Long Island Transportation Plan
To Manage Congestion

Framework for Developing and Evaluating Improvement Strategies

The Long Island Transportation Plan to Manage Congestion (*LITP 2000*) will establish an integrated, multi-modal transportation program of cost-effective strategies to manage congestion and improve the movement of people and goods in Nassau and Suffolk Counties. The proposed process for identifying and evaluating potential strategies to achieve this goal is described below as an introduction to the proposed methodology for all participants who will be involved in the process. This paper addresses: identification of the congestion and mobility problems on Long Island; development of potential alternative strategies for solving the problems; and the process for evaluating the strategies to determine those which are implementable, effective, and affordable.

HOW DO WE IDENTIFY CONGESTION AND MOBILITY PROBLEMS?

Before strategies for managing congestion and improving mobility (i.e., the movement of people and goods, defined in terms of travel time, efficiency, transit passenger crowding, safety, and cost) can be developed and evaluated, we must first identify the causes of current congestion and mobility problems on Long Island and forecast their magnitude in the future. Therefore, as one of the initial technical analyses in the Study to develop LITP 2000, existing transportation conditions will be reviewed. In addition, future congestion and mobility conditions will be forecast.

These forecasts of future congestion and mobility conditions will assume that all plans and projects that currently have funding and approval will be completed by the analysis years. The future analysis years for which congestion and mobility problems will be forecast are 2007 (consistent with federal requirements for analysis of project conformity with national air quality standards); and 2020 (20 years after implementation of short-term solutions defined by LITP 2000 as well as the planning horizon year for the New York Metropolitan Transportation Council's Long Range Transportation Plan, of which LITP 2000 will be part). The future effects of potential improvement strategies developed during the LITP 2000 effort will also be forecast for these two analysis years.

Existing congestion and mobility problems and projections of where and when future problems will likely occur will be assessed in terms of travel speeds, travel times, delays, and transit passenger crowding. The locations and extent of identified problems will be shown on computer-generated maps. Once the congestion/mobility problems and their locations are identified, alternative improvement strategies to deal with them, both in the near term and in the long term, will be developed.

HOW DO WE DEVELOP IMPROVEMENT STRATEGIES?

To help develop and recommend improvement strategies, a technical advisory committee (TAC) has been established. The committee consists of representatives of:

- Long Island Counties, Towns, and Cities
- State Legislature and Agencies
- Transit and Regional Planning Agencies
- Federal Transit Administration, Federal Highway Administration
- Colleges and Universities
- Long Island Association (LIA)
- NYS Motor Truck Association
- Auto, Bicycle and Commuter Groups
- LITP 2000 Subcommittee Representatives

Input from the general public is extremely important to help the TAC develop suitable alternative ways to remedy congestion problems on Long Island.

In addition to the TAC, a number of *LITP 2000* subcommittees have been organized to discuss specific transportation issues and potential improvements, such as transit, ridesharing, bicycle and pedestrian options; traffic operations; cargo movement; land-use and zoning policies and actions; and new and innovative transportation technologies. The subcommittees include local governmental and transportation provider members who provide professional/technical expertise and volunteer members from the general public who will provide their ideas and perspectives representing typical users of Long Island's transportation system.

Examples of potential improvement actions which may be considered by the TAC and the subcommittees include:

- A continuous system of high-occupancy-vehicle (HOV) lanes within Nassau and Suffolk Counties.
- Express, circulator and shuttle bus services.
- Improved connections between commuter rail and bus transit.
- Bicycle and pedestrian facilities.
- Transportation Systems Management (TSM), which are actions to improve the efficiency of the existing transportation system.
- Intelligent Transportation Systems (ITS), which are technology-based improvements, to increase the efficiency of vehicular flow on existing roads.
- Access management options for arterial roadways to reduce traffic conflicts.
- Travel Demand Management (TDM) actions and policies, which encourage people to modify their travel behavior, including participation by businesses to implement them.
- Land-use and zoning policies and practices that encourage ridesharing, walking, bicycling, and bus use.
- Appropriately scaled highway and transit capacity improvements that complement community goals and plans.
- Strategically located park-and-ride lots to support ridesharing and transit use.
- Actions to improve the movement of cargo.

It is expected that the example list of potential improvement actions will be greatly expanded and clarified with specific input from the public and the *LITP 2000* subcommittees.

While one potential improvement *action* may have some measurable effect in addressing an identified congestion/mobility problem, it is likely that a combination of complementary individual actions into a unified *strategy* would provide a markedly greater benefit. For example, certain actions such as supporting land use/zoning regulations and accommodation of non-auto modes (bicycling, walking) may enhance the effectiveness of the improvement action. Therefore, a typical improvement strategy is likely to consist of several actions that would work together to address a congestion/mobility problem.

WHAT DO IMPROVEMENT STRATEGIES CONSIST OF?

Two examples may serve to illustrate how the combined effects of individual improvement actions formed into a strategy may result in a more effective improvement. Imagine a traffic congestion problem along roadways in a major, high-growth corridor. The introduction of a circulator bus system connecting residential, commercial/retail, and office concentrations within the corridor may be an effective means of encouraging some drivers to leave their cars at home and travel, instead, by bus for at least some of their trips, with a resultant reduction in traffic volume. In addition to the primary action, a new bus service, several other improvement actions could be undertaken to enhance the attractiveness of the bus service and improve overall travel efficiency for potential riders:

- employer incentives for employees commuting by bus may encourage greater bus use by people living and working within the corridor and, thereby, reduce vehicular congestion;
- construction of park & ride lots at locations convenient to residential areas to encourage greater bus use and possibly carpooling to reduce congestion;
- designation of a bus/carpool lane along the corridor's major roadways, perhaps with traffic signal pre-emption for buses, would reduce travel time for buses and carpools and enhance the attractiveness of the circulator bus system for potential users; and
- Institute paid parking at businesses and LIRR stations, where SOVs pay the premium rates and carpoolers have access to preferred parking locations and pay reduced rates or park for free.

As a second example, a potential remedy to a congestion problem along a major, high-growth arterial roadway may be the primary action of roadway widening. In addition to this primary action, two supporting actions could be included:

- access management would reduce traffic conflicts at intersections and driveways, thereby improving overall travel speeds and safety; and
- a trip reduction ordinance would lead to more ridesharing and transit use, thereby reducing the long-term future growth in additional vehicles using the new lanes.

In both examples, the effectiveness of the overall strategy would depend on all of the related individual actions being implemented. The following table illustrates how individual actions could be combined to create improvement strategies with greater cumulative benefits. The "rows" identified along the left side are possible **primary actions** to remedy a particular problem. The "columns" identified at the top of the table are potential **supporting actions**

which may enhance the primary action's effectiveness. Proceeding from left to right across the row for a given primary action, a professional judgment will be made about whether each supporting action would likely support or negate the effectiveness of the primary action.

Example Strategies Table

	Potential Supporting Actions				
	Linear Widening	*Access Mgmt.*	*HOV Lane*	*Park & Ride Program*	*Circulator Bus System*
Primary Actions					
Linear Widening	*	+2	*	+1	+1
Access Management	0	*	+1	+1	+1
HOV Lane	*	0	*	+2	+1
Park & Ride Program	-1	0	+2	*	0
Circulator Bus System	0	0	+2	+1	*

LEGEND: ***does not apply**
-1 **negates the effectiveness of the primary action**
0 **does not affect the primary action**
+1 **supports the primary action**
+2 ***significantly*** **supports the primary action**

The above table is only an example to aid in understanding how *LITP 2000* strategies may be developed. The TAC and the subcommittees will greatly expand the list of actions that will comprise the final strategies table.

Using the table as a guide, strategies could be developed by combining each primary action under consideration with corresponding supporting actions that would support or significantly support the given primary action. For example, construction of HOV lanes together with a rideshare program may be one alternative strategy for a particular congestion/mobility problem. If reasonable, a commute express bus service might be added to the HOV-lane/rideshare combination to form another alternative improvement strategy.

The New York State Department of Transportation (NYSDOT), working with the TAC and with input from the *LITP 2000* subcommittees and the general public, will use this approach of combining primary and supporting actions to develop comprehensive improvement strategies for the identified congestion and mobility problems.

HOW DO WE EVALUATE ALTERNATIVE STRATEGIES?

Most likely, a large number of potential alternative strategies will be developed from among the initial list of improvement actions. Therefore, the process to evaluate potential alternatives will accomplish the following:

- "fatal-flaw screening" of the initial list of potential improvement *actions* to eliminate those which are infeasible (i.e., have one or more "fatal flaws") and do not warrant further consideration as part of an alternative improvement strategy, and thereby reduce the initial list to a manageable number of potentially feasible options;
- qualitatively and quantitatively assess the list of alternative improvement *strategies* created by combining primary and supporting actions which survive the fatal flaw screening and thereby reduce the initial list to a manageable number of potentially feasible options; and

- recommend a preferred improvement strategy for each congestion/mobility problem which, on the basis of the evaluation process, would be implementable, effective, and affordable.

Screening Evaluation. The first step in the evaluation process will be a fatal flaw screening of the initial list of potential alternatives to eliminate from further consideration those which would not be implementable. An improvement action will be considered **implementable** if it would be:

- Supportive of quality of life and local environmental issues.
- Consistent with *LITP 2000* study goals and applicable approved plans.
- Consistent with standards for engineering design, constructability, safety and operation, as appropriate.

Table 1 lists the evaluation criteria against which each potential improvement action will be judged, on a "pass/fail" basis, to determine if it would be implementable. Any action which fails to satisfy any of these criteria, i.e., has a fatal flaw, would not be pursued further.

Technical Evaluation. The next step in the evaluation process is the "Tier I" evaluation in which the technical merits of the strategies (i.e., combinations of primary and supporting actions that passed the fatal-flaw screening) will be determined. NYSDOT, with input from the TAC, LITP 2000 subcommittees, and the general public, will do both qualitative and quantitative evaluations to assess the relative effectiveness and affordability of each alternative strategy, compared to other strategies under consideration for an identified congestion/mobility problem. This is necessary to help ensure that the *LITP 2000* transportation investments made on Long Island will be made wisely.

An improvement strategy will be considered **effective** if it would:

- Manage future system-wide traffic congestion.
- Improve person travel efficiency.
- Improve cargo movement efficiency.
- Improve travel by transit and non-motorized modes.
- Help achieve federal and state air quality standards.

Table 1
Fatal Flaw Evaluation of Alternative Actions

Objective

Implementability

- Supportive of quality of life and local environmental issues
- Consistent with LITP study goals and applicable approved plans
- Consistent with standards for engineering design, constructability, safety and operation, as appropriate.

Evaluation Criteria	Pass/Fail
1. An alternative should substantially satisfy the project goals.	
2. An alternative should substantially support local planning policies and strategies consistent with congestion management.	
3. An alternative should be consistent with approved transportation, community development, and land use plans and projects that support congestion management.	
4. An alternative should be capable of implementation without extensive community or traffic system disruptions/impacts that could not be effectively mitigated	
5. An alternative should avoid substantial displacement of residential or commercial properties and fragmentation of established communities	
6. An alternative should not result in significant adverse environmental impacts that could not be cost-effectively mitigated (i.e., avoid taking or significant fragmentation of wetlands, habitats of protected species; taking of Section 4(f) or 6(f) properties; taking of substantial properties known to be contaminated with hazardous wastes)	
7. An alternative should substantially conform with defined engineering design and safety standards and with standard practices for construction, maintenance, and operations.	

Table 2
Tiers I & II Objectives, Evaluation Criteria, and Performance Measures

Objectives/Evaluation Criteria	Performance Measures
Effectiveness - Tiers I & II	
1. Manage future system wide traffic congestion	a. Decrease Auto Miles Traveled
	b. Reduce Auto Trips
	c. Reduce System-Wide Vehicle Travel Time Lost In Congestion (Vehicle Hours of Delay at LOS E & F)
	d. Reduce the Number of Congested Route Miles During Peak Periods (Miles at LOS E & F)
	e. Decrease the Percentage of Single-Occupancy Vehicles in the Traffic Stream During Peak Periods
	f. Increase Vehicle Occupancy (Defined as the Number of People Traveling in All Modes Divided by the Number of Cars Being Used)
2. Improve person travel efficiency	a. Increase Average Person-Travel Speed on Buses
	b. Increase Average Person-Travel Speed in Autos
3. Improve cargo movement efficiency	a. Reduce Excessive Truck Travel Delay
	b. Assessment of Potential to Reduce Long-Haul Goods Movement Arriving and Leaving Nassau and Suffolk by Truck
4. Improve travel by transit and non-motorized modes	a. Increase the Share of Person Trips by Transit
	b. Assessment of Potential to Increase Non-Motorized Travel
5. Help achieve federal and state air quality standards	a. Decrease Emissions (Tons per Peak Period of CO, HC, NOx, and Particulates)
6. Improve highway safety	a. Tier I - Assessment of Potential to Reduce Accidents
	b. Tier II - Reduce Expected Number of Accidents on Roadway Network
Affordability - Tiers I & II	
1. There is a very reasonable chance that federal, state, local and/or private funding will be available to implement the strategy (Tier I)	Assessment of Potential Funding Sources
2. It has an acceptable life-cycle cost with respect to congestion reduction benefit (Tier II)	Maximize the Ratio of "Reduction in Systemwide Vehicle Travel Time Lost in Congestion" to "Life Cycle Cost"
Environmental Impacts - Tier II	
1. Minimize adverse impacts	a. Assessment of Potential Community Disruption (none, minor, moderate, major)
	b. Minimize Acquisition of Residential and Commercial Properties (No. of Parcels)
	c. Minimize Takings of Wetlands (Acreage)
	d. Minimize Takings of 4(f) Resources (Acreage)
	e. Minimize Takings of Hazardous Sites (Acreage, No.)
2. Mitigate any disproportionally high and adverse effects on minority and low-income populations i	a. Minority and/or Low-income Populations in Excess of 50% of Potentially Affected Areas
	b. Assess the Likelihood of High Adverse Effects on Identified Populations

An improvement strategy will be considered **affordable** if:

- There is a very reasonable chance that federal, state, local and/or private funding will be available to implement the strategy.
- It has an acceptable life-cycle cost with respect to congestion reduction benefit.

The results of the Tier I technical evaluation will be reviewed by the TAC. Based on these results, and with input from the public and *LITP 2000* subcommittees, the TAC will recommend which improvement strategies, if not all, should proceed to the "Tier II" technical evaluation, a more refined and detailed analysis of effectiveness and affordability. Table 2 lists the Tiers I and II performance measures associated with each of these effectiveness and affordability criteria. The Study's technical procedures, notably travel demand forecast modeling, will be used to evaluate each improvement strategy's performance against these measures and, thereby, determine which among the strategies would most effectively and affordably address the congestion/mobility problems. The Tier II evaluation will provide more refined quantitative estimates of each improvement strategy's transportation performance as well as its potential environmental impacts against the measures listed in Table 2. As part of the TAC's review of the Tier II evaluation results, the affordability of alternative strategies will be a more significant factor than in the previous steps of the evaluation process.

The TAC will then recommend the preferred improvement strategies, which are implementable, effective, and affordable, to manage congestion and improve mobility on Long Island. The recommendations will be subject to public review.