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State Trunk Highway Program

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The Department of Transportation's (DOT) state trunk highway program is responsible for the construction, improvement, and maintenance of the state's 11,220-mile trunk highway system and for improvement on 563 miles of connecting highways under local jurisdiction. This paper provides an overview of the structure and scope of the program, describes how it is administered within DOT, details the four main program components, and describes how the program is financed.

Overview

The responsibility for roads and highways is divided between local governments and the state. The state generally has jurisdiction over arterial roads, which function as corridors for interstate and inter-regional travel. This network is called the state trunk highway system. Generally, counties are responsible for collector roads, which serve short distance, intra-regional traffic or provide connections between arterial roads and local roads. Municipalities (including towns) are responsible for local roads, such as residential streets and town roads, which provide property access and short distance, local mobility services. Certain municipalities also have arterial streets under their jurisdiction that are marked as state highways, which are designated as connecting highways.

Jurisdiction does not always follow this functional classification. For instance, a county road can begin to function as an arterial highway if traffic patterns change. However, current DOT policy is to align jurisdictional responsibilities with functional classifications whenever possible.

Table 1 depicts the distribution of roads by current jurisdictional responsibility. Although state trunk highways and connecting highways together comprise only 10.3% of total road mileage, they carry 59% of the total traffic volume. Of the 11,220 miles of state trunk highways (excluding connecting highways), about 87% are rural and 13% are in urban areas.

Table 1: Road Miles by Jurisdiction

Jurisdiction	Miles	% of Total
State Trunk Highways	11,220	9.8%
Connecting Highways	563	0.5
County Trunk Highways	19,769	17.3
Town Roads	61,921	54.2
Municipal Streets*	18,836	16.5
Other Roads**	1,833	1.6
Total	114,142	100.0%

*Excludes connecting highways.
**Includes park and forest roads and county roads not on the county trunk highway system.

Structure of the Program and Its Organization Within the Department

Prior to the 2001 legislative session, the state highway program had three main components: (1) state highway rehabilitation; (2) major highway development; and (3) highway maintenance and traffic operations. The 2001-03 biennial budget act (2001 Act 16) added a fourth component for the rehabilitation or expansion of freeways in southeast Wisconsin, which had previously been the responsibility of the state highway rehabilitation component or, in the case of highway expansion, the major highway development component. The appropriations for southeast Wisconsin freeway

rehabilitation are due to sunset at the end of fiscal year 2010-11. If not extended, any outstanding balances and encumbrances in these appropriations, as well as the program responsibilities, would be transferred to the appropriations for state highway rehabilitation.

The administration of the highway program is shared between two divisions within the Department of Transportation: the Division of Transportation System Development and the Division of Transportation Investment Management. The Division of Transportation System Development is responsible for establishing standards for construction and for the execution of the actual design and construction of projects, while the Division of Transportation Investment Management is responsible for statewide planning and the financial management of the program.

While the Division of Transportation Investment Management is housed in the Department's central office in Madison, the Division of Transportation System Development has staff in both the central office and in regional offices in different locations throughout the state. For the purposes of administering the highway program, the state is divided into five regions. This five-region system replaced a previous, eight-district system in 2005, although the Department maintains administrative offices in all of the former district headquarters cities (Eau Claire, Green Bay, La Crosse, Madison, Rhinelander, Superior, Waukesha, and Wisconsin Rapids).

The five regions and the counties in each region are shown below.

Current Five-Region Structure

Region	Counties
North Central	Adams, Florence, Forest, Green Lake, Iron, Langlade, Lincoln, Marathon, Marquette, Menominee, Oneida, Portage, Price, Shawano, Vilas, Waupaca, Waushara, and Wood
Northeast	Brown, Calumet, Door, Fond du Lac, Kewaunee, Manitowoc, Marinette, Oconto, Outagamie, Sheboygan, and Winnebago
Northwest	Ashland, Barron, Bayfield, Buffalo, Burnett, Chippewa, Clark, Douglas, Dunn, Eau Claire, Jackson, Pepin, Pierce, Polk, Rusk, St. Croix, Sawyer, Taylor, Trempealeau, and Washburn
Southeast	Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, and Waukesha
Southwest	Columbia, Crawford, Dane, Dodge, Grant, Green, Iowa, Jefferson, Juneau, La Crosse, Lafayette, Monroe, Richland, Rock, Sauk, and Vernon

Planning, Programming, Design, and Construction in the Highway Improvement Program

The highway rehabilitation, major highway development, and southeast Wisconsin freeway rehabilitation components of the highway program are sometimes collectively referred to as the highway improvement program. This program can be divided into four stages of development: planning, programming, design, and construction. This section describes these stages.

Planning

Planning involves both the identification of long-term transportation needs and goals and the monitoring of conditions, such as pavement condition, traffic patterns, and safety. Within the Department, the planning function is shared between the Division of Transportation Investment Management and the regional offices.

In order to be eligible for federal transportation aid, the state must have a long-range highway plan covering a period of at least 20 years that outlines the state's broad policy goals for transportation. In

developing a transportation plan, DOT must consider a range of planning factors, which are listed in the federal transportation law. For instance, the plan must aim to promote economic vitality, safety, system preservation, and the accessibility and mobility of people and freight. It must also seek to protect the environment and promote energy efficiency and the connectivity between different transportation modes, and it must consider the safety and security of the transportation system. In addition to the requirements that are included in federal transportation law, the federal Clean Air Act requires the Department's transportation plan to be coordinated with the state's implementation plan, developed by the Department of Natural Resources, which designates how the state intends to control emissions of pollutants in ozone nonattainment areas.

In addition, as a condition of using federal transportation aid, DOT must consult with the state's metropolitan planning organizations (MPOs) in developing the statewide plan. Federal transportation law requires each metropolitan area with a population greater than 50,000 to have a designated MPO representing local governments. Each MPO develops a metropolitan transportation plan in consultation with local governments in the region.

DOT's most recent completed state highway plan covers the period between 2000 and 2020. Similar to earlier plans, *Wisconsin State Highway Plan 2020* divides the state trunk highway system into subsystems: (a) Corridors 2020; (b) other principal arterials; (c) minor arterials; and (d) collectors and local function roads. The Corridors 2020 component is a network consisting of 3,650 miles of principal highways, including the state's interstate system, most rural multilane routes, and some important two-lane highways. The network is further divided into the backbone system and the connector system.

The primary segments of the Corridors 2020 backbone system include: (a) STH 29 from I-94 west of Chippewa Falls to Green Bay; (b) USH 53 from Superior to Eau Claire; (c) USH 151 between Fond du Lac and the southwestern border of the state; (d) USH 41 from the Milwaukee area to Marinette in northeastern Wisconsin; (e) USH 10 between the Fox Cities and Stevens Point; and (f) the entire Interstate system. Most of the backbone system consists of multi-lane freeways or expressways. Only two segments, a section of USH 41 in Oconto and Marinette counties and a section of USH 151 in Fond du Lac County remain two lane highways at this time. However, the expansion of USH 151 to four lanes is nearing completion.

The highway plan establishes traffic movement and road condition performance thresholds for each subsystem and, using computer models for traffic growth and pavement deterioration, predicts how much it would cost to rehabilitate and improve highways to keep most segments of highway above those thresholds by the year 2020.

Using this methodology, the plan estimates that the amount of highway expansion and rehabilitation spending needed to meet the plan's goals over the 21-year period between 2000 and 2020 would be $20.4 billion in 1999 dollars, or an average of $972 million per year. Since the completion of that plan, spending on the highway improvement programs has generally fallen short of the plan's recommended spending levels.

The reconstruction and expansion of the Milwaukee area freeway system accounts for 27% of the total cost of the 1999 highway plan's recommended expenditure level. That plan, however, noted that a study of the southeast Wisconsin freeway system by the Southeastern Wisconsin Regional Planning Commission (SEWRPC) that was just beginning at the time would result in updated estimates and recommendations for the reconstruction of those freeways. SEWRPC's study, which was completed in 2003, recommended improvements to the freeway system, including the con-

struction of additional lanes on 127 miles out of a total of 270 miles in the system. SEWRPC estimated the cost of the system reconstruction at $6.23 billion in 2000 dollars. The Department's estimate of reconstructing the freeway system in its long-range highway plan, which included a recommendation to add lanes on 57 miles of freeway, was $5.4 billion in 1999 dollars.

Although long-range highway plans like the 2020 state highway plan cover a period of 20 years or more, they generally must be updated every several years to take into account changing conditions and reconsider various transportation goals. The Department is currently in the process of developing a new transportation plan that will replace the 2020 highway plan, as well as the existing plans for other modes of travel. The new plan, called *Connections 2030,* identifies travel corridors throughout the state, including important transportation facilities of various modes within the corridor. Unlike the prior plan, *Connections 2030,* when complete, will identify the transportation system outcomes associated with various spending levels, including a scenario in which funding does not increase over current levels.

Programming

The programming stage involves selecting and scheduling improvement projects based on available funding and policy priorities. In developing this schedule, decisions must be made on which projects should be given highest priority, relying, in part, on the adopted highway plan, which outlines the broad policy goals of the highway program.

The task of programming projects is either done by staff in the transportation regions or by DOT central office staff, depending upon the type of project. Major highway development projects, large or costly bridge projects, and rehabilitation of multi-lane highways are programmed by the central office, while other rehabilitation projects are programmed by the regional transportation offices. The portion of the rehabilitation budget that is reserved for the more routine highway and bridge projects is allocated to the regions based on an estimate of the total rehabilitation needs within each region. Regional offices develop project schedules based on the amount allocated to the region. Although there is some central oversight of this process, the regions are given considerable discretion in choosing which projects to put into the schedule.

Since the number of major highway development projects and larger highway and bridge rehabilitation projects may vary considerably from year to year within a given region, these projects are scheduled by the central office. This way, regions are not forced to exhaust their allocations on large projects, thereby neglecting more routine rehabilitation.

The DOT central office, in consultation with the regional offices, compiles program schedules for the following six years for the major highway development and rehabilitation programs into a comprehensive, six-year program. The six-year program, which is updated periodically based on changes in funding and in the plans for individual projects, provides a listing of all anticipated projects that indicates the type of project, the location, estimated cost, and scheduled construction date. The first two years of the six-year program are based on funding levels provided by the most recent biennial budget. The other years are also based on this funding level, although the schedule for projects in the later years is more likely to change, since funding levels may be changed in subsequent biennial budgets.

Design

The design process typically begins far in advance of actual construction. For major highway projects, the design stage may take eight to 10 years, beginning with concept development. Sim-

ple resurfacing projects may take one to two years. In part, the length of the design process is dictated by the amount of data that must be collected to complete required environmental reviews and to create the detailed plans for construction. Furthermore, because highway construction affects private landowners, as well as the driving public, the Department uses an extensive public involvement process to receive and respond to multiple concerns regarding proposed projects. In addition, the highway engineers must have detailed information on the quality and type of soil and the physical characteristics of the landscape in order to put together the design proposal, which is eventually used to put the project up for bidding.

In addition to the design work that is directly related to the construction of the highway, there are numerous other preconstruction activities that lengthen the process. For instance, the Department frequently must purchase land for the construction of a new highway or the expansion of an existing highway. This requires negotiation with affected landowners.

For most highway projects the design stage includes environmental studies and mitigation. If an initial environmental assessment on a project determines that the impacts of the project on the environment could be significant, federal and state laws require the Department to do (or to contract for) an environmental impact statement. Because projects can harm or destroy wetlands or other sensitive wildlife habitat, these consequences must be reported in advance of the project. In response to these expected impacts, the Department must plan to restore or create wetlands to replace those destroyed by the highway project. Environmental impact statements also forecast the effects on residential and commercial development and identify impacts on historically or archaeologically significant sites. When possible, the Department must also respond to these impacts. The impact statements and the mitigation plans must be approved by the federal government, which can increase the amount of time required to complete the design phase.

Funding for the design process is provided within the appropriations for the corresponding programs. During recent biennia, the design budget has been established at about 15% of the net construction program size (total construction budget less funds provided for construction engineering). The design function is carried out by a combination of DOT staff (both in the Division of Transportation Investment Management and the district offices) and private firms.

Construction

The construction stage involves the preparation of projects for bidding and the oversight of the construction work done by contractors. The preparation of bids is done within DOT's central office, while the management of project construction is done by staff in the regional transportation offices.

Projects are put up for bidding every month, generally on the second Tuesday. Although project bidding is spread throughout the year, the busiest months are in the winter and early spring, which allows the largest projects to begin early in the construction season.

The preparation of a project for bidding starts when a design is completed by regional office personnel or an engineering consultant. DOT central office staff review the completed project design to ensure that all of its elements are consistent with state standards and then, from the design, develop a project proposal. The proposal contains estimates of the amount and type of work needed to complete the project. For instance, the proposal may provide an estimate of the amount of excavation or crushed rock needed, typically expressed in cubic meters or cubic yards.

Once the proposals have been completed, the project is advertised, which occurs about five

weeks in advance of the bidding date. Contractors interested in a making a bid on a project request a copy of the proposal from the Department, which the Department provides on a compact disc. The bids are submitted on a cost-per-unit basis. That is, contractors estimate how much it would cost them to deliver one unit of every item in the proposal. Once the bids are received, the unit prices are multiplied by the estimated quantities and then totaled to arrive at the final bid price. If there are no irregularities in the submitted bids, the firm with the lowest bid receives the contract.

Once construction begins, a project manager monitors the work done by the contractor. Project managers may be DOT staff from the regional office or engineering consultants hired by the Department. Project oversight typically involves the monitoring of construction materials and techniques for quality and may involve making minor modifications to the design of the project to account for unanticipated contingencies. For some projects, the extent of DOT monitoring may be limited because the contracts contain warranty provisions that require the contractor to repair any defects that appear within a specified number of years after the completion of the construction.

Major Highway Development

The major highway development program provides for the development and construction of new or significantly altered highway projects. Major highway projects are defined as projects that have an estimated cost exceeding $5,000,000 in current dollars and consist of at least one of the following: (a) construction of a new highway of 2.5 miles or more in length; (b) relocation of 2.5 miles or more of existing roadway; (c) the addition of one or more lanes at least five miles in length; or (d) the improvement of 10 miles or more of an existing divided highway to freeway standards. Projects providing an approach to a bridge over a river that forms a boundary of the state are excluded from this definition. Also excluded, since 2001, are any highway expansion projects on the freeways of southeast Wisconsin. These projects are done under the southeast Wisconsin freeway rehabilitation program.

Major Highway Project Selection Process

The process for selecting projects for the major highway development program involves the Legislature to a greater extent than other highway projects since all major highway projects must be enumerated in the statutes prior to beginning construction. In order to assist in this process, the Transportation Projects Commission (TPC) was created to review proposals for major projects and make recommendations to the Governor and Legislature as to which ones should be enumerated. The TPC includes the Governor, who acts as the chairperson, five senators, five representatives, three public members appointed by the Governor, and the Secretary of Transportation (a nonvoting member). In a change adopted in the 2003 legislative session, the statutes specify that a project may not be enumerated unless the TPC has recommended the project for approval.

In addition to making recommendations for project enumeration, TPC approval is also required before DOT can start an environmental impact statement (EIS) or environmental assessment (EA) on a project. Since a potential project must first receive TPC approval prior to the start of an EIS or EA and then, after the environmental documents are completed, must be recommended by the TPC for enumeration, the approval of a project by the Commission proceeds in a two-phase process that takes at least two biennial cycles. The typical approval process proceeds as follows.

1. DOT selects potential projects for preliminary consideration based on its analysis of congestion, safety, and public interest.

2. DOT presents a list of potential projects that are considered to be good candidates for proceeding with an EIS or EA to the TPC. The statutes specify that DOT is to present this list by October 15 of odd-numbered years.

3. By March 15 of the following year (even-numbered year), DOT makes a recommendation to the TPC as to which projects should be allowed to proceed to the EIS or EA stage.

4. By the next April 15, the TPC approves a list of projects that may proceed to the EIS or EA stage.

5. Upon completion of the environmental documentation, DOT again presents the project to the TPC for consideration. Typically, a list of these projects are presented in the spring of even-numbered years, but given the time needed to complete the environmental documentation, this may be two years following the approval of the project by the TPC that allowed DOT to proceed with the EIS or EA. For more complex or controversial projects, this stage may be delayed by more than one two-year cycle. The TPC holds public hearings at different locations in the state on the candidate projects.

6. DOT reports its recommendation for projects to be enumerated in the next biennial budget to the TPC by September 15 (even-numbered years). DOT assigns a score to each project using a system outlined in an administrative rule. The system assigns each project a score between zero and 100 for each of five criteria. Each of these scores is multiplied by a weighting factor to determine a final score. The criteria and their weights are, as follows: (a) enhances Wisconsin's economy (40%); (b) improves highway safety (20%); (c) improves traffic flow (20%); (d) minimizes undesirable environmental impacts (10%); and (e) serves community objectives (10%). According to the administrative rule, a project must be worse than the average highway of the same type in terms of either traffic congestion or highway safety to be recommended to the TPC.

7. By the following December 15, the TPC submits its recommended list of projects to be enumerated to the Governor and Legislature. The TPC may or may not include the projects recommended by DOT and may add additional projects. The TPC may designate an otherwise nonqualifying project if it receives a petition for such designation from a city or village for a project that is within its corporate limits and is estimated to cost $2,000,000 or more, provided that the project is not a freeway.

In another change adopted in the 2003 legislative session, the TPC is prohibited from recommending a project for enumeration unless a final EIS or EA has been approved by the Federal Highway Administration. Previously, projects were enumerated prior to the completion and final approval of the environmental documentation, which could result in lengthening the time between enumeration and construction if the EIS had not been completed. Under the change, projects should be closer to construction at the time of enumeration. It should be noted, however, that this will not necessarily shorten the overall time between the start of the environmental process and completion of the project, but instead will result in the enumeration of the project at a later stage.

The TPC is prohibited from recommending a project for enumeration unless the project, along with all other enumerated projects, can be started within six years following the project's enumeration, assuming a constant, real-dollar program size throughout the period. The Commission, however, may recommend a project that could not otherwise be started within the six-year time period if it also recommends a funding proposal for the major highway development program that would allow the project to be started in six years.

In part because of the prohibition against rec-

ommending a project for enumeration before a final environmental document is completed, and the financial constraint provisions, the TPC did not meet in either 2004 or 2006 to consider new projects for enumeration. The last time projects were enumerated, therefore, was in the 2003-05 biennial budget.

Enumeration gives DOT the authority to build a project, but does not establish a statutory priority or timetable or require a specific design. It also does not require DOT to actually construct the project. Consequently, DOT has the authority to begin an enumerated project either before or after the date indicated in TPC or legislative discussions. With a few exceptions, however, the Department has typically undertaken projects in the same order that they were enumerated.

The Department is required to publish a report twice each year providing an update on the estimated cost of each enumerated project. According to the Department's August, 2006, report, the remaining cost to complete all enumerated projects was $2,416.3 million, which was $248.1 million higher than the previous report, published in February, 2006. Since no new projects were added to the list between these two reports, the increase in costs is due entirely to increases in the cost of construction and real estate, or to changes to the scope of existing projects. As of this time, the Department has not developed a new project schedule reflecting the new cost estimates.

Table 2 shows the list of enumerated highway projects that have not yet been completed. The final two columns show the total cost of each project and the remaining estimated cost, as of the Department's August, 2006, report. Projects that are substantially complete, but have some auxiliary costs remaining, are not listed individually in the table. Instead, the remaining costs are included under the heading "Minor Work to Complete Other Projects." In some cases, however, the remaining costs can be significant and so these projects are listed. For instance, although the Eau Claire freeway is complete, some work will continue on the existing USH 53 and other local streets within the city at various points over the next several years.

State Highway Rehabilitation Program

DOT allocates funding in the state highway rehabilitation program between three subprograms: (1) existing highway improvement; (2) backbone rehabilitation; and (3) state bridges. The purpose of each of these subprograms is to preserve and to make limited improvements on the state highway system.

Existing Highway Improvement and Backbone Rehabilitation

The existing highways and backbone rehabilitation components of the rehabilitation program are responsible for highway surface improvement projects. The existing highway component is responsible for projects on state highways that are not Corridors 2020 backbone routes. These projects are programmed by regions using funds set aside for regional allocation. Backbone highways, including interstate highways, are typically more expensive to rehabilitate, so these projects are programmed by the central office, in consultation with the regional offices. However, rehabilitation of southeast Wisconsin freeways, as of 2001, are the responsibility of the southeast Wisconsin freeway rehabilitation program instead of the state highway rehabilitation program.

Highway rehabilitation projects can generally be divided into three main types: resurfacing, re-

Table 2: Enumerated Major Highway Projects Remaining to be Constructed ($ in Millions)

	State Trunk Highway	County	Total Est. Cost**	Remaining Cost**
Projects Enumerated in 1989				
Waupaca to Stevens Point*	10	Waupaca & Portage	$82.9	$18.6
Stevens Point to Marshfield	10	Portage & Wood	221.0	213.0
Waupun to Fond du Lac	151	Fond du Lac	127.8	47.2
Projects Enumerated in 1991				
Whitewater Bypass*	12	Jefferson & Walworth	38.3	5.2
Projects Enumerated in 1993				
Beloit Bypass	81/213	Rock	7.8	7.7
Sauk City to Middleton*	12	Dane	136.4	14.2
Houlton to New Richmond*	64	St. Croix	116.5	26.0
Fond du Lac Bypass*	151	Fond du Lac	48.6	9.9
Projects Enumerated in 1995				
Oconomowoc Bypass*	16/67	Jefferson & Waukesha	53.0	10.9
Eau Claire Freeway*	53	Eau Claire & Chippewa	176.3	59.7
Projects Enumerated in 1997				
Burlington Bypass	11	Walworth & Racine	144.9	122.2
I-90/94 to Ski Hi Road	12	Sauk	155.0	144.7
La Crosse Corridor	53	La Crosse	118.1	117.0
Dyckesville to STH 42	57	Kewaunee & Door	96.7	55.6
STH 22 to STH 64	141	Oconto & Marinette	64.9	7.9
Projects Enumerated in 1999				
Oconto to Peshtigo	41	Oconto & Marinette	170.8	162.5
STH 67 to USH 41	23	Sheboygan & Fond du Lac	95.6	93.5
Projects Enumerated in 2001				
Janesville to Watertown	26	Rock, Jefferson & Dodge	342.4	328.2
Wausau Beltline	39/51	Marathon	279.3	145.0
Projects Enumerated in 2003				
Viroqua to Westby	14	Vernon	51.6	50.4
Prairie du Chien to STH 60	18	Crawford	24.9	23.2
De Pere to Suamico	41	Brown	416.5	413.6
STH 26 to Breezewood Lane	41	Winnebago	337.5	334.7
Minor Work to Complete Other Projects				5.4
Total				$2,416.3

* Mainline highway of the project is substantially complete as of December, 2006. Remaining costs reflect items such as related work on the local road system. For other projects that are substantially complete, the auxiliary costs may be for items such as fencing or landscaping. Estimates of these amounts are shown under "Minor Work to Complete Other Projects."

** Cost estimates are from DOT's August, 2006, report on the major highway program.

conditioning (further classified as major or minor), and reconstruction. These types of rehabilitation are described below.

Resurfacing means placing a new surface on existing pavement to provide a better, all-weather surface and a better riding surface, and to extend or renew the life of the pavement. It generally does not involve improvement in traffic capacity or geometrics (roadway characteristics such as road width and the number and severity of roadway curves and hills). Resurfacing may include some elimination or shielding of roadside obstacles, culvert replacements, installation of signals, marking

signs, and intersection improvements. Usually, the acquisition of additional right-of-way is not required, except possibly minor acquisition for drainage and intersection improvements.

Reconditioning refers to work in addition to resurfacing. Minor reconditioning includes pavement widening and shoulder paving. Major reconditioning includes the improvement of an isolated grade, curve, intersection, or sight distance problem to improve safety. Major reconditioning projects may require the acquisition of additional land for right-of-way.

Reconstruction means the total rebuilding of an existing highway to improve maintainability, safety, geometrics, and traffic service. Major elements may include flattening of hills and grades, improvement of curves, widening of the roadbed, and elimination or shielding of roadside obstacles. Normally, reconstruction would require additional acquisition of right-of-way.

DOT also uses a special classification of reconstruction called pavement replacement. This type of project, like all reconstruction projects, involves the complete rebuilding of the roadway pavement and base. However, pavement replacement generally does not involve changes in the road alignment and does not require additional right-of-way. This type of project is done where an existing pavement and base have deteriorated to the point of needing replacement, but where the road was originally built to high standards, and thus does not need geometric improvements. This is commonly the case on rural interstate highways.

The selection of specific projects is based on an evaluation of surface pavement condition, the number and severity of hills and curves, accident numbers and rates, and traffic congestion. This process, which is also used in preparation of the six-year highway program, allows DOT to identify existing conditions and improvement needs.

In addition to these main highway rehabilitation types, the existing highway and backbone rehabilitation components of the rehabilitation program fund a number of other activities, including: (a) pavement maintenance work that is less extensive than full resurfacing, but more extensive than the pavement repair normally done in the maintenance component of the highway program; (b) additions or deletions to the state trunk highway system through jurisdictional transfer agreements with local governments; (c) improvements to permanent weigh scale facilities; (d) construction projects at rest areas; (e) hazard elimination safety projects; (f) noise barriers; and (g) wetland mitigation projects.

State Bridge Improvement Program

The state bridge improvement program provides funding for the replacement or rehabilitation of deficient bridges on the state trunk highway system. Bridge deficiencies may include: (a) structurally deficient bridges; (b) functionally obsolete bridges, characterized by narrow roadways, restricted clearances, or poor alignment; and (c) bridges that have load capacity restrictions. To monitor bridge conditions and to assist in assessing deficiencies, DOT maintains a computer-based bridge appraisal system. This system is developed from bridge field inspections and central office appraisal of the inspection results.

Most bridge projects are programmed by regional offices using regional allocation funds. DOT allocates funds to the regions for both the bridge and existing highway rehabilitation components of the rehabilitation program, but these sources are combined, so regions can program any mix of bridge and highway projects, as needed.

High-cost bridge rehabilitation projects, however, are programmed by the central office in order to avoid reducing the efforts by the regional offices to improve lower-cost, deteriorating bridges. High-cost bridges are bridges with a deck area greater than 40,000 square feet. Table 3 lists

Table 3: High-Cost Bridges Scheduled Between 2007 and 2012 ($ in Millions)

County	Highway	Bridge	Final Contract Year*	Estimated Cost (2006 Dollars)
Door	Local	Maple – Oregon, Sturgeon Bay	2007	$30.0
Outagamie	Local	College Avenue, Appleton	2008	7.6
Crawford	USH 18	Mississippi River, East Channel	2008	3.3
Crawford	USH 18	Mississippi River, West Channel	2008	5.0
Winnebago	STH 44	Fox River, Oshkosh	2008	20.4
Marathon	STH 153	Main Street, Mosinee	2008	5.6
Door	Local	Michigan Street, Sturgeon Bay	2009	12.0
Iowa & Sauk	USH 14	Wisconsin River, Spring Green	2009	9.5
Adams & Juneau	STH 82	Wisconsin River, Point Bluff	2012	5.5
Brown	STH 96	Fox River, Wrightstown	2012	8.1

* "Final contract year" reflects the year that the Department expects to let the final major construction contract for the project. In some cases, the project may not be completed until the following year.

the high-cost bridge rehabilitation projects that DOT anticipates constructing between 2007 and 2012. In some cases, local governments may be required to pay for a portion of the cost of constructing these bridges, but the table shows only the portion of the cost paid with state or federal funds.

Southeast Wisconsin Freeway Rehabilitation

The 2001-03 biennial budget, 2001 Act 16, created a separate program for the rehabilitation and expansion of southeast Wisconsin freeways. Under this program, southeast Wisconsin freeways are considered to be any state trunk highways within Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, or Waukesha counties that have four or more lanes of traffic physically separated by a median barrier and that give preference to through traffic by limiting traffic access to interchanges only. 2001 Wisconsin Act 109 modified the program by prohibiting the Department of Transportation from performing any rehabilitation, which includes, for the purposes of this provision, the addition of any lanes to existing southeast Wisconsin freeways, using the appropriations for state highway rehabilitation or major highway development.

The first freeway reconstruction project initiated since the creation of a separate program for southeast Wisconsin freeway rehabilitation was the reconstruction of the Marquette Interchange in Milwaukee. Construction on the project began in 2004 and is currently scheduled to be completed in 2008. A total of $783 million has been provided for the project through the 2005-07 biennium. The Department estimates that an additional $27 million will be spent to finish the project in the 2007-09 biennium, bringing the total estimated cost to $810 million.

Following the completion of the Marquette Interchange project, the Department's plan is to begin work on other southeast Wisconsin freeway reconstruction projects, beginning with the segment of I-94 between the Mitchell Interchange in Milwaukee County and the Illinois state line. The Department plans to begin preliminary work (environmental studies and design) on the project and begin construction on certain interchanges along the freeway during the 2007-09 biennium, provided that the funding for these activities is provided.

In addition to the project on I-94 between Milwaukee and the Illinois border, the Department has

indicated its intention to also begin some preliminary activities for the reconstruction of the Zoo Interchange (I-94, I-894, and USH 45) during the 2007-09 biennium.

As of this time, the Department does not have an updated estimate of the cost of these two projects, but the 2003 freeway system study conducted by the Southeastern Wisconsin Regional Planning Commission (SEWRPC) included estimates of the cost of reconstructing the freeway system for all segments and interchanges. According to that study, the cost of the I-94 project between the Mitchell Interchange and the state line was $915 million in 2000 dollars if an additional lane in each direction is added, or $803 million if no new lanes are added. The cost of the Zoo Interchange was estimated at $412 million with additional capacity or $398 million without additional capacity. Updated estimates will be produced as the result of more detailed engineering studies, and may differ from these amounts if the project limits differ from those used in SEWRPC's study.

The total estimated cost of the freeway system reconstruction in SEWRPC's report is $6.25 billion over a 30-year period (2001 to 2030), or an average of just over $200 million per year. It should be noted that SEWRPC's study is a recommendation regarding what action to take. The final decision as to when and how to reconstruct the freeways will be made by the Governor and Legislature.

Any future construction project on southeast Wisconsin freeways that adds lanes to a freeway five or more miles in length would be constructed under the southeast Wisconsin freeway rehabilitation program, instead of the major highway development program. Like capacity expansion projects done under the major highway development program, southeast Wisconsin freeway capacity expansion projects must be enumerated in the statutes prior to the start of construction. Unlike major highway development projects, however, southeast Wisconsin freeway expansion projects do not have to be reviewed and recommended for enumeration by the Transportation Projects Commission. No lane expansion projects have been enumerated for southeast Wisconsin freeways as of the end of the 2005 legislative session.

Maintenance, Repair, and Traffic Operations

The final component of the state highway program is the maintenance, repair, and traffic operations program. This program is responsible for a variety of activities related to the upkeep of state highways and highway rights-of-way. Unlike the other state highway program components, the activities performed under the maintenance and traffic operations program generally do not require extensive planning and design. The maintenance programs are divided into two program areas: (a) highway maintenance; and (b) highway traffic operations. Each is described below.

Highway Maintenance

The majority of state trunk highway maintenance activities are performed by county workforces under contract with the state. Generally, the counties perform the actual maintenance activities and DOT sets statewide maintenance policies and (primarily through the regional offices) oversees their work. This arrangement has existed in its current form since 1932, although counties were involved in some way in the maintenance of state roads prior to that time.

Two areas of general maintenance are performed primarily by private contractors: (a) vegetation management, including plantings, inventory, and the spraying of herbicides along roadsides; and (b) the maintenance of year-round rest areas by disabled citizens participating in sheltered workshops.

Highway maintenance can generally be separated into two types of activities, winter maintenance and general maintenance.

Winter maintenance involves the maintenance and upkeep of state trunk highways during the winter season. The principal activities performed under this program are snowplowing, drift control, and application of de-icers. These activities are performed almost entirely by county workforces under contract with the state. The state, however, purchases de-icing salt directly and provides it to the counties for use on state highways.

General maintenance involves the daily or periodic repair and upkeep of state trunk highways, including the following activities:

- mowing and weed control, brush and tree removal, trash pickup, and recycling;
- maintenance of rest areas, tourist information centers, waysides, scenic overlooks, and historical markers, including parking, picnic, and toilet facility improvements;
- surface, base, and shoulder repair;
- minor bridge repair;
- plantings and landscaping in rest areas and other areas;
- emergency repairs and accident cleanup;
- drainage, culvert landscaping, erosion control measures, and guard fence repairs;
- lift bridge and ferry operation; and
- repair of damaged traffic signs.

Maintenance Costs

Counties are reimbursed for state maintenance work based on three criteria: (a) county labor costs; (b) county machinery costs; and (c) materials supplied by the county. DOT uses a reimbursement formula that is based on all counties' actual machinery costs, averaged over a period of five years, and each county's employee wage rates. Due to variable county labor contracts, some counties receive a higher hourly reimbursement rate than others.

In order to exercise control over the amount of general maintenance work that is done on state highways, the contract that DOT enters into with the counties establishes a maintenance budget for each county. The budget is established based on a consideration of various factors present in each county, such as the type of state highways (for example, concrete versus asphalt or multi-lane freeway versus two-lane highway), number of lane miles of each type, condition, and amount of traffic. Once established, counties are generally expected to stay within that budget. This may mean that a county may be directed to curtail certain maintenance activities late in the year to stay within the established budget if expenditures earlier in the year were higher than expected.

Highway Traffic Operations

Highway traffic operations involve the installation of traffic control and safety devices designed to enhance the orderly and efficient flow of vehicles on existing state trunk highways. Highway traffic operation functions include: (a) pavement marking activities, such as centerline and edge line painting, channelization lines, stop lines, curb and crosswalk lines, or the installation of raised centerline reflectors; (b) highway signing activities; (c) traffic signalization activities; and (d) highway lighting activities.

Prior to the passage of the 2001-03 biennial budget (2001 Act 16), many of the capital expenditures under the traffic operations program, such as the installation of traffic signals, signs, and highway lights, were funded from the state and federal appropriations for state highway rehabilitation. A provision included in Act 16, however, required that these expenses be funded from the maintenance and traffic operations appropriations, unless they are included in a larger highway improvement project. The provision also mandated that the installation of any intelligent transportation sys-

tem, unless included in a highway improvement project, be funded from the maintenance and traffic operations appropriations instead of from the highway rehabilitation appropriations, as had previously been the case. Intelligent transportation systems are designed to improve traffic flow and provide the public with information on traffic conditions in urban areas using such devices as freeway ramp meters, variable message signs, and traffic cameras.

To account for this shift in program responsibilities, $27.0 million was provided in the maintenance and traffic operations appropriation in 2001-02 for these functions, which was the approximate amount that the Department indicated had previously been spent from the state highway rehabilitation appropriation for these functions on an annual basis. In 2002-03, however, the amount provided for these functions was reduced to $7.4 million and, in subsequent years, this amount was eliminated. In response, the Department has reduced capital expenditures on traffic operations items and has financed this reduced level from other base maintenance and traffic operations funds.

State Trunk Highway Program Finance

The state trunk highway program is funded through several sources. Traditionally, funding for the highway programs has been provided with funds from the state transportation fund, federal highway aid, and transportation revenue bonds. In the 2003-05 and 2005-07 biennia, however, state transportation fund dollars were used as part of a strategy to balance the state's general fund budget, which resulted in a different mix of funding for the highway programs. In short, general obligation bonds were used in both biennia to replace transportation fund revenues in the highway improvement programs so that, in turn, transportation fund revenues could be used to assist general fund programs. The amount of bonding provided for this purpose is discussed later in this section, but for a more detailed discussion of these provisions, see the Legislative Fiscal Bureau's informational paper entitled "Transportation Finance."

State Funding

The segregated state transportation fund is the state funding source for the state trunk highway program. The transportation fund is a separate, nonlapsible trust fund administered by DOT. The primary revenue sources for the transportation fund include a motor fuel tax, motor vehicle and driver's license fees, railroad taxes, and aeronautical taxes and fees.

Table 4 shows total state transportation fund revenues appropriated for the state highway program for the past 10 biennia. As can be seen in this table, transportation fund appropriations for the highway programs were lower in the 2003-05 and 2005-07 biennia than they were in prior biennia, which is the result of the use of transportation fund revenues to assist the general fund.

Table 4: State Trunk Highway Programs - State Transportation Fund Appropriations

Biennium	State Segregated Appropriations	Change From Prior Biennium
1987-89	$563,571,500	
1989-91	622,130,700	10.4%
1991-93	632,628,200	1.7
1993-95	707,424,600	11.8
1995-97	765,822,000	8.3
1997-99	846,210,500	10.5
1999-01	930,437,100	10.0
2001-03	1,032,255,800	10.9
2003-05	457,307,900	-55.7
2005-07	866,582,900	89.5

Bonding

Revenue bonding authority has been used as an ongoing state funding source for the highway program since the early 1980s. Revenue bonds, as opposed to general obligation bonds, are repaid solely from a dedicated revenue source. In the case of transportation revenue bonds, the dedicated revenue source is the motor vehicle registration fee and related vehicle fees. To ensure the stability of the bonds for investors, bond repayment receives first priority on those revenues.

Revenue bond proceeds are used to fund the construction of major highway development projects and administrative facilities. Bonding authority is generally provided with each biennial budget act. Enough bonding is authorized for anticipated use during the biennium, plus an additional amount to allow projects begun in that biennium to be completed in subsequent years in the event that additional funds or bonds are not provided in a timely fashion for those years. This funding strategy, in contrast to the standard biennial approval of state expenditures, is employed to reflect the high cost and long-term nature of the projects, which may span multiple biennia. Although the approval of unused revenue bond authority could be rescinded by a future legislative action, the early legislative approval of this form of expenditure authority for long-term construction projects is provided as a means of assuring the completion of a project once it is begun.

As noted earlier, general obligation bonds were also used in the state highway programs during the 2003-05 and 2005-07 biennia to replace transportation fund revenues. In the 2003-05 biennium, a total of $565.5 million was authorized for highway improvements and in the 2005-07 biennium, $250.0 million was authorized. Debt service payments on these bonds are being paid from the general fund.

Separate from these general obligation bonds, which were provided to replace transportation fund revenues, the 2005-07 budget also provided $213.1 million in general obligation bonds for the Marquette Interchange reconstruction project as a key part of financing that project. Debt service on the Marquette Interchange bonds is paid from a transportation fund appropriation.

Federal Funding

Federal funds are distributed based on multi-year federal surface transportation authorization acts. The current act is entitled "Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users" or SAFETEA-LU.

Table 5 shows the amount of federal formula-based highway aid (this excludes discretionary grants and Congressional earmarks for specific projects) received in each year since 1991.

Table 5: Federal Formula-Based Highway Aid History ($ in Millions)

Year	Amount
1991	$239
1992	324
1993	305
1994	341
1995	346
1996	331
1997	375
1998	410
1999	465
2000	498
2001	531
2002	549
2003	536
2004	596
2005	579
2006	587

Federal highway funds are spent both in the state highway program and in other DOT programs, such as: (a) the local transportation facility improvement assistance program, which funds rehabilitation projects on principal streets and highways under local jurisdiction; (b) the local bridge improvement assistance program; (c) the conges-

tion mitigation and air quality improvement program, which provides funds for projects designed to reduce traffic congestion and pollution caused by vehicles; (d) the transportation enhancements program, which provides grants for bicycle and pedestrian facilities and the rehabilitation of historic transportation facilities; and (e) the railroad crossing improvement program, which mainly funds the installation of crossing warning signals and gates.

In the state highway program, federal appropriations are estimates of funding to be received and do not control the amount that may be spent. DOT can spend all funds received from federal sources, not just the amounts specifically estimated by the Legislature in budgetary schedules.

DOT is required, however, to submit a plan for making adjustments to its appropriations to the Joint Committee on Finance for the Committee's approval if the amount of federal aid received in a given year differs by more than 5% from the amount estimated.

Local Funding

Local funds for the improvement of state trunk highways are provided principally to fund portions of a project that are a local priority. Local funds can include both monies from local governments and private businesses. In conjunction with DOT's improvement projects, local communities fund certain project components that are not eligible for state or federal funding. These local initiatives may include sidewalks, curbs, gutters, special access traffic lanes for local traffic, lighting, and other traffic control features.

Local cost sharing is required by DOT for: (a) the cost of items not directly associated with the transportation services provided by the highway project, such as parking lanes; (b) costs incurred at state and local road interchanges and intersections, with local units paying for the costs on the local road and sharing in the costs of the interchange bridges; (c) 25% of the cost of preliminary engineering for all improvements on connecting highways; and (d) a portion of the costs for improvements on state trunk highways, or connecting highways, that provide a substantial, direct benefit to a community or its members.

Funding Level

Table 6 shows the funding, by source, for the four components of the state highway program, plus for administration and planning. Since local funding is not used for programming purposes and the actual amounts used are not reflected in budget appropriations, this funding source is not included in the table.

Table 7 shows total funding (excluding local funding) for the five components of the highway program for the past six biennia.

Table 6: State Trunk Highway Programs -- 2005-07 Biennium Funding ($ in Millions)

Program	Gen. Ob. Bonds	Revenue Bonds	Current Revenue Funding Sources: State	Current Revenue Funding Sources: Federal	All Sources
Major Highway Development	$0.0	$297.6	$87.2	$158.0	$542.7
State Highway Rehabilitation	250.0	0.0	311.0	644.8	1,205.8
Southeast Wisconsin Freeway Rehabilitation	213.1	0.0	82.3	175.8	471.3
Highway Maintenance, Repair, and Traffic Operations*	0.0	0.0	352.6	2.2	354.8
Administration and Planning	0.0	0.0	33.4	8.7	42.1
Total	$463.1	$297.6	$866.6	$989.5	$2,616.7

NOTE: Totals may not add due to rounding.

* Includes an appropriation for the operating costs of state-owned lift bridges.

Table 7: State Trunk Highway Program Funding History -- All Funds ($ in Millions)

	Major Highway Development	State Highway Rehabilitation	Southeast Wisc. Freeway Rehabilitation*	Highway Maintenance/ Traffic Operations	Administration and Planning	Total
1995-97	$338.8	$853.4	---	$277.2	$40.3	$1,509.7
1997-99	402.8	1,002.8	---	290.2	45.4	1,741.2
1999-01	439.5	1,107.8	---	311.4	50.5	1,909.2
2001-03	473.6	1,142.0	$203.9	363.3	49.0	2,231.8
2003-05	482.6	1,098.4	262.9	333.2	50.8	2,227.9
2005-07	542.7	1,205.8	471.3	354.8	42.1	2,616.7

*This program component was part of the state highway rehabilitation component prior to the 2001-03 biennium.