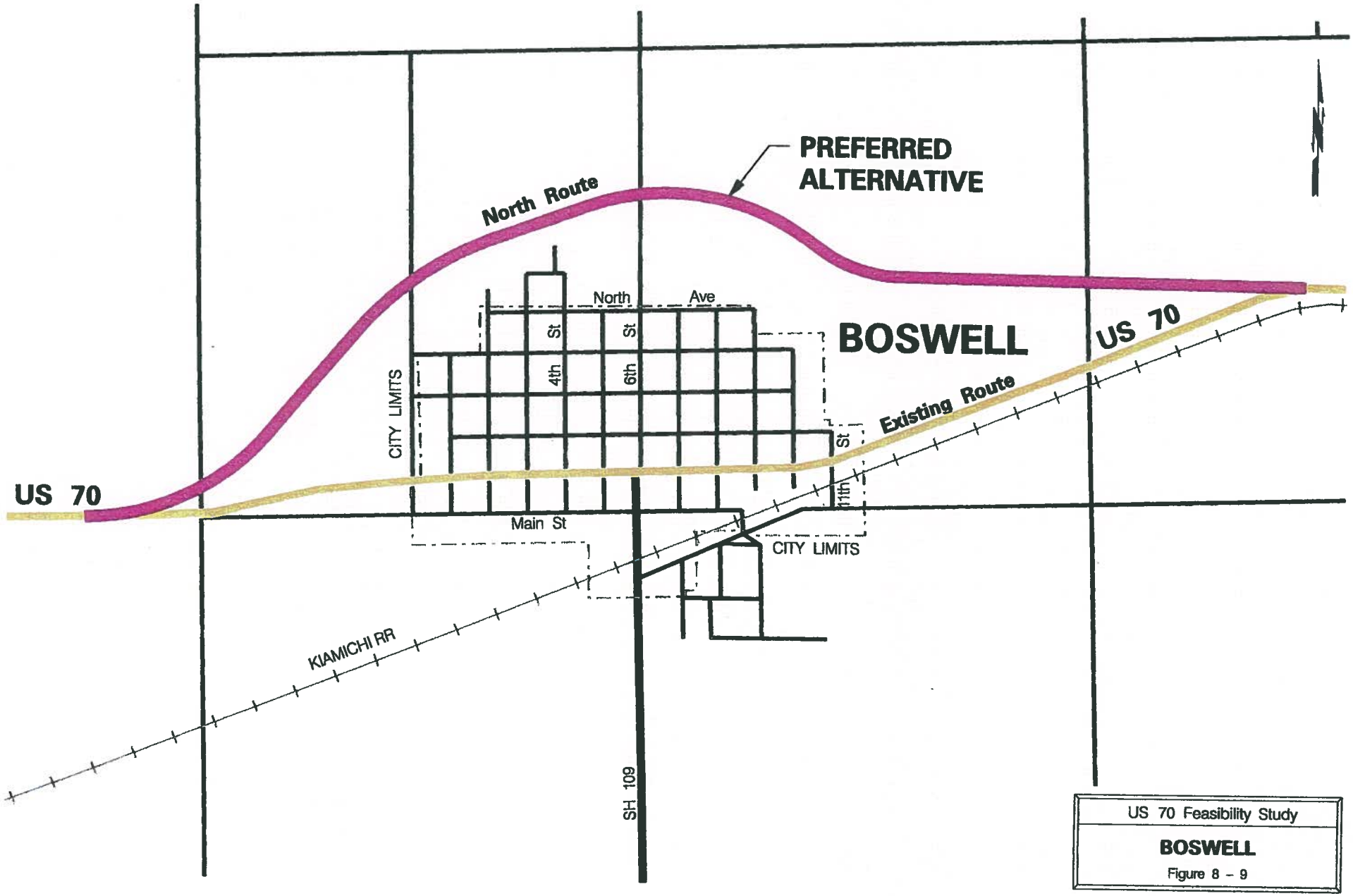
Figure 8 – 7



US 70 Feasibility Study

BOKCHITO

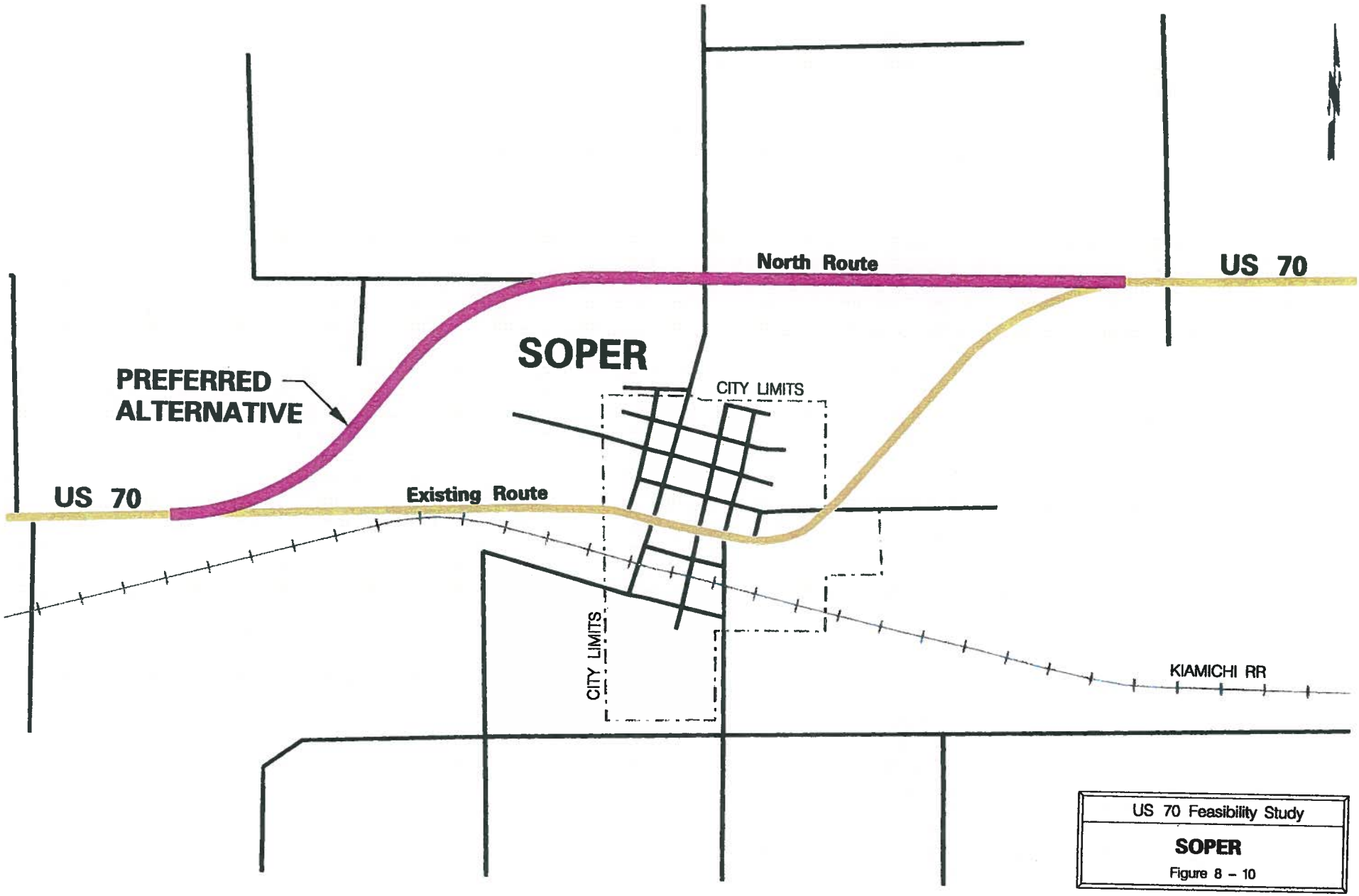
Figure 8 – 8



US 70 Feasibility Study

BOSWELL

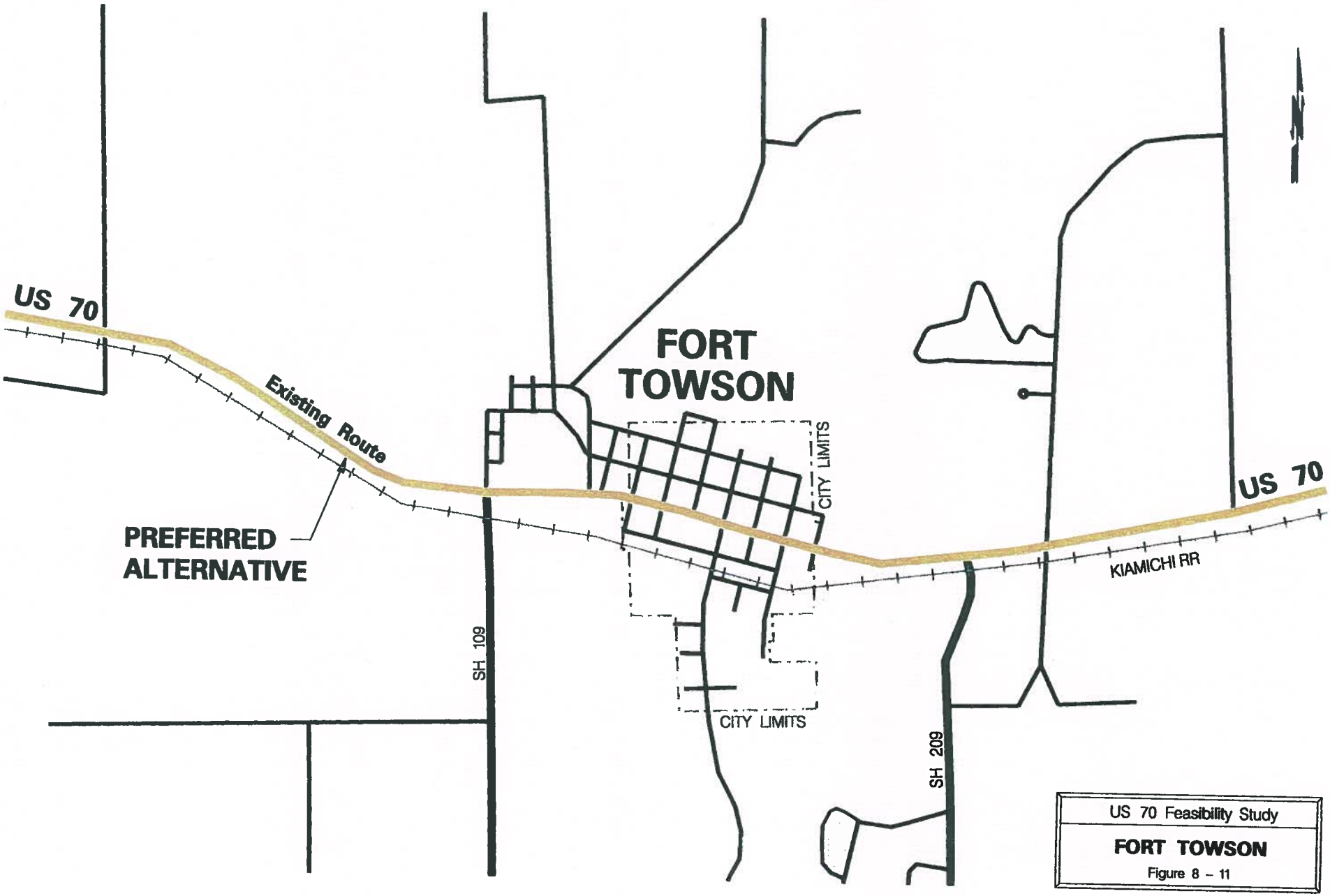
Figure 8 – 9



US 70 Feasibility Study

SOPER

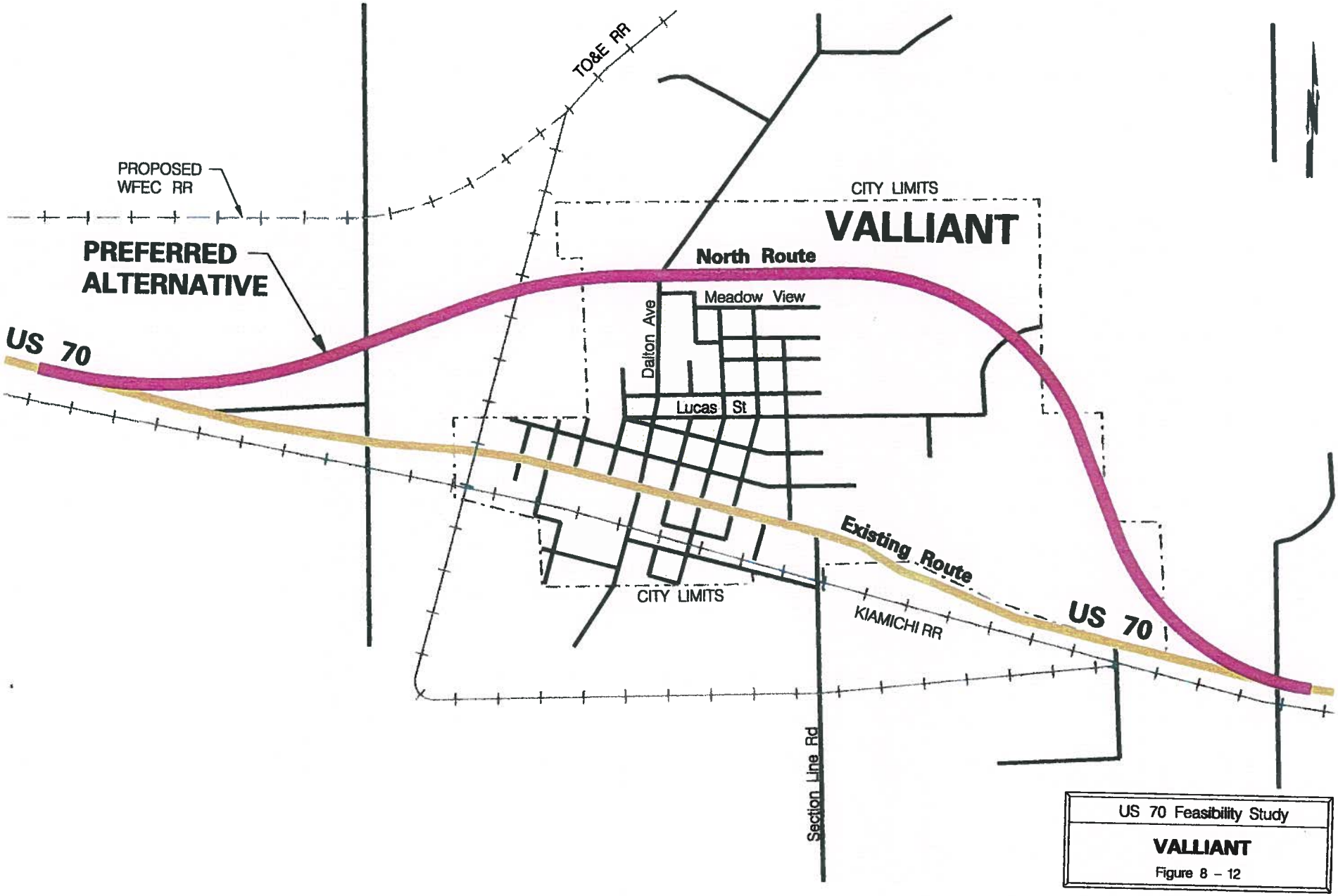
Figure 8 – 10



US 70 Feasibility Study

FORT TOWSON

Figure 8 – 11

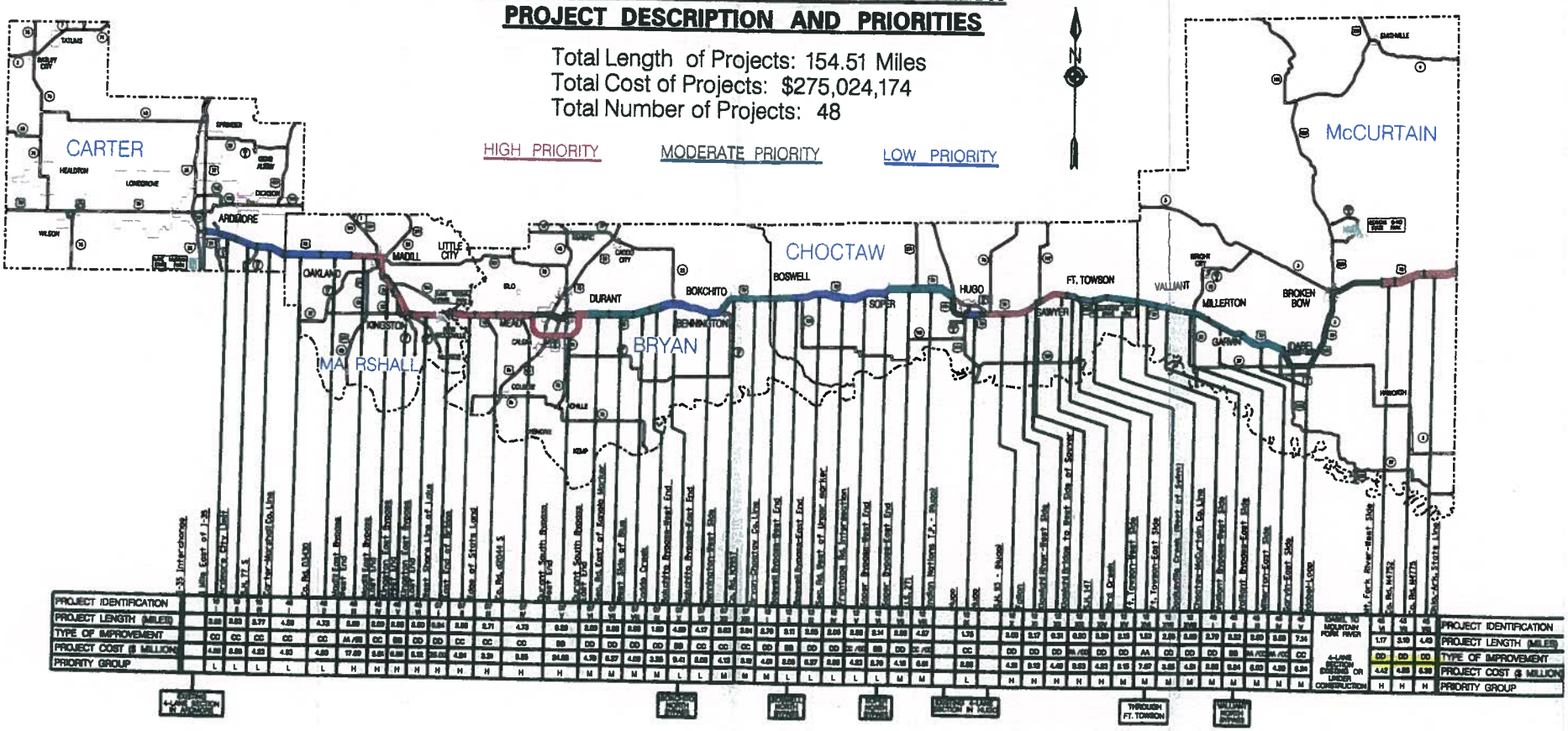


US 70 Feasibility Study
VALLIANT
Figure 8 – 12

U.S. HIGHWAY 70 IMPROVEMENT CORRIDOR
PROJECT DESCRIPTION AND PRIORITIES

Total Length of Projects: 154.51 Miles
Total Cost of Projects: $275,024,174
Total Number of Projects: 48

HIGH PRIORITY MODERATE PRIORITY LOW PRIORITY



LEGEND

PROJECT IDENTIFICATION	10 COUNTY CODE IV SECTION NUMBER
TYPE OF IMPROVEMENT	AA 5 – LANE SECTION, CONSTRUCT ALONG EXISTING ALIGNMENT BB 4 NEW LANES, CONSTRUCT ALONG NEW ALIGNMENT CC ADD 2 NEW LANES, NO IMPROVEMENT TO EXISTING LANES DD ADD 2 NEW LANES, WIDEN & RESURFACE EXISTING LANES EE ADD 2 NEW LANES, MAJOR IMPROVEMENTS TO EXISTING LANES
PRIORITY GROUP	H HIGH PRIORITY M MODERATE PRIORITY L LOW PRIORITY

US 70 Feasibility Study

PROJECT PRIORITY MAP

Figure 8 – 13

Low priority projects are found along the corridor:

- Between Ardmore and Durant.
- Bokchito to east of Bennington.
- Boswell to Soper.
- Near Hugo.

Bypasses of Bokchito, Boswell and Soper are included in this priority group.

The proposed location of the future lanes of US 70 and the bypass locations are shown in Figure 8-14 The number and type of developments adjacent to US 70 were factors in determining which side of the road the new lanes would be located. The objective was to minimize the impact to existing structures. Areas along the corridor where the additional two lanes should be positioned south of the existing roadway are:

- Between Ardmore and Oakland.
- From Kingston to west of the Lake Texoma Lodge.
- East of Lake Texoma to Mead.
- From Bennington to the north bypass around Boswell.
- Along the Hugo Bypass.

From the end of the Madill bypass to the beginning of the Kingston bypass, the new pavement would best be placed east of the current lanes.

The additional lanes should be built north of the existing facility:

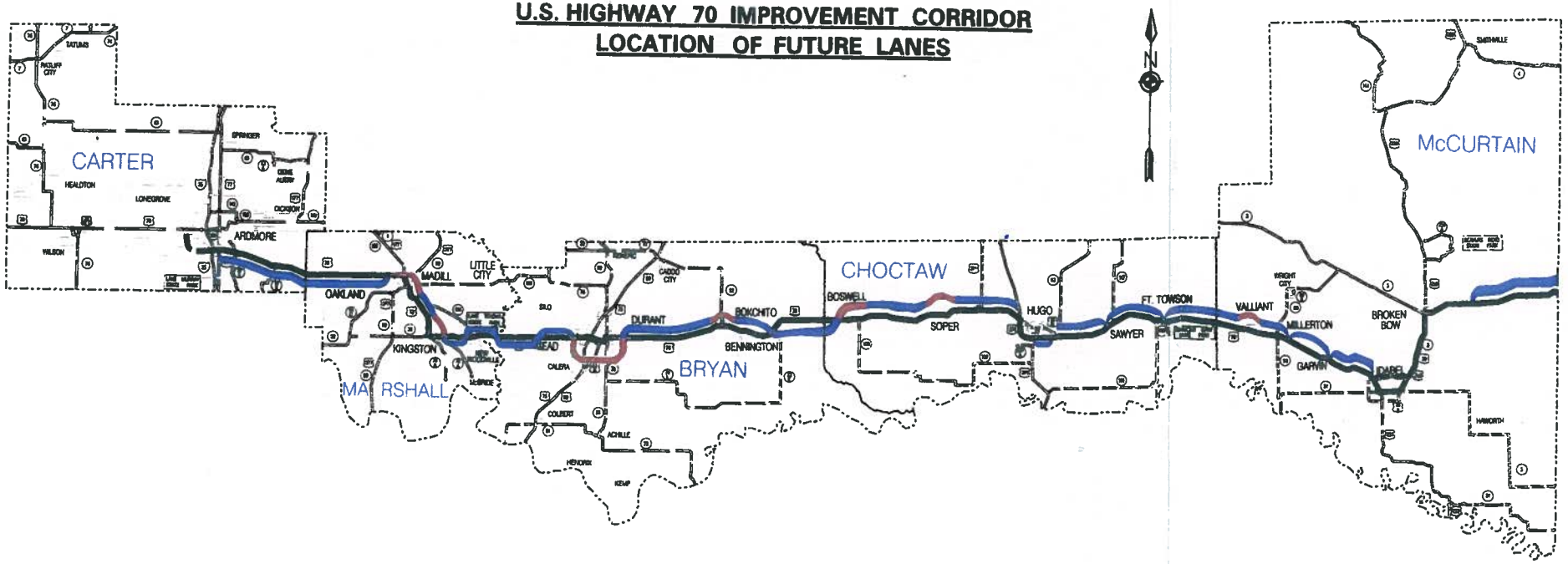
- Across Lake Texoma.
- Between Mead and the Durant bypass.
- From the east end of the Durant bypass to Bennington.

The section across Lake Texoma would involve a new bridge parallel to the existing Roosevelt Bridge. With the exception of the Hugo bypass area, the Kiamichi Railroad runs parallel on the south side of US 70 between Boswell and Idabel. Therefore the additional lanes should be located north of the existing lanes, opposite of the railroad tracks, in this portion of the corridor. New lanes are presently under construction on the north side of US 70 from Broken Bow east to the Mountain Fork River. Future lanes east of the river to the state line should also be located north of the existing pavement.

Five lane sections are planned in the following areas:

- Through Oakland.
- In front of the Lake Texoma Lodge.
- Through Sawyer, Fort Towson, Millerton and Garvin.

U.S. HIGHWAY 70 IMPROVEMENT CORRIDOR
LOCATION OF FUTURE LANES



LEGEND:

- LOCATION OF FUTURE LANES
- PREFERRED BYPASS LOCATION

US 70 Feasibility Study

FUTURE LANES LOCATION

Figure 8 – 14