3 Transportation System Inventory

3.1 Purpose

Before any analysis can begin, data for the study area must be collected from the field or other available sources. This chapter provides guidance in the selection criteria and collection methods of appropriate data for use in transportation analysis. Topics covered include:

- Field Inventory
- Vehicle Count Surveys
- Travel Time Surveys
- Saturation Flow Rate Studies
- Crash Data
- Data Resources from ODOT

3.2 Field Inventory

Specific data related to field conditions that may affect traffic safety and operations shall be collected directly during a visit to the area. In addition, inventory data can be collected through other sources such as previously conducted studies or databases maintained by the agency with jurisdiction over the roadway. There is no substitute for a field visit as an analyst cannot get a good feel for the project area otherwise. Notes, photographs and/or video should be taken of the project area in addition to the inventory data to reference, and possibly include, as graphical elements in the final report. The most common types of field data needed are discussed below.

3.2.1 Geometric Data

Geometric data typically includes:

- Street names
- Lane/shoulder/median widths
- Lane configurations
- Sidewalk widths and locations
- Intersection and access spacing
- Horizontal and vertical roadway alignments
- Storage bay lengths (from stop-bar to start of taper)
- Bike lanes and width
- Parking width and locations

3.2.2 Operational Data

Operational data typically includes:

- Speed limits
- Intersection controls (signalized, stop-controlled, yield, merge, etc.)
- Signal characteristics (timed, actuated, split-phased, protected left turns, etc.)
- Signing (especially turn prohibitions)
- Parking locations, signing, striping, and frequency of parking maneuvers
- Crosswalk location and frequency of use
- Bus stop locations and bus route frequency
- General operations observed during peak period on field visit; note perceived and actual problems, standing queues, poor access/intersection spacing, movements of vehicles and pedestrians/bicyclists

- Saturation flow studies
- Travel time studies
- Rail crossing locations, train frequency and duration of blockages

3.3 Vehicle Count Surveys

The data collected from vehicle count surveys is used in nearly all types of analysis procedures, and can include information regarding volumes of vehicles, types of vehicles, vehicle speeds and directions of vehicle flow. When such information is needed, the analyst must determine the appropriate time and method of data collection to obtain the desired results.

3.3.1 Vehicle Count Locations

Vehicle count locations should be identified in the project SOW, and should be determined based on the needs of the subject project. For TISs, the analysis area and study intersections are typically selected from estimates of anticipated impacts from added traffic based on site trip generation and distribution, and existing intersection operations. For most other project types the analysis area and study intersections are selected by considering the problem that is being addressed by the study, and the information that will be needed to fully assess it and propose appropriate solutions.

3.3.2 Vehicle Count Periods

The selection of the time and date of a vehicle count survey is often determined by the analysis needs of the project. For most projects, the 30 HV should be used to represent design volumes. In fully developed portions of Metropolitan Planning Organization (MPO) areas, the 30^{th} highest hour is generally assumed to be represented by the weekday peak hour. Where 30 HV will be used in analysis, the counts should be taken as close to the 30^{th} highest hour as possible. This typically requires collecting counts on a weekday afternoon (usually in summer) in most larger urban areas, but may include weekends for high recreation areas (the coast), or areas experiencing lunch hour peaks or high reverse direction flows during the day. There may be instances where both a weekday and weekend traffic count will be needed for areas such as the coast, Sisters, or other recreational areas with various seasonal and weekend traffic characteristics. Caution should be exercised when seasonally adjusting a count to the 30 HV. If the adjustment is more than 30%, the characteristics of the traffic and its flows are most likely NOT represented by the count information. Turn movement patterns can be so different they cannot be adequately represented by a seasonal adjustment. See Chapter 4, Design Hour Volumes. In general, days potentially influenced by state or federal holidays or other significant events that may alter normal traffic patterns should be avoided. Consideration should also be given to the presence of schools and major employers or attractions that experience significant peaks in generated trips due to shift changes or event scheduling. It is also common to avoid Monday and Friday counts when weekday data is desired, as the trip characteristics on these days generally differ from the remainder of the week.

In the Portland Metro area, while infrequent, there may be times when additional counts must be collected for the time period beyond the weekday peak hour to ensure the following hour meets the adopted 2-hour mobility standard. This is generally only necessary when the operational threshold for the second hour of the peak period is lower than the threshold for the first hour of the peak period and the analysis shows the first hour operating below its threshold, but above the threshold for the second hour.

The duration of the vehicle count survey is typically determined by the analysis needs of the project, and may be focused on a single hour of operation or a full 24-hour period. Some examples of common count periods and their intended uses are:

- ***Peak Period Count:*** These are typically used to capture a peak hour of operation when that hour can be reasonably anticipated to fall within a known 2- to 3-hour window. This is the minimum count duration. When the time of the peak hour is uncertain, the count duration should be extended as needed (preferably to a 16-hour count) to ensure this hour is captured. If this time is greater than four hours, then a 16-hour count shall be collected. Peak period counts should only be used for driveway counts and turning movement only counts.
- ***16-Hour Count:*** This is the standard intersection ODOT count duration used in planning and project applications such as capacity analysis, air/noise traffic data, and road, bridge and pavement design. Sixteen-hour counts are also used for the analysis included in the traffic signal warrants from the *Manual on Uniform Traffic Control Devices for Streets and Highways*. Older counts will have the previous 14-hour duration standard.
- ***48-Hour Count:*** These counts are typically used to capture data covering an entire day. While often referenced as a “daily” count, these count periods often extend to as much as 48 hours to ensure a complete data set that includes all 24 consecutive hours in a single day. Forty-eight hour counts are used for counting roadway segments such as free-flow ramp or connection movements.
- ***7-Day Count:*** These are typically used to capture daily fluctuations over a week-long period. Seven day counts have hourly and daily breakdowns, and are only done on roadway segments.

3.3.3 Vehicle Count Methods

The collection of vehicle count surveys can be conducted manually or by mechanical/electronic devices (usually road tubes or video cameras), with the data processed later at a workstation. The most common categories of count methods are intersection classification counts, Jamar electric counts, use of video camera, road tube counts and traffic signal controller counts.

Intersection Classification Counts

Intersection Classification counts provide vital information for project development. They provide peak hourly volumes (PHV), ADT and vehicle classifications such as cars, pickups, buses and trucks for each approach and movement. Additionally, the K-factor (percent of ADT in the peak hour) and the D-factor (percent of traffic in a single direction) can be derived from count data. These are then used to convert PHV to ADT. For further explanation of traffic volume characteristics, refer to the HCM – Part I: Overview.

Hourly and daily traffic volumes need to be tabulated for a specific roadway before a 30 HV can be determined. If ODOT Region staff or an ODOT traffic count consultant collects the count information, they will conduct the counts manually or by using electronic traffic counting equipment. The following is a detailed explanation of each of the counting procedures that ODOT uses to count traffic flows.

- ***Turning Movement - Classification Counts:*** This type of count procedure classifies 13 different types of vehicles including the number of pedestrians and bicycles. Refer to the FHWA vehicle classification descriptions in Chapter 11. Passenger and other two-axle vehicles are tabulated both with and without trailers. The number of axles for single-unit trucks and for all single, double and triple trailer trucks is recorded along with buses and motorcycles. A typical region intersection count will include the turning movements summarized by medium trucks, heavy trucks and all vehicles. These classifications are:

    - Medium Trucks: 2-axle other with trailer, 2-axle 6-tire single-unit and buses
    - Heavy Trucks: 3-axles and greater single-units and all combinations
    - All vehicles: Passenger cars, trucks, buses, etc.

  The intersection classification procedure should be used for the collection of turning movement counts. Data is recorded in the field and is then sent to the Transportation Systems Monitoring (TSM) Unit for processing. These counts are used when more detailed information may be needed later for other purposes such as pavement design and signal warrants. Another advantage is that the output from this type of count can easily be electronically processed for air and noise traffic data. (See Chapter 11).

  The TSM Unit will summarize the intersection count using an automated process. A number will be given to each count so that it can be accessed easily. A hardcopy will be stored in TSM's files. The first page of the ODOT intersection count provides a sketch of the intersection counted, the date, location, count number and the ADT for each movement. The second page provides a summary of movements broken down into 1-hour increments. Some intersection counts will break the peak periods into 15-minute intervals instead of 1-hour intervals. Specify 15-minute count intervals for any period when peak hour factors are needed. The rest of the pages show individual turning movements with the vehicle classifications, a summary of the bicycle and pedestrian counts and a summary of the movement volumes. Sample intersection and tube counts have been included in Appendix D for reference.

Counts are sent to the requestor either electronically or hardcopy by mail. If the count was completed earlier, not per request, provide the TSM data analyst with the electronic number (refers to year and number) found in the lower right corner of the cover sheet for the count printout. The TSM Unit will send either an electronic or hardcopy version of the count.

- ***Jamar Electronic Counting Equipment:*** This procedure classifies traffic flows into autos, light truck and heavy truck classifications and tabulates the hourly traffic volumes for the count period. Limitations of the Jamar boards cause the Region counting staff to classify two-axle trucks differently from the typical medium and heavy trucks. Therefore, Jamar electronic counting equipment should only be used for short duration counts. They should not be used for intersection classification counts, as they do not have a sufficient number of bins. Technicians electronically record the field data. The only advantage is that Region staff can electronically process the count data easily. These counts are particularly useful in determining the traffic flows at a location during the peak hour. The Jamar counts are also not usable for other purposes such as for the TSM Unit's use and pavement design.

  The Jamar traffic count is in raw form. There is neither sketch nor summarized data like the traffic count completed manually. The first pages are a summary for the classification "all vehicles." The following pages show traffic counts for the individual classifications of autos, light trucks and heavy trucks.

  TSM Unit does have some Jamar electronic traffic counts, but does not have a single file that contains a listing of all the hardcopies. The hardcopies for Jamar traffic counts are filed in each Region. Contact Region staff to get a copy.

- ***Video Cameras:*** In addition to manual counting methods, improvements in technology have led to the widespread use of video cameras for vehicle counting. When using video cameras, vehicle movements at the count location are recorded throughout the duration of the desired count period and the movements are counted later, at a workstation, using one of the methods described above. This method can be advantageous in that it does not require the presence of a field technician throughout the duration of the count, may have less influence on driver behavior in some situations, allows for flexibility in scheduling and processing counts and provides a database that can be easily revisited if more information is desired at a later time or if an error in the count is detected. When using video cameras to collect count surveys, a good vantage point that will provide a clear view of all movements being counted is essential. Also, be sure to have an adequately charged battery and enough video tape to collect the amount of data needed.

ODOT typically employs video cameras for vehicle count surveys, and has occasionally used permanent traffic monitoring cameras in this manner. Video cameras can be useful data collection tools and, given the appropriate vantage point, can be used to collect many types of data such as O-D data, saturation flow rates and travel times.

Road Tube Counts

Road tube counts are often employed when the level of detail afforded by intersection counts is not necessary or practical given the data needs or duration of count. While they are often more cost-effective over longer durations (48 hours or longer) because they are not monitored during the count, sources of error can be harder to detect. Road tube counts are subject to vandalism or damage by street-sweepers, snowplows, or studded tires, and should not be done where vehicles may stop on the tube or cross the tube at an angle because under or over-counting may occur. Tubes are also susceptible to be damaged on higher speed arterials (40 mph or above), highways and freeways.

Traffic Signal Controller Counts

The 170-type and later traffic signal controllers have the ability to store loop detection information that can be downloaded at a later date. This data is attractive to the end user as there are a large number of usable installations available. However, experience with use of this data shows that the count data is unreliable with a large undercount of turning vehicles.

3.3.4 Ordering Counts

Before any count surveys are ordered, the TSM Unit should be contacted to determine if there are any previous usable counts for the project area. If a count of the correct type is available for the project area from a previous survey, and it is less than three years old, it can be used to develop the traffic for the project, pending approval from TPAU. If recent development has occurred, sometimes a count that is less than three years old may not accurately represent the traffic flows on a section of roadway. If counts less than three years old are not available, order the count. If the count cannot be provided in the timeframe needed, an older count can be used in an area where the traffic flows haven't changed much recently. Older counts up to five years old can be used in areas of little to no growth. Engineering judgment should be used to determine if the traffic flows and movement patterns in the older count are representative of the present traffic flows.

When ordering counts the name of the person making the request, the person to whom the data will be sent, the locations, time periods, dates, types of counts and collection methods must be clearly communicated to those conducting the counts. A map showing the count locations, durations and other special requirements should also be provided to help eliminate misunderstandings. See the sample count request in Appendix D.

When ordering intersection counts, be sure to specify a 16-hour, turn movement, full federal classification count for each location. Fifteen-minute breakdown periods must be specified for at least the standard morning, noon and evening peak periods. Also, specify the date by which the count is needed at least five weeks from the count request date. Send a courtesy copy (cc) to the TSM Unit to alert them that the counts are on the way, and their work should be scheduled. Count requests in Regions 3, 4 and 5 are made directly through Region Traffic, while counts in other Regions are requested through the TSM Unit. If Region does not have the resources to do the traffic counting, the counting will be contracted out to a consultant. Region has to know the same information so that a consultant can be contracted to do the work.

3.4 Travel Time Surveys

Travel time surveys measure the duration of time taken for a vehicle to travel from one point to another along a designated route, and are often used to quantify congestion over a corridor. The data collected from travel time surveys works well with statistical analysis, and the results are often more easily understood by the public than other methods used for measuring congestion.

3.4.1 Data Collection

The most common method used for collection of this data involves the use of a “floating car.” The elapsed time is measured from a car driven along the designated route maintaining an average travel speed relative to other cars on the roadway. Other methods include license plate matching and the use of various intelligent transportation system technologies. Travel time data is collected at the beginning and end of a designated route, and can be collected between predetermined points along the route as well, depending on the level of information desired.

When collecting travel time data, all runs should be taken under good weather conditions and during a time that is representative of the time period of interest for the study. Also, be sure to distribute the travel time runs over several days of the week and over multiple weeks.

3.4.2 Applications

The data collected during travel time surveys can be used to measure congestion in several ways, but the most common application involves before and after comparisons, usually measuring the changes in performance resulting from a transportation improvement. Because travel time surveys can not be used to predict changes in performance, a sample of data must be collected for every scenario of interest under actual conditions or during the actual time period of interest.

Other common uses of travel time data include the calculation of average travel speed, which is used to define the level of service for urban streets, and the calculation of delay by comparing measured travel speeds to desired travel speeds. Additionally, travel time data can be used for calibration and validation of micro-simulation models.

Travel time data can also be used in a cumulative analysis procedure. If travel time data is collected for all roadways in the study area, the shortest time method can be used to assign traffic volumes to the roadway network.

3.4.3 National Cooperative Highway Research Program Report 398

National Cooperative Highway Research Program (NCHRP) Report 398[1] represents a comprehensive source of information regarding travel time surveys. It provides guidance on the uses of travel time data, includes comparisons of travel time surveys to other congestion measuring techniques, identifies the strengths and weaknesses of travel time surveys and provides recommendations for proper data collection and analysis. All travel time surveys conducted should be performed in accordance with the recommended practices in this report.

When collecting travel time data, all runs should be taken under good weather conditions and during a time that is representative of the time period of interest for the study. Also, be sure to distribute the travel time runs over several days of the week and over multiple weeks. The number of runs required to obtain a statistically representative sample size with a good confidence level can be determined from the following tables from NCHRP Report 398.

Table 3-1 Suggested Sample Sizes for Arterial Streets

Arterial Street Signal Density Group	Number of Test Sections	Average Coefficient of Variation %[a]	Minimum Number of Runs – 90% Confidence, 10% Relative Error[b]
Low – less than 3 signals per mile	320	9%	2 (6) runs[c]
Medium – 3 to 6 signals per mile	433	12%	4 (6) runs[c]
High – greater than 6 signals per mile	109	15%	6 runs

[a] Coefficient of variation (c.v.) = mean speed (mph)/speed standard deviation (mph).
[b] Sample size for 90% confidence level, 10% relative error was used as an example. Precision levels should be set by local agencies in accordance with uses of data and desired precision.
[C] Four runs considered practical minimum on arterial streets.
Source: NCHRP Project 7-13, Reference (2).

Table 3-2 Suggested Sample Sizes for Freeways/Expressways

ADT per Lane Stratum	Average Coefficient of Variation %[a]	Minimum Number of Runs - 90%Confidence, 10% Relative Error[b]
Low – less than 15,000 ADT per lane	9%	2 (5) runs[c]
Medium – 15,000 – 20,000 ADT per lane	11%	3 (5) runs[c]
High – greater than 20,000 ADT per land	17%	8 runs

[a] Coefficient of variation (c.v.) = mean speed (mph)/speed standard deviation (mph).
[b] Sample size for 90% confidence level, 10% relative error was used as an example. Precision levels should be set by local agencies in accordance with uses of data and desired precision.
[C] Five runs considered practical minimum on freeways.
Source: NCHRP Project 7-13, Reference (2).

[1] Lomax, T., Turner, S., and Shunk, G. *"Quantifying Congestion, Volumes 1 & 2", NCHRP Report 398*, TRB, National Research Council, National Academy Press, Washington, D.C., 1997.

3.5 Saturation Flow Rate Studies

The saturation flow rate is a critical component in the analysis of signalized intersection capacity and can be defined as the flow in vehicles per hour that can be accommodated by a lane group assuming that the green phase is displayed 100 percent of the time. Saturation flow rate data is collected on an ongoing basis. Copies of saturation flow rate studies should be sent to TPAU so that the work on developing the default values can continually be improved. To date, this research has shown that a default saturation flow rate of 1800 passenger cars per hour of green per lane is appropriate in most cases, with some exceptions as noted below. See the Transportation Analysis webpage on the TDD Planning Section website for the latest information on saturation flow rates.

3.5.1 Field Measurements of Saturation Flow Rates

Field measurement of saturation flow rates is preferred over estimation. Using default values and adjustment factors will produce more accurate results and does not require further modification. If possible, saturation flow rates should be collected at no less than one major intersection on each main study area roadway. When using these values in analysis be sure to set all of the adjustment factors to 1.0. The measurement of the saturation flow rate in the field shall be in accordance with methodology described in Appendix H in Chapter 16 of the *Highway Capacity Manual* (*HCM*) and submitted on the *HCM* Field Saturation Flow Rate Study Worksheet.

Once the field saturated flow rate is obtained, the ideal (unadjusted) saturation flow rate should be back-calculated by applying adjustment factors to account for the influence of lane widths, heavy vehicles, approach grades, on-street parking, bus stops, area type, lane utilization, turning movements and bicycle and pedestrian conflicts. Heavy vehicles, parking maneuvers, turning movements, and bicycle and pedestrian conflicts must be collected during the same period as the field saturation flow study to be able to back-calculate an accurate value.

3.5.2 Default Values for Base Saturation Flow Rates

Except in larger urban areas, field conditions generally do not allow the *HCM* saturation flow study procedures to be met. A roadway approach may not have long enough queues during the study or intersection spacing may be so tight that long enough queues without gaps are not possible. In these cases, a default ideal unadjusted saturation flow is determined as follows:

- Outside of MPO urban areas the unadjusted saturation flow rate is 1800 passenger cars per hour of green per lane (pcphgl).
- Inside MPO urban growth boundaries an unadjusted saturation flow rate of 1900 pcphgl may be used, unless one or more of the following conditions is present, in which case 1800 pcphgl shall be used.

Conditions indicating use of lower base saturation flow rate inside urban growth boundaries:

- On-street parking
- Greater than 5% trucks
- Roadways intersect at severe skew angle (i.e., greater than 20 degrees off perpendicular)
- One or more driveway approach(es) with a combined volume in excess of 5 vph, are present downstream of the intersection within the functional area (see Chapter 7) or upstream within the length of the standing queue
- Poor signal spacing or observed queue spillbacks between signals during the peak hour
- Less than 12-foot travel lanes

The ideal (unadjusted) saturation flow rate is converted to an actual flow rate by applying adjustment factors to account for the influence of lane widths, heavy vehicles, approach grades, on-street parking, bus stops, area type, lane utilization, turning movements and bicycle and pedestrian conflicts. Theoretically, once adjusted, the result would be equivalent to the field measured value.

3.6 Crash Data

Crash data can come from a variety of sources, and is useful for identifying problem areas of the highway experiencing an above-average frequency of crashes or reoccurring crash patterns. The analysis procedures that use this data are described in Chapter 5-7, while the data itself is described below.

3.6.1 Safety Priority Index System

The Safety Priority Index System (SPIS) is a method developed by ODOT in 1986 for identifying hazardous locations on state highways. Major revisions in the reporting were made in 1999. The SPIS score is based on three years of crash data, and considers crash frequency, crash rate and crash severity. ODOT bases its SPIS on 0.10-mile segments to account for variances in how crash locations are reported. To become a SPIS site, a location must meet one of the following criteria:

- Three or more crashes have occurred at the same location over the previous three years.
- One or more fatal crashes have occurred at the same location over the previous three years.

The use of this information is discussed in Chapters 5-7, and the documentation on how the SPIS is calculated can be found at the Safety Priority Index System website.

3.6.2 Sources of Crash Data

Oregon Motor Vehicle Traffic Crash Database

ODOT's Crash Analysis and Reporting (CAR) Unit provides motor vehicle crash data through database creation, maintenance and quality assurance, information and reports and limited database access. Crash data since 1985 is maintained at all times. Vehicle crashes include those coded for city streets, county roads and state highways. The CAR Unit website offers a variety of publications containing information on monthly and annual crash summaries.

Depending on the level of analysis needed, there are various reports that can be obtained. It should be noted that even though this database often represents the most current data available, data for a given year is typically not available until at least 6 months into the following year.

Detailed information for individual crashes can also be obtained by contacting the CAR Unit and specifying the segment of highway and time period of interest. Because crashes are reported by milepoint, a concern or cause may be located just outside of the analysis area. Therefore, the area of requested crash data should always be greater than the area of analysis. Internal ODOT users can access the crash data reports via the Intranet Transviewer application, except for non-state highway crashes, which are obtained from the CAR Unit. While several years of data may be available for any given roadway segment, it is common practice to analyze only the most recent 3 to 5 years of data as factors such as traffic volumes, environmental conditions and roadway characteristics may change with time.

Although there are other sources of information, such as police departments and local groups that collect information, the ODOT CAR Unit data is the standard source. Oftentimes these other sources include reporting calls, not the actual investigation/report, and groups often include near-misses and/or don't have all the facts, so the report is erroneous. The CAR data has the checks and balances built into the data collection that matches "both sides of the reports" for a crash, treating all areas the same so comparisons can be made. This is also the database used to calculate all the comparison rates published in the crash rate books.

Accident Summary Database

Produced annually since 1990, this database/software combination for use on a desktop computer is useful to generate quick summary reports that are often sufficient to answer questions when there is not time to do a detailed analysis. The accident summary database uses three years of crash data, the middle year traffic volume estimate and the annual SPIS numbers to generate a report that includes an estimated crash rate.

TransGIS Mapping Tool

TransGIS is a mapping tool that provides a graphical display of many types of safety, volume and crash data on a state map. The user can choose the information that is displayed, and can zoom into the map to increase detail as well as display city and county maps behind this data.

Collision Diagrams

The CAR Unit can create a crash diagram that depicts the crashes on a given roadway section. However, this is typically an operational issue, not an analytical one.

Crash Rate Tables

Crash Rate Tables have been published annually by the CAR Unit since 1948. Tables in the front of the book list statewide crash rates for several categories of the State Highway System. More tables list the crash rates for selected sections of each state highway, as well as a rural/urban break out. Additional tables list intersection crash data and fatal crash data. The use of these tables is discussed further in Chapter 5.

Statewide Transportation Improvement Program – Safety Investment Program (STIP – SIP)

The Statewide Transportation Improvement Program - Safety Investment Program (STIP-SIP) is a process to selectively place safety countermeasures on roadways with a history of fatal and serious injury crashes, and perform minimal safety upgrades on roadways with low fatality and severe injury crash history. Because of its operational nature, this information is typically furnished by either Region Traffic or the TRS. The use of the STIP-SIP information in identification of crash patterns is discussed in Chapter 5.

3.7 Data Resources from ODOT

ODOT, through its Transportation Data Section, collects substantial data for system inventory, volumes and crash information that can be used for the purpose of conducting traffic studies. Because much of this data is collected and processed by different units within the Department, clear and frequent communication between units regarding what is desired and what is available is critical for ensuring these resources are readily accessible. Furthermore, good communication between units will help to obtain the right data in a timely manner, which is important for maintaining project schedules. Coordinate with the appropriate ODOT department or staff as noted below.

3.7.1 Timelines

- Traffic count request letters should be submitted at least five weeks before counts need to be taken. Allow one additional month for the Transportation Systems Monitoring Unit to process the counts, total lead time nine weeks.
- Crash data requests from the CAR Unit should be made two to four weeks before the information is needed.
- Allow about one month to gather remaining inventory data from the Intranet Transviewer application, TransGIS (Internet or Intranet), or the Roadway Inventory and Classification Services (RICS) Unit.

3.7.2 Personnel

- Transportation Systems Monitoring or Region Traffic staff provide count data.
- RICS Unit staff provide inventory log data; Region as, necessary.
- Region Traffic staff provide signal timing sheets.
- Crash Analysis and Reporting Unit staff provide crash data.
- The project analyst will be responsible for all other system inventory data.

3.7.3 Product

Typical project area inventories may include:

- Project area map
- Photos for use during the project
- Complete record of geometric and operational data for each study area roadway
- Copies of all vehicle count surveys taken

- Travel time survey data, where applicable
- Saturation flow rate data and calculations
- Crash data