CHAPTER 5: TRAVEL FORECASTS

DEFINITION

Travel demand forecasting is a method used to predict future traffic conditions in an area, city, or region. This is done to identify where problems will exist in the future along streets and at intersections. One tool used to perform a travel demand forecast is a traffic model.

TRAFFIC MODEL

A travel forecasting model was developed in 1991 for the city of Corvallis and the surrounding metropolitan area. Philomath was included in this model because it was estimated that the Corvallis/Philomath area will be designated as an urban area by the year 2000. A computer modeling program known as EMME/2 was used to simulate traffic on the regional street network for existing (1991) and future year (2016) conditions. This traffic model was used as a tool in projecting traffic volumes for various street improvement alternatives identified in the Philomath TSP.

Two time periods were analyzed in the original model: the average daily traffic (ADT), and the PM peak hour. Average daily traffic includes the total traffic over a 24-hour period for a typical weekday. The PM peak hour is a one-hour period that usually occurs between 4:00 and 6:00 p.m. for an average weekday. This is also the time period when traffic volumes on the local street system are usually the highest. The PM peak hour was selected as the critical period for analysis in the Philomath TSP.

It should be noted that the city of Corvallis/Philomath area EMME/2 traffic model has been updated twice since its inception. The first update was performed in December 1994 by DKS Associates, Inc. The second update, which included only minor changes in land uses in Corvallis, was performed in 1996 by Kittelson and Associates, Inc. The second update to the Corvallis/Philomath EMME/2 model (containing the most current information) was used to aid in the Philomath travel forecast. A check was made with ODOT, the city of Corvallis, and Kittelson and Associates, Inc., to ensure the integrity of the most recent model update. This version of the model was compared to existing traffic and adjusted to provide data to closely match the existing traffic (calibrated).

Information on the development of this model such as a description of the traffic modeling process can be found in the *Corvallis Model Update Travel Model User's Guide*, prepared for ODOT and the city of Corvallis by DKS Associates, Inc., December 1994.

FUTURE TRAFFIC FORECASTS

Once the Corvallis/Philomath traffic model was developed to represent the 1991 traffic conditions for the existing population, future traffic volumes were estimated based on a population increase to 62,500 in the region, including approximately 5,200 in Philomath. It is expected that the population will reach this number by the year 2016, which is also the forecast year selected in the Philomath TSP.

Traffic for the year 2016 was first assigned in the EMME/2 model to the existing major street system to determine which portions of the Philomath street system would be deficient within the next 20 years. This was established as the No-Build scenario. The model was then used to evaluate the effects of alternative roadway configurations on traffic assignment, such as the potential one-way couplet in the downtown area. These alternatives are described in Chapter 6.

NO-BUILD SCENARIO

The No-Build scenario establishes the baseline for all other analyses. This scenario assumes that no major changes will be made to the existing transportation system during the next 20 years. By comparing the future traffic demand with the unchanged transportation system, we can determine where future traffic problems are likely to occur.

Traffic Volumes

The results of the No-Build PM peak hour forecast traffic for the year 2016 are shown in Figure 5-1. It is important to note that most of the PM peak hour volumes illustrated in this figure were taken directly from the 2016 No-Build EMME/2 model run output. It was explained earlier in this report (Existing Traffic Volumes - Chapter 4) that in most areas the 1991 EMME/2 model traffic volumes resembled 1996 volumes. The 2016 traffic projections essentially represent existing 1996 volumes combined with future additional traffic from increased population and employment over the next 20 years. The No-Build year 2016 Average Daily Traffic volumes are shown in Figure 5-2.

Two locations were manually adjusted to reflect more accurate traffic projections: US Highway 20 west of the Alsea Highway intersection and Highway 20/34 east of the Alsea Highway intersection. It was explained earlier in this report how the existing 1996 volumes in these two areas were adjusted. Future traffic at these two locations was estimated by applying future additional traffic to the adjusted 1996 volumes.

Changes in Traffic Patterns

Without changes to the existing street system, delays are expected to become exceedingly long during the PM peak hour along Highway 20/34 through Philomath, particularly between the Alsea Highway intersection and 19th Street. The model results show that traffic volumes between the Alsea Highway intersection and 19th Street will increase over 50% by the year 2016. As a result, drivers will use alternative routes, which parallel Highway 20/34 (Main Street), in an attempt to bypass as much of the downtown area as possible. Soon, routes like Green Road to 19th Street, West Hills Road to 9th Street, and Chapel Drive to Fern Road/13th Street will experience significantly higher traffic volumes.

Future Traffic Operations

Once future traffic volumes were projected, the operations of key streets and intersections were analyzed.

Streets

Based on the EMME/2 traffic model, increased traffic along Highway 20/34, between the Alsea Highway and 19th Street, are estimated to push PM peak hour v/c ratios well over 1.0 (over capacity) in many areas for westbound traffic, and just over 1.0 for eastbound traffic. A v/c ratio over 1.0 indicates the roadway's capacity has been exceeded by traffic demand. This also means that traffic would be expected to be stop-and-go during the peak hours with considerable delay. In the area between the Alsea Highway and 9th Street intersections, the v/c ratio is estimated to reach around 1.52 for westbound traffic. Further to the east between 9th Street and 13th Street, v/c ratios are expected to reach 1.28 for westbound traffic. Between 13th Street and 19th Street, v/c ratios are expected to be just over 1.0 for both directions of travel. With a current v/c close to 1.0 and LOS of F for this area, operations will deteriorate more as traffic volumes increase in the future.

(NOT TO SCALE)

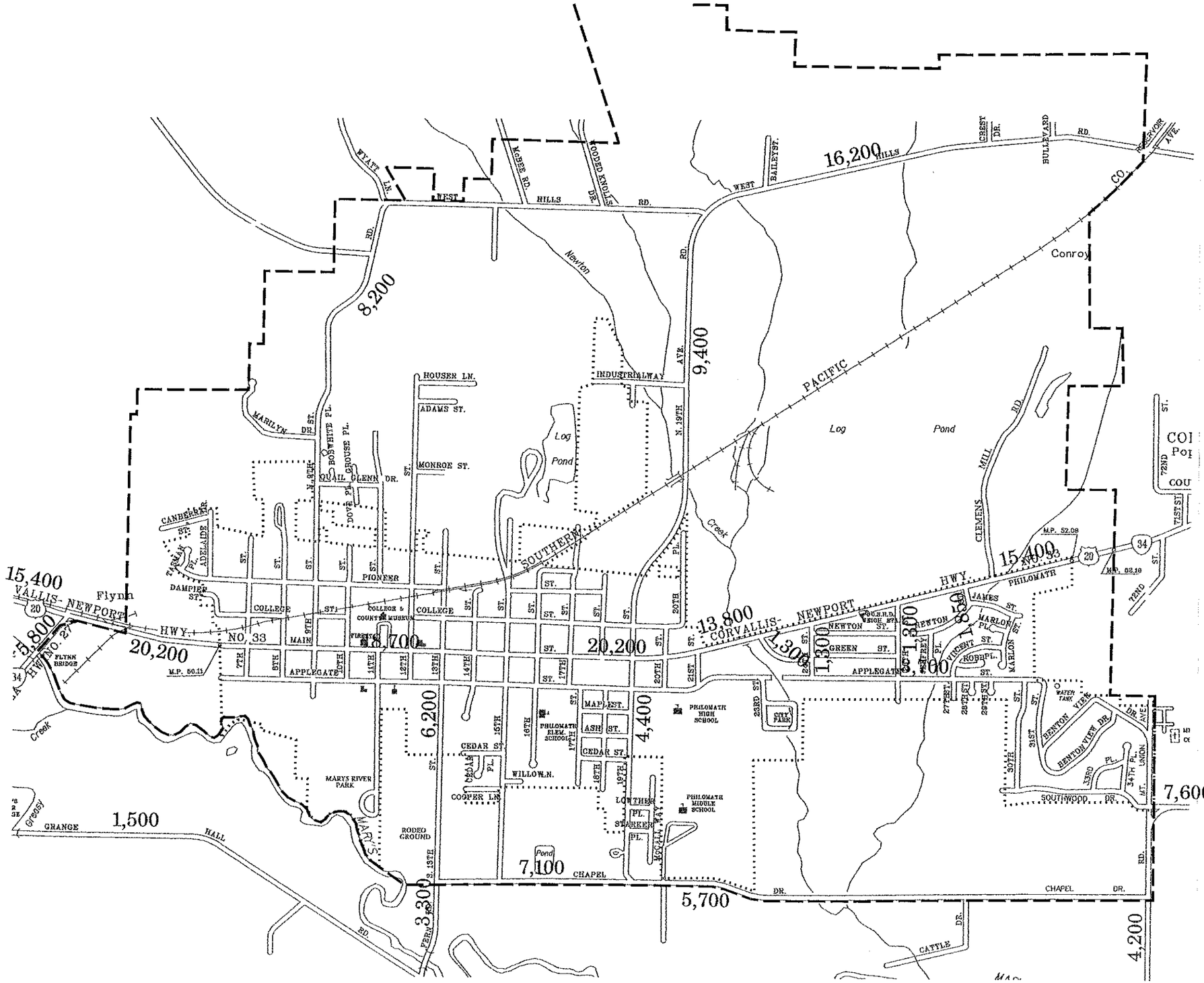
LEGEND:

- URBAN GROWTH BOUNDARY
- CITY LIMITS
- 450 WESTBOUND VOLUME
- 450 EASTBOUND VOLUME
- 450 SOUTHBOUND VOLUME
- 450 NORTHBOUND VOLUME

FIGURE 5-1

2016 No Build PM
Peak Hour Traffic Volumes

ODOT0254/FIG5-1.DGN/TNT/08-20-98



(NOT TO SCALE)

LEGEND:

- URBAN GROWTH BOUNDARY
- CITY LIMITS
- 4,200 2016 ADT VOLUMES

FIGURE 5-2

2016 No Build Average Daily Traffic Volumes

ODOT0254/FIG5-2.DGN/TNT/08-20-98

With most of the additional traffic between the current and future years projected to use the other alternative parallel routes previously mentioned, additional increases in traffic along Highway 20/34 east of 19th Street will be minimal. However, v/c ratios are still projected to reach just under 1.0 (capacity) in this area east of 19th Street.

Intersections

Future traffic operations at the two key signalized intersections and five key unsignalized intersections are described in Tables 5-1 and 5-2 along with their current operations.

For the five intersections counted in April 1998, future traffic volumes were determined by applying increased traffic between the 1991 model, which in most areas of Philomath represents current (1996) traffic conditions, and the 2016 No-Build scenario added to existing traffic volumes. Adding increased traffic to actual existing traffic reflects a more realistic estimate. As for the remaining two intersections not counted, traffic operations were determined directly from year 2016 model output.

TABLE 5-1
YEAR 2016 NO-BUILD
LEVEL OF SERVICE AND SATURATION VALUES (X)
AT SELECTED SIGNALIZED INTERSECTIONS

Location	Current LOS (Sat. Value X)	2016 No-Build LOS (Sat. Value X)
Hwy 20/34 (Main Street)		
at 13th Street	B (59%)	D-E (84%)
at 19th Street	C (63%)	E (95%)

Results indicate a deterioration from LOS B to D/E at the intersection of Main Street and 13th Street, and a deterioration from LOS C to E at Main Street and 19th Street, which exceeds the minimum requirement of LOS D along the highway[1].

[1] This is the minimum level of service standard from the 1991 Oregon Highway Plan, assuming that the area is part of a Corvallis/Philomath Metropolitan Planning Organization (MPO).

TABLE 5-2
2016 NO-BUILD LEVEL OF SERVICE
AT SELECTED UNSIGNALIZED INTERSECTIONS

Location	Traffic Movement	Current LOS	2016 No-Build LOS
Hwy 20 and Hwy 34	Northbound; Left	C	E*
	Northbound; Right	A	C
	Westbound; Left	A	D
Main Street and 9th Street	Eastbound; Left	A	D
	Westbound; Left	A	A
	Southbound; All	D	F*
	Northbound; All	D	F*
Main Street and 26th Street	Westbound; Left	A	A
	Northbound; All	D	D
Applegate Street and 13th Street	All Movements	A	A
Applegate Street and 19th Street	All Movements	A	A

*Below minimal operating standard

Applying the same minimal operating standard of LOS D, two unsignalized intersections are expected to fall below this standard: Highway 20/34 at OR Highway 34, and Main Street at 9th Street.

The 2016 No-Build (no transportation system improvements) option results in a large increase in traffic on local streets and additional delay on Highway 20/34 in Philomath. Highway 20/34 east of 19th Street has a small increase in PM peak hour traffic while the PM peak hour traffic on West Hills Road increases approximately three times. Minimum standards for acceptable levels of service are expected to be exceeded as previously shown. Major transportation system improvements are necessary to mitigate the future expected deficiencies, which would result from the No-Build scenario in Philomath. The next chapter includes evaluations of the improvement options.