

PROJECT PRIORITIZATION & PROJECT SELECTION

The demand for transportation improvement far exceeds the funds available. Good stewardship mandates that the agency use limited dollars to preserve and improve Vermont's transportation assets in the most efficient manner. The agency must apply asset management principles to take a long-term view of the overall transportation network, and choose activities that minimize long-term costs.

The agency owes transportation stakeholders an explanation of why one project was chosen over another. To that end, the agency developed a quantitative project prioritization method that assigns a numeric score to competing projects. This score is a crucial part of the *Road to Affordability* program. Under that strategy, more emphasis is placed on preserving bridges, pavement, culverts and other assets. Priority scores guide VTrans and other stakeholders as to which projects to postpone and which ones to accelerate.

Project prioritization is the result of legislation in 2005 and 2006. Sec. 48 of Act 175 19 V.S.A. paragraph 10b(c) of the 2006 Legislative Session directs the Agency of Transportation to explain how projects are prioritized and selected for inclusion in the annual budget.

The legislation reads:

The agency of transportation, in developing each of the program prioritization systems schedules for all modes of transportation, shall include the following throughout the process:

The agency shall annually solicit input from each of the regional planning commissions and the Chittenden County Metropolitan Planning Organization on regional priorities within each schedule, and those inputs shall be factored into the prioritizations for each program area and shall afford the opportunity of adding new projects to the schedules.

Each year the agency shall provide in the front of the transportation program book a detailed explanation describing the factors in the prioritization system that creates each project list. (Emphasis added: This write-up satisfies that directive.)

The legislation builds on Section 53 of Act 80 19 V.S.A. paragraph 10g of the 2005 session. That legislation requires the Agency to develop a numerical grading system to assign a priority rating to paving, roadway, bridge, and bridge maintenance projects. It requires the rating system to include asset management-based factors which are objective and quantifiable including:

- Safety
- Traffic volume
- Availability of alternate routes
- Future maintenance and reconstruction costs
- Priorities assigned by the regional planning commission or the MPO

The legislation also requires that the Agency consider the functional importance of the highway or bridge to the economy as well as its importance to the social and cultural life of the surrounding communities.

The agency is prioritizing projects related to bridge, pavement, roadway, buildings, bike/pedestrian, park & ride lots, aviation, rail, transportation enhancements, and new public transit routes. Each Program Manager develops a method appropriate for the asset. Those methods take advantage of available data and technology.

Background:

The agency started the project prioritization program in 2005 and expanded it in 2006. It continues to evolve in 2007 for the FY'09 budget. The Agency strives to minimize long-term costs by using available data and engineering analysis to determine the optimum treatment at the right time.

As explained in the following document, the priorities balance agency asset-management principles with regional priorities. Local transportation priorities are an important factor that helps determine where a project falls on the Agency's prioritization list. Each Regional Planning Commission (RPC) and the Metropolitan Planning Organization (MPO) rank all projects in their region in order of importance. These rankings are given "weight" within the Agency's scoring process to reflect a region's needs.

RPC/MPO Input:

As of 2007, VTrans has gone through three iterations of project prioritizations with the RPCs/MPO. VTrans is doing the following:

By February 1 of each year, VTrans' Policy & Planning Division produces a list of all Capital Program projects that are not yet under contract. The RPCs/MPO prioritize these projects and return the results to the Agency by June 1. The VTrans Policy & Planning Division assembles the RPC/MPO priorities and delivers them to the Program Managers who incorporate the priorities into their own scores. These scores drive the budget for the fiscal year starting twelve months later.

In 2007, the agency implemented a process for RPCs/MPO to formally request a "critical need" new project to be added to the transportation program. The project request must clear a very high hurdle since the state simply cannot afford to add to the large project backlog. We do recognize, however, that in some highly unusual cases a critical new project might rise to the top. RPCs/MPO may submit documentation for a critical-need project to VTrans. It will be evaluated by a team in VTrans after which VTrans will accept or deny project. The process is described in another document titled *Criteria and Process for Considering Critical Need Project Requests* provided to the RPCs/MPO.

PRIORITIZATION FACTORS BY PROJECT TYPE

Paving:

The Paving Section is responsible for providing the traveling public with the best highway surface condition, with the funding available, using a variety of surface treatments. The Paving Section collects information about pavement surface condition with a specially equipped van that measures several factors including rutting, cracking, and pavement roughness. These data are analyzed for the entire State Highway network to determine the optimum treatment to maximize the pavement's life expectancy. These factors are combined with regional priorities to develop the annual paving program.

Factors for paving are:

- Pavement Condition Index (17.5 points)
 - Weighted based on condition; more points are assigned for higher levels of deterioration.
- Benefit/Cost (65 points)
 - The B/C is provided by the Pavement Management System, a.k.a. dTIMS. Factors include optimal treatment, traffic volume, and type of traffic (trucks).
- Regional Priority (17.5 points)
 - Does the regional planning commission support the project from a local land-use and economic-development perspective?

The results from these analyses are summarized for the three program funding categories/functional classifications: Interstate (90% Federal/10% State), State Highways (80/20), and Class 1 Town Highways (80/20).

Bridge:

The Structures Section inspects long bridges (greater than 20 feet) at least every two years as required by the Federal Highway Administration's National Bridge Inventory. Engineering factors from the inspection are combined with regional priorities, and other factors to produce a numeric score. Prioritization factors for bridges are:

- Bridge Condition (30 points)
 - Weighted based on condition of major, inspected components (deck, superstructure, substructure, and culvert); more points assessed for higher levels of deterioration. The condition is determined at the most recent inspection.
- Remaining Life (10 points)
 - Correlates the accelerated decline in remaining life to condition.

- Functionality (5 points)
 - Compares roadway alignment and existing structure width, based on roadway classification, to accepted state standards. Too narrow or poor alignment bridges are safety hazards and can impede traffic flow.

- Load Capacity and Use (15 points)
 - Is the structure posted or restricted? What is the inconvenience to the traveling public if the bridge is out of service? What is the average traffic use on the structure?

- Waterway Adequacy and Scour Susceptibility (10 points)
 - Are there known scour issues or concerns? Is the structure restricting the natural channel? Are channel banks well protected or vegetated?

- Project Momentum (5 points)
 - Points are assigned if the project has a clear right-of-way, has all environmental permits, and the design is ready and waiting for funds to become available.

- Regional Input and Priority (15 points)
 - Does the regional planning commission support the project from a local land-use and economic-development perspective?

- Asset – Benefit Cost Factor (10 points)
 - This compares the benefit of keeping a bridge in service to the cost of construction. The “benefit” considers the traveling public by examining the traffic volume and the length of a detour if the bridge were posted. For example, a bridge with a high traffic count that does not have a good detour around it would get a higher benefit score.

Assigned points are summed together to yield a maximum point value of 100.

Roadway:

Roadway projects include full depth highway reconstruction, realignment, increasing highway width, adding lanes, and more. Some of these projects take years to develop due to the time required to obtain permits and to purchase Right-of-Way. There is a large backlog of projects that the Agency is working through. Factors in Roadway prioritization are:

- Highway System (40 points)
 - This factor looks at the Highway Sufficiency Rating and the network designation. Interstates are held to the highest standard, followed by non-Interstate primary and then off-primary roads. The Highway Sufficiency

Rating considers traffic, safety, width, subsurface road structure, and more.

- Cost per vehicle mile (20 points)
 - This is the project cost divided by the estimated number of miles vehicles will travel on the project. This is a relatively easy method to get a benefit/cost ratio for comparing similar projects.
- Regional Priority (20 points)
 - The top RPC Roadway project is assigned 20 points. The score is reduced for lower RPC priorities. Projects listed as priority #10 and lower get two points.
- Project Momentum (20 points)
 - This factor considers where the project is in the development process and anticipated problems such as Right-of-Way or environmental permitting. Some projects are so far along that they must be completed or the Agency would have to pay back federal funds.
- Designated Downtown project
 - Per 2007 legislation Sec. 38. 19 V.S.A. § 10g(1)(3), VTrans awards ten bonus points to the base score for projects within a designated downtown development district established pursuant to 24 V.S.A. § 2793.

Traffic Operation (Intersection Design):

- Intersection Capacity (40 points maximum)
 - This factor is based on Level of Service (LOS) for the intersection and the number of intersections that are in the coordinated system. Projects with a lower LOS and that are part of a larger coordinated system receive higher scores for this category.
- Accident Rate (20 points maximum)
 - This factor is based on the critical-accident-ratio for the intersection. Projects with higher critical-accident-ratios receive higher scores for this category.
- Cost per Intersection Volume (20 points maximum)
 - This factor uses the estimated construction cost and average-annual-daily-traffic through the intersection. VTrans calculates the construction cost of the project for each anticipated user through the intersection. Projects with lower costs per intersection volume receive higher scores for this category.
- Regional Input and Priority (20 points maximum)
 - This factor is based on the ranking of projects from the RPCs/MPO. The RPCs/MPO rank the projects based on criteria they develop. Projects with higher regional rankings receive higher scores for this factor.

- Project Momentum (10 points maximum)
 - This factor considers:
 - Where the project is in the development process
 - Anticipated problems such as Right-of-Way or environmental permitting
 - Funding.

Park & Ride:

The Agency of Transportation has 29 Park & Ride lots strategically placed in various locations in the state. Demand for Park & Ride spaces and new lots is increasing, especially as fuel prices rise. Requests for new lots are evaluated based on the following criteria:

- Total Highway and Location (40 points)
 - An accumulation of points from individual scorings of Highway Sufficiency Rating, Current Average daily Traffic, Highway Function (Network), distance from Primary Network and Public Transit Service.
- Cost/Parking Space (20 points maximum)
 - Correlates the facility project cost with the total number of parking spaces.
- Regional Input and Priority (20 points)
 - Regional Planning Commission support for the project from a Regional perspective, and the project's priority within the region.
- Project Momentum (20 points)
 - Projects that are already underway, projects that are already in VTrans' capital program and have identified funding, and projects that do not anticipate permitting or right-of-way problems are assigned more points.

Bicycle/Pedestrian:

The Bicycle/Pedestrian Section solicited bicycle and pedestrian projects from the Regional Planning Commissions and the MPO. The project prioritization scoring is as follows:

- Land Use Density (20 points)
 - Weighted based on surrounding land use condition.
 - Downtown or Village center
 - Connects outlying area to Downtown or Village Center
 - Connects Residential Area to School or Recreation area
 - Part of Regional Network
- Connectivity to a larger network of bicycle and pedestrian facilities (10 points)
 - Correlates the proximity of the proposed bike or pedestrian improvement to a larger (local or regional) network of facilities.
 - Completes critical missing link

- First facility in a community
 - Links to both ends of facility
 - Links to one ends of facility
 - Does not link to existing facility
- Multi-Modal Access (5 points)
 - Correlates the proximity of the proposed bike or pedestrian improvement to other transportation modes. For example, points are given if the sidewalk, path or bike lane provides access to a bus station, train station or a Park & Ride lot.
- Designated Downtown or Village Center (5 points)
 - Points are assigned if the proposed facility is completely or partially within a downtown area.
- Project Cost (20 points)
 - Cost is analyzed per linear foot plus a consideration for bridges and retaining walls.
- Regional Priority (20 points)
- Project Momentum (20 points)

Two points are assigned for each of 10 different factors:

 - Project Development Process
 - Project definition complete
 - Preliminary design complete
 - Environmental permits acquired
 - ROW clear
 - Funding
 - Project was funded in previous fiscal year
 - Project construction identified in the State Transportation Improvement Plan
 - Project construction expenditures are in the current Capital Program
 - Anticipated Workflow Problems
 - No environmental/resource problems anticipated
 - No design problems anticipated
 - No ROW problems anticipated

Transportation Enhancement Projects:

Applications are reviewed by VTrans’ Policy and Planning Division and the Local Transportation Facilities (LTF) Section to ensure that that the proposed projects meet all eligibility requirements for consideration.

LTF staff reviews and comments on the applications for technical feasibility, budgetary feasibility, cost/benefit of the proposed project, and the capability/track record of the project sponsor.

Applications and the LTF comments are scored by the Transportation Enhancement

Grant Committee (TEGC). The score is based on the following ten criteria: (Note: Per legislative directive, preference is given to bicycle and pedestrian facilities as well as projects that are within Designated Downtowns and Villages.)

- The project promotes quality, linkage, and variety in Vermont's transportation system. (10 points)
Points are given for project characteristics such as:
 - Has a clear, desirable, and defensible relationship to surface transportation.
 - Creates or completes a new transportation facility where it is needed.
 - Enhances the function and/or aesthetics of an existing transportation system.
 - Makes linkages to other modes of transportation, including public transportation, bicycling and walking facilities.
- Benefits a substantial number of Vermonters and visitors to the State. Does the project serve populations currently not served or underserved? (10 points)
- The project is compatible with its surroundings as well as relevant state, regional, and local planning. The project is supported by the RPC or MPO: (10 points)
- The project is feasible and likely to be finished. (10 points)
 - There are no substantial environmental concerns, property ownership issues, or design challenges.
 - The project has a completed study demonstrating its feasibility.
 - The project has completed an analysis other than a feasibility study, has a detailed budget and firm commitment of local matching funds.
 - The project sponsor has made provisions for long-term maintenance and its costs.
- The project enjoys strong community support. Indicators of support are: (10 points)
 - Letters of support from organizations and individuals.
 - A local financial match greater than 20 percent.
- The project accurately and effectively addresses one or more of the 12 eligible Transportation Enhancements activities. (10 Points)
- The project is particularly innovative or creative. For example, points are given if the project has unique partnerships, innovative design, and use of local materials. (10 points)
- The project budget is 50 percent or more for pedestrian and bicycle travel surfaces. (10 points)
- The project benefits an economically disadvantaged area, as evidenced by State designation or the town's most recent U.S. Department of Labor rate of unemployment. (5 points)
 - The Project is located within Orleans and Essex Counties or within the geographic area of the Springfield Regional Development Corporation.
 - The project is located in a town where the rate of unemployment exceeds 5.9 percent.

- The project benefits a designated downtown or village, as determined by the Vermont Downtown Board.
 - The project is within a Designated Downtown District (5 points)
 - The project is directly adjacent to a Designated Downtown District (3 points)
 - The project is within a Designated Village District (2 points)

The TEGC members return their scores for each project to the Policy and Planning Division where the scores are averaged for each project.

The TEGC awards funds usually in the priority ranked order until there is approximately \$500,000 left. At that time, the committee considers the geographic distribution of projects. If necessary, projects might be elevated in priority to achieve better geographical distribution

Aviation:

The Aviation Program prioritizes projects by scoring 14 airport and project factors. Safety is paramount. To maintain safety, the Federal Aviation Administration (FAA) has stringent regulations that trigger airport improvements and projects. Projects are also initiated by the aviation community and by the Agency to meet our own standards.

Airport project descriptions, costs and scoring factors are maintained in the Airport Information Management System (AIMS) data base. AIMS is updated annually when the Capital Improvement Program is negotiated with the FAA for federal funding. Projects that are accepted by the FAA are presented to the Legislature in the Aviation Program’s annual budget request for the state’s 10 percent matching funds.

Burlington International Airport (BIA) projects are prioritized by BIA. The state, by statute, can provide up to three fifths of the match funds, and serves as a pass through for federal funds.

Scoring weights for state-owned airports are:

- Airport activity (number of operations and based aircraft): (0 to 100 points)
- Population served & local government support: (0 to 24 points)
- Economic Development: (0 to 40 points)
- Project Type (runway type, paving, navigation, etc.): (0 to 120 points)
- FAA Priority & Standards ranking: (0 to 120 points)
- Previous Federal/State Funding: (0 to 200 points)
- Cost/Benefit for Projects less than \$75,000: (100 points)
- Resource Impacts: (0 to 40 points)
- Local Interest/Support: (0 to 20 points)

The scores are totaled, ranked by priority, and made available to the public. The VTrans Aviation Section selects vendors to complete the projects that are funded.

Rail:

VTrans owns 305 miles of active rail line that is leased to private operators. The rail operator is responsible for maintaining the track and bed. VTrans, however, is responsible for the bridges and sometimes contributes towards track upgrades. To remain viable, most of the lines require substantial work to support higher weight limits, double-stack containers, and higher speed passenger service. As with other assets, the needs are greater than the available funds. This necessitates hard choices among competing projects.

Prior to initiating new projects, it is necessary to assure that the current system is preserved. Preservation represents a significant challenge due to the age of the infrastructure. Preservation of the current system is the agency's number one priority. The second priority is to improve the infrastructure to a modern standard that supports the movement of people and goods. A flow chart in the State Rail and Policy Plan depicts the process for that decision-making. Once identified, new projects are subjected to the following ranking system for prioritization.

- Railroad freight operations: This measures the increase in ton-miles or car-miles. (60 points)
- Railroad passenger operation: Points are awarded for an increase in passenger count or passenger miles traveled. (60 points)
- Line conditions: Points are awarded if the project increases the Federal Rail Administration track condition. (60 points)
- Operational costs: Points are awarded based on the operational costs required from the state. (60 points)
- Facility Standards: Does the proposed project address clearance and/or weight limitations? (60 points)
- Priority Route: Points are awarded if the project is on one of the rail priority routes. (60 points)
- Vermont based activity: Points are awarded for carloads and passengers in Vermont and/or rail jobs created in Vermont. (40 points)
- Government and local support: (40 points)
- Economic Development: (40 points)
- Documented non-state funding opportunities: (60 points)
- Resource Impacts: Does the project require environmental mitigation? (60 points)
- Regional scope: Points are awarded if the project increases competition, partners with other states, or improves intermodal connections. (60 points)
- Utilization of resources: More points are awarded if the project schedule is one year or less. (30 points)
- General safety: Safety can involve rail crossings, ROW, security, etc. (60 points)

Public Transit New Starts:

Thirteen independent public transit providers cover regions of the state. VTrans subsidizes their operation under a variety of federal and state programs related to transportation and human services. A major component of public transit in Vermont is a federal program to maintain air quality by encouraging expansion of public-transit routes. That program, CMAQ (Congestion Mitigation and Air Quality), provides 80 percent of the operation of new public transit routes for a period of three years. Proposals for New Start funding involve an open competitive process through VTrans' Public Transit Section. Proposals for new public-transit routes are evaluated and scored. New Start awards are based on that score.

The scoring weights for the New Start program are:

- Mobility improvements: This gauges the project's capacity to shift travelers from single-occupancy vehicles to public transit. (15 points)
- Environmental Benefits. (10 points)
- Operating Efficiencies: This looks at the proposed project's estimated cost per vehicle mile and cost per hour. (15 points)
- Project coordination: This evaluates how well the proposed route fits in with existing routes. (10 points)
- Regional Connectivity: This evaluates route connectivity to outside transportation agencies including coordination of schedules. (15 points)
- Local financial commitment: This looks at the stability and reliability of the local match, and the provisions to cover unanticipated cost overruns and funding shortfalls. (20 points)
- Sustainability of funding continuation: This examines the continuation of funding after the three-year, start-up funding ends. (15 points)

Central Garage Vehicle Fleet:

The Central Garage provides VTrans safe and reliable vehicles through an internal service fund. Within that system, there is an understanding that some fleet activities are critical and require the most reliable response times. Replacement purchases and repairs are prioritized accordingly. Equipment can be grouped into three priority tiers:

- The top tier is:
 - Snowplows are most critical as maintaining winter travel is the highest profile activity of the Agency.
 - Front-end loaders are critical to loading sand and salt into those trucks, and are also a high priority.
 - DMV enforcement vehicles provide a significant portion of the state's law enforcement activities and are also considered critical.
- A second tier of equipment is important but not as time critical. Examples of those are:
 - Pick-up trucks and heavy utility vehicles that provide the mobility the Agency staff needs to do their jobs.

- Graders that are used to clear ice, wing back snow drifts, and are generally difficult to rent.
- Least critical are those pieces of equipment whose work can be scheduled ahead of time and which could be obtained through other sources. The Agency has rental agreements with equipment owners throughout the state.
 - Excavators.
 - Backhoes.
 - Tractors.
 - Miscellaneous construction equipment.

There is no rigid formula that dictates when equipment should be replaced. Age, mileage (or hours of service), historic and anticipated repair costs, and consequences of failure enter into priorities for replacement vs. repair.

Safety:

VTrans runs a Highway Safety Improvement Program (HSIP) to enhance safety on all Vermont roads. The prioritization process starts with determining high-crash locations from reported crashes, crash severity, road geometry, and anecdotal information.

The Agency scores each location and sorts the list. Agency staff closely reviews the top 50 crash locations, and determine possible improvements. A cost/benefit analysis is conducted to determine the maximum safety improvement for limited dollars. Most high-crash sites get a low-cost improvement such as signs/lines, but a few are targeted for more expensive geometric improvements based on the severity and types of crashes.

The crash analysis is for both state and town-owned roads. HSIP projects are considered on all public highways.

DISTRICT LEVEL DECISION MAKING

The Agency has nine district offices throughout the state. These offices are responsible for normal highway operations and maintenance such as plowing, minor repairs, culverts, guard rails, installing signs, etc. Unlike other Agency programs, Districts respond to immediate problems and conduct normal maintenance required for a safe and efficient transportation network. A number of factors go into District decisions to address a particular problem or condition. Those are in priority order:

- Time critical activities: These are related to safety such as snow and ice control, critical bridge repairs, guardrails, sign repairs, potholes, other emergency repairs and storm damage. The focus is on keeping the transportation system functional and safe. These activities take place primarily on State facilities, but Districts often provide aid to towns.
- Maintenance Activities: These are often seasonal activities such as mowing, ditching, and culvert maintenance that maintain the overall condition of the

transportation system. The amount of these activities accomplished is determined by funding and staffing resources.

- **Preventive Maintenance Activities:** These strategic activities add service life to the system and include bridge repair as well as culvert linings and inverts. Funding often dictates the amount done.

Support Activities such as personnel administration, technical support to towns, administration of grant programs, and maintenance of equipment and facilities are done to support all of the above or in support of towns.

TOWN PROGRAMS

The Agency manages several programs for the benefit of towns. These are not listed separately in the Annual Budget; however, the decision process is described below.

Class 2 Roadway:

The Agency distributes grants to towns for Class 2 Town Highways. Projects are selected by VTrans District Administrators based on town input and VTrans' knowledge of the transportation problem. The District Administrator tracks the history of the grant awards by town to ensure, over time, an equitable distribution of the available funds based on the number of Class 2 town highway miles. Occasionally, a critical Class 2 highway need arises in a town that is not due for a grant based on the equitable distribution formula. When this occurs and the District awards a grant to such a town, the District will then ensure that future grants bring the equitable distribution back into line.

Town Highway Structures:

Town Highway Structure grants are awarded to towns for bridges or large culverts. Bridge projects are selected by VTrans District Administrators based on town input and VTrans' knowledge of the transportation problem. The District Administrator tracks the history of the grant awards by town to ensure that, over time, there is an equitable distribution of the available funds based on the number of structures on the town's highway system. Occasionally, a critical bridge need arises in a town that is not due for a grant based on the equitable distribution formula. When this occurs and the District awards a grant to such a town, the District will then ensure that future grants bring the equitable distribution back into line.

Municipal Mitigation Grants:

The Municipal Mitigation Grant program consists of four separate grant programs.

- Better Back Roads Program.
- Clean and Clear Program.
- Two federal storm water mitigation earmarks.

These four programs address roadside erosion problems as well as environmental problems associated with stormwater runoff.

Projects are selected by committees made up of representatives from VTrans, the Vermont Local Roads Program, the Northern Vermont Resource Conservation and Development Council, and the Vermont Agency of Natural Resources. Projects are prioritized and selected by these committees based on the applicant's ability to demonstrate that the project will reduce or eliminate roadside erosion or reduce water pollution generated by, or directly associated with, existing public roads and road maintenance activities.