# CHAPTER 4
# Transportation Planning

## 4.1 Travel Demand Modeling

The Missouri statewide model, in conjunction with the existing urban area models in Kansas City, Columbia and St. Louis, are being used to develop baseline (2000) and future (2020 and 2030) traffic projections. The existing and future traffic projections will be used to update the corridor-wide and SIU specific Purpose and Need, and as input into the interchange operations analysis, the traffic safety evaluation and the economic development evaluation.

### 4.1.1 GEC RESPONSIBILITIES

The GEC will provide the SEC with estimates of average daily traffic for the base year (2000) and the forecast years (2020 and 2030) on the appropriate sections of the I-70 corridor, as well as traffic volumes just north and just south of I-70 on crossroads that have interchanges with I-70. Volumes for I-70 that are provided will include mainline and ramp daily volumes. The traffic forecasting process will also produce directional splits for mainline I-70, percent of heavy vehicles and turning movement percentages for all interchanges where turning movement counts are not available. The GEC will also provide K factors (percentage of daily traffic occurring in the peak hour), peak hour directional factors and peak hour factors (PHF) for use in converting daily traffic volume forecasts to peak period volumes for use in traffic analysis. For SIUs 4 and 7, the GEC will provide traffic projections for each of the build alternatives.

Measures of effectiveness (MOEs) will be provided for each alternative scenario for SIUs 4 and 7. Specific MOEs that will be provided include changes in vehicle miles of travel (VMT), vehicle hours of travel (VHT) and average network speed.

The GEC will provide the travel demand modeling results according to the following revised schedule:

- SIU No. 1 – Modeling results will be taken from the I-70 MIS process for much of the corridor, so all forecast traffic will not be available until early 2003.
- SIU No. 2, 3, 5, and 6 – Forecasts have been developed and are being formatted for distribution.
- SIU No. 4 – All initial assignments have been developed and are under review. The GEC will work with the SIU 4 SEC to define and model proposed alternatives.
- SIU No. 7 – The revised travel demand model has been calibrated and initial alternative assignments are being generated. All initial assignments are expected to be available the week of November 4, 2002.

Traffic adjustment factors will be provided along with the statewide model results.

### 4.1.2 SEC RESPONSIBILITIES

Although the GEC will provide daily volume forecasts for the I-70 mainline along with crossroads, each SEC must develop peak hour volumes for use in the traffic operations analysis at interchanges. Where turning movement counts are available they will be used as a basis for developing future year peak hour turning movement volumes. Counts will be available for interchanges that the SEC has been tasked to count and interchanges that have recently been counted by MoDOT. If turning movements are not available at an interchange, the SEC shall request turning percentages from the statewide travel demand model.

The SEC will develop future year peak hour turning movement volumes. This will be done by 1) factoring the existing counts based projected traffic growth on the I-70 mainline and crossroad, and 2) factoring volumes to reflect expected traffic growth as a result of localized development at interchanges. The statewide travel demand model does not reflect site specific development that will impact ramp volumes. Each SEC must make interchange specific adjustments to account for local development. The resulting ramp volumes need to be adjusted to be consistent with the forecast I-70 mainline traffic by the SEC.

### 4.1.3 SPECIFIC SIU 4 AND 7 SEC RESPONSIBILITIES

Based on the fact that SIU 4 and 7 will probably be evaluating one or more bypass alternatives, each SEC will need to develop travel efficiency calculations for each alternative alignment for the base and forecast years (2000, 2020, and 2030) using changes in VMT and VHT provided from the travel model, as well as accident savings which will be derived from separate safety calculations. The changes in VMT will be used to estimate the total savings in vehicle operating costs, the VHT will be used to calculate travel time savings and the accident information will be used to calculate savings related to PDO, injury and fatality accident reductions.

Estimates of travel efficiency savings will be discounted to base year dollars using a 7 percent discount rate as proscribed by the Office of Management and Budget (OMB) revised Circular A-94. The 7 percent discount rate is a commonly accepted rate for analysis of this type, and is appropriately conservative. To account for the fact that OMB Circular A-94 is updated periodically as presidential budgets are submitted, SECs will perform sensitivity analyses of travel efficiency benefits using 4 and 10 percent discount rates.

To estimate the annual benefits from travel time savings, two streams of benefits will be analyzed to account for the two future “build” years. The first stream is the twenty year period from 2000-2020. The benefits will be interpolated in straight-line fashion over the twenty year period. The second stream of benefits is the 30 year period from 2000-2030. Again, travel time savings will be discounted and analyzed in a straight-line fashion over the time period. Guidance will be provided in the form of an example Excel spreadsheet that demonstrates the discounting process.

SIUs without bypass or realignment alternatives do not need travel efficiency savings calculated as any savings accruing to travelers on those sections will be negligible. Changes in VMT and VHT will be provided by the GEC for each SIU that has bypass or realignment alternatives (SIU 4 and 7).

#### *Estimating Travel Efficiency Savings*

Estimating travel efficiency savings involves three types of savings: 1) travel time savings, 2) vehicle operating cost savings and 3) crash reduction savings (crash savings calculations are discussed further in the Safety (4.3) section). The three types of savings are added together to

determine total travel efficiency savings. Those travel efficiency benefits will be calculated for two vehicle types: passenger vehicles (automobiles) and commercial trucks.

***Travel time savings*** – One objective of a highway improvement is to reduce the time required to travel between two points. Two types of time-savings could result from highway improvements: An average total reduction in travel time in which all highway users experience reduced travel time and thus have more time to allocate elsewhere, and a reduction in variability in travel time without lowering the average time en route. Because standard value-of-time calculations are based solely on reductions in average total travel times, an improvement in variability of travel times would not contribute to calculated reductions in transportation costs. Yet, reducing variability of travel times reduces costs associated with the shipment of goods, thereby bringing about a gain in economic productivity.

Calculating travel time savings has two main components: 1) vehicle hours traveled (VHT) and 2) a value of time for the occupants of each vehicle. VHT is a statistic produced by travel models to represent the total hours traveled on a road network, and differences in VHT from a no-build model scenario to a build model scenario represent the total amount of time savings travelers have gained or lost. The value of time for vehicle occupants varies from place to place, the most commonly used estimate of the value of travel time is the prevailing wage rate in the study area. For this study, the Missouri statewide wage rate will be used in calculations because trips that often travel between regions of the state. Values of time to be used in time savings calculations are provided in Table 4.1.

**Table 4.1**
**Values of Time Used in Time Savings Calculations**

| Category | Value of Time (in Year 2000 $) |
|---|---|
| Trucks | $16.19 |
| Automobile-business* | $14.01 |
| Automobile-leisure* | $8.40 |

Source: *Average Wages for the 30 largest Employing Occupations in Missouri (2000)*, report published by the Missouri Department of Economic Development, Economic Research and Information Center. Numbers updated to 2000 dollars using GDP Deflator Inflation calculator.

*The FHWA Highway Economic Requirements System (HERS) calculates the value of automobile-business travel time to be equal to the average wage rate for civilian workers, and the value of automobile-leisure travel time to drivers to be approximately 60 percent of the average wage rate.

SECs will compute travel time savings for the base year build scenario (2000) and the forecast years (2020, 2030) build alternatives. These estimates will be calculated for each alternative by multiplying the value of time for vehicles (autos and trucks) by the number of vehicle-hours saved. The vehicle-hours saved provided by the travel model will be presented as net hours saved network-wide, and splits for auto-business/auto-leisure, and trucks will be provided from the model. Timesavings from vehicles diverted to the new alternatives, as well as time savings from users of other highways due to reduced congestion on existing highways are included in the VHT saved.

***Vehicle Operating Cost Savings*** – While the cost of constructing and maintaining highways are significant, the costs of operating motor vehicles on those facilities are even more significant. Vehicle operating costs are comprised of a number of components, some of which are use related (oil, gasoline, maintenance, and tires) and others that are time related (e.g. insurance and license fees). Values to be used in calculating vehicle operating costs are provided in Table 4.2.

**Table 4.2**
**Values of Vehicle Operating Cost Savings**

| Category | Per mile operating costs (In Year 2000 $) |
|---|---|
| Automobiles * | $0.26 |
| Trucks ** | $0.42 |

Source:
* Automobile costs taken from *The Vehicle Fleet-Our Nation's Highways* (2000), report published by FHWA. Values inflated using NASA GDP deflator inflation calculator.

** Truck costs taken from *Operating Costs of Trucks in Canada* (1999), published by the Canadian Transport Ministry. The report detailed operating costs in different regions of the US for comparison purposes.

Estimating vehicle operating cost savings for a particular alternative requires two components: 1) the change (either a reduction or increase) in vehicle miles traveled (VMT) from the no-build scenario to the build scenario being analyzed and 2) the per-mile cost of operating vehicles. VMT is a statistic produced by the travel model to represent the total number of miles traveled by vehicles over the network. A bypass alternative, depending on its location, can either add to the number of miles required to travel from one point to another, or can shorten the distance and reduce the VMT.

Per-mile vehicle operating costs (VOC) for automobiles have been estimated using a report from the Federal Highway Administration entitled "*The Vehicle Fleet-Our Nation's Highways-2000.*" This report lists VOCs for 12 categories of vehicles from subcompact cars to full-size vans. Those VOCs include fixed costs such as insurance, financing, depreciation, registration fees, and taxes that are normally not included in VOC values. To remedy this, another FHWA report found at "www.fhwa.dot.gov/ohim/onh00/pie2.htm" provides a percentage breakdown of operating costs by component category, allowing fixed cost components to be subtracted from the overall VOC values found in the previous FHWA report. After subtraction of the appropriate components from the all-encompassing VOC values, the 12 categories of automobiles/light trucks have been averaged together to determine a final auto/light truck VOC. The resulting VOC value, and the value to be used for the automobile/light truck category, is 26 cents/mile.

The vehicle operating cost value for heavy trucks is derived from a 1999 report published by the Canadian Transport Ministry titled "*Operating Costs of Trucks in Canada-1999*." The report contains highly detailed accounting of both fixed and variable costs for several types of motor carriers in Canada and several United States regions, including the Midwest. The Midwest sub-region uses Kansas City and St. Louis markets (among others) as a basis for cost development. The VOC value provided by this report for the heavy truck category in the Midwest US region is 42 cents/mile.

Estimates of vehicle operating cost savings will be computed for the base year build scenario (2000) and the forecast years (2020, 2030) build alternatives. These estimates will be calculated for each alternative by multiplying the per-mile vehicle operating cost for the appropriate vehicle (autos or trucks) by the number of vehicle miles saved. The vehicle-miles saved provided by the travel model will be presented as net miles saved network-wide. VOC savings from vehicles diverted to the new alternatives, as well as VOC savings from users of other highways due to reduced congestion on existing highways are included in the VOC saved.

## 4.2 Traffic Operations

In order to determine existing and projected traffic deficiencies within the I-70 corridor, a traffic operational analysis will be completed. The analysis will analyze the series of alternatives to

address those deficiencies and will evaluate the overall effectiveness of those alternatives in minimizing the traffic deficiencies.

### 4.2.1 METHODOLOGY

To conduct the traffic operational analysis, the SEC will perform a series of tasks. These tasks include the following:

- Collect existing traffic information, including volume and turning movement counts, where data currently exists.
- Inventory existing traffic conditions at the appropriate interchanges, including interchange geometry and configuration.
- Review previous studies (if any) that have been conducted for the area.
- Conduct traffic counts at critical ramp terminals and frontage road intersections, as per the individual SEC scope of service.
- Obtain forecasted traffic information for 2020 and 2030 from the GEC to estimate additional traffic in interchanges at the forecast years.
- Analyze traffic operations for the I-70 interchanges using Highway Capacity Manual (HCM) methodologies. The analysis of interchanges will include merge and diverge points and crossroad intersections. Adjacent frontage road intersections should also be analyzed where appropriate.
- Develop a computer-based traffic micro-simulation model (such as Synchro or CORSIM) to generate level-of-service and delay information for each critical interchange, per the individual SEC scope of service.

### 4.2.2 GEC RESPONSIBILITIES

The GEC will provide base year (2000) and forecast years (2020, 2030) ADTs for the I-70 corridor. I-70 mainline, interchange, and major crossroad volumes will be provided. Directional volumes will be provided for the I-70 mainline, non-directional volumes will be provided for crossroads. Only base year (2000) ramp volumes will be provided, since future year ramp volumes will depend on local traffic along with regional traffic growth. The GEC will provide adjustment factors for use in factoring daily traffic volumes to peak hour volumes. At rural low volume interchanges where traffic counts are not being collected, turning percentages from the travel demand model will be provided. The GEC will analyze mainline I-70 traffic operations using HCM's basic freeway analysis procedures.

### 4.2.3 SEC RESPONSIBILITIES

The SEC will provide a traffic operations summary table detailing levels of service (LOS), approach delays, queuing issues, other existing and potential traffic issues, and remedies to those issues for interchanges. This includes ramp terminals (mainline and crossroad) and adjacent frontage road intersections. A similar evaluation of the performance of the build alternatives will also be performed.

## 4.3 Travel Safety

Improving travel safety is a primary goal for federal, state, and local governments when considering making improvements to roadways. An improved roadway facility should markedly improve travel safety rather than making travel conditions more dangerous.

### 4.3.1 GEC RESPONSIBILITIES

The GEC provided the SECs with 6-year crash data obtained from MoDOT. The crash data were posted on InterXchange. The data are grouped in SIU specific ZIP files that can be found in the "\Community\Crash Data\" folder on InterXchange. The data have been geocoded into ESRI shape files. The following GIS layers have been posted to InterXchange:

- One SIU-specific point layer (02-07-03_SIU_X_Allvehicles.shp) containing records for each vehicle involved in crashes in the I-70 corridor. In instances in which more than one vehicle was involved in the same crash, each vehicle involved will have a record in the database detailing the conditions and situation of the crash. The field that contains the identifier for each crash is "ACC_MSHP_I.".

- One SIU-specific point layer (02-07-03_SIU_X_Crashlocation.shp) with duplicate crash records removed. This layer provides the location of each crash. Each point will correspond with one crash and data will not be vehicle specific.

- One SIU-specific point layer (02-07-03_SIU_X_Crossmedian.shp) identifying cross-median crashes. Each point will correspond with one crash and data will not be vehicle specific.

- One SIU-specific point layer (02-07-03_SIU_X_Fatal.shp) identifying crashes involving fatalities. Each point will correspond with one crash and data will not be vehicle specific.

Each GIS data point layer includes locations (I-70 east/westbound and major cross-roads) of all crashes from 1995-2000 and detailed data about crash severity, crash conditions and circumstances, and involved-vehicle types. Please note that some crash data are missing. Crash data were not available for the following crossroads:

- County Road 145, Lafayette County
- County Road 348, Lafayette County
- County Road 329, Saline County
- Bryant Bottom Road, Cooper County
- Ashley Road, Cooper County
- Elm Ave, Warren County

Also, in SIU 4 and 5 entries in the "Vehicle Type" field are not provided for northbound and southbound MO Route 87 and US 63.

Current crash rates are being calculated by the GEC for fatal and non-fatal crashes and will be available on InterXchange by October 31, 2002. Separate crash rates are being developed for mainline I-70 and cross roads. Crash rates will be provided for each roadway segment, with mainline I-70 segments defined as being from the bridge deck at interchange A to the bridge deck at interchange B. Roadway segments for crossroads are defined as from the centerline of mainline I-70 to approximately 1 mile north on the crossroads, and from the centerline of mainline I-70 to approximately 1 mile south on the crossroad. Ramps will be incorporated into the crossroad rates, which will also include the crashes at ramp terminals.

### *Safety Benefit Calculation*

The GEC will also provide crash rate adjustment percentages to reflect safety benefits of the improved I-70 facility and monetary values for property damage-only (PDO), injury, and fatality crashes. The monetary values for crash severities can be found in Table 4.3.

**Table 4.3**
**Monetary Values of Crashes by Severity**

| Crash Severity | Monetary Value ($2000)* |
|---|---|
| Property Damage-Only (PDO) | $3,350 |
| Injury | $45,900 |
| Fatal | $3,500,000 |

*Values are based on current MoDOT benefit-cost analysis guidance.

### *Crash Rate Adjustments*

Proposed improvements to I-70 will have significant safety benefits. In an effort to quantify these benefits, crash rate adjustments have been developed for use in estimating the reduction in crashes resulting from an improved I-70. Adjustment factors are provided for property damage only (PDO), injury and fatal crashes. Separate factors are also provided for suburban/rural SIUs (1, 4 and 7) and the rural SIUs (2, 3, 5 and 6). Separate adjustment factors reflect benefits of 1) widened median, 2) the addition of a lane in each direction and 3) general geometric enhancements.

***Median Benefit*** – The wide median designed to allow drivers to safely recover control when they leave the roadway should significantly reduce cross-median crashes. To develop adjustment factors that reflect the reduction in crashes resulting from the wide median, 95 percent of the cross-median crashes were removed from the crash data and new crash rates were calculated. To provide larger data sets while reflecting the differences between certain SIUs, crash data from SIUs 1, 4 and 7 were aggregated as suburban/rural and crash data from SIUs 2, 3, 5 and 6 were aggregated as rural to produce composite crash rate adjustments. Table 4.4 summarizes the percentage reduction in crash rates when 95 percent of cross-median crashes are removed.

**Table 4.4**
**Percentage Change in Crash Rates**
**with Elimination of Cross-Median Crashes**

| | Crash Type | | |
|---|---|---|---|
| | Property Damage Only | Injury | Fatal |
| Suburban/Rural (SIUs 1, 4 & 7) | -0.7% | -2.3% | -17.7% |
| Rural (SIUs 2, 3, 5 & 6) | -1.2% | -3.7% | -22.6% |

***Benefit of Adding Lanes*** – Adding an additional lane in each direction along I-70 will reduce the density of traffic per lane. A similar number of vehicles will be distributed across six lanes rather than only four. Very limited research has been conducted to determine the safety impact of adding lanes on freeways. The Highway Economic Requirements System (HERS) model developed and used by the Federal Highway Administration includes a crash prediction model that considers the ratio of volume to capacity on a freeway facility[1]. The model predicts a minor

[1] *Highway Economic Requirements Systems: Technical Report*. Federal Highway Administration. December 2000.

reduction in crash rates as capacity increases relative to volume. The addition of a lane in each direction results in an increase in available capacity.

The HERS crash prediction model that reflects the impact of a reduced volume to capacity ratio was developed for urban freeways. For this reason the relative impact on crash rates is used rather than the predicted rates. There is no reason to conclude that the relationship between volume to capacity ratios and crash rates on urban freeways would be significantly different than the relationship on rural freeways.

To estimate the reduction in crash rates resulting for the two categories of SIU segments, an estimate average daily traffic volume was developed for each category at the mid point of the planning period. These volumes were input into the model with four and six lanes. The percentage difference in crash rates was determined by comparing the resulting crash rates. Table 4.5 summarizes the results.

**Table 4.5**
**Percentage Change in Crash Rates**
**Resulting from Widening from 4-Lanes to 6-Lanes**

| | Percent Change |
|---|---|
| Suburban/Rural (SIUs 1, 4 & 7) | -5.4% |
| Rural (SIUs 2, 3, 5 & 6) | -1.6% |

***Geometric Improvement Benefits*** – Other geometric improvements to the I-70 corridor will also have safety benefits that will result in a reduction in crashes. Unfortunately, quantitative methods available to predict the impact of geometric improvements on safety are nonexistent for freeways. A relatively recent National Cooperative Highway Research Program (NCHRP) research project conducted an in-depth assessment of the ability to quantify safety benefits of highway design decisions[2]. Based on a thorough literature review, a summary of known relationships between design features and safety was produced. Table 4.6 summarizes the relationships relevant to I-70 geometric improvements that were reported to exist.

**Table 4.6**
**Known Relationships Between**
**Safety and Highway Design Features**

| Freeway Design Element | Known Relationship |
|---|---|
| • Side Slope<br>• Clear Zone<br>• Type of Appurtenances | Design of features is known to influence crash frequency and/or severity. |
| • Width of Shoulder<br>• Design of Ramp Proper | Design of features is presumed to influence crash frequency and/or severity; research has established only weak relationships or evidence is conflicting. |
| • Normal Cross Slope<br>• Type of Shoulder<br>• Horizontal Curves<br>• Vertical Alignment<br>• Vertical Clearance | Design of features is presumed by current practice to be related to crash frequency and/or severity but research has not successfully demonstrated a relationship. |

Despite the lack of demonstrated benefits and methods for quantifying benefits, a general consensus exists that roadway design is a factor that contributes to highway safety. The

[2] Pfefer, Ronald, Timothy Raub and Richard Raub. *Improved Safety Information to Support Highway Design*. NCHRP Report 430. Transportation Research Board. 1999.

following roadway design enhancements that will provide safety benefits are proposed as part of the I-70 improvements:

- Grooved shoulders
- Wide median and outside shoulders
- Increased clear zone
- Improved guard rail design
- Improved fill and cut slopes
- Some increased horizontal curve radii
- Improved vertical alignment
- Standard merge and diverge ramp termini
- Increased minimum clearance

The MoDOT *Manual on Identification, Analysis and Correction of High-Crash-Locations*[3] provides crash reduction factors for some of the proposed roadway enhancements, which help demonstrate the benefits and suggest a reasonable range for making corridor-wide adjustments to reflect the improvements to I-70. Table 4.7 summarizes the percentage reduction in all crashes expected for specific improvements. The crash reduction percentages are for standalone improvements and can not simply be added together to reflect multiple improvements.

**Table 4.7**
**Estimated Crash Reduction Percentage**
**from MoDOT Manual**

| Countermeasure | Percent Reduction |
|---|---|
| Upgrade Guardrail | 5% |
| Groove Shoulder | 25% |
| Improve Gore Area | 25% |
| Flatten Side-Slope | 5 to 11% |
| Source: Manual on Identification, Analysis and Correction of High-Crash-Locations | |

The crash reduction percentages provided in the MoDOT manual are for specific site improvements, so they must be reduced when being applied to a corridor such as I-70. For example, improving the gore area will impact crashes in the vicinity of the gore area. The number of crashes outside of the influence area of ramp gores will not be impacted..

To account for the perceived safety benefits of the proposed geometric improvements to I-70, existing crash rates will be reduced by 10 percent. This percentage is considered reasonably conservative for estimating future life cycle benefits of crash reductions on an SIU corridor basis.

The accumulation of the crash adjustments for the wide median, additional lanes and geometric improvements results in composite adjustment percentages. Table 4.8 summarizes the composite adjustment factors. The adjustment percentages should be applied to average crash rates for each SIU to quantify the safety benefit of improved I-70.

[3] Manual on Identification, Analysis and Correction of High-Crash-Locations. Third Edition. Department of Civil and Environmental Engineering, University of Missouri-Columbia. 1999.

**Table 4.8**
**Percentage Change in Crash Rates**
**for Improved I-70 Corridor**

| | Crash Type | | |
|---|---|---|---|
| | **Property Damage Only** | **Injury** | **Fatal** |
| Suburban/Rural (SIUs 1, 4 & 7) | -16% | -18% | -33% |
| Rural (SIUs 2, 3, 5 & 6) | -13% | -15% | -34% |

### 4.3.2 SEC RESPONSIBILITIES

The SEC will provide a detailed safety analysis for each design alternative for the base (2000) and forecast (2020, 2030) years using the following methodology:

1) Identify and categorize crashes by severity (PDO, injury, fatality), crash type (highlighting median crossover crashes), and year for the existing corridor.

2) Calculate average 6-year crash rates for PDO, injury and fatality crash types.

3) Calculate improved I-70 crash rates by applying adjustment percentages provided above.

4) Using the crash rates for the improved I-70 facility and forecasted volumes from the travel model, calculate the number of crashes for improved I-70 for the base and forecast years.

5) Compare no-build/build base and forecast years' crash numbers to estimate reductions by crash type.

6) Apply and discount appropriate monetary values to crash reductions to determine crash savings for base and forecast years.

Included in the safety analysis for each design alternative should be crash savings by crash type and year, discounted monetary crash savings by crash type and year, identification of high-crash rate locations, and explanations for the high crash rates at those locations (e.g. deficient geometrics, limited sight distance). The GEC will review all safety calculations developed by the SECs.

### 4.3.3 TORT LIABILITY DISCLAIMER

In any document that presents or discusses safety data, Tort Liability text must be included as an appendix and correctly referenced. Exhibit 4.1 provides the text that must be included as an appendix and a copy of the text is available on InterXchange in the "\Community\Crash Data" folder. The Tort Liability text was provided by MoDOT's attorney. Each section of the document that discusses safety data must contain a prefatory footnote, numbered right by its title or heading, with the text on the same page that reads:

> ***Accident statistics and safety data summarized or presented in this ____ are protected under federal law. See Appendix X.***

Insert the correct term in the footnote text blank above, corresponding to the "chapter", "unit", "section", "subsection", "table", "chart", "paragraph", or etc., where the accident statistics and safety data are summarized or presented. If the discussion takes place in several portions of a larger chapter or unit, then you may use the more inclusive term at the beginning of that chapter or unit, to avoid repetitive footnotes.

**Exhibit 4.1**
**Tort Liability Text Appendix**

**Appendix X**
**Traffic Accident and Safety Data**

The National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321-4370f, requires that this analysis of the proposed project must consider and discuss its effects and impacts on mankind, and its effects and impacts on plants, animals, resources, and the natural world in general. One of the key elements to be discussed in any NEPA analysis of a proposed highway project is its effects and impacts on the safety of those who use those highways. However, Congress has recognized that even while this document summarizes and presents traffic accident and safety information for the general information and benefit of the public, pursuant to federal law, some people may attempt to use the information to establish federal, state or local liability in lawsuits arising from highway accidents. Congress has enacted a law, 23 USC Section 409, which prohibits the discovery or use of highway accident and safety data, developed under federal law to make highway safety improvements, in litigation seeking damages for accidents and occurrences on these highways. Congress's rationale is obvious: the safety data was compiled and collected at their request, to help prevent future accidents, injuries and death on our nation's highways. If that information can be used in expensive damage suits, then the millions of dollars that litigation may cost the Missouri Department of Transportation (MoDOT) and local governments will not be available for their use to make Missouri's highways safer.

Traffic accident statistics and safety data are compiled, presented and summarized in portions of this NEPA document. Where noted in an introductory footnote to a segment of this document, the discussion, reports, lists, tables, diagrams and data presented throughout that chapter, unit, section or subsection was compiled or collected for the purpose of identifying, evaluating or planning the safety enhancement of potential accident sites or hazardous roadway conditions pursuant to federal law. Thus, that information and its supporting reports, schedules, lists, tables, diagrams and data are not subject to discovery, and they are prohibited by federal law (23 USC § 409) from being admitted into evidence in a federal or state court proceeding, or from being considered for other purposes, in any action for damages arising from an occurrence on the highways, intersections or interchanges discussed in this document.

## 4.4 Corridor Purpose And Need Statement

The purpose and need for improvements in the I-70 corridor will be updated to reflect more current data that will be available. The updated purpose and need statement will specifically address the following issues:

- ***Roadway Capacity*** – The GEC will provide updated base and forecast years ADTs for each SIU. SECs are responsible for performing further capacity analyses to determine where capacity issues currently exist, and where future issues may arise. SECs are responsible for updating their SIU-specific purpose and need statements to reflect the more current data.

- ***Traffic Safety*** – The GEC will provide updated 6-year crash statistics from MoDOT databases. The SEC is responsible for performing traffic safety analyses to develop historic crash rates for roadway segments and intersections, and to identify high crash rate locations. SECs are responsible for updating their SIU-specific purpose and need statements to reflect the more current data.

- ***Role in National Defense*** – The GEC will provide the SEC information related to the importance of I-70 to national defense. Information will include I-70 and its relation to homeland defense, evacuation routing, SEMA/FEMA needs, and military deployment needs. The SEC will include the information related to I-70 and national defense in the SIU-specific purpose and need statement, as relevant.

- ***Corridor-Wide Traffic Impacts*** – The GEC will provide additional information as needed regarding the relationship of I-70 corridor traffic to U.S. 36 and U.S. 50 corridor traffic. Historic traffic growth trends will be assessed and comparisons will be made with other Midwest interstates. The SEC will include the corridor-wide traffic information in the SIU-specific purpose and need statement. .

The GEC will provide a corridor-wide purpose and need "insert" to the SECs for inclusion with the environmental documentation for each SIU.

## 4.5 Intelligent Transportation Systems Plan

Development of an ITS Master Plan for I-70 has been eliminated from the current I-70 program, but general guidance on the incorporation of ITS in the environmental documentation will be provide in early 2003. ITS systems in the I-70 corridor will enhance the proposed roadway improvements, but should not affect roadway design considerations or have significant negative environmental impacts. The primary impact of implementing ITS along the I-70 corridor will be operational and safety benefits that result from the ITS systems and the cost to provide the ITS systems. Guidance will be provided on the estimated costs by SIU for implementing and operating the proposed systems.

The discussion of ITS in the First Tier EIS generally reflects what is expected for the I-70 corridor. The strategies discussed in the First Tier EIS may be revised to insure consistency with the Missouri Statewide ITS Plan and the ongoing planning effort that is focusing on statewide operations and management of the transportation system.