Table 2.1: Use of ITS Data for Stakeholder Applications

Stakeholder Group	Application	Method or Function	Collection and Use of: Current Data	Collection and Use of: ITS-Generated Data
MPO and State Transportation Planners	Congestion Management Systems	Congestion Monitoring	Travel times collected by "floating cars": usually only a few runs (small samples) on selected routes. Speeds and travel times synthesized with analytic methods (e.g., *HCM*, simulation) using limited traffic data (short counts). Effect of incidents missed completely with synthetic methods and minimally covered by floating cars.	Roadway surveillance data (e.g., loop detectors) provide continuous volume counts and speeds. Variability can be directly assessed. Probe vehicles provide same travel times as "floating cars" but greatly increase sample size and areawide coverage. The effect of incidents is imbedded in surveillance data and Incident Management Systems provide details on incident conditions.
	Long-Range Plan Development	Travel Demand Forecasting Models	Short-duration traffic counts used for model validation. O/D patterns from infrequent travel surveys used to calibrate trip distribution. Link speeds based on speed limits or functional class. Link capacities usually based on functional class.	Roadway surveillance data provide continuous volume counts, truck percents, and speeds. Probe vehicles can be used to estimate O/D patterns without the need for a survey. The emerging TDF models (e.g., TRANSIMS) will require detailed data on network (e.g., signal timing) that can be collected automatically via ITS. Other TDF formulations that account for variability in travel conditions can be calibrated against the continuous volume and speed data.
	Corridor Analysis	Traffic Simulation Models	Short-duration traffic counts and turning movements used as model inputs. Other input data to run the models collected through special efforts (signal timing). Very little performance data available for model calibration (e.g., incidents, speeds, delay).	Most input data can be collected automatically and models can be directly calibrated to actual conditions.
Traffic Management Operators	ITS Technology	Program and Technology Evaluations	Extremely limited; special data collection efforts required.	Data from ITS provide the ability to evaluate the effectiveness of both ITS and non-ITS programs. For example, data from an Incident Management System can be used to determine changes in verification, response, and clearance times due to new technologies or institutional arrangements. Freeway surveillance data can be used to evaluate the effectiveness of ramp meters or HOV restrictions.
		Pre-Determined Control Strategies	Short-duration traffic counts and "floating car" travel time runs. A limited set of pre-determined control plans is usually developed mostly due to the lack of data.	Continuous roadway surveillance data makes it possible to develop any number of pre-determined control strategies.
		Predictive Traffic Flow Algorithms	Extremely limited.	Analysis of historical data form the basis of predictive algorithms: "What will traffic conditions be in the next 15 minutes?" (Bayesian approach).
Transit Operators	Operations Planning	Routing and Scheduling	Manual travel demand and ridership surveys; special studies.	Electronic Fare Payment System and Automatic Passenger Counters allow continuous boardings to be collected. Computer-aided dispatch systems allow O/D patterns to be tracked. AVI on buses allows monitoring of schedule adherence and permits the accurate setting of schedules without field review.
Air Quality Analysts	Conformity Determinations	Analysis with the MOBILE Model	Areawide speed data taken from TDFs. VMT and vehicle classifications derived from short counts.	Roadway surveillance provides actual speeds, volumes, and truck mix by time of day. Modal emission models will require these data in even greater detail and ITS is the only practical source.

Table 2.1: Use of ITS Data for Stakeholder Applications

Stakeholder Group	Application	Method or Function	Collection and Use of:	
			Current Data	ITS-Generated Data
MPO/State Freight and Intermodal Planners	Port and Intermodal Facilities Planning	Freight Demand Models	Data collected through rare special surveys or implied from national data (e.g., Commodity Flow Survey).	Electronic credentialing and AVI allows tracking of truck travel patterns, sometimes including cargo. Improved tracking of congestion through the use of roadway surveillance data leads to improved assessments of intermodal access.
Safety Planners and Administrators	Safety Management Systems	Areawide Safety Monitoring; Studies of Highway and Vehicle Safety Relationships	Exposure (typically VMT) derived from short-duration traffic and vehicle classification counts; traffic conditions under which crashes occurred must be inferred. Police investigations, the basis for most crash data sets, performed manually.	Roadway surveillance data provide continuous volume counts, truck percents, and speeds, leading to improved exposure estimation and measurement of the actual traffic conditions for crash studies. ITS technologies also offer the possibility of automating field collection of crash data by police officers (e.g., GPS for location).
Maintenance Personnel	Pavement and Bridge Management	Historical and Forecasted Loadings	Volumes, vehicle classifications, and vehicle weights derived from short-duration counts (limited number of continuously operating sites).	Roadway surveillance data provide continuous volume counts, vehicle classifications, and vehicle weights, making more accurate loading data and growth forecasts available.
Commercial vehicle enforcement personnel	Enforcement of Commercial Vehicle Regulations	Hazardous Material Inspections and Emergency Response	Extremely limited.	Electronic credentialing and AVI allows tracking of hazardous material flows, allowing better deployment of inspection and response personnel.
Emergency Management Services (local police, fire, and emergency medical)	Incident Management	Emergency Response	Extremely limited.	Electronic credentialing and AVI allows tracking of truck flows and high incident locations, allowing better deployment of response personnel.
Transportation Researchers	Model Development	Travel Behavior Models	Mostly rely on infrequent and costly surveys: stated preference and some travel diary efforts (revealed preference).	Traveler response to system conditions can be measured through system detectors, probe vehicles, or monitoring in-vehicle and personal device use. Travel diaries can be imbedded in these technologies as well.
		Traffic Flow Models	Detailed traffic data for model development must be collected through special efforts.	Roadway surveillance data provide continuous volume counts, densities, truck percents, and speeds at very small time increments. GPS-instrumented vehicles can provide second-by second performance characteristics for microscopic model development and validation.
Private Sector Users	Truck Routing and Dispatching	Congestion Monitoring	Current information on real-time or near real-time congestion is extremely limited.	Roadway surveillance data and probe vehicles can identify existing congestion and can be used to show historical patterns of congestion by time-of-day. Incident location and status can be directly relayed.
	Information Service Providers	Trip Planning	Information on historical congestion patterns is extremely limited. This information could be used in developing pre-trip route and mode choices, either alone or in combination with real-time data.	