

## **CHAPTER FOUR – ALTERNATIVE DEVELOPMENT**

The CMPO Regional Transportation Plan was adopted in January 2005. This Regional Transportation Plan represents a Technical Update of this earlier effort. As such, the CMPO did not follow the lead of other MPOs across the State of Utah and develop policy level alternatives. The list of transportation projects included in the 2005 Regional Transportation Plan was reviewed and new projects were considered to either substitute for specific projects or add to the list of previously planned projects. This section discusses the tools used to evaluate one project versus another and does not address large-scale policy level alternatives for the CMPO transportation system.

Alternative development considers many factors including how the project performs, costs and benefits, level of service, and potential impacts. Many of these performance indicators come from the regional travel demand model. The CMPO regional travel demand model is a tool used to evaluate transportation benefits of project for the Cache Valley. The travel model uses socioeconomic inputs such as population and employment to forecast future travel trends and traffic volumes. The CMPO recently updated their regional travel demand model from MINUTP to a new TP PLUS model. This new model incorporates updated figures from the last RTP including updated 2030 socioeconomic data, new college trips data, updated external to external trips, new transit percentages, and an updated roadway network.

### **I. Analysis Tools**

Each project or alternative is analyzed with a set of analysis tools such as vehicle hours traveled, vehicle miles traveled, volume/capacity, average daily volume and others. These tools are used to evaluate the effectiveness and benefit of potential projects and to test comparable alternatives against each other. The tools used to analyze projects are described in detail below.

#### **A. Traffic Volume**

Traffic volume refers to the average number of vehicles on a road in a given day. The volume of vehicles on a road is directly related to the congestion that can be expected depending on the road's capacity.

#### **B. Volume/Capacity Ratio (V/C)**

The volume/capacity ratio is a number between zero and two and is derived from dividing the traffic volume on a road by the capacity of that roadway. A volume/capacity ratio of 1.00 represents a road where the volume matches the capacity. As the number surpasses 1.00 and approaches 2.00, more congestion is indicated. The volume/capacity ratio is a good measure of how congested a roadway is and also indicates the level of service of a road.

#### **C. Congested Speed**

Congested speed is the estimated speed at which traffic would be moving based on modeled congestion. The congested speed is taken directly from the travel model on the segment of the road with the slowest congested speed.

#### **D. Vehicle Miles Traveled (VMT)**

Vehicle miles traveled is the regional total of all miles traveled in an average day. It is the sum of distance traveled by all vehicles in the Cache County daily regional travel demand model.

#### **E. Vehicle Hours Traveled (VHT)**

Vehicle hours traveled is the regional total of all time spent on the transportation network on an average day. It is the total travel time of every vehicle trip in the Cache County daily regional travel demand model.

#### **F. Average Speed**

The average speed is for all vehicles over the course of a day. It is derived by dividing the vehicle miles traveled in the region by the vehicle hours traveled in the region. More congested roads leads to higher VHT and slower speeds.

### **II. Travel Demand Modeling**

In order to evaluate alternatives, individual projects were modeled for the year 2030. The projects to be evaluated were determined by the CMPO and the technical committee. Each of the projects identified were to be compared to a base 2030 network or a “no-build” network. This base network included all the existing roads in the model and several other roadway improvements thought to be committed by the year 2030.

#### **A. Baseline Projects**

Baseline projects were those assumed for the no-build scenario and include the Priority 1 and Priority 2 projects from the 2005 Long Range Plan and projects that have federal funding earmarks, such as 3200 South in Nibley. These projects will be assumed as “in place” in the 2030 travel modeling of alternatives. Table 4-1 is a list of the baseline projects. These projects were all assumed completed in the base 2030 model run and in every other modeled scenario except for those that tested one of the alternative projects.

#### **B. Alternative Projects**

Project alternatives were developed by the technical committee and CMPO staff. These projects were tested individually against the assumed baseline projects, using the travel demand model. The project alternatives identified for project-specific analysis are:

- 1000 West from US-89/91 in Nibley connecting to US 89/91 at 2500 North, widen to a 5-lane arterial
- 1400 West from US-89/91 in Nibley to Smithfield, new construction as a 5-lane highway
- 2500 North from 1400 West to 1600 East, widen to a 5-lane arterial
- SR-30 realignment from US-89 to about 1400 West, new construction as a 5-lane arterial
- 1200 East from US-91 to 300 South Smithfield, widening and new construction of a 5-lane arterial
- 3100 North 1600 East to 200 West in Hyde Park, widen to 5-lane arterial
- 1700 South US-89/91 to SR-165, widen to a 3-lane collector
- 1200 West US-89/91 to 300 North Hyrum, widen to a 3-lane collector
- 100 East from 300 South in Logan to 100 North in Providence, widen to 3-lane collector

**Table 4-1: Baseline Projects**

Project Location	Limits		Project Description
	Begin	End	
100 East (River Heights)	300 South (Logan)	100 North (Providence)	New Construction 2-Lanes
100 East (Logan)	400 North (SR 89 - Logan)	300 South (Logan)	Widening to 80' ROW
250 East (Smithfield)	3600 North (Hyde Park)	600 South (Smithfield)	Widening to 80' ROW
200 East (North Logan)	2500 North (N. Logan)	3600 N (Hyde Park)	New Construction 2-Lanes
200 East (North Logan)	SR 89	2500 North (N. Logan)	Widening to 80' ROW
200 East (Logan)	100 North (Providence)	SR 89	New Construction and Widening to 80' ROW
Short Dugway (Logan)	SR-89	300 North (Logan)	New Construction and Widening to 4-lanes
200 East (Logan)	100 North (Providence)	Mill Road (Millville)	New Construction and Widening to 80' ROW
200 West	2500 North (Logan)	600 South (Smithfield)	New Construction 4-Lanes
400 North (Logan)	Highway 91 (Logan)	Ties into SR 30 at 1400 W	Widening to 4-Lanes
SR 89/91	3200 South	2500 North	TSM Improvements
3200 South (Nibley)	SR 89/91	SR 165 (Nibley)	Widening to 3-lane minor arterial
On Functional Classification System			Spot Improvements