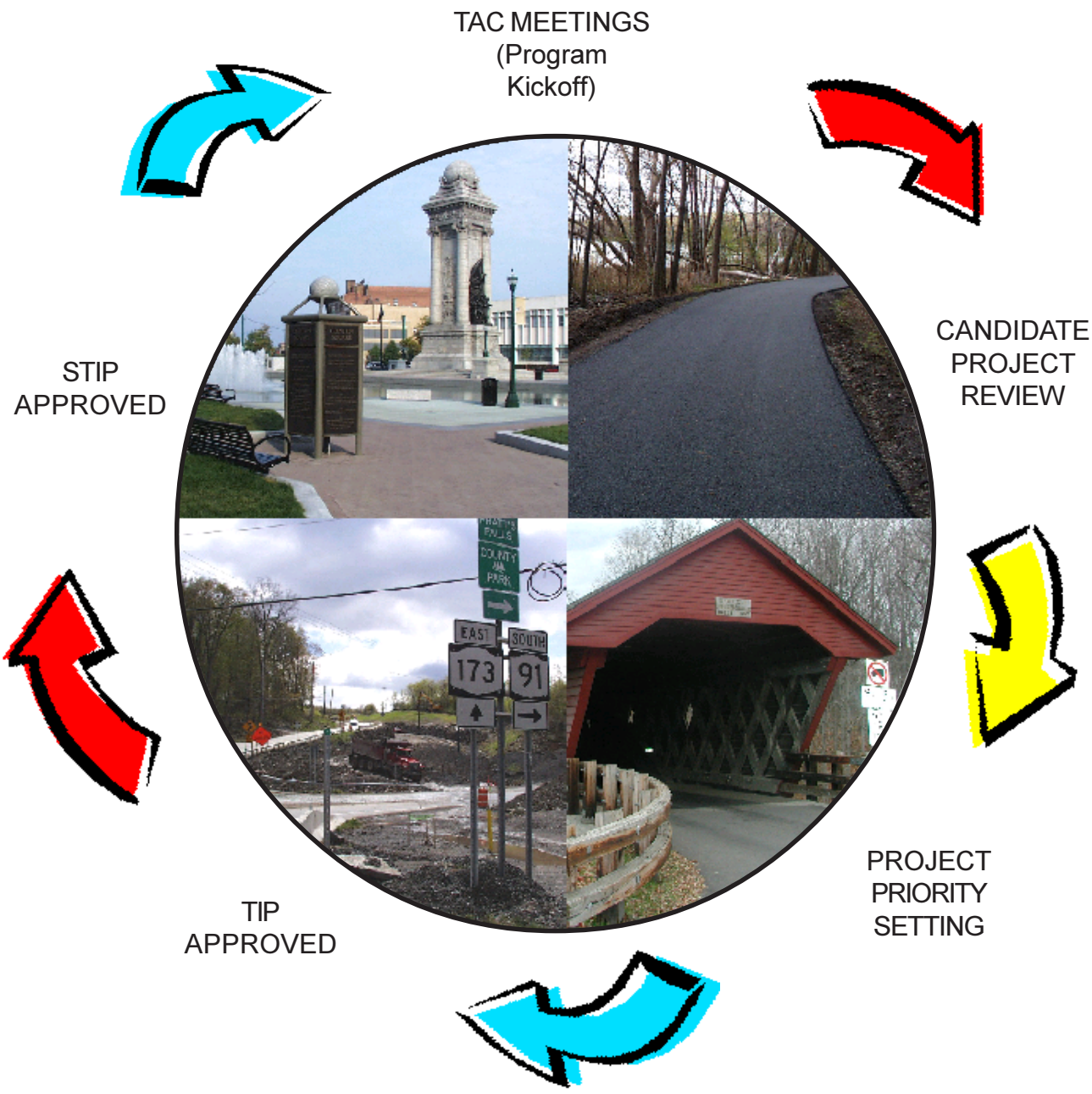
Transportation Improvement Program (TIP)

Guidebook - Fall 2006

Draft Working Copy ~ Subject to Revision



Ithaca Tompkins County Transportation Council

New York State Department of Transportation

Syracuse Metropolitan Transportation Council

SMTC

September 2006

This Guidebook is a tool intended to help Project Applicants in completing the Transportation Improvement Program (TIP) application. To make this Guidebook as useful and helpful as possible, the Ithaca-Tompkins County Transportation Council (ITCTC) welcomes your feedback. Please send any comments and/or suggestions to:

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Please note that the information contained in this document is current as of September 5, 2006. Subsequent revisions to any individual page or to the entire document will be noted with a Revised Date.

This document was prepared with financial assistance from the Federal Highway Administration and the Federal Transit Administration of the U.S. Department of transportation through the New York State Department of Transportation.

Contacts

For information on the TIP Process or specific highway information, please contact the appropriate individual noted below:

Information Required	Contact Name	Agency	Phone	Fax	E-Mail
Ø TIP Process Ø Applications Ø CMAQ Ø Traffic Count Data	Fernando de Aragón	Ithaca-Tompkins County Transportation Council	274-5570	274-5578	itctc@tompkins-co.org
Ø TIP Process Ø Applications Ø Federal Aid System Ø Pavement Condition Scores for New York State Roads	Janis Gross	New York State Department of Transportation	428-4409	428-4417	JGROSS@dot.state.ny.us
Ø Bridge Rating Scores for State and Non-State Bridges	Darlene Morabito	New York State Department of Transportation	428-4321	428-4417	DMORABITO@dot.state.ny.us

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CHAPTER 1

INTRODUCTION

Preface

Federal regulations require that a region's urban transportation planning process include the cooperative development of the Transportation Improvement Program (TIP), a staged multi-year program of projects consistent with a Long-Range Transportation Plan (LRTP). This region's TIP is developed cooperatively by a team led by the local Metropolitan Planning Organization (MPO) and the New York State Department of Transportation (NYSDOT) Region 3 staff.

What is an MPO?

MPOs are composed of elected and appointed officials representing local, state and federal governments or agencies having interest or responsibility in comprehensive transportation planning. MPOs are responsible for carrying out the urban transportation planning process, through the development of a LRTP and a five-year TIP. There are two MPOs located within Region 3. In the Syracuse Metropolitan Area the MPO is the Syracuse Metropolitan Transportation Council (SMTC), and in the Ithaca Metropolitan Area the MPO is the Ithaca Tompkins County Transportation Council (ITCTC).

What is the TIP?

The TIP identifies the timing and funding of all highway, bridge, transit, bicycle, and pedestrian transportation projects scheduled for implementation in the region over a five-year period using federal transportation funds.

The TIP reflects the priorities and direction of the region and its state and federal partners in the transportation planning process. The TIP and the projects it contains must be consistent with the goals and objectives identified in the current Long-Range Transportation Plan for the region (Appendix A).

The TIP is part of the region's effort to establish and maintain the planning process required by the federal government as a condition for receipt of federal transportation funding. The federal government requires that the TIP be updated and adopted by the local MPO at least every four years.

The TIP development process requires only projects eligible for federal aid. However, the TIP document may include, for informational purposes, non-federally funded projects occurring in this region.

What is the Statewide Transportation Improvement Program (STIP)?

The STIP begins as a compilation of the regional Transportation Improvement Programs (TIP's) that have been adopted by the Metropolitan Planning Organizations (MPOs) and evolves into a

comprehensive list of all highway (state or local) and all transit (capital or operating) projects in urban and rural areas that propose to use federal funds. All federally funded projects and certain Metropolitan Transportation Authority (MTA) funded projects proposed to begin between October 1st and September 30th from all of the regional TIP's (i.e. a compilation of all the programs) across the state are included in this STIP. Federally funded projects in rural areas are also included in the STIP. The STIP is required to be updated every three years and to include a minimum four-year listing of federal-aid projects for approval by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA).

What Geographic Area Does the TIP Cover?

Please refer to Appendix B for TIP Planning Area Maps. Projects *outside* the MPO metropolitan planning area fall primarily under the purview of the NYSDOT. The planning area for the ITCTC includes all of Tompkins County.

What Types of Projects Should be Included in the TIP?

Federal regulations require that any transportation project within the metropolitan planning area that is to be funded with U.S. Department of Transportation funds must be included in the TIP.

The types of projects listed below are eligible for federal funding. Any municipality or agency desiring federal transportation funding to advance any of the project types listed below should submit a project proposal for inclusion in the TIP. A more detailed listing of eligible projects is presented in Appendix C of this document.

- Projects on the federal aid system (road and bridge construction, reconstruction, resurfacing, restoration, rehabilitation, etc.)
- Public transportation (vehicle maintenance and operations, capital improvement projects, mass transit system construction, etc.)
- Projects that are not on the federal aid system, but may be eligible for federal funding for other reasons (e.g. bridge projects, bicycle and pedestrian facilities, etc.). The projects, however, must be linked to the transportation network.

Who Can Submit Project Proposals?

Any MPO member agency and any municipality within the TIP planning area can submit project proposals for the TIP. This includes transit agencies, county, city, town and village governments, the State of New York, and their transportation departments, among others.

Private individuals and organizations may recommend project proposals if the project is sponsored by the municipality in which the project will be located. It is important to note that the municipality has to agree in writing that it will provide full funding and maintenance for the proposed project. The TIP is a reimbursement program and only those municipalities or government entities, which can enter into a municipal agreement with the NYSDOT, can apply for these federal transportation funds. The TIP Application must be submitted by the sponsoring municipality.

What Agencies are Involved in the TIP Development Process?

The federal Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) states specifically that the local MPO of an area will work with the State Department of Transportation and other transportation agencies to develop the TIP. In accordance with SAFETEA-LU, the MPOs and the NYSDOT work as a cooperative team with other interested parties to develop and manage this region's TIP.

To guide the TIP development process, each MPO has established an appropriate committee for their metropolitan areas comprised of representatives from the MPO member agencies. These Committees also assist their respective MPOs and the NYSDOT in maintaining the TIP between updates, including review of substantive changes in projects that may require amending the adopted TIP.

How are Projects Selected for the TIP?

At the beginning of each TIP cycle, the NYSDOT convenes the Technical Advisory Committee (TAC). The TAC, consisting of the NYSDOT, representatives of municipalities and transit agencies, as well as the appropriate MPO, meet to confirm the process and principles for that cycle. This process includes a review of the NYSDOT Goal Oriented Programming (GOP) Criteria. In addition to this process, the MPO convenes a committee responsible for capital projects. The committees consider regional transportation investment priorities, project evaluation criteria, the development schedule, and other process elements, as appropriate.

The appropriate committee scores all project proposals pursuant to specific project evaluation criteria. While the TAC utilizes primarily the GOP criteria, the SMTC, having access to additional federal funds, utilizes a basic checklist (Appendix D) as well as a ranking based on the Long-Range Transportation Plan goals and objectives (Appendix A). The resulting scores provide a preliminary basis for ranking project proposals.

These preliminary rankings are reviewed and discussed with the appropriate committee, and adjustments to rankings are made as necessary to reflect overall funding considerations, geographic balance, and other factors not specifically captured by the Project Evaluation Criteria. Based on available revenue estimates, funding is then assigned to the ranked projects in accordance with funding availability and eligibility restrictions.

At this point, a draft TIP document is made available for public review and comment, including one or more public meetings, in order to solicit input on the proposed program of projects. The draft TIP, public comments, and recommended amendments based on public comments are presented to and reviewed by the MPO's Planning Committee. The Planning Committee then sends its recommendations to the Policy Committee for adoption of the TIP.

How are Project Proposals Submitted for the TIP?

Applicants must submit a complete application package consisting of the following:

1. A brief **Cover Letter** that includes a list of projects for which proposals are being submitted;
2. Two completed copies the appropriate **Initial Project Proposal (IPP)** (Appendix G*)* for *each* new project and/or *each* previous TIP project with substantial project scope or funding need changes. There are separate IPPs for the following types of projects: Safety, Bicycle/Pedestrian, Bridge, Highway, Public Transit and Air Quality. (Note: Air Quality funds are not available for Tompkins County, therefore this IPP form cannot be used in any ITCTC submission.) A *separate TIP IPP must be completed for **each** project for which federal funds are requested; and*
3. An **8 ½ x 11 photocopy-ready map** illustrating project location and boundaries for each project.

All applications must be received by **the date noted in your project solicitation letter.**

Complete application packages for the Syracuse Metropolitan Area should be submitted to:

Mario Colone, TIP Program Manager
Syracuse Metropolitan Transportation Council
100 Clinton Square
126 North Salina Street, Suite 100
Syracuse, NY 13202

Complete application packages for the Ithaca-Tompkins County Metropolitan Area should be submitted to:

Fernando deAragon, Director/TIP Program Manager
Ithaca-Tompkins County Transportation Council
121 East Court Street
Ithaca, NY 14850

Complete application packages for all other areas should be submitted to:

Mark Frechette, PE
Regional Planning and Program Manager
Planning and Program Management
New York State Department of Transportation
333 East Washington Street
Syracuse, NY 13202

All applications must be complete when submitted to the MPO or NYSDOT. The IPP forms presented in Appendix G must be used. Copies of IPP forms in hardcopy or digital form may be obtained by calling the ITCTC (274-5570) or visiting its website (www.tompkins-co.org/itctc). Applications that do not use the IPP forms and format will not be considered for inclusion in the TIP.

CHAPTER 2

DEVELOPMENT PROCESS

The TIP/STIP development process consists of the steps listed below.

1. Confirm TIP Development Process (August-September)

At the beginning of each TIP cycle, the Technical Advisory Committee (TAC), consisting of the New York State Department of Transportation (NYSDOT), representatives of municipalities and transit agencies as well as the appropriate MPO, meets to confirm the process and principles for that cycle. This process includes a review of the NYSDOT Goal Oriented Programming (GOP). In addition to this process the Metropolitan Planning Organization (MPO) convenes a committee responsible for capital projects. The appropriate MPO committee considers regional transportation investment priorities, project evaluation criteria, the development schedule, and other process elements.

2. Determine TIP Project Status (Mid-September)

Project applicants should begin reviewing projects they sponsor in the adopted current TIP, as well as projects they are proposing for the new TIP, to determine which projects require new applications. TIP projects fall under one of the following project status categories:

A. Committed Projects with No Significant Changes:

Projects included in the currently adopted TIP with **no significant change** in scope or federal funds will be considered committed projects and need not be re-submitted for inclusion in the new TIP.

Committed projects are defined as:

- Projects included in the currently adopted TIP and having **no significant changes** to project scope, federal funding, or cost

  (The criteria used to determine whether a project has significant scope or funding changes are the same criteria used to determine whether a TIP amendment is required when changes occur during the TIP program period. TIP Amendment Criteria is found in Appendix F);

- Routine project progressions reflecting project schedule adjustments and minor funding revisions; or

- Existing projects that have been identified as ongoing commitments at historic funding levels.

B. Committed Projects with Significant Changes:

Projects in the currently adopted TIP that have experienced **significant** project scope or funding need changes **must be resubmitted** for inclusion in the new TIP. These projects will be evaluated and ranked with new project proposals.

C. New Projects:

Projects **not** included in the adopted TIP.

If you have any questions about the status of a project in the TIP, please call your appropriate MPO or NYSDOT contact noted in the front of this handbook.

3. Solicit Project Proposals (Mid-September)

The MPO and NYSDOT will send a "Call for Projects" letter and the TIP Guidebook to MPO member agencies and the appropriate officials of eligible counties, municipalities, and authorities in September, notifying the officials of the opportunity to submit project proposals.

Letters may also be sent to private citizens or private sector organizations that have requested TIP notification. ***These groups may suggest project proposals provided a local government has formally agreed to sponsor and fund the proposed project. The application must come from a municipality or entity that can enter into a municipal agreement with the NYSDOT.***

4. Prepare and Submit Project Proposals (September –LateNovember)

Applicants have until November to prepare and submit project applications in accordance with the instructions provided in the Call for Projects letter and TIP Guidebook.

If additional help is needed to complete the forms, applicants may contact the appropriate MPO or NYSDOT staff noted in the front of this handbook.

5. Project Evaluation (December)

The TIP Development Process provides objective evaluation of each project. However, the TIP **must** be financially constrained to available resources, as well as balanced by project type and geographic area. Therefore, not all submitted proposals can or will be included in the final TIP.

Before new projects are considered, existing TIP commitments will be evaluated and summarized to assure that MPO Staff and committee members have the information necessary for assessing how new projects will complement or supplement the already-approved program of projects.

All newly proposed TIP projects and current TIP projects with significant changes to scope or cost will be evaluated using the following two-step process:

A. TIP Eligibility Screening

Each project must meet certain minimum requirements. These include:

- Is the proposed project eligible for federal transportation funding? (Appendix C)

- Is the proposed project consistent with one or more goals outlined in the Long-Range Transportation Plan? (Appendix A)
- Does the applicant have reasonable cost estimates and funding plan
- Does the project fulfill a legitimate transportation need?
- Does the applicant have reasonable anticipation of completing the project within the TIP time frame (the five-year program horizon)?

The MPO/NYSDOT team will use the information provided in the project proposals to complete the screening process. Once it is determined that a project meets the minimum screening requirements, the project will undergo detailed Project Evaluation.

B. Detailed Project Evaluation

The MPO/NYSDOT team will assess each project that meets the minimum requirements relative to the overall and mode-specific evaluation criteria. This will also include analysis of cost/benefit within the GOP categories.

The results from this assessment provide a preliminary basis for ranking projects submitted for funding.

6. Prepare Preliminary List of TIP Projects (December)

The preliminary rankings are reviewed and discussed with the appropriate committees, and adjustments to rankings are made as necessary to reflect overall funding considerations, mobility impacts, geographic balance, and other system-level issues or factors not specifically captured by the Project Evaluation Criteria.

Based on available revenue estimates, funding is assigned to the ranked projects in accordance with funding availability, eligibility restrictions and timing considerations. This is a delicate optimization process in which the MPO/NYSDOT team attempts to fund as many proposed projects as possible within the funding and project ranking parameters.

The MPO/NYSDOT team will use the funding sources outlined in Appendix C to determine potential funding sources for a given type of project. The basic goals, restrictions, and other pertinent information about each funding program are outlined.

Please note that the TIP must be ***FINANCIALLY CONSTRAINED***. That is, the total amount of funds programmed for projects in the TIP for each year of the five-year period must not exceed the projected total amount of funds available to the MPOs for that period. The MPO/NYSDOT team must ensure that the test of financial constraint is met for *each* of the Federal funding categories programmed in the TIP.

7. Committee Review and Recommendation of Draft TIP (January)

The preliminary list of TIP projects and funding assignments that emerges from the previous step constitutes the basis of the Draft TIP.

The Draft TIP is presented to the MPO Planning Committee or appropriate subcommittee for their consideration and recommendation of projects. Based on the reviews and recommendations, a Draft TIP document is prepared for the public review process.

8. Public Involvement (February – Mid-March)

At this point, a Draft TIP document is made available for public review and comment, including one or more public meetings, in order to solicit input on the proposed program of projects. The Draft TIP, public comments, and recommended amendments based on public comments are reviewed by the MPO Planning Committee.

Note that the principal public review concerns at this stage are related to assuring that projects are consistent with the LRTP, addressing regional issues, and the establishment of project priorities. Public involvement related to specific project proposals or the package of proposals recommended by an applicant is most appropriately conducted by the applicant.

9. State/Federal Agency Review of Draft TIP (April)

Following the public review period and subsequent Committee review and recommendations, the MPO/NYSDOT team will prepare and forward a recommended program of TIP projects for review by the appropriate State and Federal agencies, including NYSDOT Main Office (Albany), the Federal Highway Administration (FHWA), and the Federal Transit Administration (FTA).

10. Approve Final TIP (April – May)

Following review by state and federal agencies, the final TIP document will be presented to the MPO Planning Committee. The Planning Committee reviews the document, and then sends its recommendations to the MPO Policy Committee for adoption of the TIP.

11. Publish and Distribute Final TIP Document (June)

Following adoption by the Policy Committee, MPO Staff will finalize the TIP document, publish it, and distribute it to all interested parties. Effective October 1st , this document becomes the basis for on-going management of transportation investments in the region.

APPENDIX A

Goals & Objectives
Long-Range Transportation Plan

GOALS & OBJECTIVES
Long-Range Transportation Plan

Each of the New York State Department of Transportation (NYSDOT) regions has Goal Oriented Programming Criteria (GOP) in various formats. Region 3's version is titled "NYSDOT Region 3 Goal Oriented Programming Criteria", revised September 5, 2006. These programming criteria are used to evaluate and rank candidate TIP/STIP projects that are submitted to the NYSDOT Transportation Advisory Committee (TAC). Since all TIP/STIP projects on the local system have to follow the GOP criteria, they all have to fit into a carefully balanced regional capital program. The major project type categories that have their own goals and objectives within the GOP are: Safety, Infrastructure (Bridge and Pavement), Capacity and Mobility. Other sub-categories that fit into the major ones are Economic Development, Bicycle/Pedestrian activities, and Goods Movement (Freight). The following is a summary of the NYSDOT regional priorities, as they relate to TIP/STIP candidate project funding:

- Safety is the priority. The NYSDOT will incorporate both cost effective safety projects into the regular capital program, as well as all appropriate safety appurtenances, either by maintenance or simplified design process projects.
- Bridges will be maintained, rehabilitated or reconstructed as necessary to, first ensure the safety of the traveling public and secondly, that both personal and freight mobility and economic development needs are met.
- Pavement and transit properties will be maintained to ensure an appropriate state of good repair.
- Environmental initiatives and other non-traditional projects are programmed as appropriate.
- New capacity projects will be considered as appropriate.

Those projects not funded by the NYSDOT TAC process are referred back to the Metropolitan Planning Organizations (MPO) for evaluation and ranking. An additional step is SMTC's evaluation for CMAQ and STP-Large Urban projects. Each of the MPOs has specific goals and objectives included in their Long-Range Transportation Plans (LRTP) that specify how projects are ranked and selected. In general, the goals and objectives are related to the statewide transportation master plan as outlined in the NYSDOT's "The Next Generation", dated 1996 (and soon to be updated).

Table 1 illustrates generally how the plans are all related, and how the plans can help generate TIP/STIP projects. For the specific goals and objectives for each of the MPO Long-Range Transportation Plans, the Statewide Master Plan and the GOP Criteria, please refer to each document. The documents may be found at the following locations:

Syracuse Metropolitan Transportation Council	315-422-5716	www.smtcmpo.org/lrtp.asp
Ithaca-Tompkins County Transportation Council	607-274-5560	http://www.tompkins-co.org/itctc/
New York State Department of Transportation	315-428-4409	

APPENDIX B

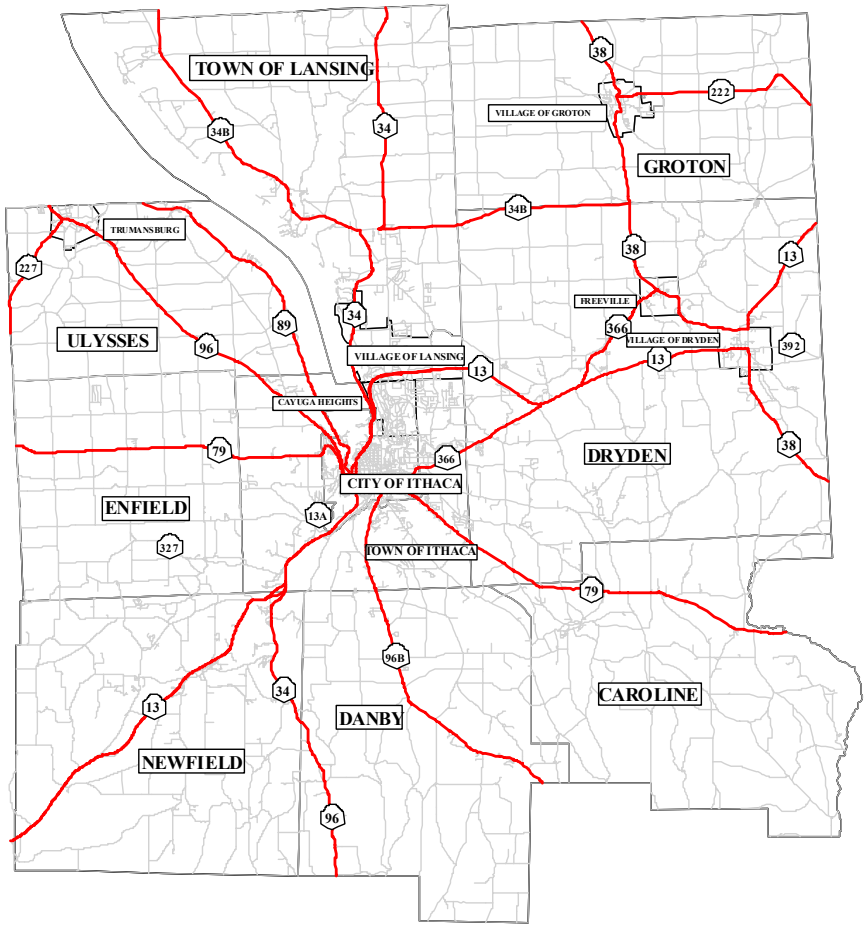
TIP Planning Area Maps

Ithaca Tompkins County Transportation Council (ITCTC)
Map of MPO Area

New York State Department of Transportation (NYSDOT)
Map of Non-MPO Areas (Rural)

Syracuse Metropolitan Transportation Council (SMTC)
Map of MPO Area

ITHACA TOMPKINS COUNTY TRANSPORTATION COUNCIL
METROPOLITAN PLANNING AREA



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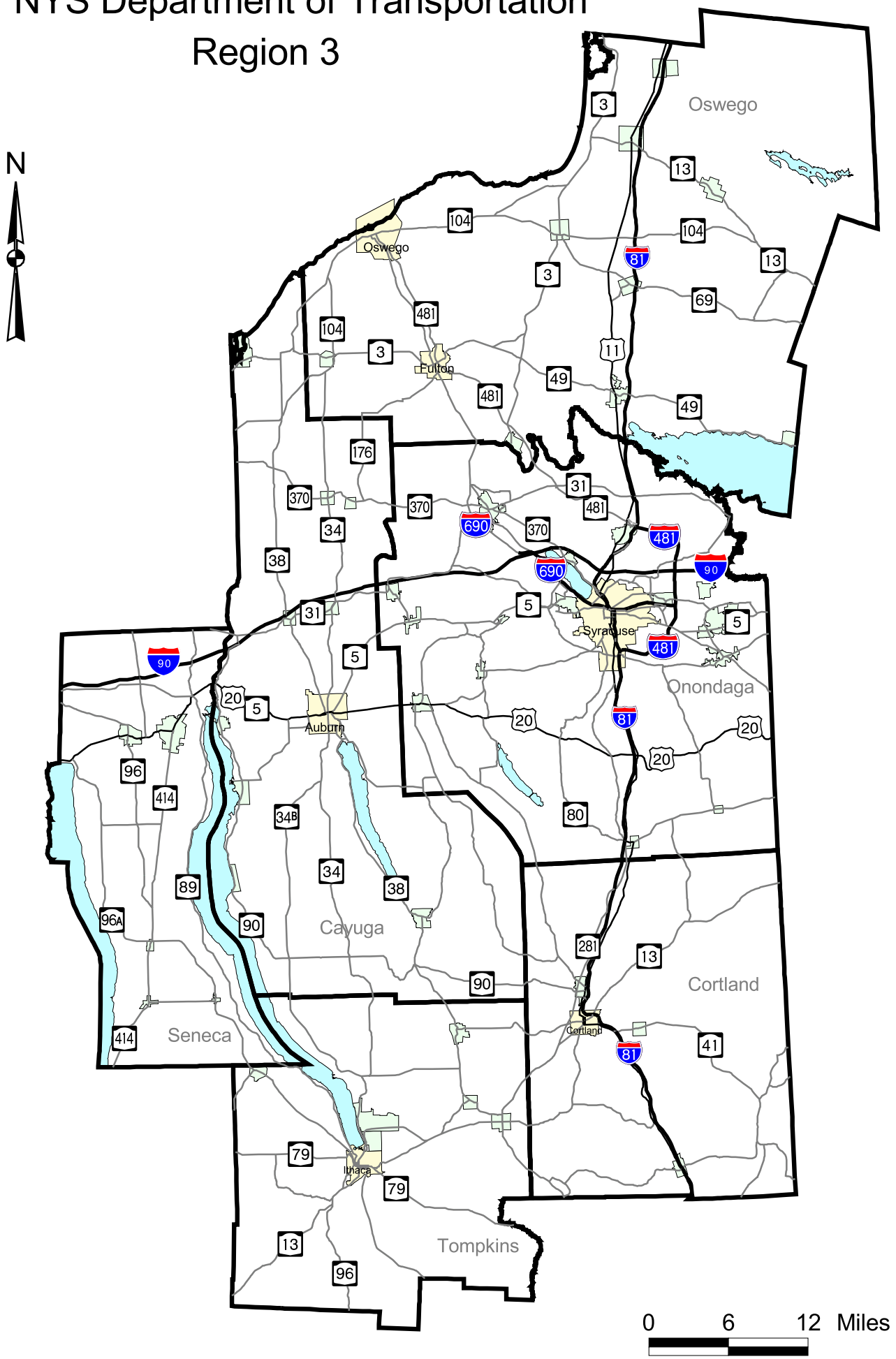
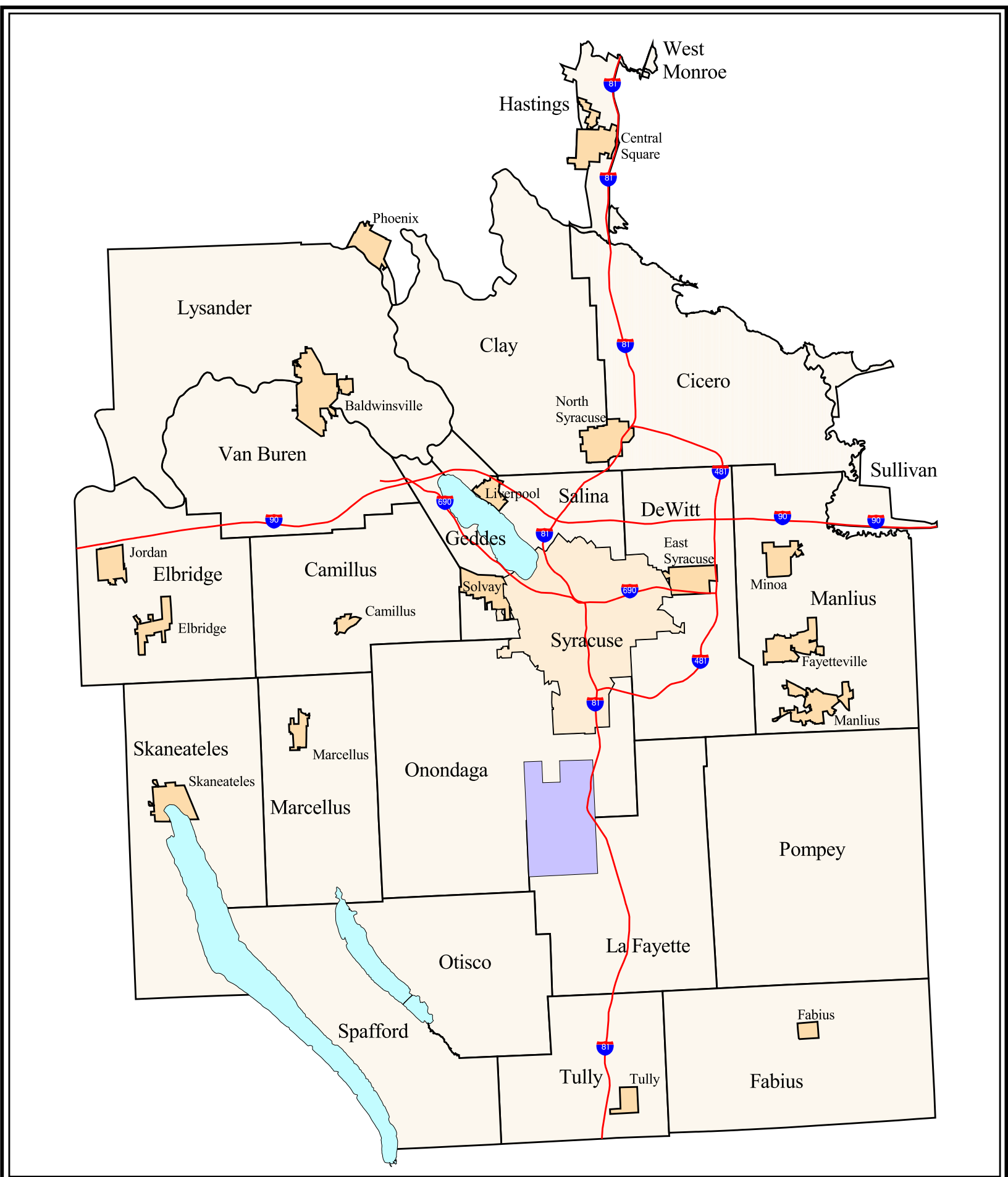
NYS Department of Transportation
Region 3





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Metropolitan Planning Area

SMTC

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APPENDIX C

Eligible Project Types by Funding Program

Note: Applicants are not expected to identify potential funding sources for projects. This information is included only to illustrate the various types of projects that are eligible for specific funding programs.

Congestion Mitigation/Air Quality (CMAQ)
(Note: This fund source is only available in the SMTC Planning area)

CMAQ projects can generally be classified in one of the following categories:

- Transit improvements;
- Outreach Activities;
- Shared-ride services;
- Traffic flow improvements;
- Demand management strategies;
- Pedestrian and bicycle programs;
- Inspection and maintenance programs.

Interstate Maintenance (IM)

The following types of projects on the *existing interstate system* are eligible:

- Reconstruction of existing through-lanes on interstate highways;
- Acceleration/deceleration lanes on interstate highways;
- Interstate interchange reconstruction or reconfiguration;
- Bus/HOV lanes or rail rapid transit as a substitute for general purpose highway lanes;
- Studies as appropriate to plan and implement the above; and
- Peripheral Park-and-Ride lots.

National Highway System (NHS)

The following types of projects are eligible if they occur on the *National Highway System*:

- Road construction, reconstruction, resurfacing, restoration and rehabilitation;
- Operational improvements;
- Highway safety improvements;
- Surface transportation planning;
- Highway research and planning;
- Traffic management and control start-up costs;
- Fringe and corridor parking facilities;
- Carpool and vanpool projects;
- Bicycle and pedestrian transportation facilities;
- Management system projects;
- Wetland mitigation associated with NHS project construction;
- HOV lanes or rail rapid transit as a substitute for new general purpose lanes on freeway and major regional arterial roadways;
- Studies as appropriate to plan and implement the above; and
- Construction of, and operational improvements for, a Federal Aid highway **not** on the National Highway System, and construction of a transit project eligible for assistance under the Federal Transit Act, if such highway or transit project is in the same corridor as, and in proximity to, a fully access controlled highway designated on the National Highway System; if the construction or improvement will improve the level of service on the fully access controlled highway and improve regional travel; and if the construction

or improvement is more cost-effective than an improvement to the fully access controlled highway that has benefits comparable to the benefits which will be achieved by the construction of or improvements to, the highway on the NHS.

Highway Bridge Replacement/Rehabilitation (HBRR)

The following types of projects are eligible for HBRR funds:

- Reconstruction; replacement, rehabilitation, repair and restoration of deficient highway bridges located on any public road;
- Widening of bridges or viaducts to relieve congestion on a public bridge;
- Construction of HOV lane structures on a public bridge; and
- Culverts of minimum size on a public bridge.

Surface Transportation Program (STP)

Types of facilities for which STP funds can be used:

Funds can be used on all facilities except roads functionally classified as local or rural minor collectors, unless:

- those roads were on a Federal-Aid highway system on January 1, 1991;
- an exemption has been made as approved by the Secretary of USDOT;
- the funding is for the following types of projects
    - Alternative mode projects (see list below)
    - Safety projects (see list below)

Projects eligible for STP funding:

- Highway (including Interstate highways) and bridge projects (including bridges on public roads of all functional classifications):
    - Construction, reconstruction/rehabilitation, resurfacing, restoration and operational improvements of the existing highway and transit systems;
    - Highway and transit safety improvements and programs;
    - Highway and transit research and development programs;
    - Capital and operating costs for traffic monitoring, management and control facilities, and programs;
    - Surface transportation planning;
    - Technology transfer programs;
    - Transportation enhancement activities;
    - Development and establishment of the six management systems identified in TEA-21: Pavement, Bridge, Highway Safety, Traffic Congestion, Public Transportation, and Intermodal Facilities;
    - Capital costs for transit projects;
    - Construction or reconstruction necessary to accommodate other transportation modes;
    - Modification of public sidewalks to comply with the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et. Seq.);

- Seismic retrofit and painting of and application of calcium magnesium acetate, sodium acetate/formate, or other environmentally acceptable, minimally corrosive anti-icing and de-icing compositions on bridges and approaches thereto and other elevated structures;
- Mitigation of damage to wildlife, habitat, and ecosystems caused by a transportation project funded under Title 23;
- Vehicles and facilities, whether publicly or privately owned, that are used to provide intercity passenger service by bus;

- Alternative mode projects:
  - Car pool projects;
  - Fringe and corridor parking facilities and programs;
  - Bicycle and pedestrian transportation facilities;
  - Modification of public sidewalks to comply with Americans with Disabilities Act of 1990;

- Safety Projects:
  - Hazard eliminations;
  - Projects to mitigate hazards caused by wildlife;
  - Railway-highway grade crossings;

- Transportation Control measures

- Natural habitat and wetlands mitigation efforts (related to STP-funded projects):
  - Participation in natural habitat and wetlands mitigation banks;
  - Contributions to statewide and regional efforts to conserve, restore, enhance and create wetlands;
  - Development of statewide and regional wetlands conservation and mitigation plans, including banks, efforts, and plans;

- Infrastructure-based intelligent transportation systems capital improvements; and

- Environmental restoration and pollution abatement projects.

STP funding is allocated into four areas: *Urban, Small Urban, Rural, and Flex*

- STP-Urban dollars can be used to fund the transportation project types mentioned above within the designated Urbanized Area. The Urbanized Area is an area with 50,000 or more persons living within a central city or cities and the surrounding densely settled area.

- STP-Small Urban dollars can be used to fund the project types mentioned above within a densely settled area with more than 5,000 but less than 50,000 persons.

- STP-Rural dollars can fund the project types mentioned above in areas outside the defined Urbanized Area (see definition above).

- STP-Flex dollars can be used to fund the project types mentioned above in any area—urban, small urban, or rural.

Section 5307 (Federal Transit Administration Formula Funding to Transit Operators)

The following types of projects are eligible for these funds:

- Mass transit operation (up to FTA approved limits with required 50 percent local match)
- Regular mass transit capital improvement projects;
- Transit vehicle maintenance and operations; and
- Studies as necessary to plan and implement the above.

Section 5309 (Federal Transit Administration Discretionary Funds)

The following types of projects are eligible for these funds:

- Special mass transit capital projects;
- Regional rapid transit system construction;
- Incremental costs of alternative fuel vehicles over and above the cost of diesel vehicles; and
- Studies as necessary to plan and implement the above.

Section 5310 (Federal Transit Administration Capital Assistance to Elderly Persons and Persons with Disabilities)

The following types of projects are eligible for these funds:

- Capital assistance projects, not to exceed 80 percent of cost, to provide service for elderly persons and persons with disabilities.

Section 5311 (for general transit assistance to rural and small urban areas only)

The following types of projects are eligible for these funds:

- Both operating and capital assistance is available up to 80 percent of the total cost for rural and small urban area projects.

APPENDIX D

Project Evaluation Criteria Checklist

Project Evaluation Criteria Checklist

ALL PROJECTS

Does the Proposed Project:

Existing Investment

- ❑ Improve the safety of the existing transportation system?
- ❑ Improve the efficiency and reliability of the existing transportation system?

Community & Economic Development

- ❑ Promote travel alternatives that are available to all persons regardless of age, physical or mental ability and/or income?
- ❑ Enhance the region's attractiveness to new and existing businesses?
- ❑ Have support from specific local land use plans? (Are there local policies/regulations in place/pending that support success of project?)

Planning

- ❑ Support corridor-level transportation solutions?
- ❑ Promote system continuity and uniformity, especially across jurisdictional boundaries?
- ❑ Address transportation needs associated with new/existing regional initiatives?
- ❑ Advance the recommendations of a specific plan(s) or study(s)? (e.g., Unified Planning Work Program (UPWP) Study, Capital Improvement Program, Long-Range Transportation Plan (LRTP), Comprehensive Plans/Master Plans, etc.)

Air Quality and Environment

- ❑ Encourage the efficient use of non-renewable energy resources and/or promote renewable alternatives?
- ❑ Contribute to maintaining or improving regional air quality?

Fiscal Responsibility

- ❑ Minimize lifetime maintenance and user costs?
- ❑ Employ innovative financing/partnerships that reflect the scope of interests impacted or served?

HIGHWAY AND BRIDGE PROJECTS

Does the Proposed Project:

- ❑ Address a key transportation system safety deficiency (e.g., a Priority Investigation Location (PIL), High Accident Location (HAL), or other accepted safety priority ranking system)?

- ❑ Contribute to cost-effective maintenance/rehabilitation of existing investments?
- ❑ Improve transportation system safety and efficiency through the use of cost-effective alternatives to construction of new traffic lanes (e.g., Transportation Systems Management (TSM), Intelligent Transportation System (ITS), access management, etc.)?
- ❑ Improve the consistency of, and transition between, segments of the existing transportation network?
- ❑ Improve the safety and operations of an existing roadway, bridge, and/or intersection?
- ❑ Incorporate transit-supportive design features?
- ❑ Incorporate bicycle and/or pedestrian-supportive design features?
- ❑ Incorporate goods movement-supportive design features?

Facility Condition Score (Maximum Score = 10)

The facility condition score for highway and bridge projects is determined by the MPO and NYSDOT staff using the following matrix:

FACILITY CONDITION SCORE MATRIX				
Road Pavement Condition Score	**Traffic Volume (average daily traffic)**			
	< 3,000	**3,000 – 8,200**	**8,200 – 20,000**	**> 20,000**
PVT £ 4	7	8	9	10
PVT £ 5	6	7	8	9
PVT £ 6	4	5	6	7
PVT £ 7	2	3	4	5
Bridge Rating				
< 3.0	7	8	9	10
3.0 – 3.49	6	7	8	9
3.5 – 4.49	4	5	6	7
4.5 – 4.99	2	3	4	5

PUBLIC TRANSPORTATION PROJECTS

Does the Proposed Project:

- ❑ Improve the convenience and attractiveness of the existing public transportation system?
- ❑ Maintain a safe and reliable vehicle fleet?
- ❑ Contribute to operating cost efficiencies?
- ❑ Expand the capacity of the public transportation system to serve new riders?

- ❑ Expand mobility options for seniors, people with disabilities, and others traditionally not well-served by the transportation system?
- ❑ Improve access to employment, education, services, and/or community facilities (e.g. community centers, parks) for those with limited transportation options?
- ❑ Support efforts to address emerging trip-making patterns (e.g., intra-suburban, suburb-to-suburb, and "reverse commute" trips)?
- ❑ Contribute to cost effective maintenance/rehabilitation of existing investments (e.g. shelters, transfer facilities, etc.)?

BICYCLE AND PEDESTRIAN TRANSPORTATION PROJECTS

Does the Proposed Project:

- ❑ Address a bicycle and/or pedestrian network safety deficiency?
- ❑ Improve the convenience and attractiveness of the bicycle and/or pedestrian network?
- ❑ Provide for/improve the accessibility of the bicycle and/or pedestrian network (through both design and maintenance)?
- ❑ Improve connections with the existing transportation system (on-street, off-street, and public transportation)?
- ❑ Improve access to employment, education, services, and/or community facilities (e.g. community centers, parks)?
- ❑ Address stated need(s) appropriately?
- ❑ Employ accepted design standards and/or guidance?
- ❑ Contribute to cost effective maintenance/rehabilitation of existing investments?

GOODS MOVEMENT PROJECTS

Does the Proposed Project:

- ❑ Improve the safety of truck or rail freight transportation?
- ❑ Promote efficient intermodal connections?
- ❑ Improve the efficiency of truck or rail freight transportation?
- ❑ Remove physical barriers to truck or rail goods movement?
- ❑ Contribute to cost effective maintenance/rehabilitation of existing investments?

APPENDIX E

NYSDOT Region 3 Goal Oriented Programming Criteria

September 5, 2006 Revision

SAFETY PROBLEM STATEMENT

Region 3 seeks to maintain and operate its transportation assets in a state of good repair such that the overall safety and security of all users of the entire transportation system is preserved.

SAFETY GOAL

Ensure that safety and security are considered in the development and implementation of all Regional programs and projects for the purpose of reducing deaths, injuries, and accident rates occurring on the Region's transportation system, and;

Maintain the existing Safety Infrastructure, and; improve incident management and user information.

CRITERIA FOR FUNDING ANY SAFETY PROJECT

Safety projects are expected to reduce identified accident patterns and accident severity attributable to needs or deficiencies in the transportation infrastructure (i.e. vehicular, pedestrian, bicycle, transit, etc.). Safety projects should be funded in the following priority:

- Safety enhancements - accident countermeasures added to capital projects initiated to address other needs are typically the most cost effective. Safety enhancements should achieve a minimum benefit/cost ratio of 5 based on their incremental costs.

- Safety capital projects - stand-alone projects implementing specific safety recommendations should be implemented provided the benefit/cost ratio is 5.0 or higher.

- Safety capital projects or safety enhancements to other projects may also be implemented with benefit/cost ratios less than 5 but greater than 1, provided the accident histories, traffic volumes, highway geometry, or other special circumstances have characteristics warranting funding.

BRIDGE PROBLEM STATEMENT

To sustain an appropriate state of good repair of Region 3 bridges by using both capital and operating funds to minimize the life cycle costs of maintenance and repair.

BRIDGE GOAL

Assure a safe and serviceable bridge infrastructure for all public highway facilities in New York State at the lowest practical life-cycle cost.

Safety: Assure that all bridges are safe for their intended use.

Preservation: Assure an acceptable bridge infrastructure condition through all appropriate life-cycle actions.

Serviceability: Address Bridge structural and geometric features that compromise the efficient movement of people and goods, appropriate to the function of the highway.

Safety

Attention should first be directed towards the Safety of the traveling public. The following criteria indicate a potential threat. Those bridges that exhibit all four of these criteria should be considered first, three of the criteria next, etc.

- Poor bridge condition
- Unaddressed "critical" needs, as per B.M.S.
- A history of structural flags
- Vulnerabilities (hydraulic, overload, steel detail, collision, concrete detail or seismic)

Closure, repair, rehabilitation, and replacement are all viable strategies to "address" bridge problems. The selected strategy needs to be technically sound, should be appropriate to the function of the highway, and consider the life cycle of the bridge. Rehabilitation and replacement strategies are appropriate for federally funded capital projects.

Preservation

Preservation is the key to minimizing the life cycle costs of the bridge infrastructure. It includes both preventive and corrective actions in both the maintenance and capital arenas. Preventive and/or cyclical activities are generally maintenance functions. This category includes: washing, painting, crack sealing, deck sealing, substructure concrete sealing, asphalt overlay replacement and bearing lubrication.

Corrective maintenance includes scour protection, damage repair, repairing localized deterioration, etc. It is generally appropriate for federal funding. .

Rehabilitation is a corrective action carried out through a capital project. It is intended to address problems on a structure in one comprehensive project. This approach should be targeted at bridges that exhibit some or all of the following:

B.M.S. indicates a need "becoming critical" or "non-critical"

Yellow structural or safety flags or other indications that flags can be expected

Vulnerabilities with a low probability of occurrence.

Serviceability

Serviceability is based on consistency between the structure and the function of the facility it carries. It includes:

Load or clearance postings

Inappropriate geometry (i.e. insufficient width to accommodate pedestrians and bicycles)

Traffic level of service constraints, etc.

Serviceability issues do not generally lead to a decision to program a project. They will, however, influence a rehabilitation decision towards a replacement, or influence the timing of a replacement project.

All projects including serviceability elements will require an incremental benefits analysis prior to approval.

CRITERIA FOR FUNDING BRIDGE PROJECTS

1. Closure, repair, rehabilitation, and replacement are all viable strategies to "address" bridge problems. The selected strategy needs to be technically sound, and should be appropriate considering the life cycle of the bridge.

2. The proposed project must be eligible for Federal Bridge Funds:

    - The sufficiency rating must be below 80 for rehabilitations
    - The sufficiency rating must be below 50 for replacements
    - Systematic preventive maintenance

3. An "Economic Analysis Worksheet for Bridges" must be completed. The worksheet must indicate the proposed project has a benefit/cost ratio above 5.

4. Programming priorities will be by goal category; safety, preservation, then serviceability. Functional Class, then B/C ratio will be used to rank the candidate projects within the goal categories.

5. For bridges carrying less than 1,000 vehicles per day, other benefits should be demonstrated such as system integrity, economic development, agricultural access, or tourism needs. The bridges in this category will be prioritized for funding in the same manner, but considered separately from the higher volume bridges. Ten to 15 % of the available bridge funding will be set aside for low volume bridges.

PAVEMENT PROBLEM STATEMENT

Maintain and operate the Region's pavement and its related appurtenances in a condition of good repair, with higher volume/higher functional classification roads in an overall higher condition than lower volume/lower functional classification roads.

PAVEMENT GOAL

The pavement goal seeks to give priority to projects on the National Highway System (NHS) and other corridors with high commercial, intercity, tourist, commuter traffic or a significant and documented economic sustainability benefit.

CRITERIA FOR FUNDING PAVEMENT PROJECTS

1. High functional class roads are addressed before those with lower service Characteristics. High volume roads with poor and fair pavement conditions will be treated before medium and low volume roads, respectively, with similar conditions.

   High volume is greater than 8,000 AADT
   Medium volume is between 8,000 and 2,500 AADT
   Low volume roads have an AADT of less than 2,500

2. Eligibility for federal funding is based on the following criteria:
   a. The functional classification must be higher than "rural minor collector"
   b. The non-federal match must be available

3. Pavement projects are ranked based on the annualized construction and ROW cost per daily person mile of travel.

4. In determining priorities, a 10% cost reduction will be applied to urban/suburban projects to compensate for utility costs if the project includes pedestrian, bicycle, and access management provisions.

5. Special consideration will be given to projects that will have economic development benefits.

Daily person miles of travel = AADT x average auto occupancy x project length Note: bus (or school bus) passengers, pedestrians, and bicycles can be added where those volumes are significant.

AVERAGE AUTO OCCUPANCY RATES

Prepared by NYSDOT Planning Data Analysis Group from DMV accident records.
Cayuga County 1.659 Cortland County 1.651
Onondaga County 1.541 Oswego County 1.648
Seneca County 1.727 Tompkins County 1.574

CAPACITY PROBLEM STATEMENT

To maintain and improve Regional capacity for all users of the transportation system.

CAPACITY GOAL

The goal is to move people and goods conveniently, reliably, safely, at a reasonable cost, and in an acceptable travel time by implementing capacity enhancement or improvement projects that are cost effective, accommodate the various inter-dependent modes, and are compatible with and enhance economic development, the community, and the environment.

The Capacity Goal includes reducing the projected Person Hours of Delay (PHD), and the projected Ton-hours of delay (THD), at Level of Service (LOS) "E" or "F" through cost effective Transportation System Management (TSM), including access management techniques, Intelligent Transportation System (ITS) and Transportation Demand Management (TDM) actions. As a last measure, capacity will be improved by selected linear capacity projects.

CRITERIA FOR FUNDING CAPACITY PROJECTS

1. To be eligible for funding, the proposed project:

    a. Must demonstrate that it currently operates at capacity - LOS "E" or "F". The PHD at an intersection is the stopped time delay, in seconds, and is reflected in LOS ratings of A to F. The PHD for a linear system is the delay relating to the average trip time on the facility. Also calibrated in LOS ratings from A to F, where A is a free flow condition, and F is moving at a crawl.

    b. Must meet the following cost effectiveness criteria:

    - For every $1 million spent, there must be a reduction of at least 35 PHD at LOS *"E" or "F". See definition of PHD to convert from vehicle hours of delay.*
    - Clear demonstration of origins and destinations,

    c. The improvements must be targeted at improving the reliability of the system during the periods of maximum congestion.

    d. The project should demonstrate other benefits.

2. Notwithstanding the above, on a selected basis, projects, which display characteristics beneficial to the community, may be ranked higher based on their potential to improve the quality of life for that community. These projects may demonstrate characteristics such as:

    - industrial corridor access or improvements
    - arterial access management/local circulation improvements
    - frontage road development/curb cut consolidation
    - strategic or planned economic development
    - agricultural needs

- bicycle and pedestrian safety
- support recommendations of a specific plan or study

The same cost effectiveness criteria as above would apply.

MOBILITY PROBLEM STATEMENT

To maintain and improve Regional mobility for all users of the transportation system including bicycle and pedestrian facilities.

MOBILITY GOAL

The goal is to provide a transportation network that allows people and goods to move conveniently, reliably, safely, at a reasonable cost, and in an acceptable travel time. This is to be achieved by implementing mobility projects that are cost effective, accommodate the various inter-dependent modes, and are compatible with and enhance economic development, the community, and the environment. These projects can include facilities to provide for, and enhance, transit and non-motorized travel as well as community and regional connectivity.

Regional capacity and mobility shall also be improved through increased transit, bicycle, and pedestrian travel, and enhanced by promoting the connectivity of the NHS routes to the non-highway transportation modes.

CRITERIA FOR FUNDING MOBILITY PROJECTS

1. To be eligible for funding, the proposed project, if highway-oriented:

    a. Must demonstrate that it currently operates at capacity – LOS "E" or "F". The PHD at an intersection is the stopped time delay, in seconds, and is reflected in LOS ratings of A to F. The PHD for a linear system is the delay relating to the average trip time on the facility. Also calibrated in LOS ratings from A to F, where A is a free flow condition, and F is moving at a crawl.

    b. Must meet the following cost effectiveness criteria:

        - For every $1 million spent, there must be a reduction of at least 35 PHD at LOS *"E" or "F". See definition of PHD to convert from vehicle hours of delay.*
        - Clear demonstration of origins and destinations,

    c. The improvements must be targeted at improving the reliability of the system during the periods of maximum congestion.

    d. The project should demonstrate other benefits.

2. Notwithstanding the above, on a selected basis, highway-oriented projects that display characteristics beneficial to the community may be ranked higher based on their potential to improve the quality of life for that community. These projects may demonstrate characteristics such as:

    - industrial corridor access or improvements
    - arterial access management/local circulation improvements
    - frontage road development/curb cut consolidation

- strategic or planned economic development
- agricultural needs

The same cost effectiveness criteria as above would apply.

1. To be eligible for funding, the proposed project, if non-motorized oriented:
   (NOTE: This category is limited to $ 1 million for this cycle.)

   - Must demonstrate specific origins and destinations,
   - Must target improvements to enhance and encourage the usage or safety of non-motorized transportation options,
   - The project should demonstrate other benefits.
   - support recommendations of a specific plan or study

2. Notwithstanding the above, on a selected basis, non-motorized projects that display characteristics beneficial to the community at large may be ranked higher based on their potential to improve the quality of life for that community. Those projects may demonstrate characteristics such as:

   - Improved air quality from reduced VMT,
   - Improved community health from enhanced walking or cycling environment,
   - Perceived "livability" indices of the community involved due to improved non-motorized travel,
   - Safety improvements to enhance usage of non-motorized travel

DEFINITIONS

ANNUAL AVERAGE DAILY TRAFFIC (AADT) - The total volume passing a point or segment of a highway facility, in both directions, for one year, divided by the average number of days in a year. Expressed in vehicles per day or VPD.

CONDITION RATINGS - A weighted average of the condition of different features of a bridge. Ratings are from 1 (one) to 7 (seven), with 1 (one) being the poorest rating. (also see Priority Deficient Bridges.)

COST EFFECTIVE CAPITAL PROJECTS - The cost effectiveness of a project is based on the project's benefit to cost ratio, which must be greater than 1:1 to be considered cost effective.

HIGH ACCIDENT LOCATIONS (HAL) - A location which experiences accident rates higher than the Statewide averages for location of a similar nature.

LEVEL OF SERVICE (LOS) - A qualitative measure describing operational conditions of a transportation facility; generally described in terms of such factors as speed and travel time, freedom to maneuver, interruptions, comfort and convenience, and safety. LOS is expressed in ranges designated A through F. A is a free flow condition. LOS E is the capacity of the system. LOS F is Forced Flow, which may actually be less volume than LOS E.

LINEAR CAPACITY PROJECTS - Widening a significant length of a highway to increase the number of through travel lanes.

PRIORITY DEFICIENT BRIDGES - Priority Deficient Bridges can be defined as those with condition ratings of less than 3, and those with condition ratings between 3 and 4 with volumes of more than 4,000 vehicles per day. A Priority Deficient Bridge can also be defined as one which includes a Primary Feature with a condition rating of less than 3, with Primary Features being any of the following: Primary Structural Member, Pier Erosion; Pier General Recommendation; Beginning Abutment or End Abutment Erosion; or Beginning Abutment or End Abutment General Recommendation.

PRIORITY INVESTIGATION LOCATIONS (PIL) - List of locations evaluated by Traffic Engineering and Safety for possible safety projects.

SUFFICIENCY RATING - Numerical score of a roadway surface related to its overall condition on a scale of 1 (one) to 10 (ten) with one being the poorest.

TRANSPORTATION SYSTEMS MANAGEMENT (TSM) - The design and improvement of the function of the transportation system such as: traffic signal improvements; intersection improvements; improved enforcement; parking measures; widening curb lanes or improving shoulders for cycling; improvements to pedestrian access and linkages; barrier or curb improvements; or any controls used to decrease the average Person Hours of Delay on the facility. TSM relates to the "supply-side" of transportation management.

TRANSPORTATION DEMAND MANAGEMENT (TDM) - Programs designed to reduce the number of vehicles on the road, particularly in peak hours such as: ride sharing; express bus or carpool lanes; provision of bicycle storage at bus or train terminals; parking ordinances; staggered hours at placed of employment. The TDM relates to the "demand-side" of transportation management.

PERSON HOURS OF DELAY (PHD) - PHD results from congestion at an intersection or one a linear transportation facility. PHD can be calculated by multiplying the VHD by a factor of 1.74, which is based on the below assumptions:

VEHICLE MIX	%	PEAK OCCUPANCY RATE
AUTOMOBILES	95	1.71
TRUCKS	4.7	1.3
BUSES	0.3	22.5
TOTAL	100	1.74 (AVERAGE RATE)

Example, using a VHD of 1,000:

VEHICLE MIX X VHD = Number of Vehicles X OCCUPANCY RATE = PHD		
5% Automobiles X 1,000	= 950 X 1.7	= 1,615 (92%)
4.7% Trucks X 1,000	= 47 X 1.4	= 66 (4%)
0.3TBuses X 1,000	=3 X 22.5	= 67.5 (4%)
Total 100%		= 1,748

The average rate is derived by dividing the vehicle hours of delay (VHD) by the total number of person hours of delay, (PHD) or 1,000/1,748 = 1.74.

If the vehicle mix is known to be significantly different than the assumptions above, particularly if the facility has a higher number of buses than these assumptions (approximately 3 buses for every 950 cars) then the percentage for each type of vehicle should be changed to more accurately represent that difference.

The source for the average vehicle occupancy for automobiles is based on national peak hour occupancy statistics found in the 1990 National Personal Transportation Survey, published by the Federal Highway Administration (FHWA). The occupancy rate for trucks is from the Syracuse Metropolitan Transportation Council statistics. The average occupancy rate for buses is from the Central New York Regional Transportation Authority (CNYRTA), based on average vehicle occupancy inbound as well as outbound in the peak hour.

PERSON MILES OF TRAVEL (PMT) - The person miles of travel are calculated by multiplying the vehicle miles of travel (VMT) by a factor of 1.74, which is based on the assumptions outlined in the definition of Person Hours of Delay (PHD) above.

APPENDIX F

SMTC TIP Project Management-Selection-Amendment Process

TIP PROJECT MANAGEMENT
Selection Process
And
Amendment Process

Project Selection is a federal term, which is applicable in conjunction with the management of an approved Transportation Improvement Program (TIP) and the Statewide Transportation Improvement Program (STIP). It is not used to identify projects that would be added to the TIP and/or STIP.

Under federal legislation and the associated Metropolitan and Statewide Planning Rules and Regulations, the term "Project Selection" refers to the process or mechanism used to manage project schedule implementation from an approved and fiscally constrained TIP and/or STIP, for advancement to the FHWA or FTA for authorization.

TIP Project Management is a general term used by the SMTC to identify the flexible guidelines the MPO utilizes for the Selection Process, as well as the Amendment Process.

Development of a flexible procedure to manage various aspects of project implementation reduces the administrative workload by eliminating the need to process a TIP and/or STIP amendment each time it is determined that an already approved project contained in year 2 or 3 of the approved TIP/STIP may be advanced for implementation in the first year, or when a fund source revision is required, to ensure quick delivery of "ready highway and transit projects." It should be noted that the addition of a new project to, or the deletion of an approved project from an approved TIP will still require a formal TIP amendment under SMTC's TIP Project Management – Amendment Process. The Federal rules [Section 450.216(a)(5) and Section 450.324(c)] require that the TIP and STIP be fiscally constrained by Federal Fiscal Year (FFY) and by fund category. This constraint is defined as the amount of funds (in each category) that is available for obligation in a given FFY.

The approved transportation program is very dynamic. Revised estimates of the value of programmed projects and/or delays in the schedule of a project caused by unforeseen events (e.g., need for minor ROW takings) create a situation where the value of the list of projects shown in the first year of the TIP/STIP may not equal the value of the resources available as the year progresses. Based upon recent history, the value of the first year's program will decrease from the initial cost. Since each year is now required to be fiscally constrained, it is essential to identify an easy mechanism to advance approved projects from subsequent years of the TIP/STIP to ensure that the federal funds available to New York in a given FFY are fully utilized and not returned to Washington for redistribution to another state.

It's imperative to understand that, in a tightly constrained TIP, all projects, of all modes, in all fiscally constrained years, represent hard commitments and all will be delivered unless withdrawn by the sponsor.

The following narrative describes the TIP Project Management procedures adopted by the SMTC:

1. Projects identified in the first year of the TIP/STIP have first right to the funds available. To the extent that all the projects are ready to be authorized and the actual costs match the programmed costs, no Selection Process or Amendment Process is required.

2. If the value of a project in the first year of a TIP/STIP increases from the programmed cost when it is ready for authorization, it will be necessary to maintain the fiscal integrity of the fund category in that FFY in order to obtain federal authorization. Generally, this will require that savings in other first year programs be identified. If that cannot be demonstrated, other first year projects or the subject project (phase) would need to be deferred to later years. If they are deferred to later years, it is important to remember that fiscal balance in years 2 and 3 of the TIP/STIP must also be maintained. This may necessitate advancement or deletion of scheduled projects in years 2 or 3. Even though this sounds onerous, it often entails only minor schedule change of a project (e.g., September 2006 to October 2007).

3. It is sometimes necessary to revise the fund category in order to ensure timely authorization of an approved project. This action is permitted under the Selection Process for fund sources, other than STP-Urban and CMAQ, if the fiscal integrity of each affected fund category is maintained, and the changes do not result in the delay of any other project (phase). If it is necessary to revise either the STP-Urban or CMAQ fund categories, the Amendment Process must be followed.

4. The most likely situations that would require use of the Selection Process are indicated below:

   - Savings are incurred at authorization (or bid) or;

   - The schedule of a project slips due to production problems, causing the authorization to be deferred to a subsequent FFY.

   In these instances, it will be necessary to select the highest ranked project that is ready for authorization on the MPO's adopted priority listing in the TIP from the second or third year of the TIP/STIP for authorization to avoid lapsing funds in the current FFY.

5. Notification to affected MPO member agencies shall be made as indicated on the Selection Process Matrix.

The Selection Process Matrix and the Amendment Process Matrix provide specific information concerning the use of the Processes under a variety of circumstances.

To the extent that projects ready to go exceed the funds available in a given FFY, the NYSDOT, with Division of Budget approval, may advance funds to construction projects late in the FFY. After new funds and/or Obligation Authority are authorized in October, these advance-funded projects are then converted from advanced funding to regular federal funding. Thus, the timely advancement of all Title I funded projects that are ready and in the approved TIP/STIP can be achieved. All projects ready to be advanced can be delivered.

The SMTC recognizes that, as part of prudently managing the Obligation Authority, the Department can select Title I (FHWA) funded projects from years 2 and 3 of the TIP/STIP and/or revise the fund category if it becomes necessary because of savings or schedule slippage in other Title I projects. The basis for selecting projects from years 2 and 3 or revising fund categories will be, to the extent possible, to select the highest ranked project from the MPO's adopted priority listing in the TIP that is ready to be authorized from the same geographic area (MPO or non-metropolitan area), then from the same NYSDOT Region, and finally, from anywhere within the state. Each sponsor should be assured that their project(s) will be authorized when ready (even if the project schedule slips), as is now the case.

Similarly, for Title III (FTA) funded projects in the TIP/STIP, there may be occasions when projects included in the first year of the TIP/STIP will not be ready for authorization at the time the grantee prepares and submits the grant application to FTA or could be authorized with another Title III fund source. To the extent that the value of the projects in the first year of the TIP/STIP does not equal the funds available, project selection may be utilized to advance projects from years 2 and/or 3 of the TIP/STIP. The grantee can select project(s) from years 2 and/or 3 if they are ready to be implemented. The value of the project(s) selected must equal those in the first year that are not ready and the fund category must be the same. If the grantee does not have projects in years 2 and/or 3 of the TIP/STIP, the grantee will consult with the MPO (in metropolitan areas) or with the NYSDOT Regions (in non-metropolitan areas) to identify other Title III projects in the TIP/STIP that can be authorized in the first year.

For the Title I and Title III funded projects, the NYSDOT or the project sponsor shall notify the MPO as indicated on the Selection Process Matrix.

TIP PROJECT MANAGEMENT
AMENDMENT & SELECTION PROCESS

Revised March 2005

DESCRIPTION	AMENDMENT PROCESS	SELECTION PROCESS	
	TIP Amendment Required	PRIOR Notification to MPO	POST Notification to MPO
ADDING / DELETING PROJECT			
Project Deleted in Entirety	Planning/Policy		
New Project Added Over $50,000 Utilizing Traditional Competitive Fund Sources	Planning/Policy		
New Project Added Under $50,000 Utilizing Traditional Competitive Fund Sources	Executive		
New Project Added Utilizing Non-Competitive Earmarked Fund Sources	Executive		
CHANGES TO SCOPE			
Project Type/Function Is Changed	Executive		
Projects Are Combined			X
Project Phase Is Added (i.e.: New ROW Phase)		X	
Project Phase Deleted		X	
Project Limits Increase			X
Project Limits Decrease			X
CHANGES TO SCHEDULE			
Phase Is Delayed 1 Or More Fiscal Years	Executive		
Phase Is Advanced 1 Or More Fiscal Years From Year 4 Or 5	Executive		
Phase Is Advanced 1 Or More Fiscal Years From Year 2 Or 3			X
CHANGES IN COSTS			
Cumulative Cost Of A Phase Increases (Less Than 20% Of Original Total Project Cost And/Or Less Than An Increase Of $250,000)			X
Cost Of A Phase Decreases			X
Cumulative Cost Of A Phase Increases (Greater Than 20% Of Original Total Project Cost And Minimum Cost Increase Of $250,000	Executive		
CHANGES IN FUNDING CATEGORY			
Changes Made to CMAQ or STP-Urban Fund Sources	Executive		
Funding For A Phase Changes In Part Or Completely (To 1 Or More Different Categories)			X
Changes To Fund Sources Other Than CMAQ Or STP-Urban			X

Funding thresholds are in federal dollars, not total project cost.

APPENDIX G

Transportation Improvement Program
Initial Project Proposal (IPP)

These forms may be found on-line at:
www.tompkins-co.org/itctc

APPENDIX H

Congestion Mitigation/Air Quality Application
(SMTC Only)

Congestion Mitigation and Air Quality Improvement Program (CMAQ)
SUPPLEMENTARY APPLICATION

This supplemental application is provided to establish a record of all projects requesting obligation of CMAQ funds. The accompanying Supplementary Form, representing typical project categories, must be completed for each project to provide project descriptions and scopes, enable the determination of CMAQ funding eligibility, calculate estimated emissions benefits (if any), and document the variables/basis for emissions estimates. Emissions estimates developed from the Supplementary Forms will accompany each project's Initial Project Proposal where CMAQ funding is anticipated.

The primary purpose of the CMAQ Program is to fund projects and programs in air quality nonattainment and maintenance areas for ozone, carbon monoxide (CO) and small particulate matter (PM_{10}) that reduce transportation related emissions. All requests for FHWA obligation of CMAQ funds are reviewed by the NYSDOT Program Management Division for completeness. Beginning with Federal Fiscal Year (FFY) 2002, the review process will include a completeness determination by the NYSDOT Environmental Analysis Bureau (EAB). All requests for the obligation of CMAQ funds must be submitted to the EAB, Air Quality Section, for a completeness determination, as well as to the Program Management Division.

A **complete application** consists of a brief project description, a project scope and funding proposal, estimated emissions benefits, and supporting calculations and references clearly identifying the sources of input data. This information must be included in applications, regardless of the method used to derive emissions benefits. The required information must be conveyed using the IPP and supplemental forms containing the required information. If, in the course of a review, a question arises regarding an emissions estimation, the EAB will contact the applicant, MPO or RPPM, to facilitate a completeness determination. The applicant, the Program Management Division, and the FHWA, will be advised of the EAB's determination of a complete application as soon as its available.

Completeness determinations will be needed for both new and ongoing projects as funding is requested. Many projects, such as construction projects and programs providing ongoing financial support, require the obligation of funds over several years, while other projects, such as those providing operational support, often result in project scopes and emissions benefits that frequently change from year to year. Accordingly, to improve the projects' emissions benefit inventory and the Department's accountability to the FHWA and EPA, each request for CMAQ funds should be accompanied by a complete application providing the project's current emissions estimates and scopes. Ongoing projects, projects selected for CMAQ funding over two or more years, may submit addendums to their applications, incorporating their original applications by reference, attesting to the fact that there has been no change to the project's initially funded scope or emission benefit.

Project emissions benefits will be determined using appropriate air quality analysis software. The software should be used, with consultation from EAB, to aid in their preparation, and establishment, of an electronic record of CMAQ funded project emissions estimates. Using this software it will be possible to calculate before and after (no-build / build) emissions benefits

using standard "CMAQ" emissions factors, or where necessary, custom emissions factors unique to a project or program. It should be noted that using a software program to estimate emissions does not obviate the need to prepare and submit complete CMAQ applications.

Study findings will be reported to the FHWA annually, as required; will be used to refine the EAB's emissions inventory; should be considered in determining continued CMAQ eligibility; and will be available for the evaluation of current and future projects.

Before and after effectiveness studies of project emissions benefits are requirements of the Department's CMAQ Program Guidelines. All applications should include provisions for both funding and implementing effectiveness studies. Study findings will be reported to the FHWA annually, as required, used to refine the EAB's emissions inventory, should be considered in determining continued CMAQ eligibility, and will be available for the evaluation of current and future projects.

The software should be mode and project neutral; have no bias, nor weighted, towards any type or mode of project. The analysis requires specific, factual data about each project. In general, there must be accurate numeric values for the claims of improvements, (VMT reduction of vehicles in the network segment[s], variation in travel speed, the miles traveled per day by the impacted population, etc.), and which follows the protocols of the Highway Capacity Manual.

First, for any project, the existing or "no-build" condition must be defined. There must be a sound and verifiable baseline condition or status from which the proposed project is beginning.

The next step is to explain the proposed improvement, both in a brief descriptive narrative or what the proposed project will do, and the before and after numbers and values of the appropriate parameters of measure. ***It must be noted that the estimated before and after conditions must be provided in numerical values***, (e.g. number of autos diverted from the target catchment area; the miles traveled per day by the target population).

It is important to note several key items:

1. Fill out only that form that is consistent with your project category (e.g. a sponsor with a project for replacement of diesel transit buses with compressed natural gas transit buses would fill out Form 1, Alternative Fuels).

2. The data provided must be germane to the proposed project and the impact area. For example, the traffic volume on an Interstate or a limited access highway is not applicable to a local inner-city bike path. The population in immediate proximity, and the traffic of the local streets adjacent to, the proposed improvement are the data that will be recognized to evaluate the projects impact.

3. It will be important to document the source of where analysis inputs come from (e.g. a bicycle survey conducted by a consultant to determine diverted VMT and riders on a trail). Keep in mind that the question of "where did the numbers come from" must be answered and the sponsor should allocate funds for this follow-up process in the project proposal**.**

FORM 1

ALTERNATIVE FUELS

Date Prepared: _____

Project Name _____

Road/Street Segment Impacted_____

Year Project Starts Operation _____

BEFORE	**AFTER**
Vehicle Type _____	Vehicle Type _____
Fuel Type _____	Fuel Type _____
Number of Vehicles _____	Number of Vehicles _____
Miles/Day _____	Miles/Day _____
Days/Year _____ (Operation)	Days/Year _____
Speed _____ (Actual)	Days/Year _____

List the Sources of Traffic Data:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

FORM 2

BICYCLE AND PEDESTRIAN

Date Prepared: _____

Project Name _____

Road/Street Segment Impacted _____

Year Project Starts Operation _____

Operational Life of the Project _____

BEFORE	**AFTER**
Functional Class _____	Functional Class _____
Speed _____ (Actual)	Speed _____
Segment Length _____	Segment Length _____
AADT _____	AADT _____
AVO _____1.541_____ (Avg. Vehicle Occupancy)	AVO _____1.541_____
% Short Trip _____0.4611_____	% Short Trip _____0.4611_____
Existing # of Bike Users _____	Net New # of Bikes _____
Days/Year _____	Days/Year _____

List Sources of Traffic Data:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

FORM 3

INTELLIGENT TRANSPORTATION SYSTEMS

Date Prepared: _____

Project Name _____

Route/Road Name _____

From _____ To _____

Year Project Starts Operation _____

TRAFFIC FLOW IMPROVEMENT

BEFORE	AFTER
Speed _____ (Actual)	Speed _____
No. of Vehicles _____	No. of Vehicles _____
Length of Segment _____	Length of Segment _____
Days/Year _____	Days/Year _____

List Sources of Traffic Data:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

FORM 4

TRANSIT

Date prepared: _____

Project Name _____

Road/Street Segments Impacted :

1. _____
2. _____
3. _____

Year Project Starts Operation _____

Operational Life of Project _____

VEHICLE REDUCTION

Vehicle Type _____

Speed _____
(Actual)
Number of Vehicles Diverted _____

Miles/Day _____

Days/Year _____

OFFSETS

Existing Service? (i.e. no offsets) _____

New Service:

Number of new buses: _____ Vehicle Type: _____

Fuel Type: _____Emission Factor:_____Source: _____

Miles/Day: _____ Days/Year: _____ Speed: _____

Notes:

1. ***The data for the vehicle reduction section must detail the vehicular traffic being replaced by the proposed transit project.***

2. ***The "Vehicle Type" refers to the vehicle being diverted from; e.g. a new bus route may take 100 cars off a certain route segment during a one-year period.***

List Sources of Data:

1. _____

2. _____

3. _____

4. _____

APPENDIX I

WORKSHEETS

INSTRUCTION FOR BRIDGE ECONOMIC ANALYSIS WORKSHEET

1. An economic analysis should be done for all proposed bridge replacements and rehabilitations. The worksheet provides a rapid and uniform method to demonstrate that a proposed bridge replacement or rehabilitation is a cost-effective use of public funds. The proposed analysis does give a reasonable measure of the bridge's relative economic value to the transportation network. It does this by assessing the hypothetical costs of abandoning the bridge against the costs of needed improvements. The economic analysis is not, however, the only factor, or necessarily the most important factor in project selection. Other factors that should receive appropriate weight are indicated under "other considerations."

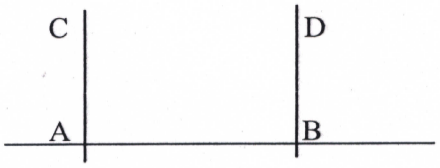
2. The remaining crossing life without the project should be estimated based on professional judgement. The following formula, based on the NYS bridge condition rating (CR) may be used as a guide:

   HIGH REMAINING LIFE (rehabilitation) = CR x (CR - 1)
   LOW REMAINING LIFE (replacement) = CR x (CR - 2)

3. Estimated project costs should include all costs associated with the project. This includes the costs of approach work, design and construction engineering, right of way, construction, maintenance of traffic (MOT) and improvements for construction detours. Costs should be in 2002 dollars.

4. Detour limits, detour lengths and present link lengths are defined as follows for the link network shown here.

   Detour limits : A and B
   Present link length (PL): AB
   Detour length (DL) : ACDB



   This diagram represents the general case. In more complex instances, where an accounting for diverse traffic origins and destinations and several detour possibilities is needed, estimate the proportion of the present bridge traffic diverting to each significant detour. Label and fill out a worksheet for each detour. The benefits are additive, so then sum them on the primary worksheet.

   The selected detour should as far as possible minimize user costs for the current bridge traffic. Long detours are often avoided by improving a closer route not presently designed to accommodate the bridge traffic. In such cases, the cost of required detour improvements should be considered in minimizing detour costs as well as in total project costs. However, in all cases traffic origins and destinations should be assessed to determine the detour limits.

5. The average annual daily traffic (AADT) is available from the Department's Traffic Volume Report.. Explain if another source is used.

6. BASE BENEFITS (BB) are calculated as shown on the worksheet, using unit benefits (UB) and life factors from the tables below. The UNIT BENEFIT is the user cost and time savings from not having to use the detour (per vehicle, per mile of present link length). It is important to be realistic in selecting detour limits. They represent the points where through traffic would depart from its present route if the bridge being analyzed were permanently closed. Different detour limits may be used for different segments of the total bridge traffic. If your ratio of DL/PL exceeds about 3, take another look at the detour limits!!!!

The LIFE FACTOR provides the relative present worth of the project based on its life and the remaining life in the current structure. A 4% rate of interest is assumed. It is 1.00 for a bridge replacement with estimated 50-year project life and no significant remaining life of the existing bridge. For rehabilitation projects, and for replacements where there is remaining life, determine the life factor from the table below.

UNIT BENEFITS ($1000)

DL	UB*
1.0	0.272
1.2	0.938
1.4	1.605
1.6	2.270
1.8	2.934
2.0	3.603
2.2	4.269
2.4	4.935
2.6	5.600
2.8	6.269
3.0	6.937
3.5	8.602
4.0	1.027
4.5	11.934
5.0	13.600
6.0	16.932
7.0	20.265
8.0	23.598
9.0	26.927
10.0	30.262

LIFE FACTORS

CROSSING LIFE WITH PROJECT	CROSSING LIFE WITHOUT PROJECT (Years) 0	2	4	6	8	10	15	20	25	30	40
5	.21	.12	.04								
10	.38	.29	.21	.13	.06						
15	.52	.43	.35	.27	.20	.14					
20	.63	.54	.46	.39	.32	.26	.12				
25	.73	.64	.56	.48	.41	.35	.21	.09			
30	.80	.72	.64	.56	.49	.43	.29	.17	.08		
35	.87	.78	.70	.62	.56	.49	.35	.24	.14	.06	
40	.92	.83	.75	.68	.61	.54	.40	.29	.19	.12	
45	.96	.88	.80	.72	.65	.59	.45	.33	.24	.16	.04
50	1.00	.91	.83	.76	.69	.62	.48	.37	.27	.20	.08

* Table values reflect consideration of vehicle operating costs, time costs and construction detour costs. ASSUMED: 50 year project life for bridge replacements, 4% interest rate, 2002 dollars, detour speed 40 mph with at least 5 mph higher speed on present route, 10% trucks, 5% reverse traffic with half having both origin and destination within detour limits.

7. ADJUSTMENTS to base benefits is necessary under special circumstances:

   Bridge traffic having origins or destinations within detour limits would have to go some distance in a direction reverse to their present travel, if the bridge were closed. Some reverse traffic is built into the base benefits, but when more than 10% of AADT represent REVERSE traffic, an adjustment in benefits is warranted. This could occur, for example, in a village with only a single crossing of an important stream or railroad barrier.

   A SPEED adjustment is appropriate in villages or other areas with low speed limits, when detour speeds are lower than 40 mph and also lower than the speed on the present route.

   When truck traffic is heavy, higher unit time and operating costs should be considered. Ten percent is built into the base benefits but an adjustment can be made when truck volumes exceed 15% of AADT.

   An eight-month consideration detour is built into the base benefits. Where traffic can be maintained through stage construction or an on-site detour, the adjustment for NO CONSTRUCTION DETOUR is warranted. (The added cost of an on-site detour during construction should be kept less than 5% of benefits for a one-season detour, 9% for a two-season detour). Special benefits resulting from building the replacement bridge on new alignment should also be noted under OTHER CONSIDERATIONS.

8. OTHER CONSIDERATIONS should be used to describe circumstances or unique problems that influence programming decisions and/or project priority.

   SCHOOL BUSES: indicate the total number of round trips per day, when available.

   EMERGENCY SERVICE: indicate those services materially dependent on the bridge (e.g., a nearby hospital or firehouse).

   COMMUNITY SENTIMENT: indicate how this bridge, compared to similar bridge projects, is viewed. Rate the intensity of sentiment from 1 to 5, where 1 is indifference, 2 is average, and 5 is extraordinary.

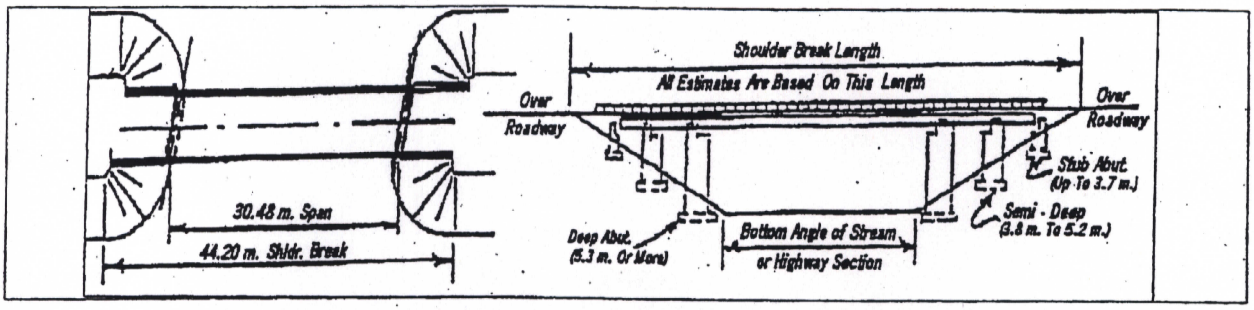
   For DEAD END ROADS, check the box provided under OTHER CIRCUMSTANCES and indicate the number of people or households served and the nature and probably value of property on the dead-end portion of the road. In this case, the B/C calculation is simply the property value divided by the project cost.

   NEARBY INVESTMENT: indicate other upcoming projects, major needs, or developments which will affect this roadway link.

   ADDITIONAL CIRCUMSTANCES: point out other items of unusual significance if relevant.

PRELIMINARY COST ESTIMATE WORKSHEET (NEW AND REPLACEMENT BRIDGES)

P.I.N. _____ B.I.N. _____ PS&E _____
BRIDGE _____ OVER _____
NUMBER of SPANS _____ SPAN ARRANGEMENT _____ WIDTH _____ m
ABUTMENT TYPE _____ SKEW _____ DEG CURVED GIRDERS _____ RADIUS _____ m
SUPERSTRUCTURE: Steel ☐ Steel Curved ☐ Prestress Conc Box Beam ☐ SLAB ☐ OTHER: _____
Alternate Design ☐ Timber ☐ Inverset ☐ Box Culvert ☐ Con-Span ☐ Hy-Span ☐
M&PT By: Detour Structure ☐ Local Roads ☐ Exist. Bridge ☐ Stage Const. ☐ NA. ☐
PREPARED BY: _____ DATE: _____



Remember to Account for Skew Angle

To determine shoulder break length with a skew, subtract the elevation of the bottom angle from the elevation of the proposed over roadway; double this number (1 on 2 slope) for distance "A". Now multiply "A" by 2 and add that to the width (perpendicular) of the bottom angle (or highway section) for Distance "B". Now divide "B" by the Cosine of the Skew Angle for the SHOULDER BREAK LENGTH.

SHOULDER BREAK DIAGRAM (Shoulder Break Length) _____ m X (Bridge Width) _____ m = (Shoulder Break Area) _____ m²

1.) Basic Bridge: ☐ Reg. 1 - 7 & 9 =$861, Reg. 8 = $968 to $1184, Reg. 10 = $1022 to $1237
Basic RR. Bridge =$2422/m² (Subtract $54 - $108 for bridges with 4 + spans)

2.) Foundations: ☐ Spread footings or footings on rock = Subtract $32
Cost based on average soil conditions & pile lengths of 6.1 m. to 10.7 m. Piles average $97 - $140 per bridge. Poor soil can increase the number and length of piles resulting in cost inputs of $215 - $323. (Reduce cost for bridges over 122 m.)

3.) Abutments: ☐ Integral = Subtract $32 for (Reg. 1-7 & 9) & Subtract $75 for (Reg. 8 & 10)
Abutments 6.1 m. - 9.1 m. high = $32 - $108. (Reg.1-7 & 9) & $54 to $162 (Reg. 8 & 10)

4.) Cofferdams: ☐ Significant cost usually found in deep water construction only. Costs based on bridges up to 15 m. wide
Water depths based on bottom of footing to OHW elev. Minor Water Diversion (Sand Bags) = $2000 - $9000 per bridge.
Divide cost on right by shoulder break m² & input Abutments in 1.2 m. to 1.8 m. of water = $8000 - $12,000 per unit.
Piers in 1.5 m. to 2.4 m. water = $40,000 - $50,000, 3.6 m. to 4.3 m. of water = $75,000 - $125,000,
Canal Pier Protection Cofferdam System (Sheeting 12.2 m High)= $130,000 - $150,000. (all are per unit)
(Tremie Seals cost $15,000 - $30,000 per unit)

5.) Long Spans: ☐ Average multi span continuous. For input choice for spans: 48.8 m - 53.3 m. = $32, 53.6 m- 57.9 m. = $65, 58.2 m - 61.0 m. = $86, 61.3 m- 65.5 m. = $129, 65.8 m- 70.1 m. = $183, 70.1 m - 74.7 m. = $237
(Add $54.00 for each 4.6 m. of additional length over 74.7 m. Truss: add $269.00 plus the factor for long spans (ex: 85.3 m truss, input $631)

6.) Curved Girders: ☐ 488 m. radius or less = $172, 488 m to 762 m. = $130, 762 m to 914 m. = $87.
Reg. 8 & 10 add $54 to these costs.

7.) Long Wingwalls: ☐ See chart on 2nd sheet for input. This factor necessary when total wingwall length exceeds 18.3m.

8.) Stage Construct. ☐ Superstructure/Substructure staging = $87 to $130, Minor staging of substructure = $32 to
Region 8 & 10 staging = $162 to $323 $65, Integral Abut. Bridges = $65 to $97, Anchor tie back systems & H-Pile wall lagging can add $54 to $108 more.

9.) Miscellaneous: ☐ Final Adjustment Area. Examples: Slope protection full channel lining = $43 to $65, Bridge less than 9.1 m. wide = $32, Bridge over 23 m. wide = subtract $32, Paint steel = $22 based on m² deck area (Girder bridge). Painting Truss = $190 SB m². Protection walls other than for staging.

SUBTOTAL: _____
15% Inflation: _____ (1995 Base to Year 2000)
TOTAL: _____
Shoulder Break Area m² ☐ X Cost / m² ☐ = BRIDGE ONLY COST _____
Cost to remove existing bridge = _____
Cost of Maintenance & Protection of Traffic = _____
Cost of detour structure = _____
Cost of channel work = _____
Cost of utilities = _____

Box culverts / Con Span / Hy Span
Length (m) ☐ X Cost per meter ☐ X 1.15%= _____
(add 15% for Year 2000 prices)

TOTAL BRIDGE SHARE: _____

M. COST APPROXIMATIONS FOR LONG WINGWALLS / RETAINING WALLS

This Chart SHould Be Used When Wingwalls Exceed A Total Length Of 18.3 m For A Single Bridge Project. The First 18.3 m Are Included In The Basic Bridge Cost

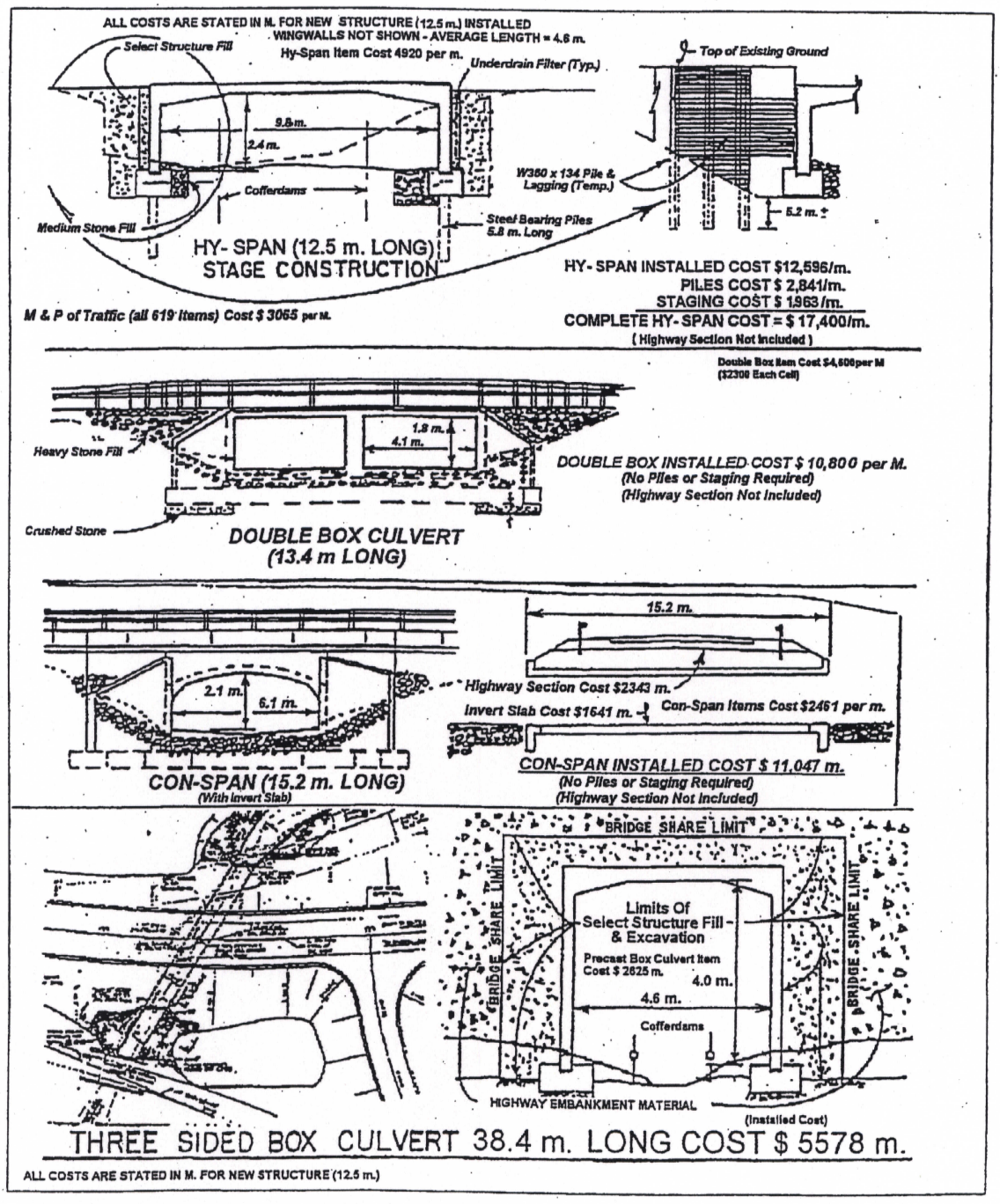
L=TOTAL WINGWALL LENGTH - 18.3M
REMEMBER TO USE AVERAGE HEIGH WHEN WINGWALLS TAPER DOWN

(AVERAGE HEIGHT	REG.1- 7&9	REG. 8	REG.10
2.4 m.	$1,640	$1,968	$2,296
3.7 m.	$2,132	$2,460	$2,788
4.3 m.	$2,460	$2,788	$3,116
4.9 m.	$2,788	$3,116	$3,444
5.5 m.	$3,198	$3,526	$3,854
6.1 m.	$3,608	$3,936	$4,264
7.3 m.	$4,756	$5,084	$5,412
8.5 m.	$5,412	$5,740	$6,068
12.2 m.	$8,856	$9,512	$10,168

_____ m X _____ = _____

End of W.W. to End of W.W. (L) | $ m. Input From Chart Above | Dollar Cost of Walls

TAKE DOLLAR COST OF WALLS AND DIVIDE BY SHLDR. BREAK FOR INPUT ON LINE # 7.(REMEMBER TO EXCLUDE INITIAL 18.3M OF WINGWALL)



DATE:_____
BY:_____

ECONOMIC ANALYSIS WORKSHEET FOR BRIDGES

(see instructions)

Project identification number _____
Bridge identification number _____

COUNTY:_____
DESCRIPTION:

Functional Class System:_____

Present Link length
(between detour limits, miles)PL = _____
Detour length (miles) DL = _____
DL/PL = _____
Current traffic volume (AADT):_____

Project characteristics:
_____ Replacement _____ Rehabilitation

NYS Condition Rating (CR):_____
Crossing life without project: _____ Years
Crossing life with project _____ Years

Construction cost ($1000) :_____
Design & const. engr.: _____
ROW cost: _____
Other (approach, MOT..):_____

Estimated project cost: $_____

BASE BENEFITS (BB) ($1000):
See back of sheet for unit benefits (UB) and Life Factor:
UB_____ X PL _____ X AADT _____ X LIFE FACTOR _____ = BB =$_____

ADJUSTMENTS:
For REVERSE TRAFFIC: This is traffic with an origin and/or a destination within the detour limits. If it exceeds 10%, enter percent as a whole number and carry through the calculation:
BB x (____ -5) / (142 x DL/PL - 128) = $_____

For DETOUR SPEEDS: If posted detour speed is less than 40 mph, and at least 5 mph lower than present route speed, circle and use the appropriate speed factor:

40	35	30	25 mph	
0	.10	.25	.50	speed factor x BB = $_____

For TRUCK TRAFFIC: If truck traffic is 15% or more, enter percent as a whole number and carry through the calculation: (____ - 10) x .02 x BB = $_____

For NO CONSTRUCTION DETOUR: If traffic can be maintained on site during construction: .05 x BB = $_____

ADJUSTMENTS = $_____

TOTAL USER BENEFITS = BASE BENEFITS + ADJUSTMENTS = $_____

OTHER CONSIDERATIONS (check and detail below as per instructions):

Dead end road:_____
School bus use:_____
Emergency service:_____
Community sentiment:_____
Related Investments:_____

BENEFIT COST RATIO: PROJECT USER BENEFITS/PROJECT COST = _____

****

(Revised 11/02)

Instructions for Completing TE 204
Project Benefit and Cost Summary

The Project Benefit and Cost Summary Form is used by any Main Office or Regional personnel desiring to summarize project benefits and costs and perform a Benefit/Cost ratio calculation for a project report or other document. The form is prepared singly; it may be typed or legibly hand written.

Section 1. Location – Fill in Identification Number assigned to this investigation as shown on FORM TE 133-1 and all other appropriate information.

Section 2. Benefits Summary – Annual Safety Benefits: This amount is the calculated annual safety benefits carried over from the TE 164 Safety Benefits Evaluation Form or other documentation. Annual Service Benefits can take several forms: Travel time savings, energy (gasoline) savings, or other operational savings (wear and tear on the vehicle, for example). For most projects, service benefits, when quantifiable, will be of several types and can readily be summed. Some or all of the "benefits" may in fact be "disbenefits"; these would be treated as negative numbers. If the overall service benefit is negative, it should be shown as a negative number.

Section 3. Cost Summary – Cost item or project element: All elements, including right-of-way, to which a service life can be assigned are included here. Elements with the same service life can be combined; however, elements with different service lives must be shown on separate lines.

Service Life: Typical service lives are shown in Table I. When the service life for a given element is not readily apparent from Table I, judgment should be used to find the most appropriate value.

Cost: the total cost for the element(s) is given.

CRF @ 4 percent: The Capital Recovery Factor for the given service life at 4 percent interest rate is entered from Table I.

Annualized Cost: The cost multiplied by the CRF @ 4 percent.

Items Subtotal: This represents the total cost of the above construction items.

Annualized Item Subtotal: The total of the above annualized costs.

Contingencies: A contingency cost should be added into each project to allow for unexpected considerations and errors of estimate, as well as items not tied to a specific construction or maintenance element, such as maintenance and protection of traffic, field office or mobilization. The exact figure chosen will depend on several variables. The type of project is important, for a simple project can generally be more accurately estimated than one more complex. The value of the contingency factor should reflect the estimator's confidence in the estimate: A less precise estimate should have a higher contingency factor. The percent to be used is chosen and multiplied by the Annualized Item Subtotal to arrive at the Equivalent Annual Cost for Contingencies. The Total Cost of Contingencies is also shown; this can be calculated by multiplying the Percent used by the Item Subtotal. (The Percent and Total Cost of Contingencies are complementary values: One can be derived from the other.)

Annual Cost for maintenance, operation, energy: This includes other annual costs not in the capital cost. It accounts for increases in maintenance and operation cost over the existing. For example, the annual cost for operation of a newly added signal is $500. Installation of guide rail at locations where none previously existed should have a maintenance cost of $1.00 per foot per year, Another example is impact attenuators, with a maintenance cost per hit: The frequency of hits could be based on past history or a predictive method, such as the ROS methodology. An explanation of the cost(s) can be included in the comments.

Total Capital Cost: The sum of the item subtotal and total cost of contingencies.

Total Annualized Cost: The sum of all annualized costs above.

Section 4. B/C Ratios – The Safety BCR, Service BCR and Total Project BCR are computed and inserted in the appropriate boxes.

Table I
Improvement Service Life (Maximum)

Improvement	Service Life (years)	Cap. Rec. Factor (4%)
Right-of-way, Obstacle Removal	100	.0408
Major Structures	30	.0578
Major Geometrics: change of intersection configuration, curve flattening, etc.	20	.0736
Minor Geometrics: left-turn bays, channelization islands	20	.0736
Major Sign Structures	20	.0736
Concrete Barrier (median or half-section)	20	.0736
Lighting	15	.0899
Metal Median Barrier	15	.0899
Metal Guiderail	10	.1233
Signals and Flashing Beacons	10	.1233
Signing	10	.1233
Concrete Pavement Grooving	10	.1233
Resurfacing (2.5 inch)	10	.1233
Armor Coat (1 inch)	5	.2246
Delineators and Guide Markers	5	.2246
Shoulder Stabilization	4	.2755
Pavement Markings:		
Traffic Paint	1	1.04
2-Component Epoxy	4	.2755
Thermoplastic	5	.2246
Polymer Tape	7	.1666
Raised Snowplowable Pavement Markers	5	.2246
	2	.5302

TE 204a (9/91)

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
TRAFFIC ENGINEERING AND SAFETY DIVISION

PROJECT BENEFIT AND COST SUMMARY

1. LOCATION

IDENT NO: _____

☐ TOWN
☐ CITY OF _____
☐ VILLAGE

Route No. or Street Name	State Highway No.	From or At Reference Marker
At Intersection With | Route No. or Street Name	State Highway No.	To Reference Marker

2. BENEFITS SUMMARY

ANNUAL SAFETY BENEFITS: $ _____ (Attach Form TE 164a or other documentation.)

ANNUAL SERVICE BENEFITS: $ _____ (Explanation and calculation must be in project report.)

OTHER ANNUAL BENEFITS: $ _____ (State their nature under "comments" and provide an explanation in the project report.)

TOTAL ANNUAL BENEFITS: $ _____

3. COST SUMMARY

COST ITEM OR PROJECT ELEMENT	SERVICE LIFE (YEARS)	COST ($)	CRF @ 4%	ANNUALIZED COST ($)

ITEM SUBTOTAL _____ ANNUALIZED ITEM SUBTOTAL _____

PERCENT USED FOR CONTINGENCIES _____ TOTAL COST OF CONTINGENCIES _____ EQUIVALENT ANNUAL COST OF CONTINGENCIES _____

ANNUAL COST FOR SPECIAL MAINTENANCE, OPERATION, ENERGY

TOTAL CAPITAL COST _____ TOTAL ANNUALIZED COST _____

Please keep in mind that any Recommendataion for Programming is based on the costs summarized here. Cost escalations during subsequent project development may necessitate the project's priority to be re-evaluated.

4. B/C RATIOS

SAFETY BCR = ANNUAL SAFETY BENEFIT / TOTAL ANNUAL COST = _____

SERVICE BCR = ANNUAL SERVICE BENEFIT / TOTAL ANNUAL COST = _____

TOTAL PROJECT BCR = TOTAL ANNUAL BENEFITS / TOTAL ANNUAL COSTS = _____

COMMENTS (Use additional sheets if necessary.)

PREPARER'S SIGNATURE: _____

DATE OF PREPARATION: _____

INSTRUCTIONS FOR COMPLETING FORM TE 164

SAFETY BENEFITS EVALUATION FORM

The 1973 Federal-aid Highway Act established five categorical Title II Safety programs'. This produced a need for a method to estimate the benefits, which could be "derived from a safety improvement at a "high hazard location," one which had a demonstrated accident history. This resulted in the TE 164 methodology, instructions for which are attached.

The methodology has three different possible methods of calculating the pro jected reduction, each of which is explained. The severity distribution is checked for significance. Safety benefits are calculated by comparing "before accident experience with the after projection. Accident costs are updated periodically; the period for which they are applicable is specified at the top of Table IV.

While this methodology was developed for Title II Safety programs, it can be used for many applications. ENGINEERS AND ANALYSTS ARE ENCOURAGED TO USE THIS TECHNIQUE TO CHECK THE COST-EFFECTIVENESS OF ANY SAFETY IMPROVEMENT.

The TE 164 **Safety** Benefits Evaluation Form is used to quantify benefits, which are realized from a reduction in accidents. It would be used to evaluate any location, which has a proven accident history. A companion methodology, the TE186 Roadside Obstacle Evaluation Form, can be used for analyzing roadside obstacles whether or not there is an accident history.

These are the instructions for 'completing the TE 164 form:

Upper Right Band Box

Traffic and Safety Identification Number: fin in the identif ication number: fill in the identification number assigned to this study as shown on FORM TE 133 (LOG OF SAFETY INVESTIGATIONS).

Evaluation of Alternate Number: if the Project Development Proposal Report includes the evaluation of several alternates indicate which alternate this evaluation covers.

Study Period: indicate the beginning and ending of the before accident data and indicate the number of years in decimal form.

Location

The location information may be omitted if it is the same as the entire proj ect proposal. However, if the project is broken down into several sections for analysis purposes or if a safety benefits evaluation is being performed on only a portion of the project proposal, the appropriate location data should be indicated.

Project Data

Briefly describe the proposed improvement and indicate the present and projected future (design year) AADT. Also, indicate the volume correction factor (i.e. the average of the present and future AADT divided by the present AADT). AADT should be used; however, if other volume measures are used, such as ADT, please indicate.

Reduction Calculation

The Reduction Calculation is -the most important step in determining anticipated safety benefits of the project proposal. To assess the reduction-potential, a careful study of past accident patterns as they relate to the project proposal is required. Three methods are included and the one most appropriate for a particular project is a matter -of judgment.

"Method I: this method relies on the tabulated average reduction factors published by the Systems Analysis Section. Table I gives values, derived from experience, for various improvement types.

Method II: this method requires the calculation of a reduction factor through, an analysis of those accidents suscepti ble to correction based on the proposal. The evaluator must recognize that all accidents susceptible to correction may not be corrected.

Method III: this method is similar to Method II except accident rates are analyzed rather than individual accidents. This method is most appropriate for general upgradings and reconstructions where the future rate is anticipated to have some relationship to statewide average rates for the given facility type. These rates are shown in Table II.

Significance Check of Severity Distribution

Line (a) % by Severity: Enter the severity percentage figures (Use Table III ACCIDENT SEVERITY DISTRIBUTION £or the existing type) .

Line (b) Actual: Enter the actual number of accidents that have occurred during the entire study period.

Line (c) Expected: The "expected" accidents are derived by multiplying the total number of actual accidents from line (b) times the various severity percentage figures from line (a) .The total accidents on lines (b) and (c) are always the same. Express "expected" accidents to the nearest tenth.

Line (d) Difference: Enter the difference between the actual and expected accidents line (b) minus line (c) to the nearest tenth. The difference may be positive or negative.

Line (e) Significance: .This step determines if the "fatal," "Injury" or the combination of "Fatal and Injury" accidents are significant. This procedure is important because it determines which set of cost figures to use in arriving at average accident costs.

To determine significance, Figure I: MAXIMUM EXPECTED DEVIATIONS is used. The procedure is to enter the graph along the horizontal axis with the number of expected accidents from line (c) . From the intersection of the expected accident frequency and the curve, the maximum "normal" deviation is read on the vertical scale. If the difference (plus or minus) on line (d) exceeds the normal deviation, then the actual number of accidents that has occurred is significantly different than the average condition and a "yes" should be entered in the appropriate place on line (e). ' If the difference is less, the actual number of accidents is normal and is not significant and a "no" should be entered on line (e) . When using the graph no value less than one should be used to determine significance. If the "expected" number of accidents is less than one, at least one "expected" accident should be used. Thus, the least "normal" deviation must be two to be significant.

The significance determination is used in the BEFORE COST PER ACCIDENT CALCULA TION section of the form. If the fatal accidents are significant, then the actual number of "Fatal," "Injury" and "PDO" accidents are used separately in calculating the before cost per accident. If the fatal accidents are not significant but either the injury or combined fatal and injury are significant, the costs are computed using the "Fatal and Injury" and "PDO" accidents. If none of the categories proved significant then the BEFORE COST PER ACCIDENT CALCULATION section is omitted and the average cost per accident for the existing facility type (from Table IV AVERAGE ACCIDENT COSTS) is used to calculate "annual costs with no improvement" in the SAFETY BENEFITS section.

Before Cost per Accident Calculation

Number of Accidents Column:- If fatal accidents tested significant in the preceding section, enter the number of fatal, injury and PBO accidents and the total on the appropriate lines.

If fatal accidents are not significant, but injury or fatal and injury accidents are significant, enter the combined fatal and injury, and PDO accidents, and the total on the appropriate lines.

Cost per Accident Column: enter the appropriate costs (from Table IV) to correspond with the entries made in the "number of accidents" column.

Accident Cost Column: Enter the product of the "number of accidents" and "cost per accident" on the appropriate lines. Enter the sum of these entries on the "TOTAL" line.

Before Cost per Accident: Divide the "total accident cost" by the "total accidents" to obtain the average before cost per accident. Enter this result.

Safety Benefits

A. ESTIMATED ANNUAL ACCIDENT COST WITH NO IMPROVEMENT:

Compute the number of accidents per year (i.e. the total number of acci dents in the before period divided by the number of years in the before period) and enter in the space provided. Enter the volume correction factor. Enter either the calculated before cost per accident or the average cost per accident (from Table IV) as determined by the significance check. Carry out the multiplications and enter the result in the space provided.

B. ESTIMATED ANNUAL COST WITH PROPOSED IMPROVEMENT:

Enter the accidents per year, volume correction factor, and reduction factor as provided. For the average cost per accident figure, the average cost for the proposed facility type from Table IV should generally be used since it is assumed accident severity distribution will -be"normal." If the evaluator feels this is not a valid assumption for a particular improvement and if the after severity distribution can reasonably be predicted, then a significance check should be made on the estimated distribution and an after cost per accident calculation should be made, as appropriate, based upon the significance.

This after check of severity distribution and cost calculation should be shown on a second SAFETY BENEFITS EVALUATION FORM showing the identification number, alternate number and location information with a reference in the PROJECT DATA section that the supplemental form is being used for a check of after severity. The Initial form should also reference the supplemental form.

ESTIMATED ANNUAL SAFETY BENEFITS

This is the difference between A and B, referenced above. Any other benefits estimated for the proposal should be added to this value 9in computing a benefit-cost ratio for the proposal.

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
TRAFFIC ENGINEERING AND SAFETY DIVISION

SAFETY BENEFITS EVALUATION FORM

TRAFFIC & SAFETY IDENTIFICATION NUMBER

EVALUATION OF ALTERNATE NO: _____

STUDY PERIOD | From ___/___/___ | To ___/___/___ | No. of Yrs. ___

LOCATION

Route No. or Street Name | State Highway No. | From or At Reference Marker

At Intersection With (If Applicable) | Route No. or Street Name | State Highway No. | To Reference Marker

PROJECT DATA

PROPOSED IMPROVEMENT:

Present AADT: _____ Future AADT: _____ Volume Correction Factor (VCF): _____

REDUCTION CALCULATION

METHOD I (From Reduction Factor Table)
Average Reduction Factor _____%

METHOD II (Engineering Analysis)

a. Total Accidents: _____
b. Accidents Reduced: _____
c. Calculated RF (b ÷ a): _____ %

METHOD III (For General Upgradings)

a. Existing Accident Rate: _____
b. Future Accident Rate: _____
c. Difference (a – b): _____
d. Calculated RF (c ÷ a): _____ %

BRIEFLY EXPLAIN HOW EXPECTED REDUCTION WAS DERIVED:

SIGNIFICANCE CHECK OF SEVERITY DISTRIBUTION

	FATAL	INJURY	F & I	PDO	TOTAL
a. %by severity					100%
b. actual					
c. expected					
d. difference					
e. significance					

BEFORE COST PER ACCIDENT CALCULATION

TYPE	NO. ACC.		COST/ACC		ACC. COST
Fatal	_____	×	_____	= $	_____
Injury	_____	×	_____	=	_____
F & I	_____	×	_____	=	_____
PDO	_____	×	_____	=	_____
TOTAL				$	

BEFORE COST/ACC (Tot. Acc. Cost ÷ Tot. Acc.) $ _____

SAFETY BENEFITS

A. ESTIMATED ANNUAL ACCIDENT COST WITH NO IMPROVEMENT:

ACC/YR _____ × VCF _____ × BEFORE COST/ACCIDENT _____ = $ _____

B. ESTIMATED ANNUAL ACCIDENT COST WITH PROPOSED IMPROVEMENT:

ACC/YR _____ × VCF _____ × (1.00 – ___ RF) × AVG. COST/ACC. _____ = $ _____

ESTIMATED ANNUAL SAFETY BENEFITS (A – B) = $ _____

PREPARER'S SIGNATURE: _____

DATE OF PREPARATION: _____

NYSDOT-Safety Information Management System

AVERAGE ACCIDENT COSTS/SEVERITY DISTRIBUTION STATE HIGHWAYS 2002

Includes period from JUN-01-2000 - MAY-31-2002

		Classification**	Accident Severity Distribution (percent)				Average Accident Costs				
			Fatal	Injury	Fatal/Injury	PDO*	Fatal	Injury	Fatal/Injury	PDO*	Average*
1	L	FULL ACCESS, RURAL, DIVIDED, 4 LANE	0.31	20.26	20.57	79.43	3,842,200	96,800	153,900	5,200	35,800
2	A	FULL ACCESS, RURAL, DIVIDED, 4 LANE	0.66	20.80	21.46	78.54	3,870,300	96,000	212,400	5,200	49,700
3	L	FULL ACCESS, RURAL, DIVIDED, 5 LANE	0.31	20.26	20.57	79.43	3,842,200	96,800	153,900	5,200	35,800
4	A	FULL ACCESS, RURAL, DIVIDED, 5 LANE	0.66	20.80	21.46	78.54	3,870,300	96,000	212,400	5,200	49,700
5	L	FULL ACCESS, RURAL, DIVIDED, 6 LANE	0.31	20.26	20.57	79.43	3,842,200	96,800	153,900	5,200	35,800
6	A	FULL ACCESS, RURAL, DIVIDED, 6 LANE	0.66	20.80	21.46	78.54	3,870,300	96,000	212,400	5,200	49,700
7	L	FULL ACCESS, RURAL, DIVIDED, ALL LANES	0.31	20.26	20.57	79.43	3,842,200	96,800	153,900	5,200	35,800
8	A	FULL ACCESS, RURAL, DIVIDED, ALL LANES	0.66	20.80	21.46	78.54	3,870,300	96,000	212,400	5,200	49,700
9	L	FULL ACCESS, RURAL, UNDIVIDED, 2 LANE	0.75	24.53	25.28	74.72	3,287,200	100,200	195,300	5,200	53,300
10	A	FULL ACCESS, RURAL, UNDIVIDED, 2 LANE	0.71	25.71	26.42	73.57	3,287,200	92,700	179,000	5,200	51,100
11	L	FULL ACCESS, RURAL, UNDIVIDED, ALL LANES	0.75	24.53	25.28	74.72	3,287,200	100,200	195,300	5,200	53,300
12	A	FULL ACCESS, RURAL, UNDIVIDED, ALL LANES	0.71	25.71	26.42	73.57	3,287,200	92,700	179,000	5,200	51,100
13	L	FULL ACCESS, URBAN, DIVIDED, 4 LANE	0.24	33.11	33.35	66.65	3,358,200	101,300	125,100	3,800	44,200
14	A	FULL ACCESS, URBAN, DIVIDED, 4 LANE	0.35	33.12	33.47	66.53	3,410,600	100,300	134,500	3,800	47,500
15	L	FULL ACCESS, URBAN, DIVIDED, 5 LANE	0.24	33.11	33.35	66.65	3,358,200	101,300	125,100	3,800	44,200
16	A	FULL ACCESS, URBAN, DIVIDED, 5 LANE	0.35	33.12	33.47	66.53	3,410,600	100,300	134,500	3,800	47,500
17	L	FULL ACCESS, URBAN, DIVIDED, 6 LANE	0.24	33.11	33.35	66.65	3,358,200	101,300	125,100	3,800	44,200
18	A	FULL ACCESS, URBAN, DIVIDED, 6 LANE	0.35	33.12	33.47	66.53	3,410,600	100,300	134,500	3,800	47,500
19	L	FULL ACCESS, URBAN, DIVIDED, 7 LANE	0.24	33.11	33.35	66.65	3,358,200	101,300	125,100	3,800	44,200
20	A	FULL ACCESS, URBAN, DIVIDED, 7 LANE	0.35	33.12	33.47	66.53	3,410,600	100,300	134,500	3,800	47,500
21	L	FULL ACCESS, URBAN, DIVIDED, ALL LANES	0.24	33.11	33.35	66.65	3,358,200	101,300	125,100	3,800	44,200
22	A	FULL ACCESS, URBAN, DIVIDED, ALL LANES	0.35	33.12	33.47	66.53	3,410,600	100,300	134,500	3,800	47,500
23	L	FULL ACCESS, URBAN, UNDIVIDED, ALL LANES	0.37	31.68	32.05	67.95	3,348,200	101,600	139,400	3,800	47,200
24	A	FULL ACCESS, URBAN, UNDIVIDED, ALL LANES	0.57	31.85	32.42	67.58	3,285,800	97,600	153,500	3,800	52,300
25	L	PARTIAL ACCESS, RURAL, DIVIDED, 4 LANES	0.16	18.46	18.62	81.38	3,245,600	94,000	121,800	5,200	26,900
26	A	PARTIAL ACCESS, RURAL, DIVIDED, 4 LANES	0.39	21.48	21.87	78.13	3,287,200	98,600	155,900	5,200	38,200

* Includes Both Reportable and Non-Reportable Accidents

** A= All Accidents, L= Non-Intersection Accidents, I= Intersection Accidents

Includes period from JUN-01-2000 - MAY-31-2002

		Classification**	Accident Severity Distribution (percent)				Average Accident Costs				
			Fatal	Injury	Fatal/Injury	PDO*	Fatal	Injury	Fatal/Injury	PDO*	Average*
27	L	PARTIAL ACCESS, RURAL, DIVIDED, ALL LANES	0.16	18.46	18.62	81.38	3,245,600	94,000	121,800	5,200	26,900
28	A	PARTIAL ACCESS, RURAL, DIVIDED, ALL LANES	0.39	21.48	21.87	78.13	3,287,200	98,600	155,900	5,200	38,200
29	L	PARTIAL ACCESS, RURAL, UNDIVIDED, 2 LANES	0.62	20.66	21.28	78.72	3,266,400	95,000	187,400	5,200	44,000
30	A	PARTIAL ACCESS, RURAL, UNDIVIDED, 2 LANES	1.98	25.49	27.47	72.53	3,631,100	106,300	360,100	5,200	102,700
31	L	PARTIAL ACCESS, RURAL, UNDIVIDED, ALL LANES	0.62	20.66	21.28	78.72	3,266,400	95,000	187,400	5,200	44,000
32	A	PARTIAL ACCESS, RURAL, UNDIVIDED, ALL LANES	1.98	25.49	27.47	72.53	3,631,100	106,300	360,100	5,200	102,700
33	L	PARTIAL ACCESS, URBAN, DIVIDED, 4 LANES	0.28	29.55	29.83	70.17	3,435,500	94,500	126,200	3,800	40,300
34	A	PARTIAL ACCESS, URBAN, DIVIDED, 4 LANES	0.45	29.60	30.05	69.95	3,377,700	95,100	144,300	3,800	46,000
35	L	PARTIAL ACCESS, URBAN, DIVIDED, 6 LANES	0.28	29.55	29.83	70.17	3,435,500	94,500	126,200	3,800	40,300
36	A	PARTIAL ACCESS, URBAN, DIVIDED, 6 LANES	0.45	29.60	30.05	69.95	3,377,700	95,100	144,300	3,800	46,000
37	L	PARTIAL ACCESS, URBAN, DIVIDED, ALL LANES	0.28	29.55	29.83	70.17	3,435,500	94,500	126,200	3,800	40,300
38	A	PARTIAL ACCESS, URBAN, DIVIDED, ALL LANES	0.45	29.60	30.05	69.95	3,377,700	95,100	144,300	3,800	46,000
39	L	PARTIAL ACCESS, URBAN, UNDIVIDED, 2 LANES	0.51	23.74	24.25	75.76	4,338,200	105,100	193,300	3,800	49,700
40	A	PARTIAL ACCESS, URBAN, UNDIVIDED, 2 LANES	0.94	29.47	30.41	69.59	3,254,600	101,300	198,900	3,800	63,100
41	L	PARTIAL ACCESS, URBAN, UNDIVIDED, ALL LANES	0.51	23.74	24.25	75.76	4,338,200	105,100	193,300	3,800	49,700
42	A	PARTIAL ACCESS, URBAN, UNDIVIDED, ALL LANES	0.94	29.47	30.41	69.59	3,254,600	101,300	198,900	3,800	63,100
43	L	FREE ACCESS, RURAL, DIVIDED, 2 LANES	0.23	22.45	22.68	77.32	3,968,500	100,300	138,700	5,200	35,500
44	A	FREE ACCESS, RURAL, DIVIDED, 2 LANES	0.31	27.26	27.57	72.43	3,287,200	106,000	141,700	5,200	42,800
45	L	FREE ACCESS, RURAL, DIVIDED, 4 LANES	0.23	22.45	22.68	77.32	3,968,500	100,300	138,700	5,200	35,500
46	A	FREE ACCESS, RURAL, DIVIDED, 4 LANES	0.31	27.26	27.57	72.43	3,287,200	106,000	141,700	5,200	42,800
47	L	FREE ACCESS, RURAL, DIVIDED, ALL LANES	0.23	22.45	22.68	77.32	3,968,500	100,300	138,700	5,200	35,500
48	A	FREE ACCESS, RURAL, DIVIDED, ALL LANES	0.31	27.26	27.57	72.43	3,287,200	106,000	141,700	5,200	42,800
49	L	FREE ACCESS, RURAL, UNDIVIDED, 2 LANES	0.61	22.46	23.07	76.93	3,524,500	94,800	185,500	5,200	46,800
50	A	FREE ACCESS, RURAL, UNDIVIDED, 2 LANES	0.87	25.44	26.31	73.69	3,583,800	97,200	212,200	5,200	59,700
51	L	FREE ACCESS, RURAL, UNDIVIDED, 3 LANES	0.61	22.46	23.07	76.93	3,524,500	94,800	185,500	5,200	46,800
52	A	FREE ACCESS, RURAL, UNDIVIDED, 3 LANES	0.87	25.44	26.31	73.69	3,583,800	97,200	212,200	5,200	59,700

* Includes Both Reportable and Non-Reportable Accidents

** A= All Accidents, L= Non-Intersection Accidents, I= Intersection Accidents

Includes period from JUN-01-2000 - MAY-31-2002

		Classification**	Accident Severity Distribution (percent)				Average Accident Costs				
			Fatal	Injury	Fatal/Injury	PDO*	Fatal	Injury	Fatal/Injury	PDO*	Average*
53	L	FREE ACCESS, RURAL, UNDIVIDED, 4 LANES	0.61	22.46	23.07	76.93	3,524,500	94,800	185,500	5,200	46,800
54	A	FREE ACCESS, RURAL, UNDIVIDED, 4 LANES	0.87	25.44	26.31	73.69	3,583,800	97,200	212,200	5,200	59,700
55	L	FREE ACCESS, RURAL, UNDIVIDED, ALL LANES	0.61	22.46	23.07	76.93	3,524,500	94,800	185,500	5,200	46,800
56	A	FREE ACCESS, RURAL, UNDIVIDED, ALL LANES	0.87	25.44	26.31	73.69	3,583,800	97,200	212,200	5,200	59,700
57	L	FREE ACCESS, URBAN, DIVIDED, 2 LANES	0.30	33.07	33.37	66.63	3,351,200	96,500	125,500	3,800	44,400
58	A	FREE ACCESS, URBAN, DIVIDED, 2 LANES	0.44	34.81	35.25	64.76	3,450,600	97,700	139,300	3,800	51,500
59	L	FREE ACCESS, URBAN, DIVIDED, 4 LANES	0.30	33.07	33.37	66.63	3,351,200	96,500	125,500	3,800	44,400
60	A	FREE ACCESS, URBAN, DIVIDED, 4 LANES	0.44	34.81	35.25	64.76	3,450,600	97,700	139,300	3,800	51,500
61	L	FREE ACCESS, URBAN, DIVIDED, 6 LANES	0.30	33.07	33.37	66.63	3,351,200	96,500	125,500	3,800	44,400
62	A	FREE ACCESS, URBAN, DIVIDED, 6 LANES	0.44	34.81	35.25	64.76	3,450,600	97,700	139,300	3,800	51,500
63	L	FREE ACCESS, URBAN, DIVIDED, 7 LANES	0.30	33.07	33.37	66.63	3,351,200	96,500	125,500	3,800	44,400
64	A	FREE ACCESS, URBAN, DIVIDED, 7 LANES	0.44	34.81	35.25	64.76	3,450,600	97,700	139,300	3,800	51,500
65	L	FREE ACCESS, URBAN, DIVIDED, ALL LANES	0.30	33.07	33.37	66.63	3,351,200	96,500	125,500	3,800	44,400
66	A	FREE ACCESS, URBAN, DIVIDED, ALL LANES	0.44	34.81	35.25	64.76	3,450,600	97,700	139,300	3,800	51,500
67	L	FREE ACCESS, URBAN, UNDIVIDED, 2 LANES	0.36	30.20	30.56	69.44	3,573,300	94,700	135,700	3,800	44,100
68	A	FREE ACCESS, URBAN, UNDIVIDED, 2 LANES	0.42	32.36	32.78	67.22	3,652,100	96,000	141,500	3,800	48,900
69	L	FREE ACCESS, URBAN, UNDIVIDED, 3 LANES	0.36	30.20	30.56	69.44	3,573,300	94,700	135,700	3,800	44,100
70	A	FREE ACCESS, URBAN, UNDIVIDED, 3 LANES	0.42	32.36	32.78	67.22	3,652,100	96,000	141,500	3,800	48,900
71	L	FREE ACCESS, URBAN, UNDIVIDED, 4 LANES	0.36	30.20	30.56	69.44	3,573,300	94,700	135,700	3,800	44,100
72	A	FREE ACCESS, URBAN, UNDIVIDED, 4 LANES	0.42	32.36	32.78	67.22	3,652,100	96,000	141,500	3,800	48,900
73	L	FREE ACCESS, URBAN, UNDIVIDED, ALL LANES	0.36	30.20	30.56	69.44	3,573,300	94,700	135,700	3,800	44,100
74	A	FREE ACCESS, URBAN, UNDIVIDED, ALL LANES	0.42	32.36	32.78	67.22	3,652,100	96,000	141,500	3,800	48,900
75	I	3 LEG, RURAL, SIGNAL, ALL LANES	0.44	31.46	31.90	68.10	3,291,900	103,000	147,400	5,200	50,500
76	I	3 LEG, RURAL, SIGN, ALL LANES	0.44	31.46	31.90	68.10	3,291,900	103,000	147,400	5,200	50,500
77	I	3 LEG, RURAL, NONE, ALL LANES	0.44	31.46	31.90	68.10	3,291,900	103,000	147,400	5,200	50,500
78	I	3 LEG, URBAN, SIGNAL, 1-4 LANES	0.26	36.10	36.36	63.64	3,410,400	98,000	121,800	3,800	46,700

* Includes Both Reportable and Non-Reportable Accidents

** A= All Accidents, L= Non-Intersection Accidents, I= Intersection Accidents

Includes period from JUN-01-2000 - MAY-31-2002

		Classification**	Accident Severity Distribution (percent)				Average Accident Costs				
			Fatal	Injury	Fatal/Injury	PDO*	Fatal	Injury	Fatal/Injury	PDO*	Average*
79	I	3 LEG, URBAN, W/ LEFT TURN, SIGNAL,5& > LANE	0.26	36.10	36.36	63.64	3,410,400	98,000	121,800	3,800	46,700
80	I	3 LEG, URBAN, NO LEFT TURN, SIGNAL,5& > LANE	0.26	36.10	36.36	63.64	3,410,400	98,000	121,800	3,800	46,700
81	I	3 LEG URBAN, SIGN, 1-3 LANES	0.26	36.10	36.36	63.64	3,410,400	98,000	121,800	3,800	46,700
82	I	3 LEG URBAN, SIGN, 4 LANES	0.26	36.10	36.36	63.64	3,410,400	98,000	121,800	3,800	46,700
83	I	3 LEG URBAN, SIGN, 5 OR MORE LANES	0.26	36.10	36.36	63.64	3,410,400	98,000	121,800	3,800	46,700
84	I	3 LEG URBAN, NONE, ALL LANES	0.26	36.10	36.36	63.64	3,410,400	98,000	121,800	3,800	46,700
85	I	4& > LEGS, RURAL, SIGNAL, ALL LANES	0.66	36.84	37.50	62.50	3,668,800	115,100	177,200	5,200	69,700
86	I	4& > LEGS, RURAL, SIGN, ALL LANES	0.66	36.84	37.50	62.50	3,668,800	115,100	177,200	5,200	69,700
87	I	4& > LEGS, RURAL, NONE, ALL LANES	0.66	36.84	37.50	62.50	3,668,800	115,100	177,200	5,200	69,700
88	I	4& > LEGS, URBAN, SIGNAL, 1-4 LANES	0.24	36.43	36.67	63.33	3,626,400	101,000	123,800	3,800	47,800
89	I	4& > LEGS, URBAN, LEFT TURN, SIGNAL,5& >LANE	0.24	36.43	36.67	63.33	3,626,400	101,000	123,800	3,800	47,800
90	I	4& > LEGS, URBAN, NO LEFT , SIGNAL, 5& >LANE	0.24	36.43	36.67	63.33	3,626,400	101,000	123,800	3,800	47,800
91	I	4& > LEGS, URBAN, SIGN, 1-3 LANES	0.24	36.43	36.67	63.33	3,626,400	101,000	123,800	3,800	47,800
92	I	4& > LEGS, URBAN, SIGN, 4 OR MORE LANES	0.24	36.43	36.67	63.33	3,626,400	101,000	123,800	3,800	47,800
93	I	4& > LEGS, URBAN, NONE, ALL LANES	0.24	36.43	36.67	63.33	3,626,400	101,000	123,800	3,800	47,800
94	I	ON RAMP, RURAL, ALL CNTLS, MERGE W/1 LANE	0.24	24.15	24.39	75.61	3,224,800	94,000	125,300	5,200	34,500
95	I	ON RAMP, RURAL, ALL CNTLS, MERGE W/2& > LANE	0.24	24.15	24.39	75.61	3,224,800	94,000	125,300	5,200	34,500
96	I	ON RAMP, URBAN, ALL CNTLS, MERGE W/1 LANE	0.18	30.09	30.27	69.73	3,482,000	100,600	121,000	3,800	39,300
97	I	ON RAMP, URBAN, ALL CNTLS, MERGE W/2 LANES	0.18	30.09	30.27	69.73	3,482,000	100,600	121,000	3,800	39,300
98	I	ON RAMP, URBAN, ALL CNTLS, MERGE W/3& > LANE	0.18	30.09	30.27	69.73	3,482,000	100,600	121,000	3,800	39,300
99	I	OFF RAMP, RURAL, ALL CNTLS, MERGE W/1 LANE	0.24	24.15	24.39	75.61	3,224,800	94,000	125,300	5,200	34,500
100	I	OFF RAMP, RURAL, ALL CNTLS, MERGE W/2&> LANE	0.24	24.15	24.39	75.61	3,224,800	94,000	125,300	5,200	34,500
101	I	OFF RAMP, URBAN, ALL CNTLS, MERGE W/1 LANE	0.18	30.09	30.27	69.73	3,482,000	100,600	121,000	3,800	39,300
102	I	OFF RAMP, URBAN, ALL CNTLS, MERGE W/2 LANES	0.18	30.09	30.27	69.73	3,482,000	100,600	121,000	3,800	39,300
103	I	OFF RAMP, URBAN, ALL CNTLS, MERGE W/3&> LANE	0.18	30.09	30.27	69.73	3,482,000	100,600	121,000	3,800	39,300

* Includes Both Reportable and Non-Reportable Accidents

** A= All Accidents, L= Non-Intersection Accidents, I= Intersection Accidents

AVERAGE ACCIDENT RATES FOR STATE HIGHWAYS BY FACILITY TYPE
(BASED ON ACCIDENT DATA JUNE 2000 THRU MAY 2002)

FACILITY TYPE FREE ACCESS CONTROL	--MAINLINE ACCIDENTS ONLY (SEE *)-- ALL TYPES ACC/MVM	 WET ROAD ACC/MVM	 FIXED OBJECT ACC/MVM	--MAINLINE & JUNCTURE ACCIDENTS (SEE **)-- ALL TYPES ACC/MVM	 WET ROAD ACC/MVM	 FIXED OBJECT ACC/MVM
RURAL FUNCTIONAL CLASS						
UNDIVIDED						
2 LANES	2.22	0.21	0.37	2.81	0.29	0.43
3 LANES	2.10	0.20	0.36	2.77	0.25	0.39
4 LANES	2.11	0.21	0.29	3.18	0.35	0.32
ALL LANES	2.22	0.21	0.37	2.82	0.29	0.43
DIVIDED						
2 LANES	2.45	0.27	0.17	3.79	0.42	0.23
4 LANES	1.53	0.13	0.21	2.15	0.20	0.23
ALL LANES	1.70	0.15	0.20	2.47	0.24	0.22
URBAN FUNCTIONAL CLASS						
UNDIVIDED						
2 LANES	2.19	0.25	0.22	3.66	0.46	0.27
3 LANES	3.01	0.35	0.15	4.98	0.64	0.19
4 LANES	2.94	0.36	0.15	5.66	0.73	0.19
ALL LANES	2.41	0.28	0.21	4.21	0.53	0.27
DIVIDED						
2 LANES	2.86	0.33	0.13	5.1 2	0.60	0.19
4 LANES	2.60	0.30	0.13	5.05	0.63	0.16
6 LANES	2.51	0.29	0.13	4.94	0.61	0.19
7 LANES	1.15	0.14	0.06	3.59	0.50	0.11
ALL LANES	2.59	0.30	0.12	5.01	0.62	0.17

++ Non-reportable accidents are included in the AAll Types@ category, but excluded from AWet Road & Fixed Objects@ categories.

* ANon-Intersection Accidents / MVM A is used for linear highway sections where there are no intersecting roads or ramp junctions within analysis limits. An example of the correct use of these rates would involve a linear section of highway which contains no intersections with other public highways, but may contain intersections with private roads or driveways.

** AIntersection & Non-Intersection Accidents / MVM@ includes intersection and mainline accidents. They are used for analysis of linear highway sections where intersections are involved within the analysis limits and are the most commonly used rates for accident analysis purposes.

AVERAGE ACCIDENT RATES FOR STATE HIGHWAYS BY FACILITY TYPE
(BASED ON ACCIDENT DATA JUNE 2000 THRU MAY 2002)

FACILITY TYPE PARTIAL CONTROL OF ACCESS	--MAINLINE ACCIDENTS ONLY (SEE *)--			--MAINLINE & JUNCTURE ACCIDENTS (SEE **)--		
	ALL TYPES ACC/MVM	WET ROAD ACC/MVM	FIXED OBJECT ACC/MVM	ALL TYPES ACC/MVM	WET ROAD ACC/MVM	FIXED OBJECT ACC/MVM
RURAL FUNCTIONAL CLASS						
UNDIVIDED						
2 LANES	1.58	0.17	0.25	2.19	0.24	0.30
ALL LANES	1.58	0.17	0.26	2.27	0.25	0.31
DIVIDED						
4 LANES	1.57	0.17	0.49	1.84	0.20	0.53
ALL LANES	1.56	0.17	0.48	1.84	0.20	0.52
URBAN FUNCTIONAL CLASS						
UNDIVIDED						
2 LANES	1.67	0.23	0.29	2.50	0.37	0.35
ALL LANES	1.88	0.25	0.24	3.01	0.43	0.29
DIVIDED						
4 LANES	1.31	0.17	0.25	2.06	0.26	0.31
6 LANES	1.15	0.16	0.21	1.72	0.23	0.26
ALL LANES	1.32	0.17	0.25	2.04	0.27	0.30

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* ANon-Intersection Accidents / MVM A is used for linear highway sections where there are no intersecting roads or ramp junctions within analysis limits. An example of the correct use of these rates would involve a linear section of highway which contains no intersections with other public highways, but may contain intersections with private roads or driveways.

** AIntersection & Non-Intersection Accidents / MVM@ includes intersection and mainline accidents. They are used for analysis of linear highway sections where intersections are involved within the analysis limits and are the most commonly used rates for accident analysis purposes.

AVERAGE INTERSECTION ACCIDENT RATES FOR STATE HIGHWAYS BY INTERSECTION TYPE
(BASED ON ACCIDENT DATA JUNE 2000 THRU MAY 2002)

INTERSECTION TYPE **RURAL FUNCTIONAL CLASS**	ALL TYPES ACC / MEV	WETLEFT ROAD ACC / MEV	TURN ACC / MEV	REAROVER-END ACC / MEV	RIGHT TAKING ACC / MEV	RIGHT ANGLE ACC / MEV	HEAD- TURN ACC / MEV	SIDE- ON ACC / MEV	SWIPE ACC / MEV
3 LEGGED INTERSECTIONS									
SIGNAL, ALL LANES	0.36	0.05	0.04	0.07	0.01	0.05	0.00	0.00	0.00
SIGN, ALL LANES	0.16	0.02	0.01	0.03	0.01	0.02	0.00	0.00	0.00
NO CONTROL, ALL LANES	0.10	0.01	0.01	0.02	0.00	0.01	0.00	0.00	0.00
4 LEGGED INTERSECTIONS									
SIGNAL, ALL LANES	0.59	0.08	0.08	0.10	0.02	0.13	0.01	0.00	0.01
SIGN, ALL LANES	0.35	0.04	0.03	0.04	0.01	0.10	0.00	0.00	0.00
NO CONTROL, ALL LANES	0.21	0.02	0.02	0.02	0.01	0.02	0.00	0.01	0.00
ON RAMP									
MERGE W/ 1 LANE	0.33	0.04	0.04	0.07	0.00	0.04	0.00	0.00	0.00
MERGE W/ 2 & > LANES	0.07	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00
OFF RAMP									
MERGE W/ 1 LANE	0.52	0.06	0.03	0.16	0.00	0.06	0.00	0.00	0.00
MERGE W/ 2 & > LANES	0.13	0.01	0.00	0.02	0.01	0.01	0.00	0.00	0.00

++ Non-reportable accidents are included in the AAll Types@ category, but excluded from all other categories.

AVERAGE INTERSECTION ACCIDENT RATES FOR STATE HIGHWAYS BY INTERSECTION TYPE
(BASED ON ACCIDENT DATA JUNE 2000 THRU MAY 2002)

INTERSECTION TYPE URBAN FUNCTIONAL CLASS	ALL TYPES ACC / MEV	WET ROAD ACC / MEV	LEFT TURN ACC / MEV	REAR END ACC / MEV	OVER-TAKING ACC / MEV	RIGHT ANGLE ACC / MEV	HEAD-ON TURN ACC / MEV	SIDE-SWIPE ACC / MEV	
3 LEGGED INTERSECTIONS									
SIGNAL, 1 - 4 LANES	0.35	0.05	0.04	0.08	0.01	0.04	0.01	0.00	0.00
SIGNAL W/ LEFT TURN 5 & > LANES	0.29	0.03	0.03	0.07	0.02	0.03	0.00	0.00	0.00
SIGNAL W/O LEFT TURN 5 & > LANES	0.23	0.03	0.02	0.06	0.02	0.03	0.01	0.00	0.00
SIGN, 1 - 3 LANES	0.16	0.02	0.01	0.04	0.01	0.02	0.00	0.00	0.00
SIGN, 4 LANES	0.13	0.02	0.01	0.03	0.01	0.02	0.00	0.00	0.00
SIGN, 5 & > LANES	0.09	0.01	0.01	0.02	0.00	0.01	0.00	0.00	0.00
NO CONTROL, ALL LANES	0.07	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00
4 LEGGED & > INTERSECTIONS									
SIGNAL, 1 - 4 LANES	0.60	0.08	0.09	0.13	0.03	0.08	0.01	0.00	0.00
SIGNAL W/ LEFT TURN 5 & > LANES	0.46	0.06	0.04	0.12	0.03	0.07	0.01	0.00	0.00
SIGNAL W/O LEFT TURN 5 & > LANES	0.34	0.04	0.03	0.07	0.02	0.06	0.00	0.00	0.00
SIGN, 1 - 3 LANES	0.27	0.04	0.03	0.05	0.01	0.07	0.00	0.00	0.00
SIGN, 4 & > LANES	0.22	0.03	0.03	0.04	0.01	0.04	0.00	0.00	0.00
NO CONTROL, ALL LANES	0.25	0.03	0.02	0.07	0.01	0.03	0.00	0.00	0.00
ON RAMP									
MERGE W/ 1 LANE	0.24	0.01	0.00	0.06	0.01	0.02	0.00	0.00	0.00
MERGE W/ 2 LANES	0.11	0.01	0.01	0.02	0.01	0.00	0.00	0.00	0.00
MERGE W/ 3 & > LANES	0.07	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00
OFF RAMP									
MERGE W/ 1 LANE	0.16	0.03	0.02	0.03	0.01	0.03	0.00	0.00	0.00
MERGE W/ 2 LANES	0.19	0.02	0.01	0.05	0.01	0.01	0.00	0.00	0.00
MERGE W/ 3 & > LANES	0.15	0.01	0.00	0.03	0.01	0.00	0.00	0.00	0.00

++ Non-reportable accidents are included in the AAll Types@ category, but excluded from all other categories.

AVERAGE ACCIDENT RATES FOR STATE HIGHWAYS BY FACILITY TYPE
(BASED ON ACCIDENT DATA JUNE 2000 THRU MAY 2002)

FACILITY TYPE	--MAINLINE ACCIDENTS ONLY (SEE *)--			--MAINLINE & JUNCTURE ACCIDENTS (SEE **)--		
CONTROLLED ACCESS	ALL TYPES ACC/MVM	WET ROAD ACC/MVM	FIXED OBJECT ACC/MVM	ALL TYPES ACC/MVM	WET ROAD ACC/MVM	FIXED OBJECT ACC/MVM
RURAL FUNCTIONAL CLASS						
UNDIVIDED						
2 LANES	1.69	0.13	0.19	2.22	0.19	0.22
ALL LANES	1.97	0.15	0.22	2.76	0.20	0.26
DIVIDED						
4 LANES	0.99	0.07	0.25	1.0	0.08	0.26
5 LANES	0.97	0.09	0.28	1.02	0.10	0.29
6 LANES	0.78	0.09	0.20	0.87	0.10	0.23
ALL LANES	0.98	0.08	0.25	1.05	0.08	0.26
URBAN FUNCTIONAL CLASS						
UNDIVIDED						
ALL LANES	1.19	0.12	0.15	1.88	0.21	0.19
DIVIDED						
4 LANES	1.09	0.12	0.21	1.47	0.16	0.24
5 LANES	1.44	0.15	0.18	1.80	0.20	0.21
6 LANES	1.78	0.17	0.16	2.26	0.22	0.20
7 LANES	1.16	0.12	0.19	1.50	0.18	0.26
ALL LANES	1.53	0.15	0.17	1.94	0.20	0.20

++ Non-reportable accidents are included in the AAll Types@ category, but excluded from AWet Road & Fixed Objects@ categories.

* ANon-Intersection Accidents / MVM A is used for linear highway sections where there are no intersecting roads or ramp junctions within analysis limits. An example of the correct use of these rates would involve a linear section of highway which contains no intersections with other public highways, but may contain intersections with private roads or driveways.

** AIntersection & Non-Intersection Accidents / MVM@ includes intersection and mainline accidents. They are used for analysis of linear highway sections where intersections are involved within the analysis limits and are the most commonly used rates for accident analysis purposes.

TABLE 1A
AADT > 5000/LANE
ACCIDENT REDUCTION FACTORS (RF)

Traffic Engineering and Safety Division
Safety Program Management Bureau
NYS DOT Revision 5/00

Improvement Codes	Description	Reduction Factor (%)	Remarks
	INTERSECTION IMPROVEMENTS		
10	CHANNELIZATION	37	Right angle 58%, Rear end/OT 30%, Rt. Turn 51%
101	Add left turn lane w/physical separation	26	Head On/SS 79%@
102	Add left turn lane w/painted separation	45	Reduces right-angle acc. by 63%, rear-end/OT 39%, left turn 35%@
103	Add right turn lane w/physical separation	*	
104	Addition of pavement markings to reduce size of intersection	*	
105	Other channelization	24	Rt Angle 47%, Rear End/OT 33%@
11	TRAFFIC SIGNALS/DEVICES	19	Right angle 34%, Rear end/OT 26%, Left Turn 18%, Head On/SS 36%
110	Other signal improvements	15@	Reduces right-angle acc. 22%@, rear-end/OT 25%
111	Install 4-way stop signs	73*	Reduction factor from Reference 2.
11A	Install stop ahead signs	15+	
112	Install minor-leg stop control	1*	
11B	Install Yield signs	23+	
113	Install new flashing red/yellow signal	26@	Reduces right-angle acc. 36%@
114	Change in operation to a flashing red/yellow signal	*	
115	Installation of a new red/yellow/green signal	20	Reduces right-angle acc. by 43%, rear-end/OT 20%@
116	Upgrading of a red/yellow/green signal (Includes larger lenses, more/better placed heads, phase adjustment, and general signal upgrades.)	19	Reduces right angle acc. by 37%,rear-end/OT 26%,left turn 26%@,Head On/SS 52%
117	Add left turn protection (change # of phases)	36	Reduces right-angle acc. 56%, rear-end/OT 35%, left turn 46%.
118	Add pedestrian signals	13*	Reduction factor from Reference 5.
119	Change in signal operation, from pretimed to traffic-actuated	28	Reduces right-angle acc. 32%,rear-end/ss 26%,Head On/SS 60%@,Left Turn 30%

Unless otherwise noted, accident reductions reflect accident trends at SELECTED locations improved by categorical safety funded projects. When reduction factors for Low Cost Accident Counter Measures (LCAC) or reduction factors from other sources were tabulated a + appears with the reduction factor or a note appears in the remarks column.

Non-reportable accidents were not used to calculate the safety project reduction factors tabulated.

Reduction factors should only be used to ESTIMATE safety benefits for respective improvements.

* Insufficient number of locations for factor calculation or no statistically significant change in accident rate. If a factor is present the source for the factor is shown in remarks. @= State Wide Average

+ Reduction Factors updated using 1992 Low Cost Accident Counter Measure Evaluations.

Improvement Codes	Description	Reduction Factor (%)	Remarks
12	COMBINATION OF CHANNELIZATION (10) & SIGNALS/DEVICES (11)	8	Right angle 30%, Rear end/OT 26%@
121	Add left turn lane w/signal (physical)	19	Reduces right-angle acc. 55%@, rear-end/OT 28%, left turn 24%@
122	Add left turn lane w/signal (painted)	16@	Reduces right-angle acc. 49%@
123	Add right turn lane w/signal	*	
124	Add left and right turning lane w/signal	14	Reduces right-angle acc. 42% and rear-end/ss 38%@
13 & 131	INTERSECTION SIGHT DISTANCE IMPROVEMENT	31*	Reduction factor from reference 4.
19 & 191	OTHER INTERSECTION WORK	*	
	Prohibit parking	32*	Reduction factor from reference 5.
	Prohibit turns	40*	Reduction factor from Reference 5.
	CROSS-SECTIONAL IMPROVEMENTS		
20	PAVEMENT WIDENING, NO LANES ADDED	59	Reduces left turn accidents 69%@
201	Widen travel way from 9 feet	*	
202	Widen travel way from 10 feet	59	Reduces left turn acc. by 69%@
21	LANES ADDED, WITHOUT NEW MEDIAN	31	Reduces Right Angle acc. 45%, Rear End/OT acc. 52%, Head On/SS 44%
211	Add additional lanes same alignment	31	Reduces rear-end/OT acc. 52%, head-on/ss 44%, right angle 45% Increases right turn acc. 79%@
212	Add climbing lane	*	
22	HIGHWAYS DIVIDED, NEW FLUSH MEDIAN ADDED	44	Reduces Rear end/OT acc. 41%, Left turn acc. 78%, Head On/SS 57%
221	Flush median added	52	Reduces left turn acc. 78%
222	Flush median added w/refuge for left turns	44	Reduces rear-end/OT acc. 40%, left turn 77%, head-on/ss 52%@ Increases right turn acc. 95%@
223	Widen flush median	*	

Unless otherwise noted, accident reductions reflect accident trends at SELECTED locations improved by categorical safety funded projects. When reduction factors for Low Cost Accident Counter Measures (LCAC) or reduction factors from other sources were tabulated a + appears with the reduction factor or a note appears in the remarks column.

Non-reportable accidents were not used to calculate the safety project reduction factors tabulated.
Reduction factors should only be used to ESTIMATE safety benefits for respective improvements.

* Insufficient number of locations for factor calculation or no statistically significant change in accident rate. If a factor is present the source for the factor is shown in remarks. @= State Wide Average

+ Reduction Factors updated using 1992 Low Cost Accident Counter Measure Evaluations.

Improvement Codes	Description	Reduction Factor (%)	Remarks
23	SHOULDER WIDENING OR IMPROVEMENT	*	
231	Shoulder stabilization	*	
232	Widen existing shoulder	17*	Reduction factor from reference 6, for 2-lane roads only
24	ADD ADDITIONAL LANES W/MEDIAN, SAME ALIGNMENT	20*	Reduction factor from reference 1, general reconstruction
25	SKID TREATMENT W/GROOVING	22@	Rear End/OT 35%, Wet Road Reduced 54%, ROR 40%, Fxd Obj 19%
251	Longitudinal grooving	21@	Reduces wet-road acc. 54%, ROR 40%, rear-end/OT 35%, Fxd Obj 19%
252	Transverse Grooving	*	
26	SKID TREATMENT W/OVERLAY	20	Open-graded mix most effective. Rt Angle 23%@, Fxd. Obj 34% Reduces wet-road acc. 50%, head-on/ss 61%
261	Resurfacing w/skid resistant pavement	13	Reduces wet-road acc. 42%, right-angle 23%
262	Resurfacing and superelevation	28@	Reduces wet-road acc. 51%@
263	Resurfacing w/open-graded mix	75@	Reduces wet-road acc. 91%@, coll. w/fixed obj 93%@, head-on/ss 90%@
264	Resurfacing w/Verglimit	31@	Reduces icy-road acc. 52%@
27	SIDE SLOPES	45@	Reduces coll. w. F.O. 62%
271	Flattening of side slopes	45@	Reduces coll. w/fixed obj 62%
272	Flattening or clearing of side slopes	*	Refer to Improvement Code 271

Unless otherwise noted, accident reductions reflect accident trends at SELECTED locations improved by categorical safety funded projects. When reduction factors for Low Cost Accident Counter Measures (LCAC) or reduction factors from other sources were tabulated a + appears with the reduction factor or a note appears in the remarks column.

Non-reportable accidents were not used to calculate the safety project reduction factors tabulated.

Reduction factors should only be used to ESTIMATE safety benefits for respective improvements.

* Insufficient number of locations for factor calculation or no statistically significant change in accident rate. If a factor is present the source for the factor is shown in remarks. @ = State Wide Average

+ Reduction Factors updated using 1992 Low Cost Accident Counter Measure Evaluations.

Improvement Codes	Description	Reduction Factor (%)	Remarks
	IMPROVEMENT AND/OR REPLACEMENT OF STRUCTURES		
30 & 300	WIDENING EXISTING BRIDGE OR OTHER MAJOR STRUCTURE	65*	Reduction factor from reference 4. Applicable to only coll. w/ bridge structure accidents.
31 & 310	REPLACEMENT OF BRIDGE OR OTHER MAJOR STRUCTURE	25*	Reduction factor from reference 7
32 & 320	CONSTRUCTION OF NEW BRIDGE OR MAJOR STRUCTURE	19*	Reduction factor from reference 3
33 & 330	CONSTRUCTION OR IMPROVEMENT OF MINOR STRUCTURE	*	
34 & 340	CONSTRUCTION OF PEDESTRIAN OVER OR UNDER CROSSING	*	
39 & 390	OTHER STRUCTURE WORK	*	
	ALIGNMENT WORK		
40 & 400	HORIZONTAL ALIGNMENT CHANGES	41	Reduces fixed-object acc. 87%, ROR 79%, head-on 64%, Rear End/OT 24%
41 & 410	VERTICAL ALIGNMENT CHANGES	*	
42 & 420	COMBINATION OF 40 and 41	20* 21*	Reduction factor from reference 1 Reduction factor from reference 4
43 & 430	SUPERELEVATION AND RESURFACING	See Code 262	

Unless otherwise noted, accident reductions reflect accident trends at SELECTED locations improved by categorical safety funded projects. When reduction factors for Low Cost Accident Counter Measures (LCAC) or reduction factors from other sources were tabulated a + appears with the reduction factor or a note appears in the remarks column.

Non-reportable accidents were not used to calculate the safety project reduction factors tabulated.

Reduction factors should only be used to ESTIMATE safety benefits for respective improvements.

* Insufficient number of locations for factor calculation or no statistically significant change in accident rate. If a factor is present the source for the factor is shown in remarks. @ = State wide Average

+ Reduction Factors updated using 1992 Low Cost Accident Counter Measure Evaluations.

Improvement Codes	Description	Reduction Factor (%)	Remarks
	ROADSIDE APPURTENANCES		
60	TRAFFIC SIGNS	14@	Reduces rear-end/OT accidents 18%, Rt Turn 59%
600	Installation or upgrading of traffic signs	13@	Lt Turn 34%@
	Replacement of standard w/large Stop signs	19+	
601	Install/improve warning signs	*	
602	Install/improve curve warning signs	*	
603	Install/improve advance curve warning flashers	54*	Reduces night accidents 62%. Reduction factors from reference 2.
604	Install/improve other signs (Arrow signs)	34+	
605	Protection/removal of fixed object	17@	Rear End/OT 44%
606	Make breakaway or install breakaway signs and/or light supports	32@	Rear end/OT 70%@
607	Install clearance and/or hazard markers	*	
62	INSTALLATION/IMPROVEMENT OF ROAD EDGE GUIDERAIL	13@	Rear end/OT 28%@, Fixed Object 14%@
622	Replacement or upgrading of deficient guiderail	9@	Red. coll. w/guiderail 31%@,coll. w/fixed obj 18%@,ROR 32%@,Rear End/OT 27%@
624	Protection or removal of fixed object in gore	*	Refer to Improvement Codes 605 & 702
625	Installation or upgrading of culvert and bridge railing	20@	Reduce collision w/bridge or culvert 38%@, Rear end/OT 32%@
626	Install road edge guiderail at new location	10*@	Red. coll. w/fixed obj 4%*@,inc. coll. w/guid. 51%@,ROR 18%*@,RE/OT 34%@
627	Removal of guiderail (w/o other improvements)	-19*@	Increase coll. w/ditch/cut/bank 360%@

Unless otherwise noted, accident reductions reflect accident trends at SELECTED locations improved by categorical safety funded projects. When reduction factors for Low Cost Accident Counter Measures (LCAC) or reduction factors from other sources were tabulated a + appears with the reduction factor or a note appears in the remarks column.

Non-reportable accidents were not used to calculate the safety project reduction factors tabulated.

Reduction factors should only be used to ESTIMATE safety benefits for respective improvements.

* Insufficient number of locations for factor calculation or no statistically significant change in accident rate. If a factor is present the source for the factor is shown in remarks. @ = State Wide Average

+ Reduction Factors updated using 1992 Low Cost Accident Counter Measure Evaluations.

Improvement Codes	Description	Reduction Factor (in %)	Remarks
63	INSTALLATION OR IMPROVEMENT OF MEDIAN BARRIER	20@	Right-Angle 53%@,Rear End/OT 32%@,Left Turn 44%@,ROR 42%@
631	Replace deficient median barrier	*	
632	Install median barrier	19@	Reduces right angle acc. 54%
633	Install/improve median barrier near gore area	17@	Reduces ROR acc. 56%@; Increases coll. w/guiderail 57%@, Rear End/OT 39%@
64	PAVEMENT MARKINGS AND/OR DELINEATORS	9@	13% - Reduction noted in reference 4
640	Install raised snowplowable pavement markers	*	
641	Centerline striping	5*	Reduction factor from reference 1
	No-passing striping	66*	Reduction factor from reference 2
642	Road edge restriping	38	Reduces coll. w/fixed obj acc 59%@, Rear-End/OT 50%
643	Delineation of shoulders	9*	Delineation group factor. Also, see code 645.
644	Delineation of curves	30*	For curves of radius <500 ft. Reduction factor from reference 2.
645	Thermoplastic pavement markings	35	Reduces coll. w/fixed obj 80%
647	Thermoplastic pavement markings, spot locations	22*	NYS DOT PIES
	OTHER ROADSIDE APPURTENANCES		
65 & 651	ROADWAY LIGHTING INSTALLATION	9*	Reduction factor from reference 4.
	Spot locations only	36@	Reduction factor from reference 2. Reduces nighttime accidents 67%@
66 & 661	IMPROVE DRAINAGE AND/OR DRAINAGE STRUCTURES	32@	
67 & 671	INSTALL FENCING	*	
68 & 681	INSTALL IMPACT ATTENUATORS	4*	NYS DOT PIES
69 & 691	INSTALL SHOULDER RUMBLE STRIPS	*	

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Improvement Code	Description	Reduction Factor (%)	Remarks
70	IMPROVEMENTS AT GORES	31	Right angle 60%,Rear End/OT 44%,Head On/SS 43%,ROR 52%
700	Protection of fixed objects/improvements of positive guidance in gore area	35	Reduces rear-end/ss acc. 45%, ROR 46%@, coll. w/fixed obj 18%@ Head-on/SS 36%, Right-angle 62%, ROR 51%
701	Thermoplastic striping & delineation in gore area	94	Reduces rear-end/ss acc. 64%@
702	Removal or protection of fixed objects in gores	7*@	Reduces rear-end/ss acc. 32%, ROR 74%@

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Questions about the accident reduction factors can be directed to Jeff Thorn, Safety Program Management Bureau, NYS DOT, 518-457-6305.

Other References cited in this table:

1. Tamburri, Thomas N., "Accident Reduction Factors for Highway Safety Projects" State of Calif. Transp. Agency, Dept. of Publ. Works Div. of Highways, 1969. (Before and after studies of 500 projects in California.)

2. Calif. Transp. Agency, Dept. of Public Works, Div. of Highways, Evaluation of Minor Improvements

Part 1 - Flashing Beacons	1967
Part 2 - Safety Lighting	1967
Part 3 - Delineation	1968
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Part 5 - Left Turn Channelization	1967
Part 6 - Signs	1968

(Before and after studies of projects in California, tabulated statistics included.)

3. Dale, C.W., "Cost Effectiveness of Safety Improvement Programs," FHWA/DOT 1973. (Project studies in Ref. 4 listed below.)

4. FHWA/DOT, Evaluation of the Highway-Related Safety Program Standards. 1977 (Compilation of safety project evaluations reported by states.)

5. Traffic Safety Center, Midwest Research Inst. Manual on Identification, Analysis, and Correction of High-Accident Locations, FHWA/DOT 1976. (Studies in cooperation with Missouri Div. of Highway Safety.)

6. Calif. Dept. of Transp. Accident Rates vs. Shoulder Width, CALTRANS 1977. (Before and after studies of projects in Calif. with tabulated statistics included.)

7. Strate, Harry E., "An Evaluation of Federal Highway Safety Program Effectiveness," FHWA 1978 (Compilation of safety project evaluations reported by states)

TABLE 1B
AADT < 5000/LANE
ACCIDENT REDUCTION FACTORS (RF)

Traffic Engineering and Safety Division
Safety Program Management Bureau
NYS DOT Revision 5/00

Improvement Codes	Description	Reduction Factor (%)	Remarks
	INTERSECTION IMPROVEMENTS		
10	CHANNELIZATION	35@	Right angle 48%@, Rear end/OT 53%, Left turn 49%
101	Add left turn lane w/physical separation	*	Head On/SS 79%@
102	Add left turn lane w/painted separation	50	Reduces right-angle acc. by 62%, rear-end/OT 54%, left turn 57%@
103	Add right turn lane w/physical separation	*	
104	Addition of pavement markings to reduce size of intersection	*	
105	Other channelization	36	Rt Angle 45%@, Rear End/OT 76%@
11	TRAFFIC SIGNALS/DEVICES	34	Right angle 50%, Rear end/OT 39%, Left Turn 26%, Head On/SS 23%, Rt.Turn 34%
110	Other signal improvements	23	Reduces right-angle acc. 30%, rear-end/OT 39%,Lt Turn 22%,Rt Turn 53%
111	Install 4-way stop signs	73*	Reduction factor from Reference 2.
11A	Install stop ahead signs	15+	
112	Install minor-leg stop control	1*	
11B	Install Yield signs	23+	
113	Install new flashing red/yellow signal	25	Reduces right-angle acc. 35%
114	Change in operation to a flashing red/yellow signal	*	
115	Installation of a new red/yellow/green signal	38	Reduces right-angle acc. by 74%, rear-end/OT 22%
116	Upgrading of a red/yellow/green signal (Includes larger lenses, more/better placed heads, phase adjustment, and general signal upgrades.)	37	Reduces right angle acc. by 47%,rear-end/OT 41%,left turn 38%@,Head On/SS 32%
117	Add left turn protection (change # of phases)	30@	Reduces right-angle acc. 54%@, rear-end/OT 27%@, left turn 41%@.
118	Add pedestrian signals	13*	Reduction factor from Reference 5.
119	Change in signal operation, from pretimed to traffic-actuated	39	Reduces right-angle acc. 41%, rear-end/ss 53%, Head On/SS 81%

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Improvement Codes	Description	Reduction Factor (%)	Remarks
12	COMBINATION OF CHANNELIZATION (10) & SIGNALS/DEVICES (11)	41	Right angle 66%, Rear end/OT 49%
121	Add left turn lane w/signal (physical)	51	Reduces right-angle acc. 68%, rear-end/OT 50%, left turn 24%@
122	Add left turn lane w/signal (painted)	30	Reduces right-angle acc. 64%
123	Add right turn lane w/signal	*	
124	Add left and right turning lane w/signal	41	Reduces right-angle acc. 70% and rear-end/ss 64%
13 & 131	INTERSECTION SIGHT DISTANCE IMPROVEMENT	31*	Reduction factor from reference 4.
19 & 191	OTHER INTERSECTION WORK	41	Reduces right angle acc. 69%@
	Prohibit parking	32*	Reduction factor from reference 5.
	Prohibit turns	40*	Reduction factor from Reference 5.
	CROSS-SECTIONAL IMPROVEMENTS		
20	PAVEMENT WIDENING, NO LANES ADDED	37	Reduces left turn accidents 77%
201	Widen travel way from 9 feet	*	
202	Widen travel way from 10 feet	37	Reduces left turn acc. by 77%
21	LANES ADDED, WITHOUT NEW MEDIAN	20@	Reduces Right Angle acc. 35%@, Rear End/OT acc. 42%@, Head On/SS 38%
211	Add additional lanes same alignment	20@	Reduces rear-end/OT acc. 42%@, head-on/ss 38%@, right angle 35%@ Increases right turn acc. 79%@
212	Add climbing lane	*	
22	HIGHWAYS DIVIDED, NEW FLUSH MEDIAN ADDED	24	Reduces Rear end/OT acc. 44%, Left turn acc. 59%@, Head On/SS 60%
221	Flush median added	44@	Reduces left turn acc. 72%@
222	Flush median added w/refuge for left turns	24	Reduces rear-end/OT acc. 44%, left turn 58%@, head-on/ss 55% Increases right turn acc. 95%@
223	Widen flush median	*	

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Improvement Codes	Description	Reduction Factor (%)	Remarks
23	SHOULDER WIDENING OR IMPROVEMENT	*	
231	Shoulder stabilization	*	
232	Widen existing shoulder	17*	Reduction factor from reference 6, for 2-lane roads only
24	ADD ADDITIONAL LANES W/MEDIAN, SAME ALIGNMENT	20*	Reduction factor from reference 1, general reconstruction
25	SKID TREATMENT W/GROOVING	37	Rear End/OT 54%, Wet Road Reduced 64%, ROR 41%, Fxd Obj 36%
251	Longitudinal grooving	37	Reduces wet-road acc. 64%, ROR 41%, rear-end/OT 54%, Fxd Obj 36%
252	Transverse Grooving	*	
26	SKID TREATMENT W/OVERLAY	13@	Open-graded mix most effective. Rt Angle 25%, Fxd. Obj 26% Reduces wet-road acc. 23%, head-on/ss 43%
261	Resurfacing w/skid resistant pavement	8@	Reduces wet-road acc. 35%@, right-angle 31%
262	Resurfacing and superelevation	28@	Reduces wet-road acc. 51%@
263	Resurfacing w/open-graded mix	75@	Reduces wet-road acc. 91%@, coll. w/fixed obj 93%@, head-on/ss 90%@
264	Resurfacing w/Verglimit	31@	Reduces icy-road acc. 52%@
27	SIDE SLOPES	43	Reduces coll. w. F.O. 62%
271	Flattening of side slopes	43	Reduces coll. w/fixed obj 62%
272	Flattening or clearing of side slopes	*	Refer to Improvement Code 271

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Improvement Codes	Description	Reduction Factor (%)	Remarks
	IMPROVEMENT AND/OR REPLACEMENT OF STRUCTURES		
30 & 300	WIDENING EXISTING BRIDGE OR OTHER MAJOR STRUCTURE	65*	Reduction factor from reference 4. Applicable to only coll. w/ bridge structure accidents.
31 & 310	REPLACEMENT OF BRIDGE OR OTHER MAJOR STRUCTURE	25*	Reduction factor from reference 7
32 & 320	CONSTRUCTION OF NEW BRIDGE OR MAJOR STRUCTURE	19*	Reduction factor from reference 3
33 & 330	CONSTRUCTION OR IMPROVEMENT OF MINOR STRUCTURE	*	
34 & 340	CONSTRUCTION OF PEDESTRIAN OVER OR UNDER CROSSING	*	
39 & 390	OTHER STRUCTURE WORK	*	
	ALIGNMENT WORK		
40 & 400	HORIZONTAL ALIGNMENT CHANGES	59	Reduces fixed-object acc. 68%, ROR 90%, head-on 67%, Rear End/OT 73%
41 & 410	VERTICAL ALIGNMENT CHANGES	*	
42 & 420	COMBINATION OF 40 and 41	20* 21*	Reduction factor from reference 1 Reduction factor from reference 4
43 & 430	SUPERELEVATION AND RESURFACING	See Code 262	

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Improvement Codes	Description	Reduction Factor (%)	Remarks
	ROADSIDE APPURTENANCES		
60	TRAFFIC SIGNS	18	Reduces rear-end/OT accidents 21%, Rt Angle 34%, LT Turn 35%
600	Installation or upgrading of traffic signs	28	Rt Angle 43%, Rear End/OT 33%, Lt Turn 51%
	Replacement of standard w/large Stop signs	19+	
601	Install/improve warning signs	*	
602	Install/improve curve warning signs	*	
603	Install/improve advance curve warning flashers	54*	Reduces night accidents 62%. Reduction factors from reference 2.
604	Install/improve other signs (Arrow signs)	34+	
605	Protection/removal of fixed object	18	Rear End/OT 42%
606	Make breakaway or install breakaway signs and/or light supports	28	Rear end/OT 72%
607	Install clearance and/or hazard markers	*	
62	INSTALLATION/IMPROVEMENT OF ROAD EDGE GUIDERAIL	16	Rear end/OT 36%, Fixed Object 16%, Rt. Angle 17%
622	Replacement or upgrading of deficient guiderail	18	Reduces coll. w/guiderail 40%, coll. w/fixed obj 23%,ROR 42%, Rear End/OT 41%
624	Protection or removal of fixed object in gore	*	Refer to Improvement Codes 605 & 702
625	Installation or upgrading of culvert and bridge railing	22	Reduce collision w/bridge or culvert 37%, Rear end/OT 34%
626	Install road edge guiderail at new location	10*@	Reduce coll. w/fixed obj 4%*@, increase coll. w/guiderail 67%, ROR 18%*@, Rear End/OT 31%
627	Removal of guiderail (w/o other improvements)	-19*@	Increase coll. w/ditch/cut/bank 411%

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Improvement Codes	Description	Reduction Factor (in %)	Remarks
63	INSTALLATION OR IMPROVEMENT OF MEDIAN BARRIER	56	Right-Angle 30%,Rear End/OT 32%@,Left Turn 44%@,ROR 42%@
631	Replace deficient median barrier	*	
632	Install median barrier	19@	Reduces right angle acc. 58%@
633	Install/improve median barrier near gore area	17@	Reduces ROR acc. 56%@; Increases coll. w/guiderail 57%@, Rear End/OT 39%@
64	PAVEMENT MARKINGS AND/OR DELINEATORS	17	13% - Reduction noted in reference 4
640	Install raised snowplowable pavement markers	*	
641	Centerline striping	5*	Reduction factor from reference 1
	No-passing striping	66*	Reduction factor from reference 2
642	Road edge restriping	44	Reduces coll. w/fixed obj acc 66%, Rear-End/OT 45%@
643	Delineation of shoulders	9*	Delineation group factor. Also, see code 645.
644	Delineation of curves	30*	For curves of radius <500 ft. Reduction factor from reference 2.
645	Thermoplastic pavement markings	14@	Reduces coll. w/fixed obj 56%@
647	Thermoplastic pavement markings, spot locations	22*	NYS DOT PIES
	OTHER ROADSIDE APPURTENANCES		
65 & 651	ROADWAY LIGHTING INSTALLATION	9*	Reduction factor from reference 4.
	Spot locations only	36@	Reduction factor from reference 2. Reduces nighttime accidents 67%@
66 & 661	IMPROVE DRAINAGE AND/OR DRAINAGE STRUCTURES	32@	
67 & 671	INSTALL FENCING	*	
68 & 681	INSTALL IMPACT ATTENUATORS	4*	NYS DOT PIES
69 & 691	INSTALL SHOULDER RUMBLE STRIPS	*	

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Improvement Code	Description	Reduction Factor (%)	Remarks
70	IMPROVEMENTS AT GORES	23	Right angle 51%@,Rear End/OT 50%,Head On/SS 34%@,ROR 56%
700	Protection of fixed objects/improvements of positive guidance in gore area	27	Reduces rear-end/ss acc. 53%, ROR 46%@, coll. w/fixed obj 18%@ Head-on/SS 51%@, Right-angle 54%@, ROR 46%@
701	Thermoplastic striping & delineation in gore area	38	Reduces rear-end/ss acc. 51%
702	Removal or protection of fixed objects in gores	7*@	Reduces rear-end/ss acc. 42%, ROR 84%

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7. Strate, Harry E., "An Evaluation of Federal Highway Safety Program Effectiveness," FHWA 1978 (Compilation of safety project evaluations reported by states)

APPENDIX J

Acronyms

ACRONYMS

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway Transportation Officials
ADA	Americans with Disabilities Act (1990)
ADAAG	ADA Accessibility Guidelines
ATMS	Advanced Transportation Management Systems
AVL	Advanced Vehicle Locating
AVO	Average Vehicle Occupancy
BPAC	Bicycle and Pedestrian Advisory Committee
CAAA-1990	Clean Air Act Amendments of 1990
CBD	Central Business District
CMS	Congestion Management System
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GIS	Geographic Information System
HAL	High Accident Location
HBRR	Highway Bridge Replacement and Rehabilitation Program
HOV	High Occupancy Vehicle
ISTEA	Intermodal Surface Transportation and Efficiency Act of 1991
ITCTC	Ithaca/Tompkins County Transportation Council
ITS	Intelligent Transportation Systems
LOS	Level Of Service
LRP	Long-Range Transportation Plan
MPO	Metropolitan Planning Organization
MUTCD	Manual on Uniform Traffic Control Devices
NAAQS	National Ambient Air Quality Standards
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
PIL	Priority Investigation Location
PMS	Pavement Management System
PS&E	Plan, Specification & Estimate

R&P	Rehabilitation and Preservation
ROW	Right-Of-Way
SDF	State Dedicated Fund
SIP	State Air Quality Implementation Plan
SMTC	Syracuse Metropolitan Transportation Council
SOV	Single Occupant Vehicle
STIP	State Transportation Improvement Program
STP	Surface Transportation Program
TAZ	Transportation Analysis Zone
TDD	Transportation Development District
TDM	Travel Demand Management
TEA-21	Transportation Equity Act for the 21st Century
TIP	Transportation Improvement Program
TMA	Transportation Management Area
TSM	Transportation Systems Management
USDOT	United States Department of Transportation
VHD	Vehicle Hours of Delay
VHT	Vehicle Hours of Travel
VMT	Vehicle Miles of Travel
V/C	Volume to Capacity Ratio