CHAPTER FIVE – EVALUATION OF ALTERNATIVES

As discussed in Chapter Four, the CMPO did not provide an exhaustive analysis of regional alternatives. However, the CMPO followed a rational and objective process for evaluating the "need" for various transportation improvements and comparing the relative merits of one improvement against another. Specifically, the CMPO incrementally modeled the traffic benefits in terms of delay and vehicle mile reduction of a subset of projects to determine the relative traffic benefits of these projects. The resulting traffic benefits reflect the results which came directly from the modeling analysis of each project. It should be noted that the travel model represents a sophisticated tool to help inform decision makers, it was not the only tool used in the analysis of projects. This chapter reports on the modeling results related to the relative benefits of those projects evaluated using the regional travel demand model.

Table 5-1 summarizes the limits of each project that was modeled using the regional travel demand model and the approximate results of the model run in terms of total motor vehicle traffic volume using each facility. As discussed in Chapter 4, projects listed in Table 5-1 were modeled incrementally above the Baseline projects presented in Chapter 4.

Table 5-1: Alternative Project Summary

Project	Limits		Distance	Travel Lanes	Volume
	From	To			
200 East to 100 East	300 South	Providence Lane	0.63	2	NA
SR-30 realignment	US-89	1400 West	1.78	4	NA
1000 West	US-89	2500 North	6.81	4	17,800 - 31,900
1400 West	US-89	100 North (Smithfield)	11.75	4	NA
1000 & 1400 West	US-89	100 North (Smithfield)	19.88	4	NA
2500 North	1400 West	1600 East	8.89	4	900 - 21,500
1200 East	400 North Logan	300 South Smithfield	6.01	4	3,900 - 13,500
1200 East	400 North Logan	300 South Smithfield	6.01	2	3,900 - 13,500
3100 North	1600 East	200 West Hyde Park	1.46	4	2,200
3100 North	1200 East	Main Street	1.51	2	2,200
1700 South	US-89	SR-165	0.85	2	5,500 - 7,700
1200 West	US-89	Hyrum	3.97	2	0 - 1,500
1200 West	US-89	3200 South	1.59	2	0 - 1,500

Table 5-2 provides comparisons of each project under the build and no-build (baseline) conditions. Both V/C ratio (volume to capacity ratio) and congested speeds reflect the conditions on the specific roadway in question. All other columns including vehicle miles of travel, vehicle hours of travel and average speed represent cumulative conditions across the entire CMPO transportation network.

Table 5-2: Project Evaluation Measures

	No Build Conditions					Build Conditions				
Project	**V/C Ratio**	**Congested Speed**	**VMT**	**VHT**	**Average Speed**	**V/C Ratio**	**Congested Speed**	**VMT**	**VHT**	**Average Speed**
200 East to 100 East	NA	NA	3,550,126	183,218	19.4	0.99	19.2	3,549,079	182,670	19.4
SR-30 realignment	NA	NA	3,552,543	184,694	19.2	0.76	21.0	3,549,145	182,329	19.5
1000 West	2.12	7.6	3,549,145	182,329	19.5	1.45	18.6	3,557,830	174,236	20.4
1400 West	NA	NA	3,549,145	182,329	19.5	0.44	32.0	3,556,115	174,608	20.4
1000 & 1400 West	NA	NA	3,549,145	182,329	19.5	0.4 - 1.3	32 - 21	3,558,272	169,994	20.9
2500 North	1.43	19.0	3,549,145	182,329	19.5	0.95	27.6	3,558,645	173,786	20.5
1200 East	1.23	22.4	3,549,145	182,329	19.5	0.67	30.1	3,555,558	180,875	19.7
1200 East	1.23	22.4	3,549,145	182,329	19.5	1.31	21.5	3,555,455	181,441	19.6
3100 North	0.2	30.0	3,549,145	182,329	19.5	0.11	31.0	3,549,398	182,135	19.5
3100 North	0.2	30.0	3,549,145	182,329	19.5	0.38	31.0	3,549,294	182,277	19.5
1700 South	0.86	25.9	3,549,145	182,329	19.5	0.65	30.2	3,549,617	182,237	19.5
1200 West	0.14	30.0	3,549,145	182,329	19.5	0.53	29.6	3,548,755	182,025	19.5
1200 West	0.14	30.0	3,557,830	174,236	20.4	1.07	25.0	3,556,440	174,451	20.4

Although the results of Table 5-2 generally fall within expected ranges, it should be noted that the sensitivity of the regional travel demand model to small network changes is not always rational. Project 9, for example, results in a change of regional vehicle miles of travel (VMT) of approximately 0.03 percent. While such a small change may be expected of a localized improvement, the actual results may be overly sensitive to model inputs of speed and capacity. As such, the results of Table 5-2 and 5-3 reflect objective modeled data which may inform decision makers of the relative benefits of certain projects, the results should not indicate precision of data, only consistency of methods through the use of the regional model.

Table 5-3 summarizes the regional benefits and provides a rough framework for evaluating and comparing projects. Under this framework, regional travel time and travel distance savings can

be translated into a monetary value. The value of every mile saved is $0.485, equivalent to the present IRS mileage reimbursement value. The value of every vehicle hour saved is $10, an approximate value consistent with federal literature which values user travel time savings between $8 and $16 per hour for personal vehicles. These values where estimated over a 25 year timeframe without inflation or discounting, and compared against the present day project cost to yield an approximate benefit to cost ratio. Theoretically, projects with the highest benefit to cost ratio provide the greatest benefits to the traveling public. As stated, results should be reviewed towards relative merits as opposed to precision.

Table 5-3: Project Evaluation Summary

Project	VMT Savings	VHT Savings	Benefit	Cost	Benefit / Cost Ratio
SR-30 realignment	3,398	2,365	$115,400,000	$13,350,000	8.6
1000 West	-8,685	8,093	$350,000,000	$51,075,000	6.9
200 East to 100 East	1,047	548	$27,300,000	$7,250,000	3.8
1400 West	-6,970	7,721	$336,800,000	$88,125,000	3.8
1000 & 1400 West	-9,127	12,335	$542,600,000	$149,100,000	3.6
2500 North	-9,500	8,543	$18,800,000	$15,600,000	1.2
1200 East	-6,413	1,454	$52,100,000	$45,075,000	1.2
1200 East	-6,310	888	$26,600,000	$27,045,000	1.0
3100 North	-253	194	$8,300,000	$10,950,000	0.8
3100 North	-149	52	$2,000,000	$6,795,000	0.3
1700 South	-472	92	$3,200,000	$3,825,000	0.8
1200 West	390	304	$14,700,000	$17,865,000	0.8
1200 West	1,390	-215	-$6,700,000	$7,155,000	-0.9

Note: Project costs reflect present day costs and have not been inflated to the middle of each phase, as presented in Chapter 8.

Analysis of individual projects presented in this chapter of the plan were used to meet the agreed upon MPO (statewide) format for the Long Range Transportation Plan (as it is referred to by UDOT) document. By analyzing the benefits of various projects, projects included in the latter phases of the MPO Plan were re-phased to reflect the modeled results of this chapter along with public comment of both this plan and the 2005 CMPO Regional Transportation Plan, which this plan updates. Therefore, a recommended alternative resulting from this analysis is presented in Chapter 8. Future updates of the Regional Transportation Plan will address projects in future phases at a greater level of detail.