

2.0 PURPOSE OF AND NEED FOR ACTION

The 29-kilometer (18-mile) segment of I-494 from I-394 to the Minnesota River is currently experiencing congestion problems during peak travel periods. Growing travel demand in the corridor will result in increasing delays over longer time periods through the year 2022 (the forecast period for this study). Congestion and its related delay problems are of special concern in this corridor, due to its important role in the metropolitan area highway system. Deficiencies in facility design, declining physical condition, and environmental issues add to the problems in the corridor that resulted in the identification of a need to initiate roadway improvements. Interstate-494 corridor conditions also have an influence on intermodal transportation issues in the area. The following sections describe the role of the I-494 corridor and these identified problems/issues in the corridor in greater detail.

2.1 ROLE IN THE METROPOLITAN AREA

2.1.1 ROLE IN THE TRANSPORTATION SYSTEM

Interstate 494 is a principal arterial roadway that serves a key role in the year 2020 metropolitan highway system (see Figure 2.1) defined by the Metropolitan Council in its *Transportation Policy Plan* adopted January 2001. Interstate 494 is the southern half of a circumferential interstate route around Minneapolis and St. Paul, and therefore, serves as a collection/distribution facility for other metropolitan area highways, as well as an urban bypass for interstate or interregional trips. The study area for this EIS includes the approximately 29-kilometer (18-mile) section of I-494 at the southwest corner of the metro area. In addition to its regional collector-distributor role, I-494 provides access to/from the rest of the metropolitan area for the rapidly-growing population and employment bases in the southwestern suburbs as well as access to the metro area from Greater Minnesota.

Within the study area, I-494 intersects with nine other principal arterial highways on the Metropolitan Council's 2020 Metropolitan Highway System. These metropolitan highways provide access between suburban areas and from the suburbs to downtown Minneapolis. The metropolitan highways that intersect I-494 in the study area include east-west highways— I-394, TH 7, TH 62, and TH 5 – and north-south highways – TH 212/Flying Cloud Drive, TH 169, TH 100, I-35W and TH 77. Trunk Highway 5 shares the east-west segment of the I-494 corridor from Eden Prairie, at the west end, to a point east of the EIS study area where TH 5 splits from I-494, providing access to the Minneapolis-St. Paul International Airport. Interstate 494 collects and distributes trips between these metropolitan highways as well as serving trips with origins or destinations in the corridor. Several of these highways are interregional corridors that provide connections between the metro area and other trade centers throughout the state.

In addition to the metropolitan highways that intersect with I-494, there are also some major highways that parallel I-494. These provide alternative routes for trips that might otherwise use I-494. However, all of these roadways are experiencing congestion problems, limiting their ability to relieve I-494 trips. TH 62 is a major east-west arterial located approximately 3.2 kilometers (2 miles) north of and running parallel to the east-west section

Figure 2.1 8 1/2 x 11

of I-494. TH 13 is a major arterial roadway paralleling the east-west section of I-494 approximately 8 kilometers (5 miles) south (across the Minnesota River) and serves as a connection between the suburban areas of Savage, Burnsville, Eagan, Mendota Heights and West St. Paul. TH 13 interchanges with the major facilities of I-35W, TH 77 and TH 169. The north-south section of I-494 is paralleled by TH 169, approximately 3.2 kilometers (2 miles) to the east.

Analysis of I-494 corridor users (using regional forecast model data) reflects the regional importance of the I-494 corridor and its role as a regional “beltway.” Approximately 7 percent of all trips made in the Twin Cities metro region utilize I-494. Of those trips, approximately 80 percent are trips that are 4.8 kilometers (3 miles) or more in total trip length (i.e. not local trips). In the peak hour, this increases to 88 percent of trips on I-494 being 4.8 kilometers (3 miles) or more in length. The average trip on the segment of I-494 from I-394 to the Minnesota River is approximately 8 kilometers (5 miles), and the average total trip length for users is approximately 27 kilometers (17 miles) (over twice the forecast average regional trip length of 13 kilometers [8 miles]). Approximately 28 percent of the trip of an average I-494 user occurs on the I-494 facility itself. These statistics reflect the relatively long (i.e. regional) trips made by the average I-494 user.

2.1.2 RELATIONSHIP TO REGIONAL POLICY

The Metropolitan Council is the metropolitan planning organization (MPO) for the Twin Cities region. The Council has adopted a comprehensive development guide for the metro area. The *Regional Blueprint* component of the guide presents the overall priorities for regional facilities and services in the Twin Cities metro area. The Council’s *Transportation Policy Plan* describes the transportation policies and plans that support the *Blueprint* and describes the Council’s approach to transportation investments through the year 2020. The regional growth strategy described in the *Blueprint* includes a focus on promoting growth and economic development within the 2020 Metropolitan Urban Service Area (MUSA) boundary, which includes the I-694/I-494 beltway. The communities along the I-494 corridor are continuing to grow, consistent with this plan, including a number of increased density redevelopment projects in close proximity to the I-494 corridor in Eden Prairie, Bloomington and Richfield.

The *Transportation Policy Plan* (TPP) includes policies and strategies to help achieve the *Regional Blueprint* vision. Policy 11 – Highway System Objectives – is relevant to the I-494 corridor. It states that “The Metropolitan Council will work with Mn/DOT and local units of government to ensure that the metropolitan highway system and its supporting road system are built and designed to increase system efficiency, serve travel demand to the extent possible, provide for user safety, and integrate and enhance other travel modes.” The TPP identifies principal arterial roadways on the 2020 metropolitan highway system, including the I-494 corridor, and describes the priorities for investment in the regional corridors. The Council’s 2000 – 2002 *Transportation Improvement Program* (TIP) includes reconstruction of the I-494 segment from TH 212/Flying Cloud Drive to TH 100 for construction starting in 2002, recognizing the high level of need for improvement in this segment. The remainder of the I-494 study corridor from I-394 to TH 77 is included in the TPP investment strategy as prioritized for “expansion” by year 2020. Projects in the expansion strategy category were

included “...because capacity needs clearly cannot be met through management and improvement activities...” alone – consistent with many of the needs stated above. The segment of I-494 in the study area from TH 77 to the Minnesota River is prioritized in the “management” category. This includes managing the system to improve its efficiency as opposed to an emphasis on expanding capacity.

It should be noted that the current TPP (unlike the 2010 Highway Plan component of the TPP described in Section 2.2.1 of the I-494 reconstruction DEIS) does not specifically recommend a designated HOV lane on I-494 from I-394 to 34th Avenue. The current TPP decreases emphasis on exclusive HOV lanes, compared to previous plans, acknowledging that the use of bus shoulder lanes, in conjunction with HOV by-pass ramps, has become more attractive due to ease of implementation and low cost.

2.1.3 RELATIONSHIP TO INTERMODAL TRANSPORTATION

Interstate-494 corridor conditions affect or have a relationship to intermodal transportation issues in the area, as described in the following sections.

2.1.3.1 Transit

The federal Intermodal Surface Transportation Efficiency Act (ISTEA), and the Transportation Equity Act for the 21st Century (TEA-21) put increased emphasis on the need to provide alternatives to the single-occupant automobile. The Metropolitan Council’s *Transportation Policy Plan 2000* and *Transit 2020 Master Plan* for the Twin Cities area also reflect this philosophy, incorporating transit features that promote their Smart Growth goals. Currently, I-494 has provision for bus use on shoulders where the shoulders are of adequate width to support such use. However, the existing I-494 facility does not provide adequate shoulder width to allow for bus use of shoulders throughout the corridor. The *Transit 2020 Master Plan* includes incorporating bus shoulder use on I-494 throughout the study area (and extending north to I-94 and east to TH 61) as part of its planned “Freeway Transit Corridor” system.

Figure 2.2 shows the location of existing transit hubs/stations in the vicinity of the I-494 study area. No additional transit hubs are indicated in the I-494 vicinity in the *Transit 2020 Plan*. However, the existing stations could be served more effectively through the development of the Freeway Transit Corridor system, including incorporation of transit advantage features in the I-494 corridor.

There are also three proposed transit/rail lines (see Figure 2.2) that cross the I-494 corridor study area. The Hiawatha light rail transit (LRT) line (from downtown Minneapolis to the Minneapolis-St. Paul International Airport and the Mall of America) will cross I-494 at 34th Avenue in Bloomington. The proposed Dan Patch commuter rail corridor is planned to cross I-494 in the vicinity of the East Bush Lake Road interchange. The Minneapolis Southwest Corridor (proposed for LRT or busway) is located just north of TH 62 and crosses I-494 in the vicinity of Baker Road. The importance of I-494 as a transit route connecting these lines or as a route to access related transit hubs could increase as these lines are developed.

Figure 2.2 11 x 17

2.1.3.2 Pedestrian and Bicycle Transportation

The I-494 corridor is currently a major barrier to pedestrian and bicycle travel in the study area. The number of local roadway crossings of the I-494 corridor is limited, and most of them are relatively high-traffic arterial roadways that are typically less conducive to pedestrian and bicycle traffic.

Figure 2.3 illustrates existing and planned pedestrian and bicycle routes in the vicinity of I-494. In addition to highlighting the major facilities owned or proposed by the five communities along the corridor, the figure includes connections to facilities owned by Hennepin Parks and the regional system. Existing and planned transit centers to which bicycle routes connect are also illustrated. Pedestrian and bicycle routes shown include facilities that are striped lanes on a roadway, paths adjacent to a roadway or independent trail alignments.

The pedestrian/bicycle routes shown in Figure 2.3 illustrate the relatively extensive network of non-motorized transportation facilities in the vicinity of the I-494 corridor, and the extent of existing and planned crossings of I-494 needed to accommodate this system. The figure also shows locations where trails come to, but not across the I-494 corridor (e.g. France, Penn, Lyndale and Nicollet Avenues). Pedestrian and bicycle movement would be facilitated if additional crossing provisions were made, to increase system connectivity.

2.1.3.3 Minneapolis-St. Paul International Airport

Interstate 494 is one of the primary routes providing access to the Minneapolis-St. Paul International Airport at the eastern end of the study area. This airport is an international hub for the upper midwest and is an important factor in the economies of the Twin Cities and the state. On-going expansion of the airport continues to increase the amount of travel to and from the airport and, despite the promotion and availability of transit use for airport trips (including planned construction of LRT service from downtown Minneapolis), the number of vehicle trips to and from the airport is projected to continue to increase over the next 20-year forecast period.

Direct access to airport property and airport-related uses is provided at the 24th and 34th Avenue interchanges on I-494. Access to the main terminal is on TH 5, which runs between I-494 and TH 55. Access to the Hubert H. Humphrey charter terminal is via the 34th Avenue interchange. The level of congestion on I-494 has an impact on the accessibility of the airport from a large portion of the metro area. In addition, since TH 62 is a parallel highway, capacity and congestion problems on I-494 can also affect operations on TH 62, which is the primary alternative route for trips to the airport from the west.

2.1.3.4 Trucking

The I-494 corridor is a major truck route for both interstate trucking and for metro area truck traffic. Interstate 494 and I-694 are the interstate circumferential central business district bypass routes for I-94 around Minneapolis and St. Paul, making interstate truck use of the I-494 corridor

relatively high. The I-494 corridor is also an important route serving intermodal (rail, barge, etc.) facilities located in the southeast metro area. In addition, the collector-distributor role of I-494 in the metro region (as described in Section 2.1.1) makes it an important route for truck trips between commerce areas in the metro region.

Heavy truck volumes in the corridor range from approximately 4.6 to 7.2 percent of the total traffic volumes. Recent counts in the corridor indicate an additional 6 percent of traffic is light commercial vehicle (e.g. delivery truck) traffic. Although these percentages of truck traffic are similar to percentages on other Twin Cities freeways, the high daily traffic volumes on I-494 result in approximately 20 percent more commercial vehicles utilizing I-494 on an average day, compared to other Twin Cities freeways (12,350 versus 10,100 commercial vehicles per day for I-494 and average Twin Cities freeways, respectively).

2.2 ROLE IN THE FEDERAL TRANSPORTATION SYSTEM

In 1991, the Intermodal Surface Transportation Efficiency Act (ISTEA) was passed by congress and signed by the president. The purpose of the Act was to develop a national intermodal transportation system that is economically efficient, environmentally sound, provides the foundation for the Nation to compete in the global economy, and will move people and goods in an energy efficient manner. The Act called for the creation of the National Highway System (NHS), consisting primarily of existing interstate routes and a portion of the primary system. The NHS was established to focus federal resources on roads that are the most important to interstate travel and national defense, roads that connect with other modes of transportation, and roads essential for international commerce. Interstate 494 is part of the NHS network.

In May 1998, the U.S. Congress passed the Transportation Equity Act for the 21st Century (TEA-21). TEA-21 builds on the initiatives established in ISTEA. It continues the mission of ISTEA to develop a balanced and sustainable transportation policy.

TEA-21 establishes the following Metropolitan Planning Organization (MPO) planning factors:

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
2. Increase the safety and security of the transportation system for motorized and non-motorized users;
3. Increase the accessibility and mobility options available to people and for freight;
4. Protect and enhance the environment, promote energy conservation, and improve quality of life;
5. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;

Figure 2.3 11 x 17

6. Promote efficient system management and operation; and
7. Emphasize the preservation of the existing transportation systems.

Maintaining the efficiency of I-494 in conveying traffic efficiently and safely is an important factor in meeting factors 2, 4, 6 and 7 of these planning objectives in the Twin Cities metro area. As part of the National Highway System as well as the Metropolitan Highway System, I-494 plays an important role in maintaining the efficiency and accessibility of the transportation system and in contributing to local and national economic vitality by facilitating the movement of goods and people (planning factors 1 and 3). As described in Sections 2.1.3.2 through 2.1.3.4 above, the I-494 corridor provides for intermodal connectivity (rail, barges and air transport), while making accommodations for pedestrian and bicycle access across the corridor (planning factor 5).

2.3 ROADWAY CONGESTION AND RELATED PROBLEMS

2.3.1 ROADWAY CONGESTION

Existing (1999) traffic volumes on I-494 were obtained from the April 2000 Mn/DOT Loop Detector Report (data from 10/99). No-Build travel forecasts for I-494 were completed for the year 2022 using the Metropolitan Council's regional forecasting models (see Appendix B for details on travel forecasts and for figures showing existing and forecast volumes). Although the forecast No-Build volumes represent a substantial increase over current levels, they will be constrained by the capacity available on I-494. To better estimate the true travel demand for the corridor, an "unconstrained forecast" that represents the demand for travel on I-494 assuming no congestion-related delay was also modeled. Table 2.1 summarizes the existing and 2022 No-Build and Unconstrained forecast volumes for selected two-way segments of I-494. This table shows that 2022 No-Build volumes in the corridor are projected to increase 7 to 31 percent if constrained by existing roadway capacity, and that unconstrained demand will increase by 28 to 57 percent.

The existing and 2022 forecast peak hour volumes were compared to the roadway capacity (based on existing roadway configurations) to provide an estimate of existing and future levels of service and potential for congestion. Figures 2.4 and 2.5 show relative levels of congestion on regional roadways in the study area, based on this volume-to-capacity-based "level of service" analysis. Level of service (LOS) "D" typically represents crowded but stable conditions. Speed and freedom to maneuver are severely restricted, and there is generally a poor level of driver comfort. Level of service "E" and "F" represent "slow-and-go" and "stop-and-go" conditions, respectively. Freedom to maneuver within the traffic stream is extremely difficult. In general, freeways in the area are currently congested, and performance levels will continue to worsen by year 2022.

Figure 2.4 8 1/2 x 11

Figure 2.5 8 1/2 x 11

**TABLE 2.1
DAILY TRAFFIC FORECAST ON SELECTED TWO-WAY SEGMENTS OF I-494**

Segment	1999 Existing	2022 No-Build	2022 Unconstrained
Minnetonka Boulevard and I-394 <i>% Change over existing</i>	110,000	135,000 <i>23%</i>	166,000 <i>51%</i>
Valley View Road and TH 62 <i>% Change over existing</i>	77,000	101,000 <i>31%</i>	120,000 <i>56%</i>
TH 212/Flying Cloud Drive and TH 169 <i>% Change over existing</i>	100,000	125,000 <i>25%</i>	157,000 <i>57%</i>
TH 169 and East Bush Lake Road <i>% Change over existing</i>	123,000	132,000 <i>7%</i>	187,000 <i>52%</i>
Penn Avenue and France Avenue <i>% Change over existing</i>	187,000	218,000 <i>17%</i>	272,000 <i>45%</i>
Portland Avenue and Nicollet Avenue <i>% Change over existing</i>	175,000	212,000 <i>21%</i>	244,000 <i>39%</i>
34th Street and 24th Street <i>% Change over existing</i>	178,000	214,000 <i>20%</i>	228,000 <i>28%</i>

Another way to measure congestion is to estimate the duration of periods when roadways are congested (i.e., operate at LOS D or worse). The regional travel forecast model, which estimates daily traffic as the sum of six discrete time periods, was used to assess the number of time periods over which congestion occurs currently and is expected to occur. While this method provides a reasonable overview of congestion levels based on a comparison of forecast volumes to estimated roadway lane capacity, the forecast congestion does not reflect additional congestion due to mainline queues that develop as a result of traffic bottlenecks.

Table 2.2 shows that 74 percent of the 58 directional (i.e. eastbound plus westbound) kilometers (36 directional miles) on I-494 currently operate under congested conditions (i.e. LOS D or worse) for at least one hour of the day, with 43 percent operating at LOS E or F (slow-and-go/stop-and-go). The results also show that 24 percent of the roadway length is operating at LOS D or worse for four or more hours of the day. For 2022 conditions (No-Build), 83 percent of the freeway will operate at LOS D or worse for at least one hour, but the duration and magnitude of congestion would increase substantially: 52 percent of the freeway would be congested for four or more hours per day and 65 percent would experience at least one hour of LOS E/F conditions. Fourteen percent of the roadway would operate at LOS D or worse for at least six hours per day by 2022.

**TABLE 2.2
PERCENT OF I-494 WITH CONGESTION⁽¹⁾**

	Existing (1999)	2022 No-Build
<u>Level of Service “D” or Worse⁽²⁾</u>		
At least one hour per day	74%	83%
At least two hours per day	73%	80%
At least three hours per day	52%	74%
At least four hours per day	24%	52%
At least five hour per day	14%	32%
At least six hours per day	5%	14%
<u>Level of Service “E” or Worse⁽³⁾</u>		
At least one hour per day	43%	65%
At least two hours per day	39%	59%
At least three hours per day	15%	40%
At least four hours per day	5%	19%
At least five hour per day	4%	7%
At least six hours per day	0%	4%

Source: SRF Consulting Group, Inc./regional travel forecast model

⁽¹⁾ Based on 58 directional kilometers (36 directional miles) of roadway, I-394 to Minnesota River

⁽²⁾ Level of Service “D” typically represents crowded, but stable conditions. Speed and freedom to maneuver are severely restricted, and there is generally a poor level of driver comfort.

⁽³⁾ Level of Service “E” or “F” represents “slow-and-go” or “stop-and-go” conditions. Freedom to maneuver within the traffic stream is extremely difficult.

2.3.2 AVERAGE SPEED AND TRAVEL TIME

Increasing congestion in the I-494 corridor results in decreased travel speeds and increased travel time for corridor users. The forecast model was used to estimate the existing and 2022 No-Build average peak hour travel speeds. The estimated existing average peak hour speeds are 64 to 68 kph (40 to 42 mph) in the morning and 58 to 61 kph (36 to 38 mph) in the afternoon. By 2022, these speeds would drop to 50 to 56 kph (31 to 35 mph) in the morning and 42 to 48 kph (26 to 30 mph) in the afternoon. As speeds decrease, travel time increases throughout the corridor.

2.3.3 DIVERSION OF TRAFFIC TO OTHER ROADWAYS

Increasing congestion on I-494 results in diversion of traffic to other roadways, including parallel regional and local roadways. This diversion is especially evident when traffic congestion increases on local roads during excessive congestion events on I-494 due to poor weather or crash incidents. However, the diversion takes place on a daily basis, to a lesser extent, as travelers try to find a faster, less congested route for their trips. Ideally, capacity should be

added to I-494 and to other principal arterials (and not to local roads) to meet regional user demands, since additional capacity can be added more efficiently to an arterial than to numerous local roads.

Some local governments have taken steps to promote use of parallel reliever routes as alternatives to the use of I-494 for local trips. The cities of Bloomington and Richfield are implementing improvements to 79th and 77th Streets, respectively, as parallel relievers for I-494. Edina is adding capacity improvements on West 77th and West 78th Streets in 2001, in addition to creating a new frontage road from West 78th Street to the Valley View Road interchange with TH 169. These local improvements include implementation (with Mn/DOT) of an integrated corridor traffic management (ICTM) project area from East Bush Lake Road to 34th Avenue, including a coordinated freeway-arterial traffic management system. However, even with those improvements to accommodate local traffic, the I-494 corridor is currently, and is projected to continue to be, congested.

Safety can be an issue when traffic diverts from the principal arterials to local streets. Local collector streets (with at-grade intersections and other potential conflict points) have an average crash rate of approximately 1.6 incidents per million vehicle kilometers (2.6 incidents per million vehicles), compared to an average of 0.7 to 0.8 incidents per million vehicle kilometers (1.1 or 1.2 incidents per million vehicle miles) for a principal arterial. Diversion of trips to local streets would likely result in an increase in the number of incidents on local roads.

2.4 EXISTING ROADWAY DEFICIENCIES

The existing I-494 corridor suffers from two types of roadway deficiencies: 1) physical deterioration due to the age of the facility and 2) design deficiencies resulting from changes in roadway design standards since construction of I-494 in the 1950s and 1960s. In addition, traffic demand has grown well beyond the levels the facility was designed to handle. Some of the specific needs and deficiencies identified in the I-494 corridor are discussed below (in no particular order of importance).

2.4.1 PHYSICAL DETERIORATION

- **Condition of Roadway and Bridges:** The pavement on I-494 has reached the end of its design life and is in need of replacement. Bituminous overlays present a temporary solution. This approach becomes increasingly inefficient economically over time, because the overlays are required with increasing frequency as the concrete base degrades. Although some bridge construction work has occurred since the DEIS, there are still many bridges along I-494 that will soon need either deck replacement or total replacement. If the deteriorating condition of the roadway and structures is not addressed, temporary repair/maintenance projects will continue. These projects fail to address the long-term rehabilitation needs of the corridor and are generally less cost-effective from a life-cycle perspective, since the increasingly frequent repairs can accumulate to a total cost that is greater than the lifetime cost of roadway reconstruction.

2.4.2 SUBSTANDARD DESIGN ELEMENTS

Some design standards—including sight distances and interchange ramp designs—have changed since the late 1950s when I-494 was designed. Roadway reconstruction would provide an opportunity to bring the roadway design up to current standards, including design issues, such as those that follow:

Inadequate Shoulder Width

The existing segment of I-494 between TH 100 and TH 77 typically has 1.2-meter (4-foot) inside and 3.0-meter (10-foot) outside shoulders. Current standards recommend 3.6-meter (12-foot) inside and 3.0-meter (10-foot) outside shoulders. Adequate shoulder dimensions are particularly a safety concern, as well as an important operational feature. The wider 3.6-meter (12-foot) shoulders provide an area for emergency vehicles to bypass congested areas in the case of accidents or other incidents and provide space where inoperable vehicles can pull off the road and wait for assistance. The existing narrow shoulders are not adequate for disabled vehicles to move out of the general traffic lanes, causing additional delays for traffic, and increasing the potential for accidents. Therefore, narrow shoulders are a substantial factor in reducing traffic flow during emergency situations. Narrow shoulders also do not allow the movement of buses during congested traffic conditions.

Inadequate Lateral Clearances

In the section of I-494 between Lyndale and Nicollet Avenues, there is only a 1.8-meter (6-foot) berm between the edge of the outside traffic lane and the retaining wall. This condition restricts traffic flow, increases safety concerns, and is not adequate for snow storage in the winter.

Inadequate Vertical Clearances

A number of bridges over I-494 have only 4.4 meters (14.5 feet) of clearance between the road surface and the bottom of the bridge. Current Mn/DOT standards require 8.0 meters (16.3 feet) of clearance. Mn/DOT's records indicate that these substandard clearances have caused numerous accidents in which high loads have hit overhead bridges in the I-494 corridor. Reconstruction of bridges in the I-494 corridor from I-394 to the Minnesota River could provide an opportunity to bring the corridor up to current clearance standards, reducing the number of high-load accidents in the corridor.

2.4.3 CLOSE INTERCHANGE AND RAMP SPACING

The American Association of State Highway and Transportation Officials (AASHTO) recommends that the minimum distance between adjacent interchanges should not be less than 1.6 kilometers (1 mile) in urban areas. There are a number of locations within the I-494 corridor that do not meet this minimum spacing guideline. The longest section of the corridor with closely-spaced interchanges is located between Penn Avenue and 34th Avenue, where average spacing is approximately 0.8 kilometers (0.5 mile).

These closely spaced interchanges create inadequate distances between on-ramps and off-ramps. Insufficient ramp spacing causes increased conflicts between traffic entering the freeway from one interchange and traffic exiting the freeway at the next interchange. These vehicle conflicts reduce the capacity of adjacent lanes and increase the potential for accidents.

2.4.4 POOR DRAINAGE DESIGN/PERFORMANCE

Because of inadequate storm water drainage capacity and roadway profiles in some areas, heavy rains cause flooding under some of the cross-street underpasses within the project corridor. Problems are most frequent at Penn Avenue and in the segment between I-35W and TH 77, where major storms (10-year storm levels or greater) can result in flooding that can cause closure of all or portions of the mainline. The flooding also creates a substantial safety hazard with the heavy traffic flows on I-494. A section of I-494 at East Bush Lake road is approximately 1.5 meters (5 feet) below the 100-year flood elevation of Nine Mile Creek. In 1987, this section of highway was closed for two weeks following a major storm because the road was under water. The cities of Richfield and Bloomington are currently addressing storm water drainage problems within their communities and are aware of the need to coordinate their improvements with I-494 highway drainage plans.

2.4.5 SAFETY CONCERNS

Crash rate data for the I-494 corridor for the years 1997 through 1999 was reviewed and compared to Mn/DOT average crash rates for similar highways in the metro area, to assess whether the congestion and/or roadway design issues described above have a substantial impact on roadway safety. This review indicated that although safety is not a major problem in the I-494 corridor, there are differences in crash statistics within the corridor. The I-494 segment from I-394 to TH 100 had a rate of 0.6 incidents per million vehicle kilometers (0.9 incidents per million vehicle miles) traveled (approximately 18 percent below the average incident rate for metro freeways), and the segment from TH 100 to the Minnesota River had a rate approximately 16 percent above the average incident rate. The lower-than-average rate on the I-394 to TH 100 segment is likely due to greater distances between interchanges, compared to the eastern section of I-494 that has more closely-spaced interchanges.

2.5 ENVIRONMENTAL ISSUES

Increasing congestion on I-494 over time will result in increasing air quality problems along the I-494 corridor, since idling vehicles are a source of carbon monoxide pollution. In addition, as discussed in Section 2.3, the existing and projected future congestion on I-494 would result in increased traffic and congestion on local arterials and on other local residential streets as motorists look for alternatives to the congested routes. The increase in local roadway traffic would, in turn, cause increased traffic noise, safety problems and air pollution in local neighborhoods. Improving operations on I-494 to decrease congestion on the freeway and to decrease traffic diversion would help to minimize these problems.

Section 2.4 discusses the inadequacies of storm water conveyance and storage in the existing I-494 corridor. In addition, there are deficiencies in storm water detention and treatment provisions in the corridor, since much of the roadway was constructed prior to the implementation of current storm water treatment regulations.