UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of LONG ISLAND LIGHTING COMPANY (Shoreham Nuclear Power Station, Unit 1)	Docket No. 50-322-OL-3 (Emergency Planning)

MOTION OF GOVERNOR MARIO CUOMO,
REPRESENTING THE STATE OF NEW YORK,
TO SUBMIT TESTIMONY ON
EMERGENCY PLANNING CONTENTION 65

At the invitation of this Board, Mario Cuomo, Governor of the State of New York, on January 17, 1984, entered his appearance in this proceeding representing the State. The Governor, both in a letter to the Board dated January 13, 1984, and in a statement by his Special Counsel on January 17, 1984, made clear that the State will participate in all aspects of the NRC's emergency planning proceeding, including conducting cross-examination and submission of testimony. As has been stated on the record, the State will file testimony on Group II issues and will advise the parties of its witnesses as they are identified.

Since early January, 1984, the State's representatives have been intensively reviewing the record on Group I issues which has been compiled thus far in this proceeding. Based on the review which has been completed to date, the State has determined that there is a need to submit testimony on Contention

65 -- Evacuation Time Estimates -- to discuss certain deficiencies in the traffic control plan proposed by LILCO and in the design, accuracy and application of the computer model on which LILCO's traffic control plan is based. The State's testimony, sponsored by Dr. David T. Hartgen, Mr. Richard D. Albertin, Mr. Robert Knighton, and Mr. Foster Beach, is attached to this Motion.

The Motion to admit the State's testimony on Contention 65 should be granted in the public interest. First, the Motion and the submitted testimony are timely. The State was invited by the Board to participate in this proceeding on January 4, 1984. The Governor responded promptly to the invitation, and the State representatives appeared on the first date of this resumed hearing. Further, the State has been diligent in reviewing the available Group I data and in submitting the attached Contention 65 testimony on January 24.*/

Second, the State's testimony on Contention 65 presents important data which are not contained in the record, and which should be considered by the Board in its review of the proposed LILCO Plan. Indeed, the State believes that Board consideration of this testimony is essential because it highlights significant facts which render the evacuation time estimates provided by LILCO unreliable.

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*/ Both LILCO and Suffolk County submitted supplemental testimony on Contention 65 on January 16 despite the fact that original testimony was filed on November 18 and cross examination of the witnesses involved was scheduled for the weeks of January 16 and 24.

Third, the admission of the State's testimony will not prejudice any party or delay the proceeding. Under the current schedule, the hearing on emergency planning issues will, in all likelihood, last well into March and perhaps April, 1984. The additional time required to consider the attached testimony will be insignificant compared to the overall scope of this proceeding. Further, the electricity proposed to be generated by Shoreham will not be needed for at least 10 years, and probably longer.**/

For the foregoing reasons, the State urges the Board to promptly grant this Motion.

Respectfully submitted,

Mario Cuomo, Governor of the State of New York

By: Fabian G. Palomino
Fabian G. Palomino
Special Counsel to the Governor

January 24, 1984

**/ See pages 33 and 35-37 (especially point 9 on page 37) of the Report of the New York State Fact Finding Panel on the Shoreham Nuclear Power Facility, dated December 1983, attached hereto.

REPORT OF
THE NEW YORK STATE
FACT FINDING PANEL
ON THE
SHOREHAM NUCLEAR POWER FACILITY

Honorable Mario M. Cuomo
Governor

Dr. John H. Marburger, III
Chairman

Stony Brook, New York December 1983

QUESTION 8 - IS SHOREHAM NEEDED TO MEET THE REASONABLY FORESEEABLE NEEDS OF ELECTRICITY CONSUMERS?

(This response is based upon the Staff Economics Report, Appendix 6(a). Although the Staff Report was discussed in regular meetings of the Panel, the specific form of this response was not.)

None of the projections done by LILCO, Suffolk County or the Commission staff indicate a near term need for Shoreham to meet demand.

LILCO projects that two 400 MW coal units would be necessary, one in 1994 and another in 1996, if Shoreham is abandoned, using their load forecast of approximately 1.6 percent per year growth in peak demand.

ESRG, a consultant to Suffolk County, projects that the first replacement coal unit, presuming Shoreham is abandoned, will not be needed until 1998 using a forecasted peak load growth rate of about 0.8 percent per year.

The staff analysis, which incorporated a forecast of peak load growth rate of approximately 1.25 percent per year with Shoreham operating and 1.1 percent per year with Shoreham not operating, also projects that the first replacement coal unit, if Shoreham is abandoned, will not be required until 1998. It should be noted that the staff projections assume operation of Nine Mile Point 2 and development of alternative energy sources, such as solar, wind, refuse, cogeneration, and landfill gas, as well as resonably expected penetrations of conservation, both price-induced and regulation-induced. It should also be noted that, without Shoreham, LILCO will be more heavily dependent on oil-fired capacity during the next 15 years.

IV. General Conclusions

The Panel worked hard to discover points of agreement and the following paragraphs are carefully worded to reflect that agreement These views are not necessarily specific responses to the questions, or even "facts" of the sort that a fact finding group might be expected to produce. They are important because they are coagulations of consensus in the thick stew of interpretive viewpoints set forth in our meetings and hearings. Not every member agrees with each point and the reader must consult Section V, the "Views of Panel Members" for clarifications of the positions of individual members.

1. The first point is that Suffolk County adopted its position after commissioning studies of reasonable quality. The county consultants are reputable in their fields, and their reports indicate deep and relevant technical knowledge of the issues with which they dealt. Many Panel members believe that the consultants tended to be conservative in their approach, but none feel that the reports are irresponsible or grossly misleading. At the same time, it is important to understand that the county position is a result of governmental, not purely scientific or technical, processes. That is, the county asserted its right to make decisions of government based upon whatever information its legislative and executive branches have available to them. This distinction between the County consultant's studies and the actual position taken by Suffolk County was stressed by the County and seems significant to the Panel as well.

2. The second point is that the Panel does not view nuclear power as inherently unsafe, although some believe that the current state of practice in the nuclear industry has not achieved a level of safety appropriate for public use. This view was shared by many who provided testimony. Although the Panel did hear concerns about the commerical use of nuclear power generally, most of the concerns were specific to the Shoreham plant: its location, quality of construction, and quality of management.

3. The Panel agrees that the Shoreham plant will probably prove to have been a mistake in the sense that everyone might have been better off if the plant had never been built. The Panel believes that the location would probably be regarded as unsuitable as a site for a nuclear power station and would not be acceptable as a licensable site under current siting practices. Estimates of demand for electricity, the price of oil, the cost of construction all turned out be be grossly inaccurate, leading to a pattern of rates and expenses that no one, including LILCO, wanted. Opinions as to how much blame LILCO must accept for creating such a situation vary on our Panel. It is certainly possible to blame the present state of affairs on the inevitable ignorance we all have of the future. But, as when in ancient societies a series of disasters led to execution of the monarch regardless of his apparent ability to prevent them, many now feel that LILCO must be held responsible for allowing the Shoreham disaster to happen.

4. This leads to the fourth view, that LILCO did not prepare itself adequately for its foray into the technology of nuclear power, and still lacks credibility as an operator of a nuclear power plant. The Panel views nuclear power as a high technology industry that demands a "zero defects" management attitude similar to that in the aerospace industry. What the Panel learned about LILCO training programs, quality assurance structure, and management experience with relevant nuclear reactor operation led many to question whether such an attitude is present. LILCO has tended to respond to criticisms by pointing to its success in satisfying regulatory agencies and seems to us to have relied too much on regulation for guidance rather than upon an independent conviction of what needed to be done. The historical role of the federal agencies has fostered the perception that they are responsible for providing guarantees of the technical quality of plant construction and operations when, by their own admission, they are unable to provide such guarantees.

5. The NRC practice of deferring consideration of off-site emergency response planning feasibility until after completion of construction does not make sense. Such considerations were in fact introduced in Shoreham construction licensing hearings but dismissed by the hearing officer as irrelevant at that time. It is clear that the existence of a completed nuclear power plant is a powerful incentive to find reasons to grant an operating license. It is too late for a change of construction licensing practice to affect the Shoreham case, but the philosophy of answering significant site-related questions before construction is too advanced may be applied to the current low power licensing situation. The governor's request of the NRC that a low power operating license not be issued before the off-site planning impasse is resolved is consistent with this philosophy.

6. The incentive to license is created by the significant investment in the plant. It is reinforced by the apparent financial advantage of operating the plant as compared with not operating it, as recognized by the economic analyses performed by Panel staff, LILCO and Suffolk County's consultants. We are impressed by how small that number may actually be relative to the nearly $4 billion that will be invested in the plant regardless of whether it operates. Event in these circumstances, it is no' obvious that failure to operate the plant would be tantamount to economic suicide for the State or the region.

7. While the economic analyses available to the Panel do indicate a financial advantage associated with the operation of Shoreham, none of these analyses take into account recently announced additional delays in the operation of Shoreham, primarily attributable to problems with the emergency diesel generators. The Panel recognizes that this delay may eliminate some or all of the economic benefit associated with operation of Shoreham. We did not have the time to analyze the economic consequences of the delay. The Commission recommends that the Governor make such an economic analysis an immediate priority.

8. Although the evaluation of off-site emergency preparedness plans is the responsibility of FEMA, the Panel does wish to express reservations about LILCO's ability to implement a plan that achieves an adequate state of preparedness without the assistance of county government. The State's responsibility for emergency preparedness requries that it pay close attention to the subsequent course of the licensing process to satisfy itself that preparedness is adequate according to its own standards should a license be awarded.

9. The projections for Long Island's future electrical energy needs on which the Shoreham construction schedule was originally based were obviously overestimates. The Panel is persuaded that ample LILCO generating capacity currently exists to satisfy probable demand for at least the next decade, and probably longer. Such estimates are of course subject to the same uncertainties that cause the original projections to be so wrong. But at this time, it is difficult to see how the demand for electricity could be so great as to require a Shoreham-sized plant within a decade or more.

10. Finally, if the plant should eventually receive a license to operate, the public would be well served by an objective inspection program by an independent technical firm acceptable to federal, State and local governments, as well as the utility. Public confidence in the quality of the plant is very low, and further inspections will either reveal problems that should be addressed prior to operation or confirm the assertions of previous inspections that found little cause for concern.

V. Views of Panel Members

The following views were prepared by individuals or groups of Panel members after the formal meetings and hearings were completed. None of the following statements is supported by every Panel member, but some are supported by more than one member, as indicated. In some cases, these statements contain phrases such as "the Panel believes" or "the Commission feels that" or "the Commission concludes that"... Such phrases should be interpreted as signifying the views only of those whose names are associated with that statement. The Panel did not operate in such a way as to generate a perceptible common viewpoint on any specific issue, except possible for the carefully worded "General Views" statements in the preceding section.

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NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of LONG ISLAND LIGHTING COMPANY (Shoreham Nuclear Power Station, Unit 1)	Docket No. 50-322-OL-3 (Emergency Planning)

DIRECT TESTIMONY OF
DR. DAVID T. HARTGEN
RICHARD D. ALBERTIN
ROBERT G. KNIGHTON AND
FOSTER BEACH

ON BEHALF OF NEW YORK STATE REGARDING

EMERGENCY PLANNING CONTENTION 65
EVACUATION TIME ESTIMATES

Q. Please state your names, occupations, and professional backgrounds.

A. My name is David T. Hartgen. I am a Principal Transportation Analyst with the New York State Department of Transportation. I currently head this Department's Statistics and Analysis Section, Planning Division.

My name is Richard D. Albertin. I am an Associate Transportation Analyst with the New York State Department of Transportation in Albany, New York. I currently direct New York's Administration of the federal Section 18, rural public transportation program.

My name is Robert Knighton. I am a Transit Specialist III with the New York State Department of Transportation. I currently head the Specialized and Capital Policy Section in the Transit Program and Evaluation Bureau.

My name is Foster Beach. I am the Regional Planning and Development Supervisor for Region 10 (Nassau and Suffolk County) of The New York State Department of Transportation.

A statement of our qualifications and experience is Attachment A hereto.

Q. Please provide us a brief background of your relevant work experience that would pertain to the testimony supplied here.

A. Hartgen

For approximately 15 years, I have been responsible in several positions at the Department which required me to develop, use, and analyze traffic models and forecasts. My experience includes the collection and use of highway travel statistics and road characteristics for the State. I have written and published a number of papers on various aspects of travel, in urban and rural settings.

Albertin

For approximately five years, I was directly responsible for the Department's computer modelling. These duties included the operation and analysis of New York's transportation analysis

modelling efforts, as well as the review of current technology and research being done.

I was also a major participant in the development of the original "Olympic Transportation Control Plan." This plan was the basis of the proposed operational strategy for the Olympic area. While originally my role was to monitor the Lake Placid Olympic Organizing Committee's responsibilities for the implementation of this plan, my assignment was changed to responsibility for the implementation of the State's takeover in many transportation related areas because of the emergency situation that existed. With the State takeover, the crisis was resolved in a short time.

I have also reviewed, at the request of New York's Disaster Preparedness Commission, the evacuation plans for New York State nuclear plants. This would include Ginna, Nine Mile and the four Indian Point county plans.

Knighton

For approximately five years I was involved with department activities in development, conduct and analysis of surveys and participated in development and use of models.

I participated in early stages of development of the Olympic Transportation Control Plan. During the Olympics, I shared responsibility with Mr. Albertin for monitoring implementation of the Olympic Transportation Control Plan by the Olympic organizing

committee and later for implementing the State takeover of the Olympic transit system.

I am a member of the State compensating team for Rockland County in case of an emergency at the Indian Point Nuclear Power Station and participated in preparation for implementation of the transit portion of the evacuation plan.

Beach

For more than ten years I have been directly involved in the planning, development and design of highway improvement programs and projects. Since 1981, I have served as the Regional Planning & Development supervisor for the region which includes Suffolk County. In this position, I am responsible for planning highway capital improvement projects in Suffolk County which are supported in part by State funds.

Purposes and Conclusions

Q. What is the purpose of this testimony?

A. The purpose of this testimony is to address Emergency Planning Contention 65 and to discuss concerns regarding the evacuation time estimates set forth in Appendix A to the LILCO Transition Plan. Our comments are directed toward four areas which, among others, have not been appropriately addressed in the Plan and result in LILCO's evacuation time estimates being unreliable. The four areas are (1) highway capacity and surge considerations;

(2) calibration and trip assignment procedures used for the LILCO traffic model; (3) behavior under stressful conditions gained from first-hand experiences during our involvement in a transportation emergency; and (4) the effect of summertime construction on evacuation time estimates.

Q. What conclusions may be drawn from your testimony?

A. Regarding highway capacity considerations: there is no evidence in the Plan that the LILCO analysis to date has used readily available data to test the accuracy of the highway capacities used in the LILCO analysis. There has been no clear description of how the geometric inputs to calculation of highway and intersection capacity were obtained and verified and hence, it is not possible to confirm the accuracy of the capacity calculations assumed in the LILCO Plan. LILCO also fails to consider the impact upon capacities and evacuation time estimates of a surge in the early portion of an evacuation.

Regarding calibration and trip assignment procedures used for the traffic model, we feel that the KLD traffic model has not been appropriately calibrated. That is, in our opinion, the factors and form that were used in the model do not appear to have been developed and/or obtained from existing Suffolk County highway conditions, or from highway and intersection capacities obtained during an emergency for an area with similar characteristics. To our knowledge, no comparison has been made with data

on capacities available from the State of New York for major highways within and close to the EPZ.

Further, there has not been adequate justification and sensitivity analysis for the assumption in the model that evacuees' behavior under stress conditions will in fact be as asserted by KLD. For instance, there is no evidence that evacuees will indeed pursue routes or corridors designated by the control plan rather than pursuing other routes and destinations they perceive as most beneficial. There is no evidence that the effects of these behaviors have been adequately tested with the model. Without adequate justification or a sensitivity analysis, the KLD assumption on the routing of evacuees as proposed cannot be assessed, nor can the evacuation time estimates be critically evaluated in this crucial area. The LILCO evacuation plan assumes no loss of capacity or increase in evacuation time estimates due to aggressive behavior, an assumption which, in our opinion, ignores experience to the contrary.

Regarding the likelihood of aggressive behavior, two members of our panel were directly involved in and supervised transportation activities, including providing directions to the general public, during an emergency. Their experiences confirm testimony by Suffolk County experts that individuals assigned transportation "control" duties are subjected to frequent verbal abuse and occasional physical assault. When established government authorities took over these same duties, these incidents dramatically decreased. While the effect this behavior would

have on evacuation times is difficult to quantify, it is clear that based on those experiences, it must be considered. It has not been considered by KLD.

Regarding the impact of construction programs, it is our belief and experience that busy construction schedules, particularly in the summer months, substantially reduce the effective capacity of sections of highway on which such construction occurs. It is our opinion that the effects of such construction can substantially reduce the effectiveness of the particular evacuation routes which often consist of highways on which these construction sites are located. KLD has not conducted an adequate assessment of these impacts.

Discussion

1. Capacities

Q. How are capacities calculated?

A. Capacities are usually determined using formulas found in the Highway Capacity Manual (Transportation Research Board, 1965) or other generally recognized professional texts. The analyst generally begins by assuming an ideal capacity (maximum service volume) and then reducing it by a factor for each relevant geometric parameter for the given highway section or intersection. That is, each geographic parameter must meet a certain level of "acceptability," or else the overall capacity is reduced

according to established factors. Among the basic factors used to determine the capacity of a highway are the following:

1. Number of lanes.
2. Type of area (urban or rural).
3. Whether the highway is divided or undivided at the median.
4. Whether the highway has control of access or is uncontrolled.
5. Type of area through which the highway goes (rural, village, suburb, city, etc.).
6. Type of culture (residential, resort, industry, etc.) adjacent to the highway.
7. Shoulder width.
8. Lane width.
9. Percent of trucks in the traffic stream.
10. Type of terrain (flat, rolling, hilly, mountanious).

Attachment B to this testimony consists of 1980 memoranda describing the procedure used by NYSDOT to calculate the Level of Service D capacities for various types of highways. A review of Attachment B shows that all of these factors influence capacity, and that the application of appropriate factors to a particular section of highway could reduce its maximum capacity by as much as 50 percent.

Therefore, it is very important to verify all the inputs used to determine capacity. If, for example, a 12 foot travel

lane is assumed but it is actually only 9 feet, the capacity would be factored down.

Q. Why is it important to develop accurate highway capacities for use in models?

A. Traffic analysis models rely on capacity as the chief criterion for how much traffic can pass a point in a given time. If the capacity is inaccurate (i.e., does not actually reflect how many vehicles can pass through a highway or intersection in a given time period), the model will produce results that do not reflect what would actually happen. This is especially detrimental to analysis of the result if the capacities used in a traffic model are too high, since that condition would result in assuming that more cars can actually travel through the section or intersection before queues begin or before people change their travel patterns. It would result in inaccurate and understated travel time estimates.

Q. In your opinion, has the accuracy of these important highway geometric parameters which affect capacity been validated by LILCO?

A. No. It appears that maps were often used, supported with a limited number of "hand-sketches" from a field survey of intersections. It is our experience that often available maps are out-dated or inaccurate. Further, it cannot be determined

from the Plan if the field-sketches were accurate or reliable. However, it is our understanding that these sketches are for intersections, not links.

Further, there are a number of items used in the calculation of capacity which have not been verified, to our knowledge. These include traffic-related items such as the percentage of trucks and buses in traffic streams. Under the LILCO Plan, there will be a larger than normal number of buses on the roadways during an evacuation.

Q. Once an adequate number of field measurements at highway sections and intersections have been made to confirm the overall reliability of the data, are there any other techniques frequently used to determine the accuracy of the capacities?

A. Yes. One method often used is to compare estimated capacities with peak-flow traffic. The Department of Transportation conducts ongoing traffic counts on state roads throughout the State. These traffic counts are often available by time of day, on an hourly basis, and during different seasons. If the peak hour traffic (i.e., the highest hour of measured traffic) were compared against calculated capacity, it would provide some measure of the accuracy of the capacity.

The State also has available seasonal variations in travel patterns along some highways in or near the evacuation area. These variations can provide an analyst a good basis

for estimating seasonal peak hour volume on selected routes.

Q. To your knowledge, were any traffic data available from the State used in developing the KLD model?

A. Not to our knowledge.

Q. Do you have an opinion with respect to the assumption underlying KLD's time estimates that all evacuation trips are generated over a period of two hours and twenty minutes?

A. Yes. KLD has not considered the effect on evacuation times of a surge of evacuation traffic onto the roadway network very early in the evacuation. Such a surge would quickly cause congestion, thus lowering capacity significantly. Indeed, the level of congestion could fall below the Level of Service D assumed by KLD in Appendix A to be the prevailing level of service on the EPZ evacuation network. (See Appendix A at III-13). That decrease in level of service will translate into increased evacuation times.

2. Calibration and Accuracy

Q. What is calibration in traffic modelling?

A. Generally calibration is any procedure used to confirm the accuracy of the model or any parameter used within it, when compared to available data that has been independently collected

or actually observed. A model is "adjusted" in an iterative fashion until the results obtained match (or as nearly so as possible) actual observations. This is usually done when a model is first developed (a "baseline" calibration), and may be re-done when the conditions to be tested vary significantly from how the model is generally being used.

Q. Why is calibration important?

A. Models are used to estimate traffic that cannot yet be determined from observations, such as projected traffic patterns after a new highway is built. To be sure the estimates are reasonable, the analyst often compares actual observations for a present (baseline) situation with the estimates produced by the model. The model is then "tuned" to produce results similar to the baseline.

As an example, the calibration method often used by NYSDOT is to compare baseline observed traffic counts with model results. These comparisons are often described in terms of the percentage deviation as a function of traffic volume. The goal is to make these deviations as small as feasible.

Q. How accurate should a calibration be?

A. Overall areawide statistics such as total network vehicle miles, should be within ± 0.2 to 1.0% of baseline numbers. Major freeways, with heavy volumes (100,000 ADT) should have calibrated

volumes within ± 15% of observed traffic, minor streets (30-50,000 ADT) would have calibrated volumes within ± 30-55%. Attachment C shows the relationship.

These baseline differences between calibrated and observed traffic, would of course be carried forward in any use of the model, unless a specific base-year adjustment is made. That does not appear to have been done in the LILCO model.

Q. Has the LILCO "DYNEV" model been calibrated?

A. As we said, all models are calibrated periodically, and we believe that the overall DYNEV model has been calibrated in Canada, and in Washington, D.C. These are calibrations for urban traffic, not emergency situations. To our knowledge, the model has not been calibrated for normal Suffolk County traffic or for evacuation applications, nor for the traffic control proposals suggested for certain intersections. While we recognize that some of this work, such as headway measurement, has been done, capacity calculations were not validated for evacuation scenarios. It does not appear that the ability to accurately calculate highway section capacities has been calibrated (or validated), nor have the portions of the model most sensitive to the non-standard situations proposed in some of the various control points. For example, the LILCO Plan calls for temporary "improvements" to the system to eliminate or reduce bottlenecks. We feel that these traffic proposals could possibly create confusion and

reduce capacity rather than improve it. We could not determine if the model validated these assumed increased capacities at "improved" locations or even if these increased capacities can be verified from studies elsewhere.

Q. How much network detail is needed to accurately calibrate an urban equilibrium traffic model, that is to ensure that it accurately reflects the baseline situation.

A. The amount of detail is dependent on the size of the area of focus, the density of the street network, and the purpose of the planned tests. Urban traffic models for general-purpose analyses typically use networks consisting of 1000-3000 nodes, 300-600 zones, and 5000-10,000 links. Even finer detail may be added to handle special problems involving turning movements at intersections. Networks of this size often still do not include all residential streets or collectors. Modelled traffic would not use these streets if they are not included in the network. For coarse sketch-planning purposes, networks of 100-300 links and 50-100 zones are often used, but the detail achievable is much less. The LILCO network would appear to be inherently not detailed enough to answer questions about multiple paths of evacuees. In other words, the scale and detail of the model (quite detailed) may be inconsistent with the scale and detail of the network (quite coarse).

Q. What, in your opinion, does this information mean for evacuation times?

A. First, the fact that KLD's model was not calibrated for Shoreham-specific or evacuation-specific data casts doubt on the reliability and validity of KLD's results. Second, the coarse network modelled by KLD casts further doubt on the validity and reliability of KLD's results. Third, even if we were to accept the assumptions and data in the model, and were to assume that the DYNEV model is calibrated as accurately as possible, we would expect predicted volumes in an emergency situation to vary from reality by substantial amounts. For example, on many links even a 15% increase in volume would move the road from level of service D (which is assumed by KLD), to level of service E, which is congested operation.

3. Aggressive Behavior

Q. Have any of you personally experienced or witnessed aggressive behavior by motorists in response to travel instructions? If so, what was the situation and what were your observations?

A. Yes, Mr. Albertin and Mr. Knighton have. During the 1980 Winter Olympics, the Department of Transportation, reacting to a limited state of emergency declared by the Governor (i.e., public safety was jeopardized), assumed several major portions of the Lake Placid Olympic Organizing Committee's transportation-related responsibilities.

At peripheral parking lots and other bus loading locations, DOT personnel began queuing spectators into various bus lines,

routing traffic within large lots and generally performed whatever functions appeared to be needed to improve the overall transit operation. These DOT personnel were identifiable by orange vests.

Although the reaction to the DOT people was good by most of the public considering the stressful, anxious conditions, DOT staff were blamed by some members of the public for the transportation problems and there were repeated instances where they were harassed, verbally abused and in at least two instances, physically assaulted.

In each case the DOT person was interrupted from performing his duties for differing lengths of time and less cooperative members of the public used this opportunity to form new lines at unintended locations, swarm buses, push and jump ahead.

In our opinion, similar behavior toward LILCO's traffic guides is likely during the stressful conditions of an emergency at Shoreham. There is no evidence that the effects of such behavior have been taken into account in the LILCO evacuation time estimates.

4. Construction

Q. Are you familiar with the State's highway construction program in Suffolk County?

A. Yes, in general and particularly with respect to projects on state highways and projects which are state funded.

Q. Can you give us an idea of the magnitude of this program?

A. Yes. During the 1984 construction season, generally April 1 through December 1 in Suffolk County, there will be four construction projects on main state roads within the Shoreham Emergency Planning Zone and five outside the EPZ, but which might be expected to impact evacuation.

During the 1983 construction season, there were five projects in the EPZ and seven outside the EPZ which could effect evacuation.

The Transportation Improvement Program for Suffolk County includes over nineteen million dollars for ten projects within the EPZ and another forty-three million dollars for ten projects outside the EPZ, but assumed to effect evacuation. Each of these projects is expected to be constructed in the next five years. Several more projects will be added as a result of the recent Infrastructure bond act. These projects are listed on Attachment D. The state reconditioning and preservation (R & P) program is only programmed for the next two years and additional R & P projects will be added for the later three years.

Q. Do you believe construction projects would effect evacuation times?

A. Yes. Construction projects occur mostly in summer when traffic volumes are highest. Often they remove one or more lanes from service reducing capacity and may disrupt planned use of shoulders as travel lanes, turning bays or for the storage of disabled vehicles. As an example, this coming summer, we will be doing bridge deck repairs on the Route 495 Long Island Expressway bridges over Sills Road and the Long Island Railroad tracks. These projects will involve closing one lane for each of three months. This lane could not be quickly reopened in case of an evacuation and would result in a loss of approximately one third of the capacity of the highway during this period.

Q. In your experience, do such repairs cause traffic delays under normal circumstances?

A. A plan for maintenance and control of traffic is a requirement for all of our projects and is described in detail in each construction contract. Despite these efforts, construction projects do cause travel delays at times even during normal circumstances. The effects of such projects on evacuation times could be substantial, but were not taken into account by KLD.

Q. Do you feel it would be possible and prudent to do computer testing of the impact of construction on evacuation times?

A. Yes. While we cannot know where construction will be going on or how extensive it will be if an accident were to occur at Shoreham, since we do not know when an accident at Shoreham

would happen, sensitivity tests should be run. For instance, one could look at projects under construction at a given point in time and adjust the capacity of the hignway for loss of lanes or shoulders during construction. The model could then determine the impact of this particular set of construction projects on evacuation times. Obviously many of the particular projects we have discussed would not be likely to be going on at the time of a future accident since many have already been completed. Nevertheless, the approach of running sensitivity tests would give a reasonable idea of the magnitude of the effect of construction, and would make the resulting evacuation time estimate more accurate.

We do know at any point in time the construction projects which are programmed to come on line, for which we will enter into contract, and which will be constructed in the coming months. In addition to the sensitivity tests mentioned earlier based on historical projects, in our opinion it would be prudent for LILCO to test the impact of scheduled construction on evacuation time estimates on a regular and ongoing basis, and to adjust its evacuation routes accordingly.

ATTACHMENT A

To Testimony of

New York State Department of Transportation

Relative to Contention 65

Personal Resume

of

DAVID T. HARTGEN

November 1983

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PERSONAL: Born: September 30, 1944, Baltimore, Maryland

EDUCATION: Duke University, B.S. in Civil Engineering, 1966
Northwestern University, M.S. in Transportation Planning, 1967
Northwestern University, Ph.D. in Transportation Planning, 1973

GOAL: Direction and administration of program, planning, policy analysis, research and development in transportation at state or federal level.

EXPERIENCE IN TRANSPORTATION:

Feb. 1981 - Present — Director, Transportation Statistics and Analysis
New York State Department of Transportation

Administer and direct a staff of 76 persons responsible for the Department's activities related to transportation statistics design, collection, summarization and interpretation; analysis of trends, issues, information in transportation. Major areas of responsibility include: (1) energy and research, including energy data collection and forecasts, energy analysis, planning methods development, and library services; (2) analysis of urban area travel patterns using UTPS - type procedures, alternatives analysis, quick response estimation methods, and supporting computer services; (3) travel and environmental data collection, including design and conduct of surveys, traffic speeds and truck data, traffic count program, and air pollution monitoring; (4) transportation systems data including highway inventory and performance, highway condition assessment, and photologging.

Major Projects and Studies include:

(1) Highway Condition - I developed and implemented a new method of rapidly assessing highway condition in the field, based on photograph scales. Beginning in 1981 the method has been used for annual highway condition evaluation of the NYS highway system. Results of the study formed the basis of the Department's Legislative requests and policy statements on highway deterioration. The data is also being used to develop deterioration rates and to project long-term condition and funding needs under alternative rehabilitation strategies. The work includes strategy analysis for pavement rehabilitation strategies, as part of the

(2) Traffic Counts - I revised and streamlined the Department's procedures for collecting traffic counts. By switching to a needs basis, (based on historic growth rates) and scheduling counts to maximize accuracy, I was able to cut the program by 35%, saving over $350,000 annually. I also instituted the conversion of present mechanical continuous counters to a telemetry system, greatly increasing ease of data collection and reducing costs. I instituted a study to determine the factors influencing the percentage of trucks on state highways.

(3) Energy Assessment Procedures - Developed, under contract to UMTA and FHWA, procedures to assess the energy impacts of transportation actions. These included data bases, evaluation methods for TSM and transit projects, energy costs of construction. Prepared manuals and workbooks for use by local and state analyst. The studies also included an energy assessment analysis for the Rochester, N.Y. Metropolitan area Transportation Improvement Program, for FHWA.

(4) Urban Area Analysis - Under my direction, revised urban area analysis procedures were developed and implemented, using small-scale micro-computer methods. Refined and updated user costing routines were implemented. A review of major structural changes in city layout and family lifecycles, based on the 1980 Census, was begun.

(5) Community Based Ridesharing- I was the Principal Investigator on an FHWA sponsored study to determine the effectiveness of ridesharing in community-based settings. The study featured a experimental design, panel survey of consumer trend patterns, extensive marketing and promotion activities, and cost-effectiveness comparisons with employer-based services.

Nov. 1971 - Head, Planning Research Unit,
Feb. 1981 New York State Department of Transportation

Directed analytic, developmental, and planning studies for the Department. Major activities included development and use of transportation planning methods and procedures; travel forecasting and analysis; evaluation of economic, social and environmental impacts of transportation proposals; studies of travel behavior and consumer response; direction of major study efforts. Extensive administrative responsibilities including budgets and work programs, Dept. Library, staff direction and supervision. Major recent studies;

(1) Transportation and Energy

Extensive ongoing analysis of energy consumption in New York's transportation sector. Elements include data base development and use, conservation planning, contingency planning, and long-range planning. Development of energy forecasts for New York State, price forecasts, and fleet turnover; transit and carpooling, equity, public views on energy use and savings patterns, input to State Energy Office; evaluation of transportation alternatives; project-level procedures.

(2) Transit Operating Assistance

Directed planning and analysis efforts of New York's initial transit operating assistance program. Elements included public hearings, and public opinion polls on transit services; transit ten-year operator statistics; models and forecasts of ridership, cost, revenue, and deficits; impacts of fare and service policies; standards, incentive programs, energy impacts; recommendations for funding and operating policies; report to Governor and Legislature.

Recent studies include transit data file system development, review of accuracy of original forecasts; studies of productivity and efficiency.

(3) Transit Analysis

Continuing studies of transit ridership, demand, cost, equity, fares and services. Major items have included: factors affecting transit use, analysis of public attitudes toward transit and how to improve it; park-and-ride transit demand, including development, implementation, and testing of disaggregate small-sample models for forecasting park-and-ride demand, transit on-board and revenue surveys for evaluation of intercity and local systems; equity in transit fares, analysis of transit fares in New York State from an equity viewpoint; dial-a-bus, development of procedures for forecasting dial-a-bus ridership in small urban areas or suburbs; transit planning techniques including guidelines for transit information systems; run-cutting evaluations; criteria for implementation of park-and-ride potential; evaluation of transit operating subsidies; design and conduct of on-board surveys in Kingston, Syracuse, Binghamton, Albany, other small cities.

Recent studies include development of planning procedures for rural transit systems; analysis of distance-based transit fare proposals for Elmira to Albany.

(4) Mobility-Limited

Periodic analyses of the travel needs of the mobility-limited particularly the elderly and handicapped, and services provided or proposed for them. These include: development of methods to forecast elderly and handicapped travel demand and mode choice; analysis of barrier removal impacts; studies of the transportation services provided to special groups in New York State; transit service consolidation. Current work focuses on the requirements of Section 504, urban area transition plans, and cost-effectiveness of barrier-removal solutions.

(5) Air Quality

Development and implementation of a system for quantifying and forecasting air pollution caused by transportation sources; estimates of impacts of the Clean Air Act Amendment alternatives in air quality in upstate New York cities.

(6) Other Studies

Periodic studies on a variety of other subjects, including: inter-city travel demand - preparation and development of inter-city data sets for New York and selected external cities; evaluation of travel demand models; development and calibration of inter-city models; intercity travel forecasts; small urban areas - transportation planning methods, including investigation of transportation planning needs; applicability of existing data sources and forecasting methodology; specification and development of new or revised planning techniques for small cities; citizen participation methods - review and evaluation of citizen participation methods; specification of procedures for implementing these methods within on-going long-range system and corridor planning processes; 1980 Winter Olympics - preliminary analysis of travel demand, development of bus circulation systems; goods movement and regulation - development of data base and models for analyzing regulatory and pricing reform; evaluation of air deregulation impacts; ridesharing - review of behavioral studies on carpooling and ridesharing with emphasis on proposed changes in Federal strategies to encourage its use; demonstrations of the effectiveness of employer-based coordinators in increasing ride-sharing; manuals and guidelines for ridesharing implementation by companies.

(7) Technical Procedures

Continuing development and improvement of various technical procedures for analyzing traffic, including: trip generation - development and supervision of implementation of revised methodology for Buffalo, Rochester, and other places; multi-variate techniques - implementation of disaggregate and multi-variate statistical programs on NYSDOT's computers; small-sample procedures - application and implementation of disaggregate mode choice and destination choice models within New York's on-line technical planning process; aggregation procedures development; observation weighting; subarea - "windowing" techniques for traffic assignment; survey designs - study designs, questionnaire development for small-sample home-interview and cordon surveys, including full designs for major update surveys in Buffalo and Rochester, and numerous small towns;

(8) Travel Behavior

Continuing studies on the basic causes and parameters of travel, including attitude and opinion measurement, social factors; choice and constraints.

June 1971 - Nov. 1971 — Senior Transportation Analyst, Planning Research Unit, New York State Department of Transportation

Member of team of professionals conducting applied and basic research in transportation planning theory and methods. Major projects included: development and use of disaggregate mode choice models, using attitudinal data; research proposal submissions to NCHRP; assistance on travel demand modeling, updating and refinement of on-line travel models.

Sept. 1970 - May 1971 — Northwestern University - I attended Northwestern on leave with full pay from NYSDOT, for doctoral study.

Dec. 1968 - Aug. 1970 — Senior Transportation Analyst, Planning Research Unit New York State Department of Transportation

Conducted independent study of the nature of family decision processes and role of traveler attitudes in mode choice decisions. Developed an operational mode choice model incorporating travel attitudinal data and socio-economic variables.

Further research into mode choice forecasting in small urban areas, and in optimal design of transit systems using linear programming methods. Assisted in the evaluation of NYSDOT's UTPS package; analysis of forecasting reliability of NYSDOT's modal split procedures.

July 1967 - Nov. 1968 — Transportation Analyst, Planning and Research Bureau, New York State Department of Transportation, Albany, NY

Preparation and analysis of urban transit and highway networks for four upstate New York cities; development, calibration and analysis of travel simulation models (land use and trip generation, trip distribution, mode split, assignment); research on optimality of transit systems.

SELECTED PUBLICATIONS AND REPORTS (partial chronological list)

*1970 "Individual Attitudes and Family Activities: A Behavioral Model of Traveler Mode Choice," High Speed Ground Transportation Journal, Volume IV:3, p. 439-467 (with George H. Tanner).

*1971 "Investigation of the Effect of Traveler Attitudes in a Model of Mode Choice Behavior," Record No. 369, Washington: Transportation Research Board (with George H. Tanner).

*1972 "A Note on the Ability of Socioeconomic Variables to Explain Attitudinal Bias Toward Alternative Travel Modes," High Speed Ground Transportation Journal, Volume IV:2.

1973 "The Influence of Attitudinal and Situational Variables on Urban Mode Choice," Preliminary Research Report No. 41, New York State Department of Transportation, Planning Division (Ph.D. Dissertation).

* published paper

*1974 "A Dynamic Model of Mode-Switching Behavior," Transportation 3 (1974) 45-58.

*1974 "Attitudinal and Situational Variables Influencing Urban Mode Choice: Some Empirical Findings," Transportation, 3 (1974) 377-392.

1975 "Public Transportation Operating Assistance: Evaluation and Options-Summary Report," New York State Department of Transportation, February 1975 (submitted to the New York State Legislature (with C. Keck, et al).

*1975 "Issues for Implementing Disaggregate Travel Demand Models", In Stopher, P.R. and Meyburg, A.N. Behavioral Travel Demand Models, Lexington Press, 1976.

*1975 "Application of Disaggregate Mode Choice Models to Travel Demand for Urban Transit Systems," Record No. 534, Transportation Research Board, p. 52-62 (with P. S. Liou and G. S. Cohen).

*1975 "Transit Deficits: A Projection for New York State, "Transportation Research Record No. 589, TRB (with S. M. Howe).

1975 "1973 Buffalo Travel Survey: Design, Conduct, Processing," (Editor), Preliminary Research Report No. 82, New York State Department of Transportation, Planning Division.

*1975 "Energy Analysis for Urban Transportation Systems: A Preliminary Assessment," Transportation Research Record No. 599, TRB 1976.

*1976 "Revenue, Ridership and Equity Implications of Differential Time-of-Day Fare Policies," Transportation Research Record No. 625, Transportation Research Board, (with David L. Weiss).

*1976 "Forecasting Dial-A-Bus Ridership in Small Urban Areas," Transportation Research Record No. 563, Washington: TRB, p. 53-62.

*1976 "Forecasting Non-Work Public Transit Demand by the Elderly and Handicapped," Transportation Research Record No. 629, Washington TRB, (with M. Pasko and S. M. Howe).

1976 "Intercity Travel Demand Models: State-of-the-Art," Office of University Research, USDOT (with G. S. Cohen).

*1977 "Incorporating Barrier Effects in Elderly and Handicapped Transit Demand Forecasts," Transportation Research Record No. 660. TRB, 1977

*1977 "Who Favors Work-Schedule Changes, and Why," Transportation Research Record No. 677, (with A. A. Tannir), TRB, 1977

*1977 "Impacts of Work Schedule Changes on Traffic Volumes and Flow," Transportation Research Record No. 677, (with A. A. Tannir), TRB, 1977

1977 "Carpooling Behavior: A Survey of Recent Findings," Paper presented at FHWA's FCP Meeting, Columbus, Ohio, November 8.

1977 "Automotive Energy Forecasts: Impact of Carpooling, Trip Chaining, and Auto Ownership," Preliminary Research Report No. 134, New York State Department of Transportation, December (with N. S. Erlbaum and

*1978 "New York's Dependence on Foreign Oil," (with R. Margiotta and L. Reilly), Transportation Research Record No. 726, TRB, 1979.

*1978 "Transit's Role," Editorial for Transportation, 6:3.

*1978 "Transportation Energy: An Overview with Emphasis on New York State," Transportation Research Record, No. 710, 1979.

*1978 "Behavioral Science Applications to Issues in Transportation Planning." in Richard M. Michaels, Transportation Planning and Decision Making: Behavioral Science Contributions, Praeger Press1980.

*1978 "New York's Response to the Mandates of the Clean Air Act", Transportation Research Record No. 714, (with R. Zabinski and G. S. Cohen).

1979 "Guidelines for Developing Transportation Energy Contingency Plans," Preliminary Research Report No. 157, New York State Department of Transportation, May 1979.

*1979 "Behavioral Models in Transportation: Perspectives, Problems Prospects," in David Bannister and Peter Hall, Transport and Public Policy Planning, Munsell Press (1981,)

*1979 "Family Reactions to Energy Constraints," (with Susan P. Phifer and Alfred J. Neveu) Record No. 765, Transportation Research Board.

1979 "Energy Considerations in Transportation Planning: The New York State Approach," in Proceedings of the Conference on Energy Considerations in the Urban Transportation Planning Process, Washington, D.C, October 17-19, 1979.

1979 "Changes in Travel During the 1979 Energy Crisis", (with others), Preliminary Research Report No. 170, NYSDOT, (November).

*1980 "Transportation Energy Contingencies: A Status Report on Public Response and Government Roles," Journal of Advanced Transportation, Spring, 1980.

*1980 "The 1979 Energy Crisis - Who Conserved How Much" (with A. J. Neveu), paper presented at the National Energy Users Conference; San Antonio, April 1980 (published in Transportation Research Board Special Report 191).

*1980 "Urban Passenger Strategies for Transportation Energy Contingencies", Transportation Research Board Special Report No. 191, TRB, 1980.

*1980 "What Will Happen to Travel in the Next 20 Years," Record No. 807, Transportation Research Board, 1981

*1980 "Issues for Developing State Transportation Energy Emergency Plans," (with R. Bixby and M. Kocis), Transportation Research Record No. 801, TRB, 1981.

*1981 "Transportation and the Behavioral Sciences," in Irwin Altman, Jack Wohlwill and Peter Everett, Transportation and Behavior, Plenum Press, 1981.

*1981 "Transportation Energy Assessment for Local Governments" (with J. M. Gross

*1981 "Can Employer-Based Carpool Coordinators Increase Ridesharing?" (with J. M. Brunso), Transportation Research Record, No. 823, TRB, 1981.

1981 "Energy Conservation in Transportation Systems Performance", International Symposium on Surface Transportation System Performance, U. S. Department of Transportation, May 11-13, 1981.

1981 "Analysis and Prediction of Highway Condition", Transportation Analysis Report No. 2, September, 1981, NYSDOT

*1981 "Visual Scales of Pavement Condition: Development, Validation, and Use", paper presented at TRB (with J. Shufon & F. Parella), 1982 (in press).

1981 "The Pavement Condition of N.Y.'s Highways: 1981" Transportation Analysis Report No. 4, 1981, December, 1981, NYSDOT

*1981 "Ridesharing Behavior and Marketing", summary of workshop, Transportation Research Board Special Report 193, 1981.

*1982 "Neighborhood Ridesharing Demonstration Study: Final Report" (with J. M. Brunso) U. S. Department of Transportation, March, 1982 (in press).

1982 "Statistical Controls for Ridesharing Demonstrations", paper presented at the Transportation Research Board, January, 1983, (with J. M. Brunso).

1982 "Community Based Ridesharing: An Overlooked Option", paper presented at the Transportation Research Board, January, 1983, (with J. M. Brunso).

*1982 "New York's Perspective on Transportation Energy Contingency Planning" Paper presented at the Conference on Transportation Contingency Planning Purdue University April 29-30, 1982 (in press, Energy).

1982 "Transportation Energy Contingency Planning" Editorial for Transportation, August.

1982 "Long-Term Prediction of Highway Condition", paper presented at the Transportation Research Board, January, 1983.

1982 "Streamlining the Collection and Processing of Traffic Count Statistics" paper presented at the Transportation Research Board, January, 1983. (with J. Lemmerman).

1982 "Equity Impacts of Gasoline Shortages and Price Rises," paper presented at the Transportation Research Board, January, 1983, (with J. M. Brunso and S. Kupferman).

1982 "Windshield Surveys of Pavement Condition: A Viable Element of Pavement Management," paper presented at the Transportation Research Board, January, 1983, (with J. J. Shufon).

1982 "Where Panels Work: Some Examples from Transportation Planning." paper to be presented at the World Conference on Transportation Research, Hamburg, Germany, April, 1983.

1982 "The Pavement Condition of NY's Highways: 1982," draft paper, December, 1982.

1983 "Initial and Subsequent Consumer Response to Gasoline Shortages," (with J. M. Brunso and A. J. Neveu), paper presented at the Conference on Energy Contingency Planning in Urban Areas, Houston, Texas, April 7-9, 1983.

*1983 "Research Pays Off: NYSDOT Improves its Highway Condition Rating Procedures," article for Transportation News, April, 1983.

*1983 "Research And Risks: How to Beat the Odds," article submitted to Transportation News, April, 1983.

*1983 Conference on Travel Analysis Methods for the 1980's (Editor and Chairman) TRB, 1983 (in press).

1983 "An Update on Trip Generation Rates" (With J.M. Brunso) paper to be presented at TRB, 1984.

1983 "Status of Highway Condition Scoring in New York", paper to be presented at TRB, August

1983 "Applications of the Highway Condition Projection Model to I-4R Analysis", paper to be presented at TRB, 1984.

1983 "Perception of the Infrastructure" (with A.J. Neveu) paper to be presented at TRB, 1984.

1983 "Characteristics of Double-Bottom Trucks in New York State", paper to be presented at TRB, 1984.

1983 "The Pavement Condition of New York's Highways: 1983", draft report, October 1983.

Experience in Teaching

1971 - Present — Lectures on urban transportation planning for NYSDOT professionals.

1971 - Present — Guest Lecturer at Northwestern University, Rensselaer Polytechnic Institute, Syracuse University, State University of New York at Buffalo, Union College, Ohio State University, University of Oklahoma, University of Illinois at Chicago Circle, Oneonta State University, Russell Sage College, Purdue University.

1973 - Present — Set up and direct NYSDOT student intern program with local colleges.

1974 — Adjunct Lecturer, Syracuse University. Course in Urban Transportation Planning.

1976-1979 — Adjunct Professor, Union College. Courses in advanced transportation planning methods, mass transit.

Experience in Teaching (continued)

1978-1981 Adjunct Professor, State University of New York at Albany, Geography Dept., set up graduate program in transportation planning; teach graduate level courses in transportation planning methods.

1982 Adjunct Professor, State University of New York at Albany, Regional Planning Program.

Professional Affiliations and Panels

Chairman, NCHRP Panel on Fuel Supply Limitations on Travel (NCHRP 8-23), 1976-1978.
Chairman, NCHRP Panel on New Approaches to Travel Behavior (NCHRP 8-14), 1975-1980.
Chairman, TRB Committee on Travel Behavior and Values (A1C04), 1977-1982.
Chairman, U. S. Committee on Fourth International Conference on Travel Behavior, 1979.
Chairman, NCHRP Panel on Transit Service for Disadvantaged (NCHRP 8-27), 1981-1983.
Chairman, Conference on Travel Analysis Methods for the 1980's, 1982.
Secretary, TRB Executive Committee, Subcommittee on TRB Financing, 1976-77.
Member, TRB Committee on Passenger Travel Demand Forecasting, 1976-82.
Member, TRB Committee on Energy, 1981-present.
Member. TRB Committee on Information Systems, 1983-present.
Member, TRB Committee on Public Transportation Planning & Development, 1975-77.
Member, NCHRP Panel on Peak Period Traffic Congestion, (NCHRP-7-10), 1974-79.
Member, Advisory Panel, Collection of a Disaggregate Data Set, 1975-78.
Member, Advisory Panel, Alternative Roles of the Automobile, 1975-76.
Member, Advisory Panel, Second Conference on Travel Behavior, 1975.
Member, Advisory Panel, Conference on Behavioral Applications to Travel, 1978.
Member, Advisory Panel, Conference on Urban Transportation Planning in the 1980's, 1981.
Member, Advisory Panel, Conference on Transportation Energy Contingency Planning, 1983.
Principal Reviewer, National Academy of Sciences.
Associate Editor, Transportation, 1975-Present.
Associate Editor, Journal of Advanced Transportation, 1974-1980.
Who's Who in the East, 1974-Present.
Who's Who in the Government, 1977-Present.

Personal Resume of Richard D. Albertin

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PERSONAL DATA: Born 10/8/48, USA Citizen Height 6'1" Weight 170 lbs.

EDUCATION

Undergraduate: 1966-1970 State University of New York at Buffalo,
Major - Civil Engineering (BSCE)

Graduate: 1971-1974 Rensselaer Polytechnic Institute,
Major - Transportation Engineering (M.S.T.E.)

Awards: Chi Epsilon Engineering (Civil) Honor Fraternity (May 1970)
Governor's Certificate of Appreciation (February 1980)
AASHTO's President's Award (October 1981)

EXPERIENCE

Date: June 1981 to present

Title: Associate Transportation Analyst, Transit Division
Employer: NYSDOT
Duties: Administration of the Federal Rural Transportation Program, Section 18. Supervise six professionals.

Date: March 1981 to June 1981

Title: Senior Research Analyst (Transportation), Statewide Planning
Employer: NYSDOT
Duties: Development of the transit portion of the Statewide Master Plan for Transportation (an overall policy document) and resolution of various transit issues related to funding, administration, policy, etc.

Date: May 1980 to March 1981 (concurrent with position described below)

Title: Senior Research Analyst (Transportation), Planning
Employer: NYSDOT

Duties: Review and coordination of the transportation elements of the federally mandated nuclear power plant emergency plans and the development of NYSDOT's emergency procedures.

Date: October 1973 to March 1981

Title: Senior Research Analyst (Transportation), Planning
Employer: NYSDOT

Duties: Development and operation of the computer transit and arterial simulation packages used by NYSDOT. Duties included applied research and application of these programs. Supervised two professionals and six technicians.

Date: April 1976 to April 1980 (concurrent with previous position)

Title: Director of Transit Operations for NYSDOT Olympic Task Force
Employer: NYSDOT

Duties: Developed original transportation plan, coordinated NYSDOT activities with the transportation consultants to the Lake Placid Olympic Organizing Committee (LPOOC) and while originally limited to monitoring LPOOC transit operations during the Olympics, was assigned to Governor's Emergency Task Force with specific responsibility of resolving transit crisis, and directing transit operations for the remainder of the games. Supervised up to forty professionals.

Date: January 1972 to October 1973

Title: Transportation Analyst, Research Unit, Planning
Employer: NYSDOT

Duties: Conducted various independent and joint effort research projects including development of intercity data and travel models, design of various transportation surveys and research into psychological attributes affecting transportation decisions.

Date: June 1970 to January 1972

Title: Transportation Engineering Trainee (enrolled in a transportation planning program sponsored by the New York State Department of Transportation and Rensselaer Polytechnic Institute).

Duties: Assigned to various units as part of a program to become familiar with Department operations, activities included development of Interstate Highway Cost Estimate and design and data evaluation of various travel surveys. Course work included statistics, urban planning and transportation planning principles.

PUBLICATIONS

Available on request

REFERENCES

Available on request

PUBLICATIONS

"Summary of New York State Intercity Travel Data," Preliminary Research Report No. 42, Planning and Research Bureau, NYSDOT, March 1973

"Development of Intercity Travel Demand Models for New York State Urban Areas," (with Gerald Cohen and David Hartgen), Preliminary Research No. 58, Planning and Research Bureau, NYSDOT, March 1974.

"Structural Correlation Between Cognitive and Affective Attitude Components: A Test of Three Theories of Attitude Modification in Urban Travel Mode Choice," Preliminary Research Report No. 59, Planning and Research Bureau, NYSDOT, May 1974.

"The Validation of the Census UTP Package for Planning Uses-Buffalo SMSA Data," (with Peter Liou, Joseph Civalier, Bernard Schatz, and Michael Trentacoste), Preliminary Research Report No. 65, Planning and Research Bureau, NYSDOT, August 1974.

"Travel Demand at the 1980 Winter Olympics: Estimation and Analysis," (with Robert Knighton and Gerald Cohen), Preliminary Research Report No. 100, Planning and Research Bureau, NYSDOT, June 1976.

"Transportation Planning for the 1980 Winter Olympic Games," (with Robert Kinghton and Gerald Cohen), Preliminary Research Report No. 109, Planning and Research Bureau, NYSDOT, August 1976. (presented (1/77) and published by TRB (#626))

"A Glossary of Simulation Terms," Preliminary Urban Planning Report No. 16, Planning and Research Bureau, NYSDOT, July 1976.

"Transportation Control Plan. XIII Olympic Winter Games" (with DOT Task Force), NYSDOT, July 1979.

"Transportation Analysis Methods for the XIII Winter Olympics" (with Charles Manning and Frederick Scholtz), ITE Journal, March 1979.

"Olympic Transportation Planning: A Retrospective Look" (with Gerald Cohen and Robert Knighton), Preliminary Research Report No. 181, Planning and Research Bureau, NYSDOT, August, 1980. (Presented (1/81) and published by TRB #798))

REFERENCES

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Mr. Ken Shiatte
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Mr. Jere Fidler
Specialized Transit Section
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Resume of

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Transit Program & Evaluation Bureau
NYS Department of Transportation
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RELEVANT EXPERIENCE

Associate Transportation Analyst - December 1980 to Present
(Senior Transportation Analyst - July 1980 - December 1980)
Transit Program & Evaluation Bureau

The Transit Division was formed in July 1980, and I was transferred from the Planning Division to the Program & Evaluation Bureau at that time. The Bureau has responsibility for policy oversite and evaluation of the Department's transit related activities including the Operating Assistance Program. As head of the Specialized & Capital Section, I supervise a staff of four professionals. Specific activities for which I have been responsible include:

- Preparation of an Evaluation of the NYSDOT Transit Capital Process. This included detailed documentation and flow charting of the capital project process, collection and manipulation of data on projects and preparation of recommendations on how to improve the process and reduce the time required to purchase a vehicle, most of which have since been implemented.

- Design and implementation of a management information system for the Transit Capital Program. One recommendation of the Process Evaluation was the establishment of a system to track capital projects and present the information in a manner suitable for management and executive staff use. This involved developing computer files for much existing data, designing tabulations and summaries and analyzing the results. This system and related data collection efforts have substantially increased our analytical capability. This effort also resulted in computerizing production of the Transit Capital Work Program which should result in substantial savings of staff time for manual updates and retyping of the old periodic report.

- Production, printing and distribution of Public Transportation Map and Directory, which has been very well received by traveling public. This included supervising a substantial data collection effort, confirming data, supervising design and layout and coordinating cartographic work.

- Analysis of transit capital needs for non-MTA transit operators including estimates of those needs over a five and ten year period, comparison of those needs to pipeline projects and evaluation of the adequacy of funds to meet those needs.

- Development and implementation of Rockland County Emergency Evacuation Plan. This involved planning a bus system to evacuate 10,000 people from Rockland County in case of a nuclear emergency and required planning of routes, acquiring commitment from private operators for over 400 buses, overseeing driver training and coordination with other agancies. A test of the plan which was developed was rated by federal reviewers as perhaps the best ever.

. Coordinate leverage leasing of transit vehicles. This effort involved reviewing and clarifying relevant portions of the tax law, working to inform the congressional delegation of the importance of this tax incentive, informing transit properties of the opportunity to obtain additional funds and coordinating lease transactions. These transactions have netted over $1.5 million in private funds for upstate transit operators.

. Administration activities including: Oversight of UMTA grants and preparation of applications, as well as monitoring charges and fund availability; personnel administration, including requesting creation of new titles, processing hirings and supervision of staff.

Senior Transportation Analyst - October 1979 to July 1980
Highway and Transit Planning Unit

The Highway and Transit Planning Unit has responsibility for planning and evaluation of programs on a statewide basis. Much effort is involved in planning for the public transportation operating assistance program and in providing input for policy making, legislation and regulation.

Some specific activities while in this unit included:

. Primary staff responsibility for elderly and handicapped transportation including participation on Governor's Task Force on Transportation for the Disabled, preparation of testimony on Section 504 implementation for Commissioner Hennessy.

. General supervision of final stages of preparation of Transit Operating Assistance Report for 1979. This activity was interrupted by the temporary assignment described below.

Assistant Director of Olympic Transit Operations - part-time - August - December 1979
DOT Olympic Task Force full-time - January - February 1980

The Department of Transportation Olympic Task Force has general responsibility for preparation of a transportation plan for the 1980 Winter Olympics at Lake Placid. This included responsibility for implementing traffic circulation and vehicle permit portions of the plan. The task force was not responsible for implementing spectator movement portions of the plan. In fact, the Department did not have authority to implement the necessary shuttle bus operations. Specific activities include:

. Coordination of Emergency Contingency Planning for 1980 Winter Olympics with State Police, Red Cross, Office of Disaster Preparedness, Department of Health, etc. and preparation of DOT emergency contingency plan.

. Participate in final stages of planning for the shuttle bus operation and monitor Lake Placid Olympic Organizing Committee (LPOOC) efforts to implement the plan.

. Select, train, supervise, and direct force of 18 DOT staff (mostly engineers) responsible for field monitoring of spectator bus system. During the transportation emergency, this group grew to 30 and assumed responsibility for field operation of the bus system including supervision of bus loading, direction of bus drivers, supervision of bus checkers, and general oversight of parking operations.

. Participate in Governor's emergency bus task force which assumed management control of the ailing spectator transportation system. This involved working with chief bus dispatchers of companies to achieve efficient utilization of available equipment including development of daily operations plan, improved fueling facilities, better driver housing and coordination between companies. This activity resulted in commendations received from Governor Carey, Commissioner Gennessy and George Briggs, Head of the DOT Olympic Task Force.

. In several "crisis" situations, assumed direct field control of spectator transportation. This involved liaison with State Police and EnCon commanders for crowd control, getting arriving buses organized, instructing drivers where and when to load and rerouting buses as necessary.

Senior Transportation Analyst
Small Urban/Rural County Transportation Study Unit - January 1977 to October 1979

This Unit has responsibility for transportation planning in non-metropolitan areas of New York State. Special emphasis is placed on planning for needed transit service and on providing improved transportation service for transportation disadvantaged groups. Development of innovative transit and paratransit alternatives and improvement of demand and cost estimating techniques is also included.

In addition to rural transit planning, the Unit is responsible for analysis of highway conditions in thirty-eight rural counties not included in 3C Planning Process.

Some specific activities include:

. Direction of the Sullivan County Rural Public Transportation Study which conducted a thorough analysis of transportation needs. The study resulted in county support for a federal (UMTA) capital grant to support an existing operator, and provided longer term recommendations for additional services. Responsibilities included planning and conducting public meetings, conducting various surveys and preparing written documentation.

. Provide direct technical support to Otsego County Planning Staff in conducting a public transportation needs study including planning and conducting a community interest survey.

. Preparation of working papers on objectives of Rural Public Transportation, Comparative Service Measures for Rural Transit and Financing Rural Public Transportation.

. Developed a technique for estimating rural transit ridership which was sensitive to levels of service provided (see publication list, TRR 718).

Research Analyst (Transportation) - June 1975 to January 1977
Planning Research Unit

The Planning Research Unit is responsible for a wide range of research for transportation planning including public transit, demand modeling and economic forecasting. Some specific projects include:

- Preparation of a report reviewing and summarizing procedures used by the New York State Department of Transportation and others in the state for projecting population, income, employment, auto ownership and trip-making. This report was used as a background for a review of forecasting as a function of the Planning and Research Bureau (see publication list, PRR 102).

- Work on Transportation Planning for the 1980 Winter Olympics at Lake Placid. This included estimation of travel demand within the Olympic area and analysis of alternative ways to meet that demand. A hypothetical system was designed to demonstrate the feasibility of using buses and to estimate the number of buses necessary. This included estimation of bus headways, analysis of space and time required to load and unload buses, analysis of the effect of heavy bus concentrations on highway capacity and estimation of highway passenger carrying capacity with various bus concentration (see publications list, PRR 100, TRR 625).

- Develop a refined 'non-commitment' procedure for estimating demand for dial-a-bus service in small urban areas. Development involved detailed analysis of public opinion and on-board bus surveys conducted in areas with existing service (see publications list, PRR 104).

- Analyzed the impact of various barriers on the use of public transportation by elderly and handicapped individuals. This resulted in development of a procedure for estimating the effect of barrier removal on transit ridership (see publications list, TRR 660).

Research Analyst (Transportation)
Forecasting Unit — May 1973 to June 1975
(Research Assistant) — (February to May 1973)

Until its combination with the Planning Research Unit in June 1975, the Forecasting Unit was responsible for preparation of long range economic forecasts for regions and subareas (traffic analysis zones and minor civil dividions). Some projects include:

- Work on the first annual Transportation Operating Assistance Evaluation Report. Particularly, a detailed analysis of transit operating cost components, including projections of cost increases for salary, maintenance, fuel and retirement benefits. A transit operating cost index was developed from this analysis and has been used in estimating transit subsidy needs for the future (see publications list, TRR 626, PRR 92).

- Assist in preparing statewide forecasts of transit ridership and deficit including preparation of estimates of input parameters.

- Prepare estimates of population, auto ownership, income and employment for several upstate urban areas. The forecasts were used to update mode split and transit O&D estimates using the Department's computer simulation package. This effort included preparation of the Capital District Economic report.

- Development of a set of growth factors for vehicle miles of travel for every minor civil division in New York State.

. Research to support the 1973 Bond Issue for New York State. This included estimating tax alternatives to raise funds and analysis of debt service cost for New York compared to other states.

Tax Examiner
New York State Income Tax Bureau - February 1971 to February 1973

As a tax examiner, my primary responsibility was the audit of individual income tax returns. From February through April, I supervised a unit of twenty-two people, including sixteen temporary clerks and six other tax examiners. I was responsible for assignment and flow of work, quality control, training of clerks, timekeeping and personal matters for the Unit.

EDUCATION

BA in Economics; 1970; Lafayette College; Easton, Pennsylvania. My first two years were in a combined Engineering-Economics Program, providing me with some technical and mathematical background in addition to economics courses.

AFFILIATION

Member of Transportation Research Board Committee on Rural Public Transportation; Chairman of the Subcommittee on Information Exchange.

PUBLICATIONS

"Capital District Economic Report", prepared for the Capital District Transportation Committee, December 1974.

"Transit Ridership and Deficits: 1980 Projections for New York State" (with Stephen Howe and Gerald Cohen), Preliminary Research Report #92, Planning & Research Bureau, NYSDOT, October 1975.

"Forecasting Fare Sensitive Dial-A-Bus Demand Without Surveys", Preliminary Research Report #104, Planning & Research Bureau, NYSDOT, July 1976. (A paper presented at the 1977 Annual Meeting of the Transportation Research Board.)

"Forecasting Independent Variables: Responsibilities and Techniques" (with David Gooding), Preliminary Research Report #102, Planning & Research Bureay, NYSDOT, August 1976.

"Travel Demand at the 1980 Winter Olympic Games: Estimation and Analysis" (with Gerald Cohen and Richard Albertin), Preliminary Research Report #100, Planning & Research Bureau, NYSDOT, June 1976.

"Transportation Planning for the 1980 Winter Olympics: (with Gerald Cohen and Richard Albertin, Transportation Research Record #625.

"Cost Increases, Cost Differences and Productivity of Transit Operations in New York State" (with William Holthoff), Transportation and Research Record #626.

"Incorporation Barrier Effects in Elderly and Handicapped Non-Work Transit Demand Forecasts" (with David T. Hartgen). Published as part of a paper entitled "Estimation of Demand for Transit Service Among the Transportation Disadvantaged" in Transportation Research Record #660.

"Dimensions of Transit Service" (with Nathan Erlbaum and Richard Malec), Preliminary Research Report #106, Planning & Research Bureau, NYSDOT, December 1976.

"Rural Attitudes Toward Public Transportation: Summary and Trade-Off Analysis" (with Douglas J. Zoerhoff), Planning & Research Bureau, NYSDOT, August 1977. (A paper presented at the 1978 Annual Meeting of the Transportation Research Board.)

"Estimating the Effect of Alternative Service Levels on Rural Transit Ridership" (with Wayne Ugolick). Transportation Research Record #718.

"Objectives & Service Options for Rural Public Transportation Service (W/DJ Zoerhoff) Preliminary Urban Planning Report #33, Dec. 1977.

"Management Operation & Marketing for Rural Public Transportation Systems (With DJ Zoerhoff, A Politano & S Kling) Preliminary Urban Planning Report #34 Aug. 1978

FOSTER J. BEACH III

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Licensed Professional Engineer in New York, No. 046595

EDUCATION

BSCE from Clarkson College, Potsdam, New York, June 1966
MSCE from Georgia Institute of Technology, Atlanta, Georgia, June 1967
MS in Management from Rensselaer Polytechnic Institute, Troy, New York, June 1974
MBA from Rensselaer Polytechnic Institute, Troy, New York, May, 1978

PROFESSIONAL EXPERIENCE

7/81 - Present — NEW YORK STATE DEPARTMENT OF TRANSPORTATION, Region 10, Hauppauge, NY
Supervisor, Regional Transportation Planning and Development III

Responsible for management and administration of 32 engineers, analysts, technicians in the Regional Planning and Development Group. Duties include: supervise, administer, develop, coordinate and monitor the Regional Capital Construction Program and Transportation Improvement Program; supervise, administer, coordinate schedule and monitor development and preparation of project initiations for addition to Capital Program; administer, monitor and coordinate development of transit, aviation, rail and port projects through the Capital Grant process; represent and speak for the Department at meetings and hearings with the public, elected and non elected federal, state and local government officials, and to the media including television, radio, and newspapers; assign work and provide guidance and leadership in the professional development of subordinates.

1/81 - 7/81 — NEW YORK STATE DEPARTMENT OF TRANSPORTATION, Region 1, Albany, NY
Associate Civil Engineer - Regional Bridge Engineer

Supervise, administer and coordinate the development and implementation of a $40M Regional Bridge Capital Construction Program with 30 engineers and technicians. Duties include: supervise and review preparation of Project Design Reports and Alternate Designs for bridges; supervise and review of plans, specifications and estimates for bridge projects; coordinate project development and technical assistance with other Regional and Departmental units; plan, schedule and monitor workloads including processing procedures and cost estimates; assign work and provide guidance and leadership in professional development of subordinates.

9/80 - 1/81
5/77 - 4/80 — NEW YORK STATE DEPARTMENT OF TRANSPORTATION, Region 1, Albany, NY
Associate Civil Engineer - Design Supervisor

Supervise and coordinate the activities of about 60 people involved in the implementation of the preliminary design phases and the technical support services for the Region's $100M design program. Preliminary design includes the development of engineering alternatives, identification and evaluation of environmentally sensitive areas.

conducting community participation and preparation of engineering and environmental reports. Technical support services include survey, right-of-way mapping, soils and electronic data processing. Also coordinate and implement policy for transportation planning in the Adirondack Park. Conduct Public Meetings and Public Hearings.

4/80 - 9/80 NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY, Albany, NY
Project Manager, Energy Conservation and Development of Renewable Resources

Developed proposals for comprehensive Community Energy Management plans and Innovative Conservation plans for energy intensive land use and business development. Developed, supervised, monitored and evaluated projects to conserve energy and develop renewable energy resources in areas of transportation, community planning and industrial use.

8/74 - 1/77 NEW YORK STATE DEPARTMENT OF TRANSPORTATION, Main Office, Albany, NY
Executive Assistant to the Assistant Commissioner for Transportation Operations

Provide high level management support and technical assistance for his management of a $200M operating budget in the Division of Design and Construction, Maintenance, Traffic and Safety and Real Estate. Research, plan, develop, implement and monitor operating policy practices with respect to departmental activities, new legislation and new rules and regulations. Contact with the public, politicians, press and high level federal, state and local officials. Served as an expeditor, troubleshooter and problem solver.

8/72 - 8/74 Senior Civil Engineer, New York State Department of Transportation, Region 1, Albany, NY
Supervise and coordinate project development and environmental analysis, including community participation, air and noise pollution studies, preparation of planning and environmental reports; conduct public meetings and work with federal, state and local officials, special interest groups and general public; member of speakers group for 1973 transportation bond issue.

12/70 - 8/72 Assistant Soils Engineer, New York State Department of Transportation, Bureau of Soil Mechanics, Albany NY
Supervise and coordinate work of nine people in conducting statewide pavement surface roughness survey; analysis and development of design procedure for recharge basins; earthwork specifications review; technical writing; analyze test-design procedures.

8/70 - 12/70 Lieutenant, junior grade, Civil Engineers Corps, U.S. Navy
Twenty-first Naval Construction Regiment, Davisville, R.I.
Special Projects Officer - preparation of Management Information Charts for command briefings, available manpower analyses.

7/69 - 8/70

Lieutenant, junior grade and Ensign, U.S. Navy, CEC
Engineering Officer - responsible for design, drawings, specifications, surveying, quality control, planning and estimating all construction projects during the Battalion's development to Vietnam: OIC of 55 man detail for paving airfield, city streets and highways.

1/68 - 11/68

Assistant Soils Engineer, New York State Department of Transportation, Bureau of Soil Mechanics, Albany, NY
Analyses of and design solutions for embankment foundation and stability problems; plan subsurface exploration programs; evaluate sand drain installations and lime stabilization project; analyses of failures or distress of manmade or natural slopes.

6/67 - 12/67

Gannett, Fleming, Corddry and Carpenter, Inc., Harrisburg, PA
Soils Engineer in Hydraulic Division
Involved with design of anchored bulkheads, retaining walls, earth dams; preparation of subsurface exploration program and subsequent laboratory testing of samples.

For five summers while in college, worked for New York State Department of Transportation, Region 4, Rochester, NY
Construction inspection of earthwork operations; pile driving operations; structural and pavement concrete placement and mixing; surveying; materials testing; traffic survey counts; pile load teses; subsurface soils exploration.

OTHER TRAINING

Managing New York State, Level I - Governor's Office of Employee Relations, 6/83

Pavement Management Principles and Practices, National Highway Institute, 24 hours, 4/82

High Occupancy Vehicle Facility Development Operation and Enforcement, National Highway Institute, 16 hours, 3/82

Time Management, New York State Department of Civil Service, 6 hours, 10/81

Management by Objectives in Government, New York State Department of Civil Service, 18 hours, 6/81

Improving the Effectiveness of Public Meetins and Hearings, National Highway Institute, 30 hours, 1978

Budget Institute by Office of Management and Finance and the Staff Development and Training Bureau, NYSDOT, 30 hours, May, 1975.

Motiviation and Productivity Seminar by Staff Development and Training Bureau, NYSDOT, 30 hours, November, 1972.

Specialized training through NYSDOT in air and noise pollution analyses.

U.S. Naval Disaster Recovery Training School, CBC, Davisville, R.I , April, 1970.

U.S. Naval Civil Engineers Corps Officer School, Port Hueneme, Calif., April 1969 to July 1969.

U.S. Naval Officer Candidate School, Newport, R.I., November, 1968 to April 1969.

PROFESSIONAL ACTIVITIES

Member of American Society of Civil Engineers
New York State Association of Transportation Engineers

ATTACHMENT B

To Testimony of

New York State Department of Transportation

Relative to Contention 65

MEMORANDUM
DEPARTMENT OF TRANSPORTATION

DATE MAR 25 1980

SUBJECT REVISED HIGHWAY SUFFICIENCY CAPACITY CALCULATIONS (LEVEL D)

FROM R. W. Tweedie, Data Services Bureau, Rm. 115, Bldg. 4 RWT

TO File

CC E. W. Campbell, Planning Division, Rm. 115. Bldg. 4
W. J. Lee, Data Services Section, Rm. 108, Bldg. 4
D. C. Fifield, Systems Applic. & Special Services Unit, Rm. 108, Bldg. 4
J. A. Engstrom, Traffic & Environmental Monitoring Unit, Rm. 106, Bldg. 4
H. N. Donaldson, Transportation Inventories Unit, Rm. 104, Bldg. 4

Following a lengthy period of discussion regarding the appropriate service levels for use in the computation of link capacities for Highway Sufficiency Rating (S-1), Level of Service "D" has been selected for use. This choice is based on the fact that Level of Service "D" is closer to the true meaning of the term "capacity" and still provides a stability of service not attainable at higher volumes.

The new capacity values are representative of steady flow situations discernible from the currently inventoried data items with the exception of passing sight distance (PSD), and as such, they do not represent point conditions (such as narrow bridges or traffic signals) or alignment. If the user knows of such conditions on a particular highway section, he should consider their effects upon the capacity as calculated.

The formula is the same as previously documented, except that the basic capacities (Factor 1) have been revised and the PSD correction (Factor 5) has been eliminated. (The principal consideration in this latter action was the unknown accuracy of the PSD data on the file.) Corrections should be applied for intersection controls and PSD as the analyst deems appropriate for the link being studied.

The computation, as currently constituted, is as follows:

Capacity (Level D) = Factor 1 X Factor 2 X Factor 3 X Factor 4

The factors used are shown in the attached tables.

RWT:DCF:lf
Attachments

RECEIVED
DATA SERVICES SECTION
MAR 28 1980
~~W. J. LEE~~
DCF

FACTOR 1: BASIC CAPACITY (1-WAY VPH)

Lanes	Area Type	Undivided		Divided	
		Uncontrolled	Controlled	Uncontrolled	Controlled
< 4 lanes	Urban	1100	----	----	----
	Rural	1000	----	----	----
4 lanes	Urban	1800	----	2800	3000
	Rural	2800	----	3400	3000
6 lanes	Urban	----	----	4200	4500
	Rural	----	----	5100	4500
> 6 lanes	Urban	----	----	5800	
	Rural	----	----	6400	

FACTOR 4: AREA TYPE ADJUSTMENT

Culture Type	Code	Area Type: Rural 1	Uninc 2	Vill 3	Sub 4	City 5	Not Used 6	Vill >5000 7
Controlled Access	1	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Residential	2	1.00	.90	.90	.90	.90	.90	.90
Resort	3	1.00	.75	.75	.75	.75	.75	.75
Industry	4	1.00	.75	.75	.75	.75	.75	.75
Business	5	1.00	.75	.75	.75	.75	.75	.75
Agricultural-Open	6	1.00	.75	.75	.75	.75	.75	.75

LANE WIDTH/LATERAL CLEARANCE*
(FACTOR 2)

Lanes / Start Value	Less Than 4					4					4+					Greater Than 4				
	001					051					101					151				
Lane Width / oulder dth	8	9	10	11	12	8	9	10	11	12	8	9	10	11	12	8	9	10	11	12
0	.61	.66	.71	.77	.88	.00	.70	.80	.85	.88	.00	.73	.82	.87	.90	.00	.74	.85	.91	.94
1	.61	.66	.71	.77	.88	.00	.70	.80	.85	.88	.00	.73	.82	.87	.90	.00	.74	.85	.91	.94
2	.63	.70	.75	.81	.93	.00	.75	.86	.92	.95	.00	.79	.88	.94	.97	.00	.76	.87	.93	.97
3	.63	.70	.75	.81	.93	.00	.75	.86	.92	.95	.00	.79	.88	.94	.97	.00	.76	.87	.93	.97
4	.65	.74	.79	.85	.97	.00	.76	.88	.94	.98	.00	.80	.90	.96	.99	.00	.77	.88	.95	.99
5	.65	.74	.79	.85	.97	.00	.76	.88	.94	.98	.00	.80	.90	.96	.99	.00	.77	.88	.95	.99
6	.68	.76	.81	.88	1.00	.00	.77	.89	.95	1.00	.00	.81	.91	.97	1.00	.00	.78	.89	.96	1.00
7***	.68	.76	.81	.88	1.00	.00	.77	.89	.95	1.00	.00	.81	.91	.97	1.00	.00	.78	.89	.96	1.00
8***	.68	.76	.81	.88	1.00	.00	.77	.89	.95	1.00	.00	.81	.91	.97	1.00	.00	.78	.89	.96	1.00
9***	.68	.76	.81	.88	1.00	.00	.77	.89	.95	1.00	.00	.81	.91	.97	1.00	.00	.78	.89	.96	1.00
Source	**	HCM Table 10.8 L of S = E				**	HCM Table 10.2 L of S = All				**	HCM Table 9.2 L of S = All				**	HCM Table 9.2 L of S = All			
Access	Uncontrolled										Controlled									

Value = Factor (N) Where: N = Start Value + (Lane Width - 8) 10 + Shoulder Width

---

sumes obstruction on right side only.
ese values are not contained in the HCM and cannot be verified.
ese values are not contained in the HCM and cannot be verified,
wever, the program as written cannot access them.

TRUCK ADJUSTMENT FACTORS (FACTOR 3)
(Percent)

Terrain	Flat				Rolling				Hilly				Mountainous			
Lanes / % Trucks	<4	4	4+	6-8	<4	4	4+	6-8	<4	4	4+	6-8	<4	4	4+	6-8
0	← 100 →				100	← 100 →			100	← 100 →			Same as Hilly			This program will not handle this.
1	99				96	97			90	93						
2	98				93	94			82	88						
3	97				89	92			75	83						
4	96				86	89			69	78						
5	95				83	87			65	74						
6	94				81	85			60	70						
7	93				78	83			57	67						
8	93				76	81			53	64						
9	92				74	79			50	61						
10	91				71	77			48	59						
11	91				71	77			48	59						
12	89				68	74			43	54						
13	89				68	74			43	54						
14	88				64	70			39	51						
15	88				64	70			39	51						
16	86				61	68			36	47						
17	86				61	68			36	47						
18	85				58	65			34	44						
19	85				58	65			34	44						
20	← 83 →				56	← 63 →			31	← 42 →						
21	79	81	83	81	54	60	63	58	← 0 →							
22	79	81	83	81	54	60	63	58	0							
23	74	73	80	79	46	55	68	55	0							
24	74	73	80	79	46	55	68	55	0							
25	74	73	80	79	46	55	58	55	0							
26	74	73	80	79	46	55	58	55	0							
27	74	73	80	79	46	55	58	55	0							
28	70	71	77	77	40	52	53	52	0							
29	70	71	77	77	40	52	53	52	← 0 →							

Where: Factor = $100/(100-P_T + E_T P_T)$ from HCM Table 10.12

No. of Lanes	Assumed L of S	Passenger Car Equivalent (E_T)			HCM Source
		Level	Rolling	Hilly	
Less Than 4	D/E	2	5	12	Table 10.9a

MEMORANDUM
DEPARTMENT OF TRANSPORTATION

DATE February 5, 1980

SUBJECT HIGHWAY SUFFICIENCY - CAPACITY CALCULATION ROUTINE

FROM R. W. Tweedie, Data Services Bureau, Rm. 115, Bldg. 4 RWT

TO File

CC W. J. Lee, Data Services Bureau, Rm. 108, Bldg. 4
D. C. Fifield, Systems Applications & Special Services Unit, Rm. 108, Bldg. 4
H. N. Donaldson, Transportation Inventories Unit, Rm. 104, Bldg. 4
E. W. Campbell, Planning Division, Rm. 115, Bldg. 4

I have reviewed the adjusted rated capacity computation contained in the Highway Sufficiency publication, along with Dave Fifield's memo of June 7, 1978, and have developed changes in the volumes which are identified as Free Flow Capacities (Factor 1) in that memo. The objective is to convert the values reported in the Highway Sufficiency publication from B Level of Service to D Level of Service. The rationale for making this change is to identify those highway sections with traffic volumes which are close to or exceed a tolerable operation condition. Level of Service D generally represents the limiting conditions during which the traffic volume is the highest that can be maincained for short periods of time without a high probability of breakdown in flow.

The D Level of Service volumes along with source documentation (Highway Capacity Manual - 1965) are attached. The documentation should allow the user to trace the numbers if necessary.

We are also eliminating the passing sight distance (PSD) correction factor for the 1978 S1 book computations. Our objective is to obtain the optimum flow at D Level of Service and at an average highway speed (AHS) equal to 50 mph. If the user wishes, he may diminish the service volume by imposing a restricted PSD. For specific highway sections, this is probably more realistic than using the % passing sight distance reported in the S1 report.

The service volumes, as revised, represent the expected values under uninterrupted flow conditions. No provision is made for signalization. In previous editions of the S1, the urban volumes were artificially depressed to account for an assumed green/cycle ratio. For the 1978 S1 book computations, the user will be expected to make necessary corrections for signalization as the specific site conditions dictate.

The net effect of these changes will be a reduction in the number of highway sections which have deficient traffic carrying capabilities. Those that do "fall out" as having a high V/C ratio will indeed be problem sections which quite likely will require some improvement.

RWT:kr
Attachments

FACTOR 1

1-Way Volumes - D Level of Service

		Undivided		Divided	
		Uncontrolled	Controlled	Uncontrolled	Controlled
Less than 4-lane	urban	1100[1]			
	rural	1000[2]			
4-lane	urban	1800[3]		2800[8]	3000[7]
	rural	2800[4]		3400[6]	3000[5]
6-lane	urban			4200[8]	4500[7]
	rural			5100[6]	4500[5]
Greater than* 6-lane	urban			5600[8] 5850	6000[7]
	rural			6800[6] 6700	6000[5]

Program uses 6000

---

[1]See Figure 6.9 on page 136 in Highway Capacity Manual - Urban intersection approach service volume, in vph of green signal time, for 2-way streets with parking.

Assumptions - 1) Curb to div. line approach width = 20'
(12' travel lane + 8' parking lane)

2) Load factor = 0.7

3) No adjustment to peak hour or metro-size or location.

4) Intersection controls capacity

[2]See Table 10.7 on page 302 in Highway Capacity Manual.

Assumptions - 1) AHS = 50 mph

2) PSD > 1500 = 100%

Service vol. = 2000 x .75 = 1500 vph (2-way)

1500 x 2/3 = 1000 vph in peak direction

[3]See Figure 6.9 on page 136 in Highway Capacity Manual.

Assumptions - 1) Curb to div. line = 32'
(2-12' travel lanes + 1-8' parking lanes)

2) Load factor = 0.7

3) No adjustment for peak hour or metro-size or location.

4) Intersection controls capacity.

[4]See Table 10.1 on page 284 in Highway Capacity Manual.

Assumption - 1) AHS = 50 mph
operating speed ≥ 35
4000 x 0.70 = 2800

could also come from Figure 6.10
on page 136
approach vol. 2600

[5]See Table 9.1 on page 252 in Highway Capacity Manual.

Assumption - peak hour factor = 0.83
operating speed ≥ 40 mph, AHS = 70 ±

[6]See Table 10.1 on page 284 in Highway Capacity Manual.

Assumption - AHS = 60 mph
operating speed ≠ 35 mph

4-lane capacity = 4000 x .85 = 3400 vph
6-lane capacity = 6000 x .85 = 5100 vph
8-lane capacity = 8000 x .85 = 6800 vph

[7]See argument for 5.

- assumes same vaolumes for both urban and rural divided and controlled highways.

[8]See Table 10.1 on page 284 in Highway Capacity Manual.

Assumption - AHS ≥ 50 mph

4 lanes 4000 x .70 = 2800
6 lanes 6000 x .70 = 4200
8 lanes 8000 x .70 = 5600

*The existing computer program will accommodate only a single urban and rural value. Thus, the two urban values will be averaged to obtain 5800 and the two rural values averaged to obtain 6400.

ATTACHMENT C

To Testimony of

New York State Department of Transportation

Relative to Contention 65

ATTACHMENT D

SOURCE: NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM
HIGHWAY TRAFFIC DATA FOR
URBANIZED AREA PROJECT PLANNING AND DESIGN
Report 255, 1982

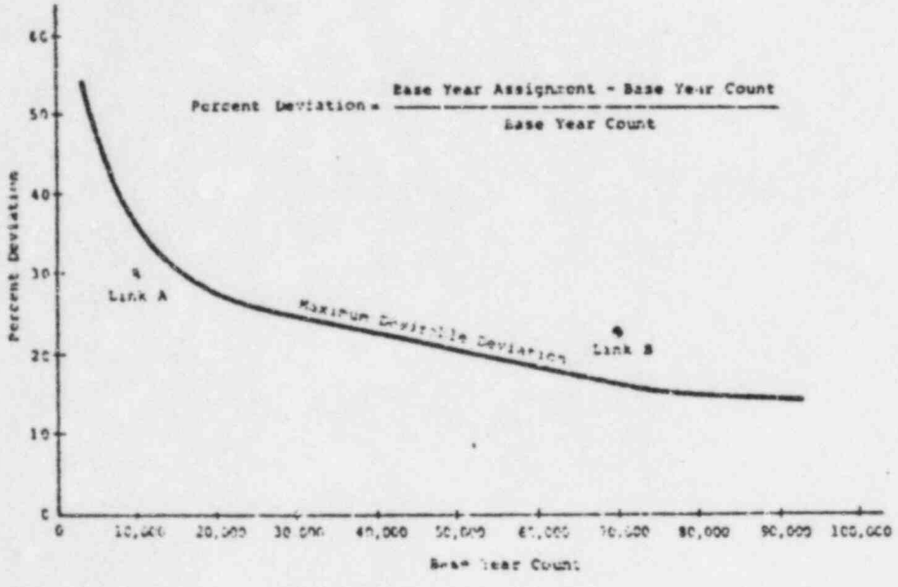

Figure A-1. Maximum desirable error for link volumes.

ATTACHMENT D

To Testimony of

New York State Department of Transportation

Relative to Contention 65

PROJECTS IN DECEMBER 7, 1983 TRANSPORTATION IMPROVEMENT PROGRAM

Projects Within EPZ:

PIN	Description	Estimated Year of Letting	Cost(M)	Category*
0041.59	Rt. 25 Bridge over LIRR in Calverton	84-85	0.8	#1
0228.19	Monolithic Deck Repairs: Rt. 495 Bridge over Sills Rd. EB and LIRR WB	83-84	0.5	#1
0327.46	Rt. 25A Reconstruction (Rt. 347-Pipe-state Hollow Rd.)	88-89	6.9	#3
0327.53	Brookhaven Intersection Improvements including Rt. 25A and Rt. 347	85-86	2.3	#2
TRN 9.67	Rt. 25 Intersection @ Ridge Rd.	85-86	0.2	#2
0753.94	Intersection Improvements in Riverhead Town	85-86	0.8	#2
0754.24	Sound Ave. Realignment @ Baiting Hollow	85-86	1.4	#1
0754.26	Chapman Blvd. Resurfacing (Railroad Ave.-County Route 111)	85-86	0.4	#3
0327.54	Rt. 25A R&P (William Floyd Pkwy.-Rt. 25)	83-84	2.8	#3
TRN 9.87	Monolithic Deck Repairs: Rt. 495 Bridges over Wm. Floyd Pkwy., Carmans River, Sills Rd. WB, Rt. 112, Medford Ave., Nicolls Rd. and Holbrook Ave.	84-85	3.5	#1
			19.6	

Projects Outside EPZ but Assumed to Impact Evacuation:

0327.52	Rt. 25A (Stony Brook Rd.-August St.): R&P	85-86	0.6	#3
0041.62	Rt. 25 Reconstruction (Nicolls Rd.-No. Ocean Ave.)	88-89	14.5	#3
0112.40	Rt. 347 Intersection Improvements	83-84	1.5	#3
0113.00	Rt. 27 Reconstruction @ Oakdale Interchange	87-88	21.5	#3
0930.43	Rt. 25A R&P @ Stony Brook LIRR Station	83-84	1.0	#3
0016.15 (TRN8.69)	Rt. 112 (Peconic Ave.-Rt. 495)	85-86	1.5	#3
0113.16	Montauk Highway Intersection Improvements (Idle Hour Blvd.-Brook St.)	83-84	0.5	#3
0753.93	Old Town Rd. R&P (Rt. 347-Sheep Pasture Rd.)	85-86	1.2	#3
0754.04	Montauk Hwy. Safety (Atlantic Ave.-Knoll Rd.)	83-84	0.5	#3
0754.05	Montauk Hwy. R&P (Lewis Rd.-Old Country Rd.)	84-85	0.2	#3
			43.0	

NOTES

Category #1 - A lane or more out of service overnight or for a long time period and not restorable within several hours.

Category #2 - A lane will be out of service during work hours but could be restored within a few hours.

Category #3 - All existing lanes open but some restrictwside clearances which might slow traffic.

GENERAL

The construction season in this region generally lasts from April 1 to December 1. For the remainder of the year, all existing lanes would be open to traffic. The maintenance and control of traffic plan is a requirement on all of our projects. This plan is described in detail in the contract documents. The projects considered above all appear in the 1984-89 Transportation Improvement Program (TIP). A few additional projects were added in Suffolk County as a result of the additional Bond Issue funds received. The projects in the EPZ are as follows:

PIN	Description	Category
TRN 0.25	Monolithic Deck Repairs on Rt. 495 over River Rd. LIRR EB and Eastport-Manorville Rd.	#1
TRN 0.27	Monolithic Deck Repairs on Rt. 495 over Blue Point Rd.	#1
TRN 0.33	Rt. 25 (River Rd.-Peconic Ave.): R&P	#3
TRN 0.32	Rt. 112 (Rt. 27-Peconic Ave.): R&P	#3

Suffolk County projects that appear in the TIP and are within the EPZ. These 100% County projects are:

Direct (within EPZ)

S.C.#	Route	Type of Work	Const. Year
5152	CR 21 Rocky Point-Yaphank Rd. @ Mill Rd., Brookhaven	Recon.	85-86
5182	CR 21 Rocky Point-Yaphank Rd., Brookhaven	Recon.	86-87
5175	CR 111 Construct new section, Town of Brookhaven	Const.	86-87

Peripheral or Indirect

S.C.#	Route	Type of Work	Const. Year
5012	CR 16 - Horseblock Rd. (Nicolls-Patchogue-Mt. Sinai Rd.)	Recon.	86-87
5150	Drainage- CR 16		84-85
5129	CR 19 Patchogue-Holbrook Rd. (Division-Montauk Highway)	Recon.	84-85
5162	Beaver Dam Bridge - Reconstruction - Westhampton	Bridge	87-88
5179	CR 43 Northville Tpke. - Riverhead Drainage	Drainage	85-86

This listing is likely to increase. The State Reconditioning and Preservation (R&P) Program is only programmed through the next two years. Additional projects will be programmed during the remaining three years. Additionally, funds from the recently approved Infrastructure Bond Act for projects such as the reconstruction of the Sagtikos Parkway Interchange with the Long Island Expressway will expand thecapital program and impact the evacuation to varying degrees.

As an example of last summer's construction program, there were 5 projects underway in the EPZ and 7 in the peripheral area in Suffolk County. Of these projects, 11 were in Category #2 and 1 in Category #1.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	
LONG ISLAND LIGHTING COMPANY	Docket No. 50-322-OL-3 (Emergency Planning)
(Shoreham Nuclear Power Station, Unit 1)	

CERTIFICATE OF SERVICE

I hereby certify that one copy of the MOTION OF GOVERNOR MARIO CUOMO, REPRESENTING THE STATE OF NEW YORK, TO SUBMIT TESTIMONY ON EMERGENCY PLANNING CONTENTION 65, including all attachments dated January 24, 1984, have been served to each of the following this 31st day of January 1984 by U.S. Mail, First Class, except as otherwise noted.

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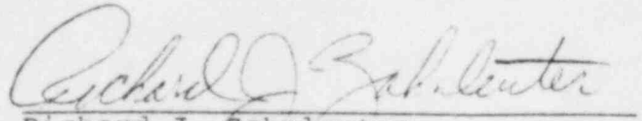

Richard J. Zahnleuter
Assistant to the Special Counsel
to the Governor of the State
of New York
Executive Chamber
State Capitol
Albany, New York 12224

DATE: January 31, 1984

* These persons were served by hand on January 24, 1984, except that the PERSONAL RESUME OF RICHARD D. ALBERTIN, which is an attachment to said motion, was served to these persons by U. S. Mail, First Class, on January 30, 1984, except that such attachment was served on W. Taylor Reveley III, Esq., by Federal Express, on January 30, 1984.