

STRATEGIC FREIGHT TRANSPORTATION ANALYSIS (SFTA)

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February 2001



**Washington State
Department of Transportation**

Washington State Transportation Commission
Planning and Programming Service Center
in cooperation with the U.S. Department of Transportation
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Strategic Freight Transportation Analysis (SFTA)

Prepared for the
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Department of Transportation

By
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Table of Contents

Project Overview	1
What is SFTA?	1
Why is SFTA important and what will SFTA do?	1
Who is involved?	2
What resources will be used?	2
What are the benefits?	2
Scoping Background.....	3
What was the need?	3
What has been done?	3
What were the objectives of this scoping?	4
What are the benefits of the scoping?.....	4
How will this scoping be implemented?	5
What was the work plan?.....	5
Project Findings and Final Scope – the new SFTA.....	6
Background.....	6
Research and Guidance Approach.....	8
Scoped Study Initiatives	8
Trade and Traffic Flows.....	8
Freight Corridor Identification.....	8
Strategic Resource Access Road Network.....	9
Existing and New Databases.....	9
Shortline Railroad Issues	9
Adaptive Research Management	10
Appendix A Contacts and Interviews During Scoping	12
Appendix B Discussion Components for SFTA.....	14

Project Overview

What is SFTA?

Strategic Freight Transportation Analysis (SFTA) is a statewide research and implementation project designed to analyze existing conditions and recommend enhancements to the freight mobility transportation system in Washington State. It is an update and broadening of the acknowledged very successful Eastern Washington Intermodal Transportation Study (EWITS).

EWITS, a major research effort, developed focused databases and economic analysis about traffic-flows, costs of transportation, relationships (complementary and competitive) among modes and impacts of NAFTA and analyses of other trade issues affecting policies. The six-year study, financed within ISTEA, was a partnership between the federal government and the Washington State Department of Transportation that eventually included additional funding partnerships with local agencies and the private sector.

Implementation of the recommended actions of this very successful effort is manifested in: the utilization of EWITS data in the Snake River drawdown studies conducted by the State of Washington's Legislative Transportation Committee and by the US Army Corps of Engineers; the Washington Wheat Commission, the Ministry of Transportation and Highways, British Columbia; transportation planners from numerous states' Departments of Transportation; local jurisdictional requests; various consulting engineering firms; etc. Over 40 studies and implementation reports still serve many clientele.

But the success of EWITS is also reason for concern. Databases do become outdated and decisions based on them could become misdirected. The statewide origin and destination truck study, the first in the nation, is in continual use by planners and policymakers, but the system underlying the traffic flows is undergoing significant and dramatic changes. Many arising issues (changing NAFTA flows, border crossings and congestion, larger rail cars, e-commerce, economic development needs, etc.) require new analyses and most likely will redirect the focus of investments.

Why is SFTA important and what will SFTA do?

Past users of EWITS data have become dependent on this source while these data become more tenuous and dated with the passing of time. Data that are outdated create misdirection. The emerging issues identified above create a need for answers to the current issues and problems of freight mobility. Such new analyses create direction for targeted

investments by the state, increasing the efficiency and effectiveness of such investment decisions.

SFTA will provide information (data and direction) for local, state and national investments and decisions designed to achieve the goal of seamless transportation. It will allow decision makers to be responsive to new and emerging issues, conduct and link (agglomerate) other studies; research and allow coordination of decisions at the local (with county and regional truck studies), state (with I-90 multimodal evaluation, Freight Mobility Strategic Investment Board (FMSIB)), national (with Western Transportation Trade Network (WTTN), Cascadia, etc.), international (with International Mobility and Trade Corridor (IMTC), BC Inland Borders, etc.). Such complementary and coordination efforts will make research benefits readily available to national, state and local decision makers while avoiding needless duplication.

Who is involved?

The participants in this study and users of its products include among others: British Columbia Ministry of Transportation and Highways, FMSIB, counties, ports, Regional Transportation Planning Organizations, Development districts, Chambers of Commerce, private consultants and entities (AVISTA Corporation, Cominco - American, etc.). All have expressed a desire for the work and a pronounced need for the research output.

What resources will be used?

SFTA will be funded at \$1.8 million over a six-year period. The early work will be focused on the statewide origin and destination study, freight corridor identification issues and several of the five-study initiatives outlined in this scoping. The innovative adaptive research management developed in EWITS, will be continued in SFTA and will utilize some of the funding to respond to emerging issue areas.

What are the benefits?

The most obvious and direct benefit of SFTA is strategic, coordinated investment decisions, enhanced by mutual agency/private understanding of the needs, choices and relationships required for an economically sustainable freight mobility sector. The many data sets and strategic economic analysis and planning will produce a proactive state role in supporting economic development efforts. Underlying many of the issues will be a new, deeper and timely understanding that allows the opportunity to address business location/transportation needs.

Scoping Background

What was the need?

The geography and location of Washington State has provided it with unique economic advantages. It is, at the same time, a coastal state, an international border, and a source of abundant natural resources that includes timber; minerals; land for agricultural production; and water for hydroelectric power, navigation, recreation and irrigation. The successful use of all these resources and corresponding enterprises is highly dependent upon an efficient transportation system that connects state-produced commodities and state-transversing commodities with their respective markets, both domestically and internationally.

The transportation system is inherently dynamic and constantly changing. Population of all regions of the state is steadily increasing and this has varied effects on the demands on the transportation system. Another important economic change comes from the North American Free Trade Agreement (NAFTA) and the World Trade Organization (WTO). With the implementation of the actions of these two efforts, the transportation of freight throughout Washington is changing and will continue to change. The volume of traffic in the major transportation corridors in the state is being affected with more routes becoming important links for goods and services that are imported or exported. Other concerns deal with environmental issues, passengers and congestion, infrastructure deterioration, etc.

What has been done?

Local, state and regional transportation planners and decision makers must contend with these changes and formulate plans to understand and adjust to these dynamics. To meet the information needs of area planners, the Eastern Washington Intermodal Transportation Study (EWITS) was initiated in 1992. EWITS was a six-year planning and data development study funded primarily through the federal Intermodal Surface Transportation Efficiency Act (ISTEA) to define and evaluate the multi modal network, freight and people throughout eastern Washington. All counties that lie to the east of the Cascade Mountains were included in the study. The implementation of the Washington State Freight Truck Origin and Destination Study also collected information on freight truck movements for all Washington counties throughout the state.

Phase I of EWITS, funded under the initial ISTEA Grant, did considerable work that lays the groundwork for conducting analysis of policy changes affecting the transportation system in eastern Washington. Basic information collected by origin and destination studies that document freight movements by mode of transportation, through specific highway

corridors, and by specific industries, provided a vibrant picture of current system use. Economic modeling efforts produced a regional input-output table of eastern Washington and a Geographic Systems Model (GIS/GAMS) transportation cost optimization model that illustrates transportation corridor flows geographically through agricultural production areas, population centers, river ports, and how the movements impact transportation infrastructure in the region.

Still, Washington continues to be the most trade-active dependent state in the United States. Over \$90 billion worth of goods pass through Washington, relying on that reliable and efficient multi modal transportation system. Freight mobility improvements, whether enhancement or preservation, are the core of supporting and increasing such economic activity. New efforts to address freight mobility issues have been developed at the state and national legislative levels. These activities, if investments are to be strategically prioritized, require a continuing database and research effort responsive and timely to new and emerging issues. The multiple data sets and model formulations developed in Phase I of EWITS require continual updating and restructuring to reflect the new issues.

This scoping effort was designed to specify the structure, direction and focus of SFTA, the second phase of EWITS. Issues to be addressed, clientele to be served and analyses to be performed are detailed in this scoping process.

What were the objectives of this scoping?

The overall purpose was to scope the structure and focus to insure statewide coverage. Specific objectives included reviewing the approach of EWITS-Phase I, determining emerging needs for planners and policy makers, and detailing and prioritizing research efforts and issues to be undertaken. Underlying themes are continuing efforts to forecast freight needs, identify gaps in the transportation infrastructure, pinpoint system improvement options critical to economic competitiveness and mobility, and to facilitate existing regional and statewide transportation planning efforts.

What are the benefits of the scoping?

This scoping outlines a project that will provide data and analysis. The phased design for product outcomes will be immediately useful to planners and decision makers from city, county, metropolitan, regional, state, national and international organizations. Issues scoped for this project are couched as an interdependent series of research inquiries. This deliberate and thorough scoping will allow the analytical tools, the new databases and the expertise of the new SFTA research team to be available to respond to, and research, emerging issues raised by policy makers and implementers

throughout the state. Improved freight mobility, updated files, prioritized investments and rural economic developments are all anticipated outcomes of this scoping exercise. This project will also develop partnerships among private firms, ports, counties, states, etc., in supporting the ongoing efforts to strategically target investment needs and choices.

How will this scoping be implemented?

The results of this scoping reflect an identification of the problems, projects, purpose and direction of SFTA. But, prior to the completion of this document, many individuals and stakeholders (see Appendix I) with diverse expertise were contacted to ensure incorporation of statewide issues, needs and directions, resolved through discussions and mutual learning process by this inclusive collaboration (see Appendix II). Representatives from the cities, counties, MPO's, RTPO's, ports, legislature, commodity and industrial groups and others were given the opportunity to comment on, develop and review the scoping document, allowing a revisiting of issues and prioritization. An additional outcome is unanimous participant support of the approval and need for phase II (SFTA). The most direct implementation, though, is the use of the results to design a research program capable of solving or providing information for solving, the problems identified in the state-wide discussions.

What was the work plan?

The project was broken into sequential actions. The various components and interviews were treated individually and later integrated into the scoping document. It was necessary that some tasks be done concurrently.

Work Tasks

1. Review EWITS-I as to usage, identified areas of needed work and potential changes in methodologies.
2. Interview advisory and steering committee members as to perspective on needs, structure and approach of phase II.
3. Interview shippers, planners, transportation modes, etc. as to perspective on needs.
4. Interview legislators, individuals interested in many commodity groups, ports, agencies and state organizations as to desired structure and outcome of SFTA.
5. Write draft-scoping document.
6. Finalize and produce scope for new research project SFTA (EWITS-II).

Project Findings and Final Scope

Strategic Freight Transportation Analysis (SFTA)

Background

The multimodal transportation system serving the United States has generated many benefits for the citizens of the country. This system serving freight mobility needs currently consists of rail, barge, truck, and air. Each of these modes contributes to moving products from origin to destination in response to either a competitive or economic advantage or where sufficient public/private incentives exist. The system developed initially out of economic need where there was a perceived private benefit for one or more of the modes. Subsequently, this system was augmented due to economic or social need where there was a perceived public benefit or responsibility.

These modes continue to contribute to the efficient movement of goods that support the underlying economic vitality of Washington State. A substantial part of international trade and economic development activities in the state includes a well-developed port system, which is strategically located not only in the Puget Sound and the coastal areas of the State of Washington, but along the Columbia/Snake River system.

The efficiency of this multimodal system depends upon the characteristics and adequacy of each mode and the necessity of public/private support to maximize the total efficiency and benefits while ensuring that this system continues to function. Numerous factors are affecting the capability of the system to serve the economic and social needs of the state and nation.

Railroads continue to abandon light density lines. Infrastructure to support truck movements continues to deteriorate or to be inadequate in the face of new and increased traffic flows and corresponding congestion impacts. New choke points arise as new freight flows intermingle with increasing passenger car traffic levels, causing increases in travel times and cost for both the freight carrier and the passenger car. Consideration of drawing down the Snake River reservoirs as a means of restoring endangered and listed stocks of salmon and steelhead is still under discussion.

These issues and many other changes have the potential of either requiring a shift to another more costly surface transportation mode or a loss of market opportunities for producers and manufacturers. These changes have serious consequences that include additional truck traffic moving on roads not adequate for such weights and volumes, and the mixing of increased truck traffic with automobiles and busses to an extent that have not been previously experienced.

An overwhelming need exists to determine how these impacts will affect the overall transportation system, the infrastructure, and the region's desired economic development. What are the specific commodity flow characteristics in the corridors? What strengths, shortfalls, economic impacts, and economic development opportunities are in place or lacking due to these desired movements? What is the cost of transport, on both public and private support systems, for what is currently moving? How can the potential benefits of this integrated system be maximized for the future and emerging demands be satisfied?

An earlier major research effort was the Eastern Washington Intermodal Transportation Study (EWITS) which developed focused data bases on traffic flow, costs of transportation, relationships (complementary and competitive) among modes, impacts of NAFTA and other trade policy changes. This six-year study, which focused on Eastern Washington, was primarily financed within ISTEA and was a partnership between the federal government and the Washington State Department of Transportation that eventually included additional funding partnerships with the private sector.

This very successful effort will serve as a model for the investigations outlined in this proposal. The utility of EWITS was demonstrated on numerous occasions by requests from various groups. Examples include the utilization of EWITS data in the Snake System draw down analyses conducted by the State of Washington's Legislative Transportation Committee in Phases I and II; The Washington Wheat Commission; The Ministry of Transportation and Highways, British Columbia; transportation planners from numerous other state Departments of Transportation; local jurisdictional requests; various consulting engineering firms, etc.

But the success of EWITS is also reason for concern. Databases do become outdated and decisions based on them could become, at the best, misdirected, at the worst, wrong. The statewide origin and destination study, the first done in the nation, is in continual use by planners and policy makers but the system underlying the traffic flow is undergoing significant and dramatic changes. New and increased NAFTA freight flows and intercountry flows are arising and coming through border ports in volumes not expected.

Increased congestion in the major transportation corridors are causing delays and traffic shifts. New maritime ship sizes cause instantaneous congestion at our ports and the highways serving those ports. New larger rail cars put stress and a competitive disadvantage on the shortline railroads that have served much of agriculture and forest products industries in the state for years. The search for economic development in all parts of the state, not just the urban areas, means new investments may be needed and information to guide such investments is essential.

Research and Guidance Approach

The research and analysis for this SFTA project will be sequentially developed as the study progresses. A major scoping for the project will allow general initiatives, with subprojects underlying them, to be developed, and this will be the first activity of the work. The earlier EWITS used "adaptive research management" to allow the research team, and the policy advisors to that team, to develop and undertake specific investigations as needs emerged or changed, rather than trying to guess what policy issues or data needs were required in the future. That model and research approach will be utilized in this project. The individual projects will be designed as stand alone short-term efforts but a full study framework is needed for long-term focus and policy strategies. The study is designed and budgeted as a six-year project so as to allow that responsiveness. An Advisory Committee of relevant stakeholders will provide long-term direction and guidance while a Steering Committee will serve as near term directors.

Scoped Study Initiatives and Budget Estimates

1. Trade and Traffic Flows

A major concern is accurate projections of the trade and traffic patterns in the state. What do the current changes in volume mean for future investment needs? What corridor improvements to handle new NAFTA freight movements will allow system wide improvements and not just move the choke points to another section of the system? This initiative (task) will include a new statewide truck origin and destination study, allowing a comparison of the 1994 O & D results; the partially updated 1997 O & D results, and identify trends and changes. Other major elements will be a grain flow study, in conjunction with the Washington Wheat Commission; border crossing and changes in Canadian traffic pattern studies, in conjunction with the Ministry of Transportation and Highways, British Columbia; a broad inventory of new development sites in the state that may generate new traffic levels; and investment strategies to be proactive to such existing or future changes.

ESTIMATED COST	\$450,000
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2. Freight Corridor Identification

There are several efforts on many fronts that are attempting to identify and designate freight corridors. The efforts of the County Road Administration Board (CRAB), the Washington State Department of Transportation (WSDOT), the Freight and Goods Transportation System (FGTS), etc. are all directed towards this mission. Issues of connectivity, jurisdictional responsibility, gaps,

capacity, choke points, needs, utilization, etc. must be determined on a statewide basis. In sum, there must be a single repository for this information to avoid duplication, and to ensure that the freight transportation system is designated for the overall economic good of the state.

ESTIMATED COST \$300,000

3. Strategic Resource Access Road Network

Washington State has a varied climate. In many areas the freeze-thaw cycle caused by the temperature differential between seasons will cause a softening of the sub-surface conditions under many of the local roadways, thereby reducing their capability to accommodate a legally loaded truck. When this condition occurs the responsible jurisdiction weight restricts the roadway for a period of time. Unfortunately, the weight-restricted roadways are often located in the areas where agricultural and forest products producers are attempting to ship their respective commodities to market. This task would delineate potential freight routes (road and rail) with the existing railroads in-place and with some prospective rail abandonments. The effort would also take into account the seasonality of movements of the commodities, investment requirements, contribution to the overall regional and state economic support, and identify potential partnership efforts among the federal, state, county, city, and private entities.

ESTIMATED COST \$300,000

4. Update and Verify Existing and New Databases

This is a critical issue. The previous EWITS model was developed and used beginning in 1994. The data within the model must be reviewed and appropriately modified with current information. This model utilizing a Generalized Algebraic Modeling System coupled with a Geographic Information System was indispensable in allowing a complete analysis of mode shifts, routes, volumes, etc. The data is continuing to be used, but due to its age may not be accurately reflecting what is now occurring in terms of freight movement. In addition, new data and systems will be produced with this updated SFTA that also must be managed.

ESTIMATED COST \$200,000

5. Shortline Railroad Issues

Washington State has lost over 35 percent of its active miles of rail line since 1970. A majority of this loss has occurred in the agricultural and forest products production areas of the state, leaving

these industries with the choice of switching to an alternate mode or going out of business. We must determine the preservation needs, balanced with the business economic viability of these rail locations, through a benefit cost analysis, including a competitive climate analysis across modes. This effort must analyze the potential for increased road damage with the abandonment of existing rail service, alternatives for shipping the product, and the magnitude of the investment (public/private) required to allow the specific facility to continue business operations.

ESTIMATED COST \$ 250,000

6. Adaptive Research Management

The technique of Adaptive Research Management was implemented in EWTS. This technique will again give SFTA the ability to react in a timely fashion to emerging political and economic issues in our changing freight mobility environment. The following reflects some selected potential issue areas that could be substituted or inserted into the SFTA as the need arises. These issues were developed in the surveys and interviews of this scoping. The additional budget proposed below would allow that adaptive, responsive work.

- A. Relationship to telecommunications (rural vs. urban), e.g. Light Lanes
- B. Transportation system statewide; national, and international connectivity
- C. Freight Rail – existing use or loss of short line railroads
- D. Truck weight harmonization required under NAFTA
- E. Water transportation – impacts to firms if there is a drawdown and strategies for investments
- F. Port access and capacity – landside transportation needs – through put capacity
- G. Potato movements from well irrigation areas – the Creston potato haul
- H. Compressed hay bale movements by container
- I. Fruit and vegetable movements and emerging corn movements
- J. Cominco-American mine re-activated in Metaline Falls
- K. Increasing British Columbia interest in 24 hour border crossings and investments

This effort may involve workshops to provide the opportunities for business to bring in their freight issues and concerns.

ESTIMATED COST \$ 300,000

GRAND TOTAL \$1,800,000

As has been previously noted, each of these initiatives can be accomplished individually. But all initiatives (tasks) should be pursued in the general order noted above, rather than in a sporadic, piecemeal fashion. The accomplishment of the total product will be much more informative and complete, allowing the best decision-making. This SFTA over the next six years will yield invaluable data to assist the State of Washington in investing in its transportation system and serving its clientele.

Appendix A

Contacts and Interviews During Scoping

Strategic Freight Transportation Analysis

Last Name	First Name	Title or Office
Ahern	John	State Representative
Armstrong	Jay	County Road Administration Board
Barcham	Don	Ministry of Transportation and Highways, British Columbia
Brodin	Doug	Washington State Department of Transportation
Daniels	Rick	Washington State Department of Transportation
Doyle	Jeff	House Transportation Staff
Ellis	Jerry	Washington State Department of Transportation
Fisher	Ruth	State Representative
Grainger	Howard	Port of Seattle
Hammond	Paula	Washington State Department of Transportation
Hankins	Shirley	State Representative
Hannus	Bob	Port of Seattle
Harger	Alan	Washington State Department of Transportation
Haugen	Mary Margaret	State Senator
Holoachak	Lorne	Ministry of Transportation and Highways, British Columbia
Johnsen	Andrew	Governor Locke's Office
Jones	Pat	Washington Public Ports Association
Kelley	Ross	Freight Mobility Strategic Investment Board Member
Loveland	Valoria	State Senator
Maher	Michelle	Transportation Commission
Marr	Chris	Transportation Commission
McLaughlin	Mary	Staff Director, House Transportation
Milburn	Peter	Ministry of Transportation and Highways, British Columbia
Miles	Glenn	Spokane Regional Transportation Council (SRTC)
Mitchell	Maryann	State Representative
Monnette	Harvey	Ministry of Transportation and Highways, British Columbia
Morrison	Sid	Secretary, Washington State Department of Transportation
Morton	Bob	State Senator
Moser	Carol	Freight Mobility Strategic Investment Board Member
Niva	Connie	Transportation Commission
O'Connell	Catherine	US Senator Gorton's Office
Olson	Judy	US Senator Murray's Office
Peterson	Doug	Ministry of Transportation and Highways, British Columbia
Pietz	Marty	Washington State Department of Transportation
Probart	Ashley	Washington Association of Counties
Schacht	Ward	US Representative Nethercutt's Office

Schmidt	Karen	Executive Director, Freight Mobility Strategic Investment Board (FMSIB)
Schoesler	Mark	State Representative
Sheahan	Larry	State Senator
Sherman	John	City of Pullman
Squires	Glen	Washington Wheat Growers
Sump	Bob	State Representative
Tax	Stephanie	Washington State Department of Transportation
Thompson	Jack	Palouse Regional Transportation Planning Organization
Toomey	Jim	Freight Mobility Strategic Investment Board Member/Port of Pasco
Weber	Jay	County Road Administration Board
White	Gretchen	Deputy Secretary for Policy, Washington State Department of Transportation
Wold	Marty	Executive Director New Regional Transportation Planning Organization (RTPO)
Wood	Alex	State Representative

Appendix B

Working Interview Elements

Strategic Freight Transportation Analysis (SFTA) **(working title was EWITS II)**

Possible Components, Discussed During Scoping

1. Traffic and Trade Flows (what threshold changes in volume are revealing changing investment needs and choices within corridors driven by increasing NAFTA freight movements – don't just move the chokepoints)
 - A. Border crossings analyses
 - B. Origin and destination study
 - i. Compare with the 1994 O & D and the 1997 partial O & D for trends
 - C. Grain flow study
 - D. New or closed firms, factories, etc. (sites that are ready, e.g. Prosser is already permitted, Moses Lake is working on a site, etc.)
 - E. Changes in Canadian transport and traffic – vehicles and routes
 - F. Identify and analyze areas of congestion, choke points, and traffic inefficiencies, e.g. 24-hour border crossings, land to air transfer, etc.
 - G. Assess all-weather road improvements and future needs
2. Freight Corridor Identification (this section will refine existing programs/efforts and avoid duplication)
 - A. Review, augment and coordinate information identifying freight corridor designations, including efforts underway by CRAB, WSDOT, FGTS, and other
 - B. Assess connectivity, jurisdictional responsibility, gaps, capacity, congestion, chokepoints, needs, utilization
3. Shortline Railroad Issues (assess the issues below in the current environment and with a prospective view)
 - A. Location
 - B. Shortline preservation needs-economic viability expressed in business plans and completed benefit cost analysis, including competitive climate analysis across modes
 - C. Analyze road damage as rail lines are abandoned
 - D. Alternatives for shipping while lessening damage
 - E. Magnitude of dollar investment needs
4. Strategic Resource Access Road Network (allows the identification of a spine network that will accommodate trucks year around for commodity movements, e.g. forest products, agricultural products, mining materials, etc.)

- A. Delineate and define potential networks with shortline railroads in-place and with shortline railroads abandoned
- B. Identification of seasonality of movements of the various commodities
- C. Investment requirements
- D. Identify potential partnerships (state, county, city, private)
- 5. Update and Verify Existing and Produced Databases Periodically
- 6. Possible Statewide Public/Private Partnerships
 - A. Country to Country
 - B. State agency to State agency
 - C. State to Local Agency
 - D. Agency to Private Sector

Brief EWITS Background

EWITS (a six year transportation study focusing on eastern Washington) was financed primarily within ISTEA and was a partnership between the federal government and the Washington State Department of Transportation that eventually included additional funding partnerships with the private sector. This was a study at a cost of \$1.5 million. We are endeavoring to use this as a model to update and produce the information on a statewide basis, i.e. Strategic Freight Transportation Analysis. We would anticipate a funding amount of approximately \$1.5 million over a period of five to six years.

The utility of EWITS (current EWITS website is <http://ewits.wsu.edu/>) was demonstrated on numerous occasions by requests from various groups. Examples include the utilization of EWITS data in the Snake/Columbia system draw down analyses conducted by the LTC in Phases I and II; the Washington Wheat Commission; Ministry of Transportation and Highways, British Columbia; transportation planners from several other state Departments of Transportation; local jurisdiction requests; various consulting engineering firms, etc.

Some of the specific outcomes that EWITS assisted in providing information and data for transportation system construction improvements on SR 395 include Hastings Road Stage 1 four lanes and Wandemere Bridge (\$16 M), Hastings Road Stage 2 four lanes (\$12 M), North Corridor Safety Improvements (\$3.5 M), US 395 Corridor Study, US 395 Corridor Environmental Assessment, and US/Canadian Border Crossing Study.

To more fully address freight mobility issues from a statewide perspective we need to build on the successes of EWITS and move to the next level on statewide basis, hence this new SFTA effort.