

Appendix 5 -
Design Year
Traffic Forecasts

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APPENDIX 5
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PROJECT DEVELOPMENT MANUAL
APPENDIX 5
DESIGN YEAR TRAFFIC FORECASTS

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1.0 INTRODUCTION

This appendix provides guidance relative to the appropriate design year to use for traffic forecasts for various project work types. Design year traffic forecasts are required for most Department highway and bridge projects.

Specific methods of traffic forecasting are outside the scope of this Appendix. In many cases simplified forecasts methods may be appropriate. Refer to Chapter 5 of the Highway Design Manual (HDM) for guidance.

Design year traffic forecast volumes are necessary to:

- Determine the appropriate scope of improvements (e.g., adding a turn lane vs. not doing so) and associated geometric design criteria.
- Determine how well the project meets objectives for capacity, delay, and mainline or intersection level of service (LOS). LOS is determined by means of capacity analysis, which requires the design year traffic volumes.
- Evaluate project work types on a consistent statewide basis.
- Allow for informed decision making on project alternatives and trade-offs.

It may not always be practicable to construct projects that fully accommodate design year traffic, or even to fully address existing traffic congestion. Engineering judgment and consideration of all relevant factors provides the flexibility in determining to what extent design year traffic can be accommodated.

The following factors should be kept in mind when using this guidance:

- This Appendix provides that future traffic impacts are considered, but traffic forecasts alone do not dictate project scope. Forecasts are only one of many factors (safety needs, mobility needs, environmental issues, community needs, etc.) to be addressed.
- Traffic forecasts provide the basis for informed, two-way communications between NYSDOT and the public on continued and future congestion levels, and the proposed project alternatives.
- Failure to analyze alternatives with design year traffic volumes may require remedial work before the end of a project pavement's expected service life (ESL), which may actually increase project costs and cause significant community disruption.

Interpretation and updating the Policy contained in this Appendix is the joint responsibility of the Design Quality Assurance Bureau (DQAB) in the Design Division and the Mobility Management Bureau (MMB) in the Planning and Strategy Group.

2.0 PROJECT WORK TYPE DEFINITIONS

The selection of the appropriate design year for traffic forecasts is a function of the project work type, and is shown in Table 5 -1 of this Appendix. Work types are defined below.

2.1 HIGHWAY PROJECTS

These are projects with a primary objective to construct a new highway or to reconstruct, restore, or preserve an existing highway. These projects could include bridge work and non-motorized accommodations of any type that is incidental to the primary purpose of the project.

2.1.1 Pavement Preventive and Corrective Maintenance

Preventive maintenance is defined as those planned activities undertaken in advance of a critical need or of accumulated deterioration so as to avoid such occurrence and reduce or arrest the rate of future deterioration. Corrective maintenance is defined as those activities to correct existing deficiencies. Both of these activities may correct minor defects as a secondary benefit.

These work types include element specific work such as resurfacing a highway's pavement and shoulders (e.g., 1R - single course resurfacing). Work also includes measures to address identified superelevation, pavement marking, signing, delineation, crack and joint sealing, and drainage work.

2.1.2 Safety Related Work

This type of project includes measures to improve the safety of existing highways, such as removal, relocation or protection of roadside obstacles; grooving; installation of impact attenuators, guide rail and median barriers; at-grade protective devices; fencing or glare screens; improved signing, pavement markings or lighting; installation or rehabilitation of traffic signals; pedestrian crossings; and bicycle accommodations.

2.1.3 3R - Resurfacing, Restoration and Rehabilitation

This type of project includes work to preserve and extend the service life of an existing highway, including any safety improvements justified by existing or potential accident problems. Low cost operational improvements are also encouraged. Work is generally limited to pavement rehabilitation along existing alignment, and can include correction of minor subgrade problems, widening of less than a lane width, minor adjustment of vertical and/or horizontal alignment, provision of turning lanes at intersections, arterial driveway consolidation, lengthening acceleration/deceleration lanes and construction of bus turnouts, and pedestrian and bicycle accommodations. These projects may also utilize Intelligent Transportation System (ITS) measures, such as signal retiming and detection,

ramp metering, overhead sign structures, and incident detection and management. Work may also include drainage improvement, slope work, and/or replacement of signs and signals, guide rails and other roadside appurtenances. Refer to HDM Section 7.2 (Freeway 3R) and Section 7.3 (Non-Freeway 3R) for further guidance on 3R projects.

2.1.4 Reconstruction and New Construction

This type of project includes work to replace an existing highway, including rebuilding to include geometric improvement, or construction on new alignment. Projects generally involve extensive rebuilding of subgrade, drainage systems, and utility work. These projects may also utilize ITS measures.

These projects provide a full depth replacement of Portland cement concrete or hot mix asphalt or full depth hot mix asphalt or Portland cement concrete construction above existing grade. Although concrete pavement has an expected service life of greater than 30 years, design year traffic forecasts will be consistent with Table 5-1.

2.1.5 Minor Intersection Reconstruction

This type of project typically provides operational improvements, including geometric changes such as new or lengthened turn lanes, restriping, improved radii, and minor channelization. Other examples of improvements include installation of traffic control devices and signs, installation of sidewalks, curbs and bus turnouts, incidental improvements such as lighting and drainage improvements, and pedestrian and bicycle accommodations. These projects may also utilize ITS measures.

2.1.6 Major Intersection Reconstruction

This type of project typically includes operational changes, major capacity enhancements, and relocation/realignment work. Major intersection reconstruction also includes revised access points for freeway interchanges, as defined in Appendix 8 (Interstate & Other Freeway Access Control & Modifications) of this manual. Major intersection reconstruction includes, but is not limited to, construction of roundabouts, single - point urban interchanges, or replacement of a directional ramp on a diamond interchange with a loop. These projects may also utilize ITS measures.

2.2 BRIDGE PROJECTS

These are projects with a primary objective to replace or rehabilitate a bridge, or repair the deck of an existing bridge. Incidental highway work is limited to the work on the approaches necessary to transition between the bridge and the untouched existing highway. For additional information, refer to the NYSDOT Bridge Manual.

2.2.1 Preventive and Corrective Bridge Maintenance

Preventive maintenance is planned activity done in advance of a critical need or accumulated deterioration so as to reduce or arrest the current or future rate of deterioration. Corrective maintenance is planned activity done to correct selected existing defects and damage. Most element-specific bridge work listed in DPM Appendix B, Section 2.5 is either preventive or corrective maintenance.

2.2.2 Minor Bridge Rehabilitation

This type of project includes element-specific bridge work listed in DPM Appendix B, Section 2.5 that does not fall under the preventive or corrective maintenance category. Examples include deck repair, bearing replacement, bridge railing upgrades and curb or sidewalk replacement.

2.2.3 Major Bridge Rehabilitation

This type of project includes significant amounts of rehabilitation work. Examples include: bridge widening, deck replacement and superstructure replacement.

2.2.4 New and Replacement Bridges

These projects include replacement of an existing bridge or construction of a new bridge. Replacement bridges have an expected service life of 75 years based on Load and Resistance Factor Design (LRFD). Because of the long service life and large capital investment for new bridges, they are the only project type where traffic forecasts are carried beyond 20 years, to a design year of ETC +30.

2.3 PEDESTRIAN AND BICYCLE ACCOMMODATIONS

It is Department policy to consider bicyclists and pedestrians as integral parts of the intermodal transportation system, and to recognize these needs in the design of transportation projects. Facilities for pedestrian and bicycle travel may include sidewalks, pedestrian crossings, bike lanes, widened shoulders or curb lanes, bike paths and multi-use paths. These facilities may or may not be separate project work types but can be elements of any highway or bridge project, and are not listed separately in Table 5-1.

Projects in areas that are used by, or likely to be used by bicyclists and pedestrians should take into account these modes of travel. The needs and objectives for pedestrian and bicycle traffic should be identified and addressed as part of the overall project development process, beginning with scoping and continuing throughout design and construction. Refer to HDM Chapter 18 (Facilities for Pedestrians and Bicyclists) for further guidance on these facilities.

2.4 OTHER PROJECTS AND MISCELLANEOUS/SPECIAL PROJECTS

These are projects that are included in the Department's Capital Program, but are not directly related to the construction of bridges and highways. Also, this type includes projects of a special or unusual nature not fitting other definitions. They include projects such as soils work, bridge removals, well drilling, drainage work, noise barriers and park and ride lots. They may be canal, rail or airport projects.

3.0 DESIGN YEAR

Table 5-1 on p. 5-8 summarizes project work types and provides design years for the traffic forecast to be used for project scoping and design. Some project work types require no traffic forecast. Others have the estimated time of completion (ETC) as the design year, or the ETC plus the specified time period (in years). Traffic forecast design years provide necessary information so that the designer can evaluate alternatives to address traffic and congestion issues. The selected design year is intended to cover the time period necessary to evaluate functionality over the expected service life of the project.

Design years for traffic forecasts other than shown in Table 5-1 shall not be used since they could result in an incomplete analysis that does not identify opportunities for operational improvements. For projects on the Interstate system, Level of Service is a critical design element, and inability to attain the specified LOS must be justified as a non-standard feature (HDM Chapter 2, Section 2.8). For all other projects, inability to attain the specified LOS should be discussed as a non-conforming feature (HDM Chapter 5, Section 5.1).

This policy on design year traffic forecasts is fully consistent with the Department's Context Sensitive Solutions (CSS) initiative. Through the CSS Public Involvement process, alternatives may be developed which do not functionally accommodate design year traffic. However, design year traffic forecasts are still needed to fully evaluate traffic conditions throughout the expected service life of the project.

Zoning, land use and planning issues, as well as anticipated future traffic patterns are all relevant to traffic forecasting projections, and need to be appropriately addressed in the forecasting process.

4.0 UPDATING DATA AND ANALYSIS

For information on updating traffic data, forecasts and analysis, refer to HDM Section 5.2.3.

Table 5 - 1 Design Year Traffic Forecast

PROJECT WORK TYPE		DESIGN YEAR
HIGHWAY WORK	Pavement Preventive and Corrective Maintenance ¹	Not Usually Required
	Safety Related Work ¹	
	3R - Resurfacing, Restoration, and Rehabilitation ³	ETC+10
	Minor Intersection Reconstruction ²	
	Reconstruction and New Construction ³	ETC+20
Major Intersection Reconstruction ²		
BRIDGE WORK	Preventive and Corrective Bridge Maintenance ¹	Not Usually Required
	Minor Bridge Rehabilitation	ETC+10
	Major Bridge Rehabilitation ²	ETC+20
	New and Replacement Bridges ²	ETC+30
OTHER WORK & MISCELLANEOUS/SPECIAL WORK ¹		Not Usually Required

Notes - all project work types:

ITS Measures When traditional capacity improvements (e.g., additional travel lanes) are not possible, minor operational improvements (e. g., ramp metering, signal timing) as well as other Intelligent Transportation System measures may help reduce delay in the design year. Where ITS measures are incorporated in a highway or bridge project, the design year shall be consistent with the project work type noted in this table.

Notes - specific project work types:

1. Many work activities can be planned, scheduled, or carried out on an emergency basis without regard to traffic volumes using the highway. However, closure of highway travel lanes requires use of ETC traffic to assure that the traffic lanes that remain open are adequate to use for maintenance and protection of traffic during closure. ETC traffic should be used to schedule operations outside peak travel periods of the day, or determine the appropriate detour routes around a highway work zone.
2. During scoping, evaluate the capacity needs of intersections near structures that are to be replaced or undergo major rehabilitation, for the design life of the structure (ETC +30 or ETC +20). Provide adequate bridge width for intersection approach lane widenings, either in the scope of the bridge work or design the bridge to facilitate future widening.
3. When the scope includes a new or replacement bridge, use ETC +30 for design year traffic forecast.