2.0 EXISTING CONDITIONS

Land use, population, traffic volumes, commuting trends, and safety were investigated during the plan’s development process to help identify the transportation-related issues.

2.1 Land Use

The far western portions of the county are predominately rural and the eastern portion of the county is experiencing the majority of the urbanization. Because of this, the county’s transportation needs are diverse due to the mixture of rural and developing areas in the county. A detailed analysis of the existing and future land use in the county as well as the general land use goals are included in the 2030 Carver County Comprehensive Plan.

2.2 Population

Carver County is experiencing a high level of population growth, with most of the growth taking place in the central and eastern portions of the county. The cities of Chaska, Chanhassen, Victoria and Waconia are estimated to account for over half of the total county population by 2030. Table 1 below organizes the cities and townships into three geographic regions. The following conclusions can be made about population growth in Carver County:

- Growth levels are significant in the eastern portion of the county. The eastern region experienced the fastest growth with an annual growth rate of 4.0 percent per year between 1970 and 2000. However, the more predominantly rural regions of the county, regions 2 and 3, also grew in population even though many rural areas throughout the State of Minnesota declined in population.
- According to the population forecast numbers, population is anticipated to continue to increase at a rate of 3.5 percent per year from 2000 to 2030. If the population forecasts hold true, the current population of the county (2000) will almost triple by 2030.

TABLE 1
Carver County Population

<table>
<thead>
<tr>
<th>Region</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – East 2</td>
<td>16,413</td>
</tr>
<tr>
<td>2 – Central 3</td>
<td>4,924</td>
</tr>
<tr>
<td>3 – West 4</td>
<td>5,325</td>
</tr>
<tr>
<td>Carver County</td>
<td>26,662</td>
</tr>
</tbody>
</table>

1 Source: 1970-2000 population totals from U.S. Census Data; 2005 estimates and 2020/2030 population projections obtained from the Metropolitan Council

2 Includes the Cities of Chanhassen, Chaska, Victoria, Waconia and Carver; and the Townships of Chaska, Laketown and Waconia

3 Includes the Cities of Norwood Young America, Cologne and Hamburg; and the Townships of Benton, Dahlgren, Hancock, San Francisco and Young America

4 Includes the Cities of Mayer, New Germany and Watertown; and the Townships of Camden, Hollywood and Watertown
The majority of the future population will continue to be focused in the eastern region of the county. This area is anticipated to grow at an annual rate of 3.1 percent between 2000 and 2030. However, both the central and western portions of the county (regions 2 and 3) are anticipated to experience the higher population growth rates between 2000 and 2030 at 5.4 (central) and 3.7 (west) percent. The level and location of projected growth continues to support the Metropolitan Council’s land use policy of focusing growth in urbanized areas.

Population and employment growth will result in additional transportation demands, thus the number of daily trips in the county will rise.

One of the primary factors that could affect the amount of growth Carver County will experience is the level of congestion on key transportation facilities. Many of the key transportation facilities in the eastern portion of the county presently experience delays, and traffic levels will increase as additional growth occurs. If traffic delays increase on these facilities, people wanting to move into the area may begin to give transportation issues greater consideration. This may ultimately slow the projected growth.

### 2.3 Existing Traffic Volumes and Commuting Trends

Continued decentralization of population and employment in the Twin Cities Metropolitan Area carries significant implications for transportation. Historical travel patterns have been predominantly into and out of the central cities. These patterns are rapidly changing as employment growth occurs in many second- and third-ring suburbs. This is creating more diverse and complex commuting patterns between suburban communities and rural areas. In fact, a significant portion of commuter trips no longer flow to the central cities but are moving from suburb to suburb. In addition, suburban employment centers are now within commuting distance of many smaller rural communities.

Another transportation trend in Carver County is the increase in north-south travel demand. Twenty years ago most of the metropolitan area was east of Carver County and, therefore, the predominant travel pattern was an east-west flow. With the urban area spreading to southern Wright County, northern Scott County, eastern Carver County and into western Hennepin County, the travel demand between these areas has resulted in increased north-south traffic flow. Average annual daily traffic (AADT) volumes on major highways and road segments were collected using 2004 Mn/DOT traffic volume data as well as the county’s County State Aid Highway database. In general, traffic volumes tend to increase as they approach larger population centers such as Chanhassen and Chaska. The major transportation corridors in Carver County include TH 5, TH 7, TH 25, TH 41, TH 101 and TH 212. Subsequent with population growth, traffic volumes along these corridors have grown since the last Transportation Plan update in 1999. Figure 2 on the following page illustrates the existing traffic volumes in the county.
**Figure 2**

**Legend**

Average Daily Traffic

- **Green** – **ADT < 500**
- **Blue** – **ADT 500 to 1,999**
- **Purple** – **ADT 2000 to 4,999**
- **Orange** – **ADT 5,000 - 10,000**
- **Red** – **ADT > 10,000**
- **Black** – New TH 212*

Railroads

Carver County

Municipal Boundaries

Source: Mn/DOT 2004, Carver County 2005

*Traffic volumes for new TH 212 were not available at the time of this map printing.

Source: J:\Maps\5563\mxd\figures\figure0X_existing_volumes.mxd

EXISTING TRAFFIC VOLUMES
2.4 Congestion/Operational Analysis

By identifying segments with congestion or operational problems, improvement options can be investigated and planned (i.e., roadway improvements, intersection control changes, alternative routes, setback requirements, etc.). In addition, these corridors can be targeted for access controls and other management tools to improve their traffic operations until major improvements are completed.

For the purposes of this analysis, threshold volumes were developed by roadway type. Threshold volumes are the volumes at which operational problems may occur (traffic backups, side street delays, slower speeds, etc.). Appendix B lists planning-level daily threshold volumes for the different roadway design types.

These threshold volumes were compared to existing average annual daily traffic volumes for each roadway segment in the county, and each segment was categorized into one of the following:

- **Uncongested** – the existing volume is less than 85 percent of the threshold volume, indicating a low probability of operational problems due to volume of traffic on the facility.
- **Near Congestion** – the existing volume is between 85 percent and 100 percent of threshold volumes, suggesting a moderate probability of operational problems due to traffic volume on the facility.
- **Congested** – the existing volume exceeds 100 percent of the threshold volume, indicating a high probability of operational problems due to the volume of traffic on the facility.
2.4.1 Existing Congested Roadways

The majority of the existing congestion in the county is located in the eastern portion along Trunk Highways 5, 7, 41 and 212. It should be noted that the methodology described above is a planning-level analysis that uses average daily traffic volumes and is not appropriate for all traffic conditions. For example, traffic conditions that do not fit average daily traffic criteria include summer volumes, holiday travel periods, road closures and river crossing closures. These conditions will produce different levels of congestion.

The roadway segments identified above as well as the other segments that are currently congested or approaching congestion are presented in Figure 3. Due to the current and expected future population growth, congestion in areas of central and eastern Carver County is expected to become more of an issue on regional facilities, occurring frequently during the peak hours. Congestion on state facilities (such as TH 5, TH 7, TH 41, TH 101, TH 212) and county facilities (such as CSAH 10, CSAH 15 and CSAH 18) is expected to increase, even with the construction of the new TH 212 between the City of Chaska and the border with Hennepin County (note: through the text of the Roadway Systems Plan, county highways eligible for State Aid are regularly referred to as CSAH XX, and those roadways eligible for only county funds are referred as to CR XX, although the County Public Works Department signs all roadways with the CR shield and plan maps reflect this policy).

2.4.2 Level of Service

Level of Service (LOS) describes how well a roadway operates. It ranges from LOS A to LOS F. LOS A corresponds with low volume and little restriction of traffic movement, while LOS F corresponds with severe restriction in traffic movement, resulting in significant delays. Level of Service is directly linked to a road’s ability to carry traffic. Generally daily traffic volume thresholds, as presented in Appendix B, document approaching congestion or over congestion, and correspond to LOS D/E.

Many factors can affect a roadway’s ability to carry traffic. These factors include design type, volume distribution by time and direction, the type of traffic (truck versus automobile), operating speeds and number of access points. Based on these factors, daily capacity can fluctuate from 8,000 to as high as 17,000 for a two-lane facility. For example, TH 101 (south of CSAH 14) and TH 5 between Victoria and Chanhassen are both two-lane rural roadways. TH 101 has significant curvature and sight distance limitations and, therefore, has a more realistic estimated capacity of closer to 10,000 vehicles instead of the established daily threshold of 15,000 (see Appendix B). TH 5 has better alignment, sight distance and limited access, so this facility is better able to accommodate the established estimated capacity of 15,000 vehicles per day.
**Legend**

**Volume/Capacity Ratio**
- 0.85 - 1.00 (Approaching Capacity)
- 1.01 + (Over Capacity)
- New TH 212*

**Railroads**

**Carver County**

**Municipal Boundaries**

Source: Mn/DOT 2004, Carver County 2005

*Congestion on new CR 61 is reflective of volume levels when this was TH 212.
The third and latest edition of the Metro District’s Transportation System Plan (TSP) for 2008-2030 predicts nearly a $20 billion shortfall between Performance-Based Plan investment needs (of $27 billion) versus the Fiscally Constrained Plan investments (i.e., anticipated funding) of approximately $6.7 billion over the 23-year period. The inability to accommodate transportation needs will result in increased safety and congestion problems throughout the region. The level of unmet capacity needs in central and eastern Carver County is cause for justifiable concern. The impacts of the future growth without additional infrastructure investments, is of serious concern to the county, local jurisdictions, businesses and residents.

2.5 Safety and Crash Analysis

Public safety is a high priority for all agencies responsible for improving and maintaining public transportation facilities. To evaluate potential safety problems in the county, a crash analysis was performed using Carver County crash records from 2001–2005. Records were collected for state trunk highways, county state aid highways and county roads. Analysis of crash data focused on identifying problems at intersections and on roadway segments. The analysis is described in the following sections.

2.5.1 Segment Crash Analysis

While a majority of crashes occur at intersections, it is also important to look at crashes along roadway segments to identify abnormally high crash locations. Although numerous factors (i.e., geometric or cross-section deficiencies, sight distance problems, excessive access, blowing and drifting snow, etc.) contribute to crashes, segment analysis identifies potential problems so that further investigations to determine design solutions can be undertaken at these critical locations. In addition, segments can be targeted for safety improvements and investments.

In order to identify segments with high crash rates, a comparison was made between average crash rates by facility type, and the rates for each individual segment in the county. Crash rates for Trunk Highways 212, 101, 41, 7 and 5 were compared with Mn/DOT statewide average crash rates for similar facility types. Table 2 shows Mn/DOT average comparison crash rates for different rural and urban roadway types based on Annual Average Daily Traffic (AADT) volumes.
TABLE 2
Mn/DOT Statewide Average Comparison Crash Rates for Trunk Highways and US Highways

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
<th>Volume Threshold (ADT)</th>
<th>Mn/DOT Statewide Average Comparison Crash Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>U-1A</td>
<td>Urban two-lane undivided trunk highway</td>
<td>10,000</td>
<td>ADT 1,500-4,999 = 3.5 ADT 5,000-7,999 = 2.6 ADT &gt; 8,000 = 3.3</td>
</tr>
<tr>
<td>U-4A</td>
<td>Urban four-lane divided trunk highway/expressway</td>
<td>32,000</td>
<td>2.1</td>
</tr>
<tr>
<td>R-1A</td>
<td>Rural two-lane undivided trunk highway</td>
<td>15,000</td>
<td>ADT 1,500-4,999 = 1.3 ADT 5,000-7,999 = 1.4 ADT &gt; 8,000 = 1.3</td>
</tr>
<tr>
<td>R-3A</td>
<td>Rural four-lane divided trunk highway/expressway</td>
<td>38,000</td>
<td>1.1</td>
</tr>
</tbody>
</table>

For County State Aid Highways (CSAH) and County Roads (CR) in Carver County, an average crash rate for each facility type was calculated. These average crash rates were used as comparison rates for the roadway segment crash rate analysis.

TABLE 3
Average Comparison Crash Rates for CSAH and CR Facilities

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
<th>Volume Threshold (ADT)</th>
<th>Carver County Average Comparison Crash Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>U-1</td>
<td>Two-lane undivided urban street</td>
<td>10,000</td>
<td>2.9</td>
</tr>
<tr>
<td>U-2</td>
<td>Two-lane undivided urban arterial street</td>
<td>10,000</td>
<td>2.0</td>
</tr>
<tr>
<td>U-3</td>
<td>Four-lane undivided urban street</td>
<td>22,000</td>
<td>2.2</td>
</tr>
<tr>
<td>R-1</td>
<td>Rural two-lane undivided roadway</td>
<td>15,000</td>
<td>2.8</td>
</tr>
<tr>
<td>R-2</td>
<td>Rural two-lane undivided reduced speed and capacity *</td>
<td>10,000</td>
<td>1.2</td>
</tr>
</tbody>
</table>

* Carver County rates are based on analysis of County crash data. Average comparison rates were developed for different facility types within the county using 2001-2005 crash data.

* Roadways with limited visibility, poor geometrics and/or poor roadway surface (gravel or poor pavement quality).

Information from Tables 2 and 3 was used to calculate a ratio of segment crash rates to average crash rates by facility type. Based on this analysis, high-crash segments on both the Mn/DOT and Carver County systems were identified.

While the ratio of segment crash rates to average crash rates identifies areas with potential safety problems, it does not account for variations caused by short segment lengths and low traffic volumes. For the purposes of this plan, high-crash segments have been identified as segments that have a crash rate ratio greater than 1.5 times the average crash rate for a facility type and a
crash frequency of more than four crashes per mile per year. Using these criteria, high-crash segments with a high frequency were identified and shown in red on Figure 4 on the following page. The orange lines shown in Figure 4 indicate locations where the crash ratio is 1.5 or higher, but there were fewer than four crashes per mile per year.

When reviewing the high-crash segment map, it is important to remember the following:

- Short highway segments can result in high crash rates.
- Segments with low traffic volumes are subject to more variability (a small number of crashes can result in a high crash rate).
- Different types of highway facilities have different crash rates. For example, the average crash rate for a rural expressway is 1.1 crashes per million vehicles per mile, while an urban expressway has an average crash rate of 2.1.

As shown in Figure 4, a number of the high-crash rate, high-frequency segments are in the urbanized areas of the county and along or adjacent to trunk highways where traffic volumes are higher (i.e. TH 41, TH 101 and existing TH 212 in Chaska and Chanhassen). For the most part, solutions to high-crash locations occurring on state roads will fall under Mn/DOT’s jurisdiction. However, based on the high-rate crash segments shown in Figure 4, there are also some areas along CRs and CSAHs that exhibit safety needs. Based on the segment crash analysis results, it is recommended that these identified crash locations be considered in selecting future safety improvement projects.

2.5.2 Road Safety Audits

During the summer of 2006, Carver County completed a road safety audit (RSA) of 11 sites. RSAs are a critical strategy for reducing traffic-related death and injury. RSAs examine the performance, design, and operations of county roadways and intersections. The ultimate goal of the RSA process is to increase safety (i.e., reduce fatal and injury crashes within the county) through engineering, enforcement and/or other strategies.

RSAs are an excellent safety tool that the county should continue to utilize. Through the RSA process, specific mitigating improvements or strategies can be identified for implementation to better improve safety on the county roadway system. This information can be used to supplement the planning-level crash analysis in Section 2.5.1.
Figure 4

Legend

Segment Crashes

- High Rate, High Frequency*
- High Rate, Low Frequency**
- New TH 212
- Railroads
- Carver County
- Municipal Boundaries
- US Highways
- State Highways
- County Roads

Source: Mn/DOT Crash Data

High crash rate is any segment that has a crash rate greater than 1.5 times the average crash rate for that design type.
*High Frequency - More than 4 crashes per mile per year.
**Low Frequency - 4 or less crashes per mile per year.