

Roadway Environment Subsystem of the Highway Traffic Records System

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The data base structure of the Wisconsin integrated highway traffic records system is composed of eight data subsystems (1): driver data subsystem, vehicle data subsystem, roadway environment data subsystem, accident data subsystem, emergency services data subsystem, traffic law enforcement and adjudication data subsystem, educational services data subsystem, and safety program management data subsystem.

The safety program management data subsystem and the emergency and educational services data subsystems are included in a total data base. They contain summary data that support the other subsystems and do not require direct operational linkages. The remaining five subsystems constitute the continuous data base and must have direct physical and operational links to form access networks.

Figure 1 shows the designed linkages for the five data-base subsystems. The controls for each of the files within the subsystems do not by themselves provide a link to the other files. The combination of control and data items allows for keys to be built for cross access between the files.

The roadway environment subsystem is composed of integrated files, which accept and store information on the characteristics of public roads. It processes and reports incremental data and summary information through the use of standardized controls and linkages, which provide access to the other subsystems of the traffic records system. The roadway environment subsystem for the state trunk network (STN) consists of ten files that include the essential linkage or control keys for cross access of five traffic records subsystems.

STN DATA CONTROLS

A reference point (RP) is used for control and linkage for seven of the ten files (Figure 2). The RP designates a landmark location on an STN highway and is marked in

the field by a posted RP sign. An office reference to RP locations is available on aerial photographs and a common name listing of the landmark.

A reference point is made up of a description of the highway identification and a sequential number. The RP signs show the highway identification on the top of the sign and the sequential number below.

The highway is identified by type, number, and direction. The highway type describes official business routes, planned routes, spurs, and off-main-line features, such as ramps, connectors, frontage roads, safety rest areas, and weight stations (2). Highway type is normally blank for main-line STN highways. The highway number is its officially designated number. The roadway direction is the last portion of the highway identification. Each highway is designated an overall north-south or east-west direction (3). When a highway is divided or consists of a pair of one-way streets, two distinct roadways exist.

The lower portion of the reference point is the sequential number. The numbering starts at the southern or western terminus of each highway and increases sequentially to the north or east to the end of the highway. The number is usually three digits.

The other controls (Figure 1) that serve as linkages between the files are structure identifications, station numbers, and municipality codes. Each bridge on a roadway is identified by a county code, a structure type, and a structure number. Traffic counting locations are assigned a station number made up of a county code and a code specifying the duration of the traffic count. A municipality code is a unique number for each county, town, village, and city in the state.

STN ROADWAY ENVIRONMENT SUBSYSTEM FILES

The ten files of the computerized data base are of two types: control files and data files. Control files provide the basis for identifying highway locations, relating data to those locations, and processing specific data systematically through the use of standardized controls. The first two files discussed here are control files, and the remaining eight are data files.

Figure 1. Linkages of data-base subsystems.

LINKAGE TITLE	DATA BASE SUBSYSTEMS				
	Driver	Vehicle	Roadway Environment	Accident	TLE & A**
Driver Name	D	D*		D	D
Driver License Number	C			D	D
Vehicle License Number		C		(D)	(D)
Vehicle Identification Number		C		(D)	
Roadway Location Identifier			C	D	D
Accident Case Number	(D)			C	
Traffic Citation Identifier	(D)	D		(D)	C
Traffic Education Identifier	D				
Emergency Receptor Identifier				(D)	

C=File Control
 D=File Data Item
 (D)=Not Computerized

* Owner Name
 ** Traffic Law Enforcement and Adjudication
 □ =Not Applicable

Figure 2. Roadway environment subsystem for the state trunk network.

Type	FILE		DATA	
	Name	Control Key	Linkage	Fields
Control	Reference Point	Reference Point		13
	RP Coincidence	Reference Point		13
Data	Event	Reference Point	Municipality Code	8
	Point Name	Reference Point	Structure Identification Municipality Code	12
	Road Alignment	Reference Point		13
	Bridge	Structure Identification	Reference Point Municipality Code	200
	Traffic Index	Station Number	Reference Point Municipality Code	31
	Traffic Counts	Station Number		31
	Municipality	Municipality Code		18
	Boundary	Municipality Code		11

1. The STN reference point file relates all RPs on an STN highway by distance. The location of an RP is independent of the data items it controls.

2. The STN reference point coincidence file establishes an equitable relation between the field-signed RP on a basic highway and its coincident RP on a nonbasic highway.

3. The STN event file provides the capability to follow, or track, the simultaneous occurrences of physical and administrative characteristics along each roadway.

4. The point name file provides the common name and location of local features along the STN highways. The data user can recognize a data location better by relating a local-feature name to an RP than by using the RP number alone.

5. The road alignment file establishes a spatial description of the physical alignment of a highway by the use of a series of geographical points based on the Wisconsin state plane coordinates.

6. The bridge file contains 200 data fields of administrative and structural information plus appraisal and condition-rating information for each structure on or over a federal-aid highway and for each structure maintained by the state but not on a federal-aid highway.

7. The traffic index file serves as a control and link for the detailed traffic characteristic data files. It provides count location descriptions and identifications in conjunction with summarized traffic volumes.

8. The traffic counts file accumulates for subsequent processing the actual traffic volume data obtained in the field.

9. The municipality file stores population, total area, and tax valuation data for all cities, villages, and towns in the state.

10. The boundary file establishes a spatial description for civil unit boundaries based on the Wisconsin state plane coordinates.

OTHER ROADWAY ENVIRONMENT SUBSYSTEM FILES

The computerized data base for the county trunk and local road networks uses three files described above and two additional files. The traffic index and traffic counts file accumulates data for all roads and streets. A shortened bridge file retains 47 data fields for bridges not federally aided. The road inventory file records the physical and administrative characteristics along the county trunk and local road networks.

During 1975 reference points were established for the county trunk network and are being incorporated as the control key in the roadway inventory file.

REFERENCES

1. Design Manual for State Traffic Records Systems, Volume II. Computer Sciences Corporation, July 1973; National Highway Traffic Safety Administration.
2. Planning Manual, pp-9322 Reference Point Selection. Division of Planning, Wisconsin Department of Transportation, Dec. 1970.
3. Interstate System Route Log and Finder List. American Association of State Highway and Transportation Officials; Federal Highway Administration, U.S. Department of Transportation, Jan. 1971.