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Montana Department of Transportation

Commodity Flow Feasibility Study

FINAL REPORT

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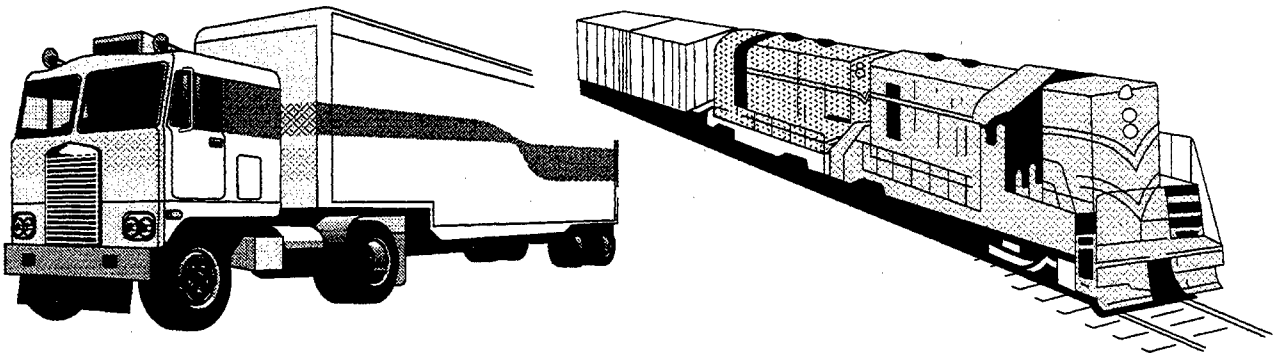

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This report presents the recommendations and findings from a study of the feasibility of establishing a program for collecting and reporting commodity flow information for the Montana Department of Transportation (MDT). Historically, the MDT has had a strong interest in ensuring that there is a good data base from which to determine Montana's freight transportation needs. This has resulted in the collection and reporting of freight-related information as part of statewide planning, rail planning, special studies, and in MDT's ongoing traffic monitoring program. MDT managers and a sample of freight transportation providers were interviewed to identify MDT's commodity flow data requirements. The focus of the study is on commodity flow information and not freight or goods movement information. The interview results provide perspective on data requirements at each level of the organization. The interview findings, and our evaluation of MDT's ongoing goods movement-related planning, indicate that MDT's commodity flow data requirements are largely met, and that the principal unmet requirements are for a better baseline of information on current and future goods movement. It is not recommended that MDT proceed with conducting a commodity flow data collection and study, as the information collected would have only a narrow use in the department.

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ABSTRACT

This report presents the recommendations and findings from a study of the feasibility of establishing a program for collecting and reporting commodity flow information for the Montana Department of Transportation (MDT). Historically, the MDT has had a strong interest in ensuring that there is a good data base from which to determine Montana's freight transportation needs. This has resulted in the collection and reporting of freight-related information as part of statewide planning, rail planning, special studies, and in MDT's ongoing traffic monitoring program. MDT managers and a sample of freight transportation providers were interviewed to identify MDT's commodity flow data requirements. The focus of the study is on commodity flow information and not freight or goods movement information. The interview results provide perspective on data requirements at each level of the organization. The interview findings, and our evaluation of MDT's ongoing goods movement-related planning, indicate that MDT's commodity flow data requirements are largely met, and that the principal unmet requirements are for a better baseline of information on current and future goods movement. It is not recommended that MDT proceed with conducting a commodity flow data collection and study, as the information collected would have only a narrow use in the department.

Montana Department of Transportation

Commodity Flow Feasibility Study

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Montana Department of Transportation
Commodity Flow Study

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I. Introduction

This report presents the recommendations and findings from a study of the feasibility of establishing a program for collecting and reporting commodity flow information for the Montana Department of Transportation (MDT).

The report is organized into the following sections:

Section II. Study Background and Approach. This section describes the background to the study, study objectives, and the analysis approach.

Section III. Commodity Flow Data Assessment. This section presents the results of the assessment of MDT's commodity flow data requirements. MDT managers' commodity flow data needs, the availability of data to meet them, and unmet data needs are described.

Section IV. Findings and Recommendations. This section presents our findings regarding MDT's unmet commodity flow data needs and recommendations for addressing MDT's commodity flow information requirements.

Section V. Implementation. This section presents options and a recommended approach for meeting the unmet data needs.

Appendices. MDT managers, stakeholders, and transportation providers interviewed for this study are listed in Appendix A, and a summary of other state approaches is described in Appendix B.

II. Study Background and Approach

A. Study Background

In the past, the MDT has had a strong interest in ensuring that there is a good data base from which to determine Montana's freight transportation needs. This has resulted in the collection and reporting of freight-related information as part of statewide planning, rail planning, special studies, and in MDT's ongoing traffic monitoring program.

The MDT's data collection is targeted on meeting the information requirements for supporting the Department's core activities, namely those involved in preserving the current highway network. MDT has a good data base from which to determine the number of trucks and their weight (equivalent single axle loads) using Montana's highways. This data is available through a sophisticated traffic monitoring program that involves the collection and reporting of the number, classification (type) of vehicles, and vehicle weight on Montana's highways. This information plays a key role in performing effective maintenance, preservation, design, and planning for the state's highways.

In recent years there has been an increased interest in more detailed and a broader range of freight-related information. This interest has arisen for the following main reasons:

- The Intermodal Surface Transportation Efficiency Act (ISTEA)[1], enacted in 1991, placed increased emphasis on intermodal planning, addressing freight in statewide planning. When first enacted, it mandated states to develop an intermodal management system. In Montana, the initial implementation of MDT's intermodal management system[2] and TranPlan 21[3], the statewide transportation plan, both identified the importance of Montana's intermodal transportation system to the state's economy and the need to have an ongoing process for identifying and addressing barriers to efficient intermodal transportation.
- Following the enactment of ISTEA, increased emphasis was placed by MDT's planners, and planning professionals nationally, on assessing and addressing freight-related transportation needs. This has been a learning process that has required determining the most effective role for supporting the state's existing economic base and economic development goals. Nationally and in other states, this has resulted in state-level and national commodity flow data collection and reporting programs.
- The enactment of ISTEA also increased the expectations of the freight industry and economic development interests regarding the investment of transportation funds in intermodal and freight-related projects. This has increased the importance of having good data from which to evaluate the merits of proposed projects.

- Following the North American Free Trade Agreement (NAFTA) and the United States-Canada Free Trade Agreement, MDT's planning division has received frequent requests for commodity flow information to address policy issues. This includes: the analysis of anticipated NAFTA related travel demands, cross border traffic, and special studies such as Billings to Great Falls highway improvements.
- At the state, multistate, and national levels there has been an interest in establishing trade corridors. This has resulted in corridor coalitions and multistate studies of anticipated trade-related transportation needs. MDT managers have participated in a number of these multistate and national initiatives to ensure that Montana's interests are represented.

This increased interest in freight and commodity flow information has highlighted a gap in the data collected and reported by MDT. The gap is primarily for origin-destination and commodity flow related information. It has been proposed that MDT conduct a research study to collect and report commodity flow-related information to bridge this gap. The MDT's experience with the ISTEA management systems and other data collection intensive work is that it is very important to evaluate what information is required, what it will be used for, and what it will cost to collect and process this information before launching into a new data collection effort. Therefore MDT decided to undertake a feasibility study to evaluate the value of undertaking a commodity flow data collection and reporting program to address the increased interest in freight and commodity flow information.

B. Study Objectives

The purpose of this study is to conduct an assessment of the benefits and costs to MDT of collecting and reporting commodity flow information. The objectives of the study are to determine:

- What commodity flow information is required.
- Who would use the information and what it would be used for.
- What commodity flow data are already available.
- What approaches and methodologies can be used to collect additional data.
- The costs of establishing ongoing data collection and reporting capabilities.
- MDT managers' priorities for commodity flow information.
- An approach to meeting commodity flow information requirements.

C. Approach

The feasibility study involved the following approach:

1. Identification of commodity flow information requirements

A series of interviews were conducted with MDT managers to determine their information requirements. (The individuals and organizations contacted are listed in Appendix A.) The questions covered were to identify:

- The commodity flow information each interviewee needs in order to perform their work successfully.
- Specific data items that are currently collected and how they are used.
- Specific data items that are not available but needed and, if available, how they would be used.
- Priorities for meeting any unmet requirements for commodity flow information.
- Issues and concerns regarding current and future commodity flow information.

2. Identification and assessment of current data availability

The availability of freight and commodity flow data to meet the information requirements identified above was assessed. The key considerations for the assessment are whether commodity flow information requirements can be met through:

- Existing data sources.
- Amending existing data collection or reporting activities to obtain additional data.
- New data collection or reporting activities.

3. Assess commodity flow information collection programs in other states

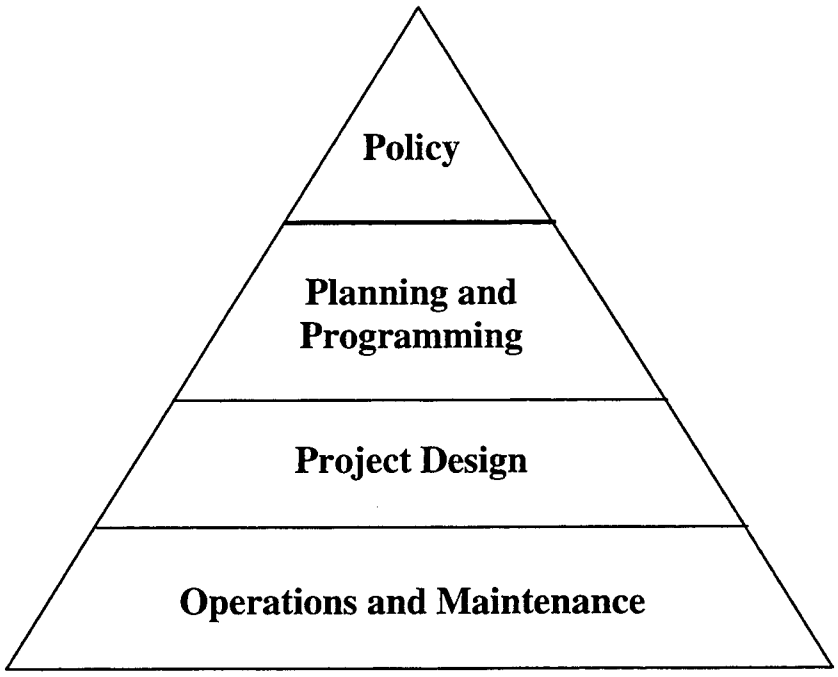
A scan of other states' approaches to meeting commodity flow requirements was undertaken. This was accomplished by drawing on our knowledge of the practices in a number of other western states and the results of recent literature reviews and research studies undertaken by the Federal Highway Administration and the National Cooperative Highway Research Program. The scan was aimed at evaluating the applicability of these approaches to Montana and their implementation costs.

III. Commodity Flow Data Assessment

MDT managers and a sample of freight transportation providers were interviewed to identify MDT's commodity flow data requirements. It is important to note that the focus of the study is on commodity flow information and not freight or goods movement information. MDT already collects information regarding the number and weight of commercial vehicles using the state's highways.

The interview results provide perspective on data requirements at each level of the organization as illustrated in Exhibit III-1 below. These requirements and the availability of data to meet them are described in turn below.

Exhibit III-1: Commodity Flow Information Levels



A. Policy Level

1. Information requirements

The principal requirements for policy level commodity flow data arise from:

- Legislators' requests for information related to specific issues such as grain movements.

- The need to communicate with the public about the importance of the transportation system for Montana's economic well being.
- The need to communicate with the public in response to specific concerns.
- Specialized studies such as the current evaluation of the economic impact of changes in truck weight requirements.
- In state and multistate policy initiatives around developing trade corridors.

2. Data collection and reporting

Data collected to support policy analysis is *ad hoc*. Typically, information is drawn from MDT's ongoing planning, secondary data sources, or targeted primary data collection.

3. Unmet data needs

Interviewees indicated that there are no unmet commodity flow data needs that are critical for MDT. Although not critical, there is, however, an unmet need for better commodity or goods movement information for policy analysis.

B. Planning and Programming

1. Information requirements

The principal requirements for planning level commodity flow data arise from:

- *Ad hoc* requests to the department for information for Environmental Impact Study documents.
- Periodic studies and the targeted evaluation in specific corridors. An example is the assessment of the impacts of a rail branch line closure on a corridor, through the increase in the hauling of wood chips or grain.
- Addressing long-range goods movement needs as part of multistate, statewide and corridor planning to anticipate Montana's future corridor level needs.
- Determining the long-range freight transportation demands arising from Montana's economy.
- The need to forecast future ESALs as part of planning and programming. For example, forest management plans determine the future use of the highway system by logging trucks.

2. Data collection and reporting

Commodity flow information is collected through the following activities:

- **Modal planning:** The Montana State Rail Plan collected and reported information on inbound and outbound rail carloads by type of commodity. This information was collected as part of the plan development from the railroads.
- **Ongoing statewide planning evaluated the major commodities flowing into and out of Montana:** The analysis is at a statewide level and did not evaluate specific corridors. This information was collected as part of the evaluation of the role that transportation plays in supporting Montana's economic base. The data were drawn from a variety of sources, but are statewide.
- **Commodity information is collected as part of the planning statistics collected at ports of entry.** However, this information is not always entered on the forms used to collect planning data and does not appear to be used.

In addition, MDT collects a considerable amount of information relating to goods movement that supports planning and programming. This includes:

- Counts of commercial vehicles by vehicle classification.
- Commercial vehicle weight data, equivalent single axle loads.
- Intermodal management system and planning information on the location of intermodal freight facilities.

3. Unmet data needs

Interviewees indicated that there are no unmet commodity flow data needs that would be met through undertaking a commodity flow data collection study. However, there is an important information requirement that is only partially met. MDT would benefit from establishing a better baseline of information regarding goods movement into, out of, and through Montana.

C. Project Design, Operations and Maintenance

1. Information requirements

- Certain commodity information is required by the Motor Carrier Services Division for federal certification.

- Commodity flow information is not required for highway design, operations, or maintenance.

2. Data collection and reporting

- The Motor Carrier Services Division collects some information relating to commodities on citations, warning tickets, permits and dyed fuel reports, and notice to appears. The commodities for which data are collected are agricultural commodities (by type), wood chips and logs, livestock, gravel, and equipment.

3. Unmet data needs

- There are no unmet commodity flow data needs for design or operational purposes.

IV. Findings and Recommendations

This section presents our findings and recommendations.

A. Findings

- **The majority of MDT's unmet commodity flow data needs are at the policy level.**

  At times MDT managers need commodity flow information to address policy issues at the state and federal levels. The information requirements tend to arise around specific issues such as grain movements across the U.S./ Canadian border or positioning Montana to benefit from the North American Free Trade Agreement.

- **Planning commodity flow information needs are met satisfactorily.**

  MDT's ongoing statewide and modal planning program is based on satisfactory information. Statewide planning has addressed intermodal freight and economic development. MDT's statewide rail planning analyzes the volume and type of commodities shipped into and out of Montana. Through these planning activities MDT has assembled a good baseline of commodity and freight information.

- **MDT has an existing program for collecting and reporting freight-related information that supports planning, project analysis and design.**

  MDT's existing traffic monitoring program supports its core business the planning, design, preservation and maintenance of the highway infrastructure. This program counts the number and type of vehicles and measures their weight.

- **MDT managers do not require the systematic collection and reporting of commodity flow information.**

  MDT managers that were interviewed do not believe that they need a systematic commodity flow data collection program to be successful.

  Few interviewees state that they would use this information if it were available.

- **Freight transportation providers contacted do not see value in MDT collecting and reporting commodity flow information.**

  A limited number of Montana organizations involved in goods transportation were contacted. They do not see collecting and reporting commodity flow information of value to MDT or improving the efficiency of goods movement.

- **Motor carriers contacted indicated that, in Montana, it is not likely to be possible to obtain corridor level origin destination commodity information for trucks because of commercial confidentiality concerns.**

  In Montana, information collected from a commodity flow survey could easily be used to gain a competitive advantage. This is because of the small number of shippers in most communities. Therefore concerns regarding commercial confidentiality would make it difficult to collect additional information.

- **Additional commodity flow information could be used by Montana agencies involved in economic development planning.**

  State agencies and other organizations involved in economic development have an interest in commodity flow information for evaluating economic development proposals. This interest usually focuses on specific proposals such as that developed by the Trade Port Office in Yellowstone County to establish an intermodal hub site[4]. In these cases, a site specific market study is always needed prior to any investment decisions. Statewide commodity flow information would not be the basis for making investment decisions.

B. Recommendations

- **Do not establish a commodity flow data collection and reporting system.**

  There is no compelling business case for MDT to establish a commodity flow data collection and reporting system. The data collected would provide information to address policy issues but is not required for successful planning, programming, and operations.

- **Address commodity flow and goods movement at the statewide level in more detail as an element in future statewide planning updates.**

  The Federal Highway Administration has undertaken developing a number of initiatives, such as the Quick Response Freight Manual[5] and the Intermodal Freight Visual Database[6], to improve goods movement information for planning. Although these initiatives will not provide good information for Montana at the city or county level, they can be used to provide statewide corridor level sketch planning information as part of any statewide planning updates. This will go a long way to meeting policy level commodity flow information requirements.

- **Focus on identifying barriers to efficient commodity flow as part of the intermodal management system work.**

  MDT has a clear policy and planning interest in ensuring that the transportation system supports the efficient movement of commodities into, out of, and through the state. MDT's intermodal management system aims to provide information to

support this goal. Rather than collecting commodity flow information to support this, we recommend a focus on periodically working with the industry to identify from their perspective the barriers or obstacles to efficient commodity flow.

V. Implementation

The interview results, and our evaluation of MDT's ongoing goods movement-related planning, indicate that MDT's commodity flow data requirements are largely met. The principal unmet requirements are for a better baseline of information on current and future goods movement. The requirement is for information on current and forecast future highway demands for goods movement. The information would be used largely for policy and long-range planning.

The following are the options for addressing this requirement:

- Option 1: Continue to use existing data and information sources.
- Option 2: Undertake primary data collection through a commodity flow study.
- Option 3: Use the existing and recently developed federal data sources to develop a better statewide baseline.

The options are evaluated in turn below.

A. Option 1: Continue to use existing data and information sources.

This option involves no change from current data collection and analysis practices.

Benefits – No additional work is required.

Costs – MDT has limited information to address policy issues and for long-range planning. This creates extra staff work to respond to *ad hoc* information requests and makes it harder to have a factual discussion regarding trade corridor and related issues.

B. Option 2: Undertake primary data collection through a commodity flow study.

This option involves a statewide commodity flow data collection study. The study would include collecting primary data on major Montana travel corridors.

Benefits – This approach would provide definitive commodity related information.

Costs – A survey of this type would cost a minimum of $375,000 and take a year to complete. Data would need to be collected at different points in the year to account for seasonal variation. Although other states have successfully collected this type of data in the field, there would be an issue regarding the commercial confidentiality of the data. Without establishing forecasting procedures, the information would only provide a baseline.

C. Option 3: Use available secondary sources to establish a goods movement baseline.

This option would involve the systematic application of the available secondary data sources, including those described in Appendix B, to Montana. These sources would provide a new systematic baseline of goods movement in Montana. The data sources do have limitations in their applicability to Montana but at the aggregate level will improve the information available to Montana policy makers and planners regarding goods movement.

Benefits – Uses existing information and provides policy and long-range planning information. This is the only unmet commodity flow information requirement identified in this study.

Costs – This type of analysis would require about 850 hours work. It could be undertaken as a goods movement element to the statewide plan or as a separate study.

D. Recommendations and Rationale

It is not recommended that MDT proceed with conducting a commodity flow data collection and study. The information collected would have only a narrow use in the department. MDT's unmet information requirements could be better addressed through undertaking a goods movement analysis using available secondary data sources. The focus should be statewide and address only major corridors to the extent that meaningful analysis can be undertaken using the secondary data sources. This could be undertaken as a separate study or as an update element of the statewide plan.

Appendix A: Interviewees

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Motor Carrier Services Division	David Galt	Administrator
	Drew Livsey	Operations Manager
Multimodal Planning Bureau	John Craig	Chief
	Dick Turner	Special Studies
Data and Statistics Bureau	Bill Cloud	Chief
	Dan Martin	
	Craig Abernathy	
Program and Policy	Sandra Straehl	
Airport/Airways Bureau Aeronautics Division	Redge Meierhenry	Chief
Chief of Staff	Jim Currie	
Governor's Office	Linda Reed	Economic Development Policy Advisor
Montana Motor Carriers Assoc.	Ben Havdahl	
Watkins Shepherd Trucking	Ray Kuntz	
Billings Metropolitan Planning Organization	Scott Walker	

Appendix B

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I. Overview of the State of the Practice

The Montana Department of Transportation seeks to determine the feasibility of a commodity flow study of the State's highways. The MDT believes that a commodity flow study would provide more detailed data and information regarding freight movements within the state, and would therefore be valuable for statewide planning. As background, several states' freight planning efforts and commodity flow studies were reviewed. These efforts illustrate the level of effort required to collect necessary data, the complexity of the studies, and their value for statewide planning. While the approaches of many states were reviewed, evaluations of the following states and national databases provide an overview of the more innovative techniques:

- California
- Minnesota
- Washington
- Wisconsin
- U.S. Census Commodity Flow Study
- USDOT Intermodal Freight Visual Database

The complexity of states' efforts to track and utilize commodity flow information varies. Many states rely on information from the U.S. Census Commodity Flow Study[7] while others have developed data-rich techniques to identify existing and forecast future production and consumption centers. Many other states do not attempt to track the origin and destination of commodity flows, but instead base their planning efforts on truck traffic statistics, traffic counts, and economic trends identified by the U.S. Census, Bureau of Economic Analysis.

Many states have recently initiated efforts to involve freight interests in their planning processes. It is expected that these efforts will yield valuable information regarding freight flows, origins, and destinations. The involvement of freight transportation system users in the planning process is expected to improve communications with state departments of transportation.

A. Efforts of Other States

1. California

The California Department of Transportation (CalTrans) is currently developing a geographic information system based upon their intermodal management system. While still under development, this system will apparently be similar to the USDOT Intermodal Freight Visual Database (discussed below). The database will visually depict freight flows throughout the state and will provide value and volume information, at a minimum. The database is not expected to include information about specific commodities, rather it is based on traffic volumes.

2. Minnesota: Statewide Perspective

The Minnesota Department of Transportation (MnDOT) investigated commodity flow movements during the development of their statewide plan. The MnDOT analyzed Bureau of Economic Analysis (BEA) regional data to determine the volume and value of national and international commodity flows originating and terminating within the state[8]. This analysis yielded a high-level illustration of freight trends, but did not disaggregate to the county level. Rather, the most precise level of detail was the BEA region, which is defined as the trade area surrounding a destination city. BEA boundaries do not coincide with state boundaries, so the level of detail for statewide planning is not exact.

To obtain more precise information, the MnDOT assessed average daily truck traffic counts on state highways, the volume and value of freight rail shipments, and river, lake, and airport transfers to determine commodity flows. Through this analysis, MnDOT was able to develop a scenario of existing commodity flows. However, MnDOT did not identify what commodities were being shipped. Rather, they tracked volumes and value. It drew upon existing and expected industry trends to plan for the policy implications and future freight needs of the state.

3. Washington: Eastern Washington Intermodal Transportation Study (EWITS)[9]

During 1993, the Washington State Department of Transportation conducted interviews with over 30,000 truck drivers at 28 separate locations across the state. These interviews were the mechanism for collecting information regarding statewide freight and goods movement. This information was used for statewide transportation planning purposes, specifically to determine the multimodal network necessary for the efficient movement of freight and

people throughout the eastern portion of the state. Information was also collected for other parts of the state when the study was expanded to encompass all of Washington. The EWITS was undertaken because no existing national, state, or local information source provided statewide origin-destination data.

The EWITS collected information at weigh stations, border crossings, and a port of entry. Data was collected by trained members of community service organizations over continuous 24 hour periods during the spring, summer, fall, and winter. The survey collected information on time-of-day movements, vehicle configuration, trucking company location, origin and intended destination, cargo type, vehicle and cargo weight, use of intermodal facilities, and the specific route traveled. This survey was the first in the nation to collect statewide freight truck origin-destination data through direct personal interviews with truck drivers. Survey information was utilized during the development of the Washington's Transportation Plan.

4. Wisconsin: Translinks 21[10]

The Wisconsin Department of Transportation (WisDOT) undertook perhaps the most complex and comprehensive freight analyses to date during the development of its long-range multimodal transportation plan. The WisDOT approach used county-level commodity flow data for all modes from state, federal, and private sources to develop a database of baseline conditions. This database provided input to a 25 year trend forecast for all freight modes (truck, rail, waterborne, and air). These freight forecasts were based on employment and productivity forecasts through the year 2020. Several alternative scenarios were developed as part of the forecasting effort, which were reviewed by a Freight Expert Panel made up of Wisconsin industry and transportation leaders and a set of subcommittees representing individual modes. Input from these reviews helped to refine the model.

Once established, the commodity flows were assigned to the state highway network, the state freight rail network, and to individual water ports and airports. These assignments helped to determine potential facility needs for the year 2020. In addition, efforts were made to determine the divertability of commodities to other modes, such as the potential for diverting some truck traffic to freight rail. This resulted in the identification of feasible future truck-freight lanes, truck-rail intermodal freight facilities and their locations, and an estimate of the tonnage divertable from trucks to freight rail.

Through their commodity flow and freight demand forecasts, WisDOT found that it would be possible to divert a "measurable" volume of traffic to rail. However, "the impact on overall highway traffic volumes was modest due to the preponderance of automobile traffic." The effort was successful in tracking

commodity origins and destinations, at a county level, for the state. It also provided the data necessary to forecast future freight conditions, which yielded a better understanding of potential facility needs.

B. National Data Sources

1. U.S. Census Commodity Flow Survey

The U.S. Census performed two commodity flow surveys, in 1977[11] and in 1993. These surveys are frequently referenced by states during their freight transportation planning efforts. The U.S. Census Commodity Flow Surveys provide information concerning the mode of shipment, the distance shipped, and origin-destination information (including value, tons and ton miles). Origin-destination information is provided on a state level and for 89 National Transportation Analysis Regions. This information can be disaggregated by individual commodity group (SIC codes) and by mode of transport.

The Commodity Flow Survey provides sample information based on 12 million shipments from 200,000 manufacturing, wholesaling, and selected other industries. The sample covers: mining, manufacturing and wholesale trade, selected retail and service industries, and selected auxiliary establishments (e.g., warehouses) of in-scope multi-unit and retail companies. The sample does not cover: Farms, forestry, fisheries, oil and gas extraction, governments, construction, transportation, households, foreign establishments, and most retail and service establishments.

Overall, the Commodity Flow Survey provides high level summary information of state to state shipments, but does not provide sufficient detail for precise planning within a state.

2. Intermodal Freight Visual Database (under development)

The USDOT is currently developing the Intermodal Freight Visual Database. It will be comprised of a Geographic Information System (GIS) of freight flows for all modes and will provide information detailed to the county level. The database, scheduled to be complete in 1998, will provide visual information for all freight movements, by industry code (SIC), and will provide volume measures. Volumes will be measured in terms of number of vehicles, weight, vehicle miles traveled, ton miles, and value.

II. Value of Studies

The sophistication of efforts to track the origins and destinations of commodity flows by state departments of transportation has increased in recent years, primarily in order to provide greater empirical information for decision making and estimations of infrastructure needs. While there have been improvements, most states still rely on basic information, such as average daily traffic and Census/Bureau of Economic Analysis information. The major benefits of more thorough analyses appear to be the following:

- They provide greater freight detail for statewide planning, which enables quantitative analysis to test assumptions and qualitative factors.
- More sophisticated efforts enable more detailed, and presumably more reliable, freight forecasting.
- Detailed commodity flow information assists in identifying opportunities for mode shifts and diversions.

III. Implications for Montana

TranPlan 21, Montana's state transportation plan, utilized numerous data sources to evaluate freight usage of the state transportation system. The plan indicated that a majority of freight traffic in Montana passes through, without an origin or destination within the state. The character of freight originating and terminating in the state was determined from Economic Census data. This approach provided a broad overview of freight movements and was adequate for planning and policy formation.

Detailed commodity flow studies, such as that performed in Washington State require significant resources and funding. The MDT should consider how such information would be used, what level of detail is necessary, and if this information would be worth its cost. Commodity flow information would be interesting and may improve the state's planning capacity. However, it is unclear if the effort required to collect the information would be cost-effective.

LITERATURE CITED

1 "Intermodal Surface Transportation Efficiency Act." U.S. Department of Transportation. 1991.

2 "Intermodal Freight Visual Database," under development by the Federal Highway Administration Office of Planning and Environment. 1998.

3 "TranPlan 21." Dye Management Group. Prepared for Montana Department of Transportation, final report. 1995.

4 Information provided by Scott Walker, Billings (MT) Metropolitan Planning Organization.

5 "Quick Response Freight Manual." Cambridge Systematics, Comsis, and Univ. of Wisconsin-Milwaukee. Prepared for Federal Highway Administration Office of Planning and Environment, contract #DTFH61-93-C-00075, draft final report. 1996.

6 "Intermodal Freight Transportation: Overview of Impediments, Data Sources for Intermodal Transportation Planning, Annotated Bibliography." U.S. Department of Transportation, Federal Highway Administration. 1995.

7 "U.S. Commodity Flow Survey." U.S. Bureau of the Census. 1993.

8 "Minnesota Statewide Transportation Plan: A Work in Progress." Minnesota Department of Transportation. 1995.

9 "Eastern Washington Intermodal Transportation Study." Washington State Department of Transportation. 1995.

10 "Translinks 21 Technical Report Series: Multimodal Freight Forecasts for Wisconsin." Wisconsin Department of Transportation. 1995.

11 "U.S. Commodity Flow Survey." U.S. Bureau of the Census. 1977.