Chapter Four—Data Collection

Meaningful performance monitoring for the SRA system requires substantial information. Arterial operations can change significantly within relatively short lengths, as the cross section, adjacent land activity and traffic changes. At present, the type and level of detail of data collected for current IDOT planning activities is insufficient to reasonably monitor SRA performance. The primary shortcoming is in the collection and maintenance of turning movement data at major intersections and mid-block traffic volumes.

Carrying out the actual performance monitoring of the SRA system will entail establishment of new procedures and commitment of resources. The authors of this report recognize the difficulties of this requirement. The ability to commit resources will in large part be dependent on the value obtained from the information. Performance monitoring as envisioned here should greatly enhance IDOT and CATS' ability to improve programming decisions, and to demonstrate meaningful effects of their investments in SRA improvements. This chapter outlines the data collection requirements for SRA performance monitoring.

Objectives of the Data Collection Effort

The type and amount of information needed to measure SRA performance are functions of the uses to which the data will be applied. Primary reasons for obtaining the data are:

1. To monitor changes in the usage and operation of the SRA system as a whole, as well as its component parts; and
2. To evaluate the benefits derived from specific types of improvements to SRA routes.

This chapter endeavors to answer the what, where, when, and how questions associated with the data collection effort. What data are required? Where should the data collection points be? When or at what time periods should the data be collected? How should the information be acquired and analyzed? Finally, what should be the frequency at which data are collected?

Data Requirements

As indicated in the previous chapter, SRA performance data are needed to evaluate:

- System Throughput
- Effectiveness of Movement
- Safety

The types and amount of data needed are different for each of these performance measures.

System Throughput. The basic descriptor for system throughput is the *number of persons* per lane per hour, but in the interests of efficiency and economy, the basic data collected would be *vehicle trips*. Variables that must be accounted for are:

- Hourly variation
- Daily variation
- Seasonal variation
- Composition of traffic (vehicle type)
- Vehicle occupancy

The volume of traffic passing a specific point on the SRA system may be determined by either manual or automatic counts. The duration of counting should extend over a long enough period to determine hourly and daily variations in traffic volume. Seasonal adjustments are commonly made based on continuous counts at control stations located throughout the system. Alternatively, the counts may be made quarterly (or at more frequent intervals) and weighted to account for seasonal variations.

Traffic composition or classification is obtained in a manner similar to that used to measure the volume of traffic. Most modern automatic counting devices are capable of distinguishing between cars and other types of vehicles.

Determination of vehicle occupancy, needed to convert vehicle trips into person trips, requires manual observation. The sole exception would be occupancy of buses which is sometimes available from the transit operator. As with observations of traffic volume and composition, vehicle occupancy should be determined at specific points along the SRA system.

Effectiveness of Movement. This descriptor refers to the time required to travel from one point on the SRA system to another. There are two components of travel to consider in determination of effectiveness of movement: speed and delay.

Speed may be measured in conjunction with volume measurements at mid-block locations. However, speed alone does not adequately represent the effectiveness of travel. Total travel time is comprised of the time in motion (a function of speed and distance) and delay (time slowed or stopped en route). Indeed, arterial performance is largely a function of delays encountered at signalized intersections. Measurement of mid-block spot speeds, no matter how frequent, would not capture intersection delays, and would hence not give a reasonable picture of arterial performance.

Arterial travel effectiveness, therefore, should be measured by independent observations of speed and delay, or by determination of total travel time along a portion of the route. The latter is often measured through use of an instrumented vehicle, or by the "floating car" method. (Note: This report does not go into the details of field data gathering procedures or techniques. The design and conducting of studies to measure speeds of moving traffic are straightforward, and covered by standard traffic engineering references.) As with throughput data, travel time or speed runs must account for traffic variations throughout the year.

Safety. Safety performance may be measured by compilation of annual accident reports acquired by the local agencies having jurisdiction along each of the SRA routes. The measure of safety performance would be the accident rate by type and location. Companion average annual traffic counts are needed on each segment of the system for which accident rates are to be calculated to assure reasonable accuracy in computation of the rates. Such counts would be obtained from the "throughput" data.

Route Segment Definition

Routes that make up the SRA system vary significantly in terms of their physical and operational characteristics. Cost-effective data gathering should recognize these differences.

The suggested approach to planning a data collection exercise is to subdivide the SRA routes into common analysis segments. Each of the analysis segments should have uniform physical and operational characteristics.

Separate data gathering, compilation and analysis would be required for each uniquely defined segment. Traffic movement and route performance are affected by site and facility characteristics, including:

Number of Traffic Lanes
Presence of a Median
Traffic Signal Spacing
Traffic Signal Synchronization
Intersection/Driveway Spacing
Frontage /Driveway Activity (Land Use)
Presence of On-Street Freight Loading Facilities
Turning Lanes at Intersections
Posted Speed Limit
On-Street Parking
Presence of Bus Transit

The SRA Design Concept Report specifies differences in design criteria for some of these route characteristics as a means of distinguishing between urban, suburban and rural areas. A summary of the common attributes by area type for various of the route characteristics or components is presented in the Table 4.1.

Table 4.1
SRA Design Criteria by Area Type

Design Criteria	**Area Type**		
	Urban	**Suburban**	**Rural**
Peak Hour Level of Service	D	C/D	C
Design Speed (mph)	35	45	60
No. Through Lanes/Direction	2	3	2
Median	14' Desirable	18' - 46'	46'- 70'
Left Turns	permitted	dual at intersections	all intersections
Shoulders	N/A	where appropriate	10' right, 6' left
Curbs	Yes	Yes	No
Sidewalks	Yes @ 10ft. wide	Where appropriate	Only if needed
Transit	Bus/HOV lane	turnouts	turnouts
No. of Traffic Signals/Mile	4+	<4	<2
Signalization	Synchronized	Synchronized	Fully Actuated
Freight Loading	Off-Peak Zone	off-street	off-street

Defining analysis segments by the attributes listed above and the range of land uses would be an involved process and would result in route segments which would likely be too numerous and too short. A rating analysis was performed, summarized in Table 4.2, in which each attribute was qualitatively evaluated relative to the three key performance measures. Each attribute was rated as high, moderate or low with respect to how significantly the attribute affects change in a performance measure. For example, travel time is directly related to traffic signal spacing, thus the attribute was rated "high." Those attributes rated "low" for all three performance measures were dropped from further utilization in the definition of analysis segments. Those attributes which were rated differently for each performance measure were also dropped from further consideration. Attributes in this category are representative of specific locations and not general route characteristics. The remaining attributes, those that rated "high" for each performance measure, are shaded in Table 4.2.

Table 4.2
Rating of Segment Attributes Relative to Performance Measures

Segment Attributes	Performance Measures		
	Throughput (Capacity)	**Effectiveness of Movement (Travel Time)**	**Safety**
Number of Traffic Lanes	high	high	high
Existing Center Median	low	moderate	high
Width of Right Shoulders	low	low	moderate
On-Street Parking	high	high	high
Traffic Signal Spacing	high	high	high
Traffic Signal Synchronization	low	high	low
Intersection/Driveway Spacing	high	high	high
Left turns at Mid-Block	moderate	moderate	high
Intersection Turning Lanes	high	high	high
Adjacent Land Use	low	moderate	low
Frontage/Driveway Activity	moderate	moderate	high
Posted Speed Limit	high	high	moderate
School/Restricted Speed Zone	moderate	high	moderate
Presence of Bus Transit	moderate	moderate	low
On-Street Freight Loading	high	moderate	low

The reduced set of attributes (shaded) was applied to a test case study in an attempt to further refine the list of attributes and to confirm the consistency of segment identification. Even this reduced set of segment defining attributes, however, yielded a large number of analysis segments with a wide range of segment lengths.

Further reduction in the list of attributes appeared necessary. It was noted that several of the attributes, e.g. traffic signal spacing and intersection/driveway spacing, indirectly describe whether or not the route segment is located in an urban, suburban or rural area.

After further analysis, a more selective set of attributes, those which are easily identified, having a high correlation to performance measures, and are related to area type, were determined. These attributes are:

Number of Through Traffic Lanes

Traffic Signal Spacing
- 4 or more per mile
- 2 to less than 4 per mile
- 0 to less than 2 per mile

The proposed method consists of dividing the total SRA system into analysis segments based on the above attributes. In instances where segment length would exceed three miles, the route would be subdivided into somewhat equal lengths of less than three miles. We believe, that by following these general guidelines, performance of the entire SRA system might be measured and described by analysis of approximately 500 to 800 route segments.

Data Acquisition

Data described earlier (traffic volume, speed, delay, occupancy, crashes, etc.) should theoretically be acquired for each unique analysis segment. Variables to be considered in formulating the data acquisition program are the coverage and frequency of the counts or surveys. There are three basic ways in which surveys of system performance may be made:

- Annual surveys of *all* analysis segments comprising the SRA system.
- Annual surveys of *representative* segments with the results extrapolated to the remainder of the system.
- Annual surveys of a *portion* of the analysis segments, rotated each year to provide total system coverage over a specified period (e.g. five years).

The selection of an appropriate process will be a function of cost and available resources to assemble the data.

Annual surveys of all segments would be the most costly and time consuming of the alternative data acquisition processes, but would yield the most complete and accurate data. About 700 analysis segments would have to be surveyed each year. Some of the required data could be obtained from secondary sources (permanent traffic counters, computerized signals, etc.), but most would require special counts and surveys conducted specifically for monitoring SRA performance .

Annual surveys of representative segments with the results extrapolated to all others would probably be the most cost-effective of the alternative methods of data acquisition. This is a process used by the Federal Highway Administration for the national Highway Performance Monitoring System (HPMS).

Special care would be required in selection of sample analysis segments. Surveys of approximately ten percent of the total segments would probably provide sufficient data to confidently predict total system performance. Note however that overall SRA system performance would be extrapolated from the sample.

Some may question the validity or utility of the results from sampling. Indeed, input from the SRA subcommittee during this study suggested that sampling and extrapolation would not be acceptable. Of course, other methods, involving more data gathering, would be more costly.

There is another alternative to collection of annual data for the entire system. A program may be devised to survey a portion of the analysis segments each year, rotating the segments studied such that the full SRA system is covered over a period of, say, three to five years. This would obviously reduce the level of effort otherwise required to cover the entire system each year, but the cost of data collection would still be substantially more than if a smaller, selected sample of the system were surveyed annually, as described above.

Traffic Volume Data ("Throughput")

The ISTEA mandated Traffic Monitoring System, requires that the traffic data collection program comply with the statistical sampling and accuracy requirements of the six management systems in terms of level of coverage, duration of count and classification of vehicles. For urban areas, which include the Chicago metropolitan area, vehicle classification counts are required on every four-mile segment of the National Highway System. Short-term counts, such as 24 hour counts are to be performed in accordance with AASHTO Guidelines for Traffic Data Programs, 1992.

As a minimum, traffic counts should cover 24 hour periods, summarized in 15 minute increments by lane by direction and by route segment. As recommended in AASHTO Guidelines for Traffic Data Programs (1992), traffic counts should be performed on urban roads such that a minimum duration of 224 consecutive hours are counted.

Speed/Travel Time Data ("Effectiveness of Movement")

The quality of flow on freeway facilities can be reasonably determined through a combination of automated speed and volume data. Relationships among speed, density and flow are well known and consistent, enabling prediction of travel times with reasonable accuracy from volume measurements.

The same cannot be said for determining the "effectiveness of movement" on an arterial street. Travel times are subject to operation at intersections, and in particular, signalized intersections. Measurements of mid-block speed are useless in predicting overall speed or travel time.

In short, to accomplish direct observation of the effectiveness of movement on SRA's requires actual measurements of overall travel time. Using current technology and methods, this entails travel time surveys using instrumented vehicles.

A complete picture of SRA performance requires the travel time studies be conducted during peak and off-peak hours. Given typical patterns of demand, it may be appropriate to conduct selected mid-day surveys.

Travel time surveys would measure the overall duration of a trip traversing a designated route segment. This time would include running time plus stopped and delay time. Observers in instrumented vehicles would note the locations and extent of delays.

Care must be taken in conducting the travel time surveys. Issues of importance include the sample size, acceptable error in measurement, variations in demand throughout the year, and extraneous effects on traffic flow such as construction zones, detours, etc. Should CATS and IDOT decide to invest in these studies, planning, training and administration will be required to ensure quality control.

Sample Size

Table 4.3 provides guidance on sample size requirements for the studies as a function of confidence levels and range in speeds. For each study (e.g. segment during a peak period) three to five travel time runs appear appropriate.

Table 4.3
Approximate Minimum Sample Size Requirements for Travel Time And Delay Studies with Confidence Level of 95.0%

Average Range in Travel Speed (mph)	Minimum Number of Runs for Specified Permitted Error				
	±1.0 mph	±2.0 mph	±3.0 mph	±4.0 mph	±5.0 mph
2.5	4	2	2	2	2
5.0	8	4	3	2	2
10.0	21	8	5	4	3
15.0	38	14	8	6	5
20.0	59	21	12	8	6

Average Range in Travel Speed (kph)	Minimum Number of Runs for Specified Permitted Error				
	±2.0 kph	±3.5 kph	±5.0 kph	±6.0 kph	±8.0 kph
5.0	4	3	2	2	2
10.0	8	4	3	3	2
15.0	14	7	5	3	3
20.0	21	9	6	5	4
25.0	28	13	8	6	5
30.0	38	16	10	7	6

Source: Institute of Transportation Engineers. ***Manual on Traffic Engineering Studies.***

Other Issues

The value of the travel time studies is in reference to previous years for monitoring of trends, etc. It is therefore important that the studies be replicated from year to year in terms of timing, methods, etc. Planning activities should uncover unusual variations in demand (e.g. avoid surveys during these periods.

Planned construction or other activities along the route or along a nearby route that might affect traffic patterns should be investigated and, if possible, avoided. Significant seasonal variations such as travel during the Christmas shopping season should be considered.

Safety Performance

Monitoring of safety performance should theoretically not require additional data gathering efforts. All agencies should be maintaining accident records for the routes in their jurisdiction. For IDOT facilities, accident reports eventually reside on computer files maintained by staff in Springfield.

Consistent monitoring of safety performance requires that accident reporting be consistent for IDOT and non-IDOT owned SRA's. Reporting levels, accuracy in coding, use of common formats, etc. are all issues of importance.

Safety performance monitoring also requires complete and accurate traffic volume data. Here, the requirements of data to measure throughput will enhance measurement of safety performance.

"Before and After" Studies

The above discussion focused on data requirements for ongoing performance monitoring of the total SRA system. An additional aspect of monitoring is measurement of the effects of a specific SRA improvements. The ability to demonstrate project effectiveness was viewed as desirable by the SRA Subcommittee of CATS for a number of reasons. Support for system improvements by the traveling public can be strengthened through clear demonstration of specific project effectiveness. Also, data from specific projects can over time provide improved programming decisions. This is accomplished through specific examples of travel time and/or safety benefits associated with a project or corridor improvement.

The same performance measures as were discussed above for the overall system would apply to project-level performance monitoring. CATS and IDOT may want to consider a separate data gathering effort, however, which would be intended to build a data base of SRA project effectiveness. This effort would entail the conducting of "before and after" studies of SRA projects.

"Before and after" studies simply involve the collection of appropriate traffic volume, travel time and speed, and accident information prior to an improvement on the SRA system, and then again a reasonable time after the improvement is complete and the arterial open to traffic. Such studies that describe the operational effects of improvements are common in the technical literature. What is proposed here is the formal adoption of a policy to obtain, compile and evaluate such information for any future SRA project.

"Before and after" studies may require more comprehensive data than would be gathered for monitoring overall system performance. Data collection efforts would be focused on the location of the improvement strategy to provide a perspective on the impact or affect of the improvement on traffic operations. Example improvements would include widening from two to four or six lanes, adding a median where none previously existed, intersection capacity improvements, construction of an arterial to arterial interchange, bus turnout construction and/or bus stop relocation, access management and control (closure of driveways or medians, construction of frontage roads), etc.

Data Requirements

Data requirements would vary depending on the project. As shown in Table 4.4, different project types should be expected to produce different effects on one or more of the SRA performance parameters. In reviewing Table 4.4, note that all typical SRA project improvements should positively influence "effectiveness of movement" (speed or travel time), and most should have some positive influence on safety. From Table 4.4, it is clear that most before and after studies will focus on travel time or speed studies and accident studies.

Traffic counts for a typical SRA project should cover 24 hours, with volumes summarized in hour increments by lane by direction and by route segment. The counts should be taken 6 months to one year prior to construction, and usually 6 months to 12 months following implementation of the improvement. Count locations should cover an area well beyond the limits of the project, say for example, the project limits plus one mile in each direction. If permanent count stations are not located within reasonable proximity to the project, seven day counts should be taken at one location during each count period.

The overall travel time should be measured for a trip traversing the project limits. Referring to Table 4.3, a sufficient number of travel time runs should be performed to discern an improvement in travel time. For shorter projects such as one to three miles of widening, it may be necessary to perform up to eight travel time runs both before and after the improvement. Approximately 6 months prior to implementation of the improvement, travel time should be measured for the weekday peak hour in the dominant direction of travel and daytime off-peak in either direction of travel. At completion of the improvement and at intervals of six to 12 months after completion, travel time should be measured for the peak and off-peak time periods.

Accident data should normally be tabulated for a period of at least three years preceding the improvement and then annually after implementation of the improvement. For many improvements, statistically reliable measures of effectiveness may require an after period of at least three years, and perhaps as many as five years after the improvement to establish an estimate of effectiveness.

Table 4.4 SRA Project Types and Their Presumed Effect on Recommended Performance Measures			
Type of Project	**Effect on SRA Performance**		
	System Throughput	**Effectiveness of Movement**	**Safety**
Capacity Additions (2 lane to 4 lane etc)	+	+	(+)
Provision for Median (4 lane to 5 lane)	0	+	+
Expansion of Intersection			
Lane Additions	+	+	(+)
Left Turn Lane	0	+	+
Interchange Construction	0	+	+
Construction of Bypass	0	+	(+)
Removal of On-Street Parking (convert to through lanes)	+	+	(+)
Signal Timing Improvement	0	+	0
Increased or New Transit Service	0	+	0
Reconstruction of Alignment	0	(+)	(+)
Access Management Control	0	+	(+)

0 No Expected Effect
+ Significant Expected Effect
(+) Minor Expected Effect

Summary of "Before and After" Studies

The ultimate objective of before and after studies is development of a data base that replaces the qualitative or hypothetical effectiveness estimates from Table 4.4 with average or typical quantitative numbers. Over a period of years, these data would provide IDOT, CATS and the communities with the means to explain in real terms the benefits of SRA improvements. The data would also enhance decision-making in project selection and evaluation.

Before and after studies appear to require even more data than are noted above for overall SRA performance monitoring. There are opportunities, however, to minimize at least the before data gathering exercise. For example, during the Phase I effort on a major project, much of the data would typically be collected under current planning procedures. These would include volume counts, accident records, and sometimes speed studies. IDOT could add to consultant scopes of work the task of collecting speed or travel time data consistent with performance monitoring requirements. For SCAT or signal system projects, traffic count and operational data describing speed and delay in the "before" time period are typically required. These data could be used in SRA performance monitoring. Additional data that would need to be acquired after project implementation would include speed and accident records.

Data Sources

The Illinois Department of Transportation collects traffic volumes annually for 24 hour periods on state jurisdiction facilities and selected county and primary local routes. Travel time data are not collected by IDOT or any other transportation agency, expect for special studies.

Accident data are collected by municipal jurisdictions. IDOT maintains a database of accident reports which are submitted by the municipalities. However, the IDOT database codes the location by key or marked route segment. The IDOT database also does not include accident data from within the City of Chicago and several municipalities which have implemented their own computerized data bases.

Recommended Data Acquisition Program

The data acquisition program as proposed, is a menu of alternatives with cost, coverage and frequency options. For purposes of this report it is assumed that the data acquisition for annual performance monitoring will be undertaken separate from the IDOT traffic counting program.. It is also assumed that utilization of the IDOT database for accident reporting and travel time surveys would be the responsibility of an agency other than IDOT. Data acquisition for before and after surveys would be undertaken separately, and may or may not use the SRA database.

Table 4.5 presents an order of magnitude estimate of the cost of SRA system wide data collection under the assumption that data would be assembled annually, every two years, every three years or every four years. We have estimated total annual cost in the range of from $0.5 million to $3.5 million depending on which alternative is selected.

Table 4.5 Preliminary Estimate of Data Collection Cost Traffic Volume and Speed Data			
Frequency of Counts (Each Location)	**Annual Cost ($Million)**		
	Traffic Volume	**Travel Time***	**Total Annual Cost**
Annually	0.6 to 0.8	1.6 to 2.8	2.3 to 3.5
Every 2 years	0.3 to 0.4	0.8 to 1.4	1.0 to 1.7
Every 3 years	0.3	0.5 to 0.9	0.8 to 1.1
Every 4 years	0.2	0.4 to 0.7	0.5 to 0.9

*Both peak and off-peak directions and times
Note: Costs to compile, evaluate, publish and distribute findings not included.

In light of the probable costs of traditional data collection, and the extent of the SRA routes in the Chicago metropolitan area, we suggest that the initial performance monitoring program be scaled back to the least effort that will accomplish the project requirements. It is believed that coverage of the entire SRA system on a three to four year cycle will provide sufficient data to monitor system wide performance. More detailed data acquisition would be required for "before and after" studies pertaining to specific route improvement projects. The costs for those are not included in Table 4.5, but are probably on the order of $0.2 to $0.5 million per year.

The following Chapter of this report references technological advances which are in process and which would probably be available to monitor SRA performance sometime in the future. We believe that some of these innovations will be available for use within a short enough time frame that they are viable candidates for system wide monitoring. In particular, a GIS-based data collection system with the capability to measure both traffic volume and travel time is just over the horizon. This type of data collection methodology would be far superior to anything that now exists.

Our recommendation, therefore, would be to design the simplest and least costly program to meet only the most pressing immediate needs, and simultaneously follow technological advances with the objective of applying these new innovations to the SRA performance monitoring program as soon as they are available.

As pertains to monitoring the safety performance of the SRA system, the cooperation of all of the jurisdictions along the SRA routes will be required to develop a uniform accident reporting system. This might take the form of a special report to be filed for each accident on an SRA route, or agreement between the various jurisdictions to convert to a uniform reporting system. The former is probably more doable. The annual accident reports would be aggregated by segment and merged with traffic volume data to determine annual rates for various types of crashes.

SRA Reporting

Performance monitoring activities will need to be summarized in reports. Based on input from CATS and the SRA Subcommittee, there are two primary purposes of monitoring that should be reflected in the reports. First, CATS desires monitoring of the overall SRA system. Aggregate measures of SRA system throughput, effectiveness of movement and safety are requested. Long term trends over time would be accumulated. Modeling activities to develop time-regression relationships could be included.

IDOT and individual communities are interested in more corridor-specific monitoring. Issues of programming and justification for projects can be answered by monitoring performance trends on a corridor by corridor basis, or even for segments of a corridor. IDOT also will be interested in monitoring the effectiveness of improvements to further refine their planning, design and programming decision making.

This section of the report outlines a prototype approach to system monitoring that would address both primary needs.

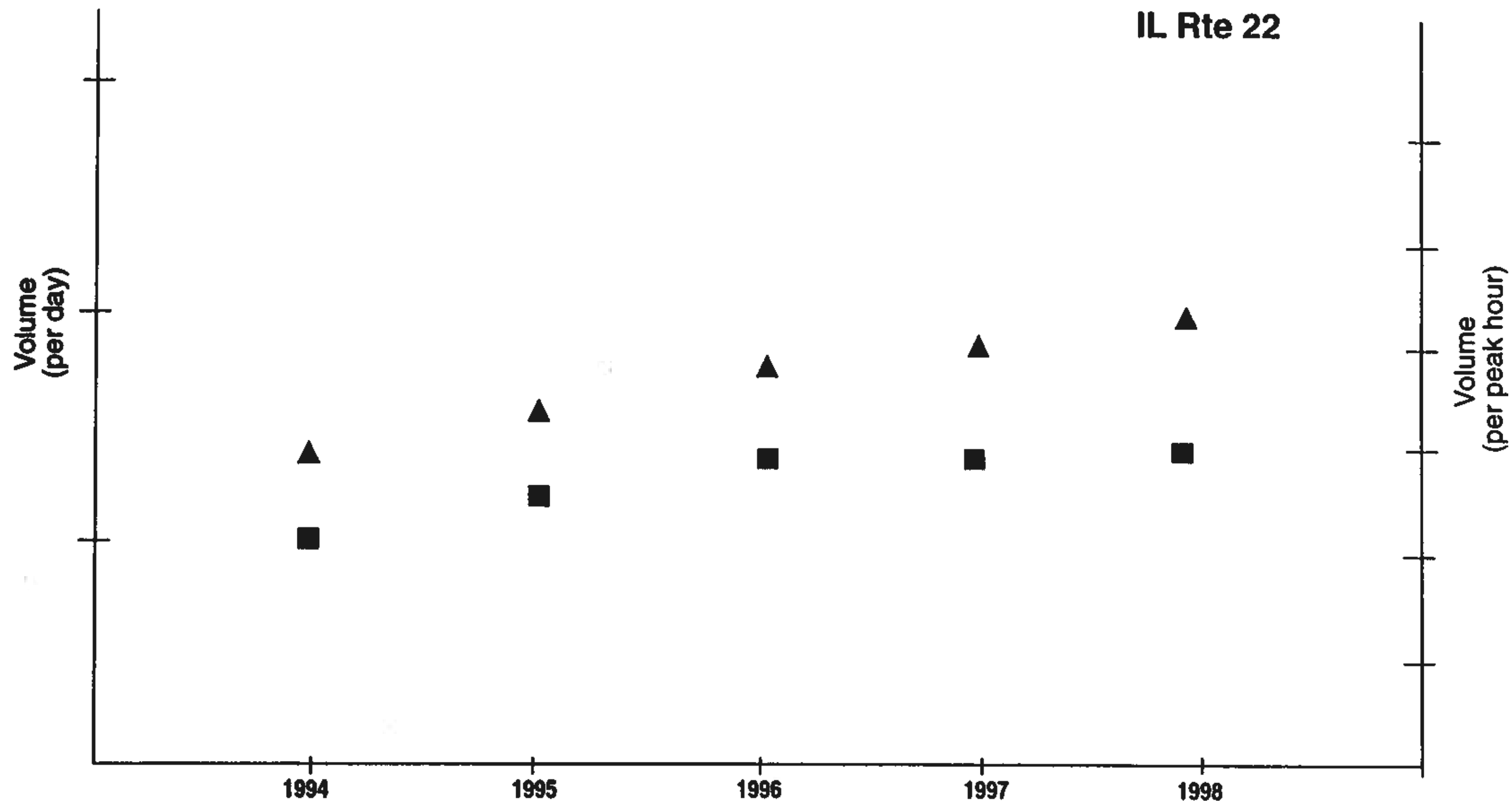
Report Content and Format

CATS or IDOT could produce an annual SRA report as outlined below. Business graphics and report narratives could be used to present overall system-wide trends in performance, specific SRA corridor activities in the past year, including construction or project implementation activities, and summaries of corridor-specific performance. Corridor performance could be organized by county, by municipal conference or any other desired subset. The annual report could also include an updated summary of estimated SRA project effectiveness, based on the best information to date on completed projects and measured performance improvements.

Exhibits 4.1 to 4-3 depict example graphics for SRA performance monitoring, to illustrate the use of annual data for the two primary needs. The exhibits show an overall system performance analysis of SRA trends. Overall graphs for county, municipal and total SRA performance could also be gathered.

One would expect year to year changes in performance to be more pronounced on a corridor specific basis. Indeed, degradation in travel speeds should be very evident as critical thresholds in demand occur, and no improvements are made. Similarly, safety problems may be more evident as traffic increases.

Note that the annual trend of a corridor's performance also is a frame of reference for before and after analysis of a project improvement. Exhibit 4.4 illustrates how project specific impacts on speed, safety or both can be demonstrated using a corridor's history of performance data. Note also the special data points representing studies done in the "before" condition, the period during which construction occurred, and the "after" data points taken approximately one year after the project. The case here could represent a major improvement such as the widening of Illinois 22 from two lanes to 4-lane divided facility.

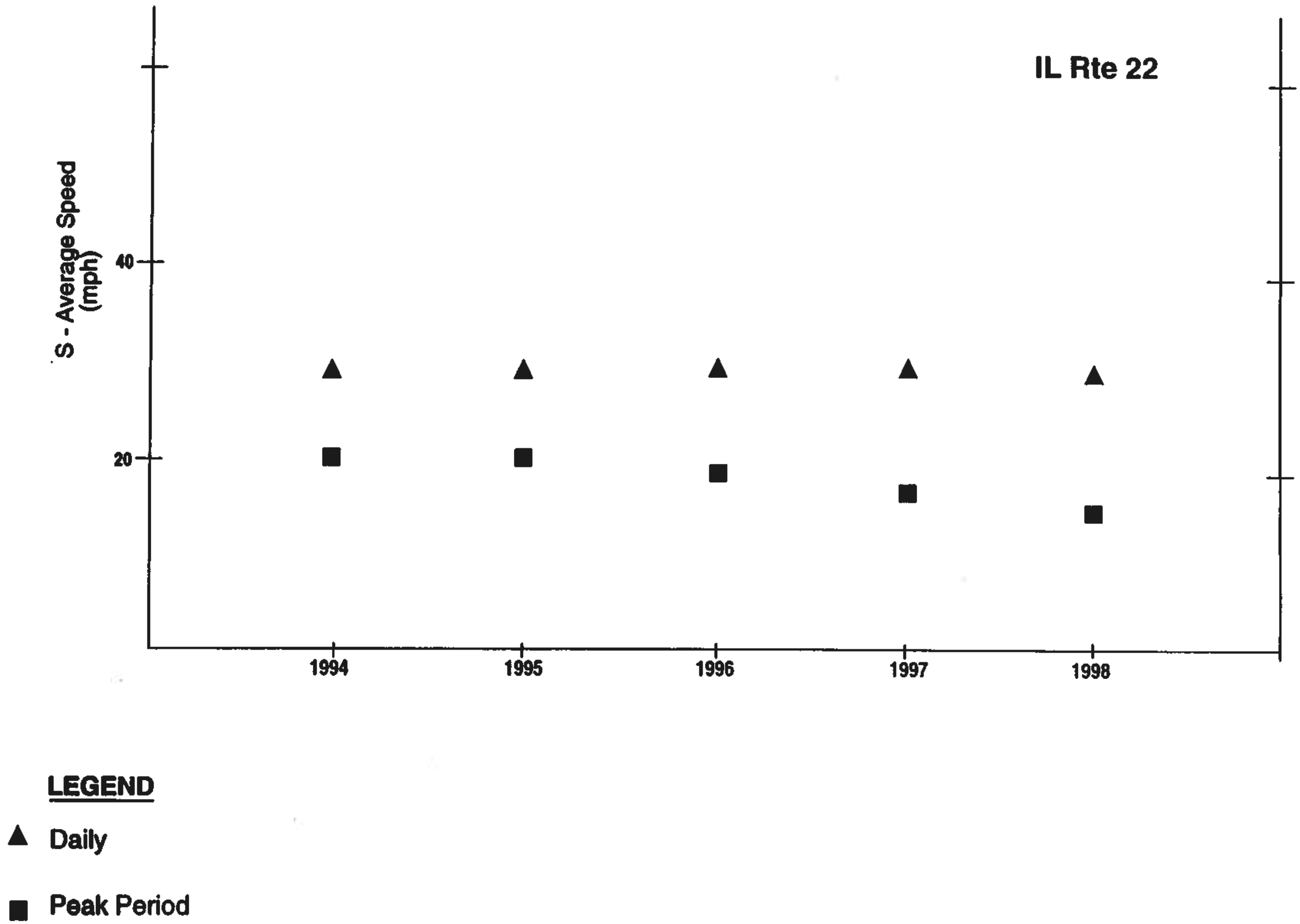


LEGEND

▲ Daily

■ Peak Period

SYSTEM THROUGHPUT -- EXAMPLE SRA SYSTEM REPORT



EFFECTIVENESS OF MOVEMENT -- EXAMPLE SRA SYSTEM REPORT

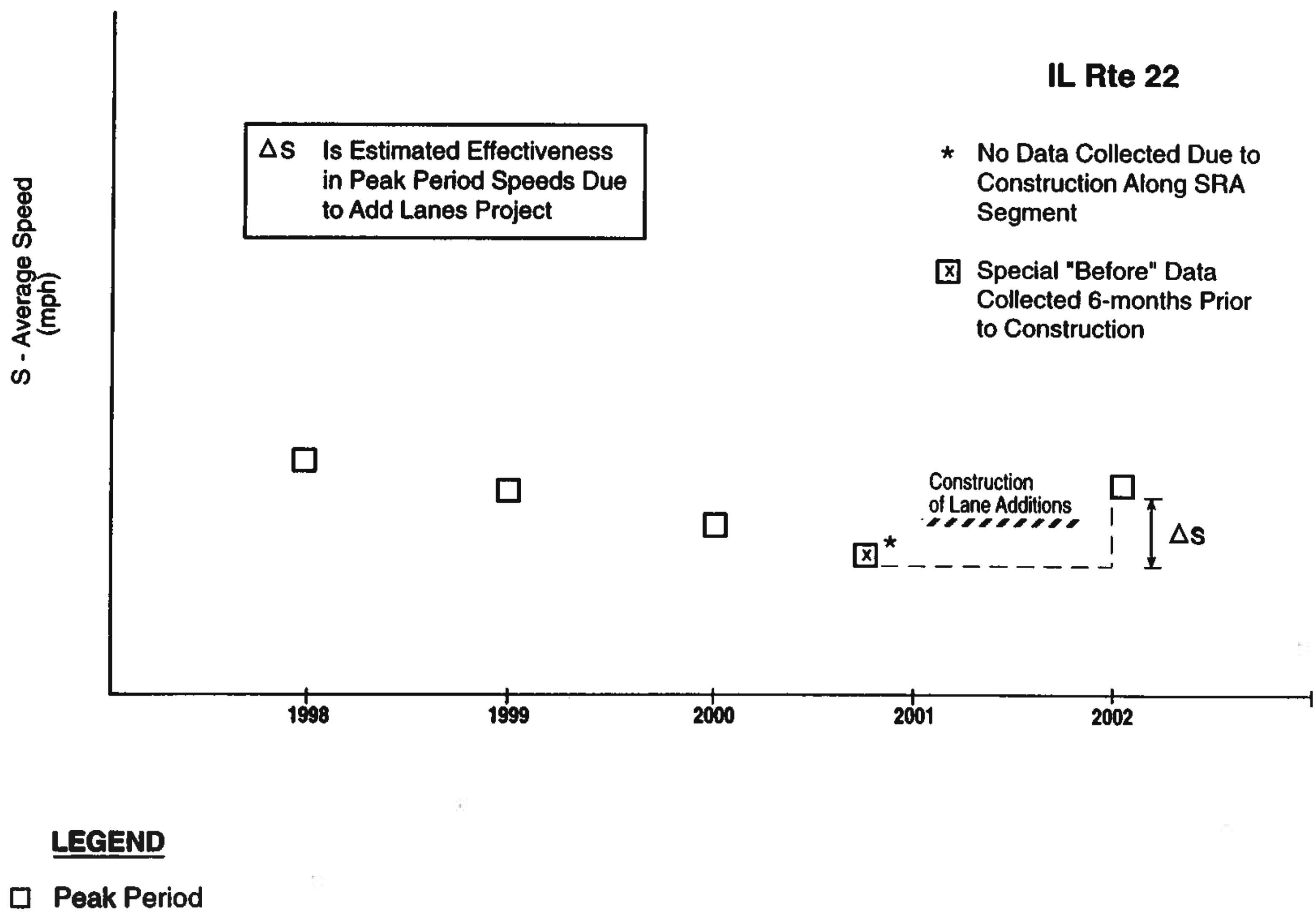
Strategic Regional Arterial Planning Study

LEGEND

▲ Total Accidents

■ Accident Rate

SAFETY -- EXAMPLE SRA SYSTEM REPORT



EFFECTIVENESS OF MOVEMENT -- EXAMPLE "BEFORE AND AFTER" SPECIAL REPORT

SRA Strategic Regional Arterial Planning Study

Exhibit 4.4

T104274.13.A4 Exhibit 4.4 7-7-97 lg

The following is a suggested outline for an annual SRA Performance Report:

I. **INTRODUCTION** – Discussion of the SRA system, objectives, performance parameters, etc.

II. SUMMARY OF SYSTEMWIDE PERFORMANCE IN XXXX

- **Total Throughput**
- **Average Effectiveness of Travel**
- **Total System Safety**

Summary graphics depicting the year's data, accompanied by brief narrative discussing important trends.

III. SRA PROJECT ACTIVITY DRUING XXXX

Narrative accompanied by map(s) and tables describing work accomplished on the SRA system in the previous year, including status of construction, planning and design activities.

IV. SRA CORRIDOR PERFORMANCE

Summary graphics depicting the latest data for each corridor in the SRA system. Graphs can be organized by County (with City of Chicago separate) or Municipal Conference. Narrative for each geographic area discussing corridor trends, major changes in corridor performance, etc.

V. EFFECTIVENESS OF PROJECT IMPROVEMENTS

Updated table/list of improvements and their expected effectiveness based on an evaluation of previous years' SRA improvements. In effect, an ongoing research summary of SRA performance effectiveness to be available for reference by IDOT and the communities for future decision-making.

Development of an annual report could be the responsibility of CATS , with input from IDOT.