SECTION 3

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SUPPLEMENTAL INFRASTRUCTURE ASSESSMENT

PART IA

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IMPACTS ON ROAD INFRASTRUCTURE

SUPPLEMENTAL INFRASTRUCTURE ASSESSMENT: PART I A — IMPACTS ON ROAD INFRASTRUCTURE

ORIGINAL ASSESSMENT FINDINGS

ROAD DEMAND: *IPLAN saves 27 more State road lane-miles and 1,621 more local road lane-miles than TREND.*

ROAD COST: *IPLAN saves $91 million in State and $648 million in local road infrastructure costs versus TREND.*

SUPPLEMENTAL ASSESSMENT FINDINGS

ROAD DEMAND: *AIPLAN saves 31 more State road lane-miles and 1,419 more local road lane-miles than TREND.*

ROAD COST: *AIPLAN saves $132 million in State road costs and $567 million in local road costs.*

— LOCAL AND STATE ROADS AND COSTS—
COMPARATIVE IMPACT ASSESSMENT DIFFERENCES
(STATEWIDE — 1990–2010)

LANE-MILES AND COSTS ($)	TREND CONDITIONS	IPLAN ORIGINAL ASSESSMENT	AIPLAN SUPPLEMENTAL ASSESSMENT
DIFFERENCE IN:			
Local Road Lane-Miles [1]	5,493	3,872	4,074
State Road Lane-Miles [1]	159.5	132.4	128.0
Local Road Costs [2]	$2,197	$1,549	$1,630
State Road Costs [2]	$ 727	$ 636	$ 595
Difference from TREND			
Local Road Lane-Miles [1]	—	1,621	1,419
State Road Lane-Miles [1]	—	27.1	31.5
Local Road Costs [2]	—	$648	$567
State Road Costs [2]	—	$91	$132

[1] lane-miles (new and expansion)
[2] millions of dollars (1990)

The major differences between IPLAN and AIPLAN are that: (1) AIPLAN generates four fewer State road lane-miles than IPLAN, at a savings over IPLAN of $41 million; and (2) AIPLAN generates 200 more local road lane-miles than IPLAN at an additional cost over IPLAN of $80 million. Different amounts of land designated in Regional Centers and the environs of Metropolitan Planning Areas influence the changes noted from IPLAN to AIPLAN.

GENERAL QUESTIONS ASKED/ANSWERS PROVIDED

The major responses to the transportation infrastructure costs assessment were questions dealing with the nature of the roads to be built, the effects on road costs of the State Plan's Centers approach, and the cautious tone of the findings. For clarification purposes it should be understood that lane-mile projections include both new roads as well as the widening of existing roads. Most of the additional state road mileage for instance, is for widenings. Thickening of density in the IPLAN scenario does reduce the need for new roads; some of this is picked up as additional lane-miles for widenings. The Centers approach may indeed strain existing road intersections. However, it is unlikely that large-scale transportation improvements will occur solely as a function of this thickening. The CUPR Road Model measures the effects of *differences* in population density between TREND and IPLAN/AIPLAN. These differences, in general, will not be so large as to be the sole cause of new intersection improvements. Insofar as these Centers are built along State highways, some differences in development density will be absorbed by State roads; this is indeed incorporated into the Model.

In response to the final concern, it must be reemphasized that data and time limitations, as well as the project scope, dictate the bounds of the study. The CUPR Road Model provides an indication of the relative impacts of alternate development scenarios on road infrastructure needs and costs; it is more than adequate for these purposes.

MONITORING/EVALUATION RECOMMENDATIONS

For a more rigorous approach to transportation planning, a statewide model of road demand should be developed. This would require data inputs of a type somewhat different from those in the CUPR Road Model. A new statewide road model could, however, be correlated to findings from the CUPR Road Model, which would ground these findings at a point in time and allow a measured and orderly departure from this point into the future.

Each development produces site-specific road demands for road extensions, road widenings, and existing road upgrades. A case-by-case monitoring of development impacts on road infrastructure, and subsequent aggregation to the county and State levels, would refine transportation impact assessments considerably.

DESIRABLE CHANGES TO BE INCORPORATED INTO THE STATE PLAN

Statements in the Interim Plan about providing the necessary road funding to move people and goods efficiently, and in the process reduce congestion, is laudable. In the State Development and Redevelopment Plan, renewed emphasis should be placed on the goals of the federal Clean Air Act, especially as they relate to potential transportation mode shifts in favor of public transportation.

PART IB

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IMPACTS ON TRANSIT INFRASTRUCTURE

SUPPLEMENTAL INFRASTRUCTURE ASSESSMENT: PART IB — IMPACTS ON TRANSIT INFRASTRUCTURE

ORIGINAL ASSESSMENT FINDINGS

TRANSIT DEMAND: ***Overall, IPLAN and TREND have negligible differences from 1990 to 2010 in transit opportunities (i.e., those communities with requisite densities for four different transit modes).***

SUPPLEMENTAL ASSESSMENT FINDINGS

TRANSIT DEMAND: ***AIPLAN and TREND also have negligible differences from 1990 to 2010 in transit opportunities. Both have very small gains or losses in the four different modes.***

— TRANSIT—
COMPARATIVE IMPACT ASSESSMENT DIFFERENCES
(STATEWIDE — 1990–2010)

NEW FUTURE TRANSIT OPPORTUNITIES	TREND CONDITIONS	IPLAN ORIGINAL ASSESSMENT	AIPLAN SUPPLEMENTAL ASSESSMENT
INCREASES IN OPPORTUNITIES	50	47	52
Local Bus (moderate level)	4	12	13
Local Bus (low level)	8	9	5
Express Bus	15	11	14
Commuter Rail	23	15	20
Difference from TREND	—	–3	+2
Local Bus (moderate level)	—	+8	+9
Local Bus (low level)	—	+1	–3
Express Bus	—	–4	–1
Commuter Rail	—	–8	–3

The major difference between IPLAN and AIPLAN is that AIPLAN distributes residential development somewhat differently from IPLAN; this reflects some further

redistribution of growth from environs to Centers, especially to suburban and rural Regional Centers. These locations, over the initial twenty-year development period, may not have the existing community-wide densities to support transit development.

GENERAL QUESTIONS ASKED/ANSWERS PROVIDED

The major questions raised concerning the CUPR Transit Model involved the linkage between projected propensities based upon densities to available funding satisfying those transit needs, and the efficacy of the Model itself. Obviously, the Model does not address issues such as the probable continuance of federal and State public sector subsidies, nor does it attempt to gauge the general public's sentiments regarding transportation infrastructure funding. Further, truly comprehensive transit modeling is far beyond the scope of this project. At best, given the information available to CUPR, the transit propensity approach is the most appropriate. Further, it is agreed that the CUPR Road Model assumes no modal shift between TREND and IPLAN/AIPLAN scenarios. In the absence of any information on significant additional transit subsidies, no model should forecast this type of change in transportation choice.

Encouraging requisite densities for enhanced transit access is only the first step in establishing transit supply and demand. In the long run, both altering established land-use patterns and increasing density in central locations will enable transit to be more viable. If energy prices increase significantly, air quality continues to be a serious problem, and general environmental awareness remains high, then fostering transit through more carefully arranged land-use patterns may become an even higher priority statewide goal.

MONITORING/EVALUATION RECOMMENDATIONS

For an integrated planning approach, an extensive statewide model of transit projections should be developed. The possibility for mode changes must be included in this model to be consistent with the requirements of the federal Clean Air Act Amendments of 1990.

DESIRABLE CHANGES TO BE INCORPORATED INTO THE STATE PLAN

The State Development and Redevelopment Plan should place more emphasis on the need for transit infrastructure in New Jersey, both for non-choice riders and as a more attractive alternative for those who currently choose to ride. Increasing the availability of transit to all residents, and especially those most in need, should be a cornerstone of New Jersey's future transportation policy.

PART II A AND B

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IMPACTS ON WATER AND SEWER INFRASTRUCTURE/ INFRASTRUCTURE DEMAND AND COST

SUPPLEMENTAL INFRASTRUCTURE ASSESSMENT: PART II A AND B — IMPACTS ON WATER AND SEWER INFRASTRUCTURE/ INFRASTRUCTURE DEMAND AND COST

ORIGINAL ASSESSMENT FINDINGS

WATER AND SEWER DEMAND: *IPLAN requires four percent less water demand and essentially the same sewer demand as TREND.*

WATER AND SEWER COSTS: *IPLAN costs about $60 million less in water and $380 million less in sewer infrastructure costs.*

SUPPLEMENTAL ASSESSMENT FINDINGS

WATER AND SEWER DEMAND: *AIPLAN requires 3.5 percent less water demand than TREND and about the same sewer demand as TREND. AIPLAN's results are almost identical to those of IPLAN.*

WATER AND SEWER COSTS: *AIPLAN costs about $85 million less than TREND in water and $480 million less in sewer infrastructure costs.*

— WATER/SEWER INFRASTRUCTURE DEMAND/COST — COMPARATIVE IMPACT ASSESSMENT DIFFERENCES (STATEWIDE — 1990–2010)

– GALLONAGE – – DOLLAR CHANGE –	TREND CONDITIONS	IPLAN ORIGINAL ASSESSMENT	AIPLAN SUPPLEMENTAL ASSESSMENT
Change in Water Demand [1]	60.13	57.52	58.03
Change in Sewer Demand [1]	46.10	46.69	46.69
Water Infrastructure Costs [2]	$ 634.3	$ 573.3	$ 549.6
Sewer Infrastructure Costs [2]	$6,790.4	$6,411.1	$6,312.6
Difference from TREND			
Change in Water Demand [1]	—	– 2.61	– 2.10
Change in Sewer Demand [1]	—	+ 0.59	+ 0.59
Water Infrastructure Costs [2]	—	– $ 61.0	– $ 84.7
Sewer Infrastructure Costs [2]	—	– $379.3	– $477.8

[1] in millions of gallons per day
[2] in millions of dollars

GENERAL QUESTIONS ASKED/ANSWERS PROVIDED

During the review and public presentation of the original Impact Assessment, several questions arose related to the water and sewer demand methodology and findings. There was general acceptance of the differences in demand and variations in outdoor water use found between development under TREND and IPLAN. It was suggested that testing the Water Demand Model with varying outdoor water-use assumptions would benefit public discussion by showing a range of possible outcomes.

Questions on the analysis of water and sewer infrastructure costs focused on the difference in costs between urban and nonurban areas, the costs of rebuilding urban infrastructure and servicing increased densities, the costs of bringing existing sewer facilities up to the standards required by the Clean Water Act, and whether the capacity of existing infrastructure had been taken into consideration in the analysis. Because the Sewer Infrastructure Model is based on a rich data set compiled by the New Jersey Department of Environmental Protection and Energy (NJDEPE) containing detailed information about existing sewer facilities, areas served, capacity, and estimates of existing and future needs and costs, and incorporates methods approved by the United States Environmental Protection Agency, the analysis dealt with all of the issues raised in these questions.

A similar data set on water facilities from purveyors is available from NJDEPE, but since it has not been been broken down by municipality, it could not be used in this analysis. More assumptions, therefore, had to be made in estimating water infrastructure costs. However, a differential reflecting expected cost variations in the State was included in the model. In addition, the number of hookups to serve development in areas where infrastructure systems are expected to exist is overestimated in order to arrive at cost estimates that would include rehabilitation.

MONITORING/EVALUATION RECOMMENDATIONS

The Office of State Planning should continue to construct a water model similar to the sewer model. Time and resource constraints did not permit the research team to embark on this effort, but it would be a valuable tool for use in monitoring. NJDEPE has data on water use, system capacity, facility needs, and other information from water purveyors in the State, but the data need to be evaluated and assigned to municipalities. The availability of this site-specific information on a municipal basis would facilitate planning. A major advantage in being able, for example, to link water supply with areas served would be the ability to test different development scenarios for their effect on the water supply.

DESIRABLE CHANGES TO BE INCORPORATED INTO THE STATE PLAN

The State Development and Redevelopment Plan's goals of conserving natural resources and directing development to areas with existing infrastructure ideally work together to ensure adequate resources for the future and more efficient and cost-effective development. However, wherever facilities are near capacity, development will trigger much higher infrastructure costs than might be expected. The specific location of development must be evaluated on a case-by-case basis in order to optimize its impact on water and sewer infrastructure needs and resultant costs.

PART III

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IMPACTS ON SCHOOL CAPITAL FACILITIES

SUPPLEMENTAL INFRASTRUCTURE ASSESSMENT: PART III — IMPACTS ON SCHOOL CAPITAL FACILITIES

ORIGINAL ASSESSMENT FINDINGS

FUTURE GROSS SCHOOL CAPITAL NEEDS:

For both TREND and IPLAN there is a total gross need (before excess capacity is drawn upon) of 365,000 pupil spaces.

EXCESS CAPACITY:

Excess capacity is distributed across many different school districts in the State—urban, suburban, and rural. There is an almost similar ability to capitalize on excess capacity for both TREND and IPLAN.

FUTURE NET SCHOOL CAPITAL NEEDS AND COSTS:

After factoring excess capacity, the 1990–2010 future school capital need under TREND is 288,000 pupil spaces; for IPLAN the need is a somewhat lower 278,000 pupil spaces. To satisfy this need, $5.296 billion will have to be incurred over the period 1990 to 2010 under TREND versus an almost similar $5.115 billion under IPLAN. IPLAN development thus affords a small savings of just under $200 million ($181 million) relative to TREND.

SUPPLEMENTAL ASSESSMENT FINDINGS

FUTURE GROSS SCHOOL CAPITAL NEEDS/EXCESS CAPACITY:

These parameters do not change in the Supplemental Impact Assessment. The AIPLAN does not revise the State's overall population change from IPLAN. Therefore the future gross school capital needs, which are population driven, remain the same. With respect to excess capacity, this measure is based on the 1990 relationship between the adequacy of the school physical plant and enrollment. This is not affected by the AIPLAN changes and so the original estimate of excess capacity remains.

FUTURE NET SCHOOL CAPITAL NEEDS AND COSTS:

After factoring excess capacity, the 1990–2010 future school capital need under AIPLAN is 279,000 pupil spaces with an attendant capital cost of $5.123 billion. AIPLAN development thus retains a small savings ($173 million) relative to TREND.

— SCHOOL CAPITAL FACILITIES —
COMPARATIVE IMPACT ASSESSMENT DIFFERENCES
(STATEWIDE — 1990–2010)

SCHOOL CAPITAL NEEDS AND COSTS	TREND CONDITIONS	IPLAN ORIGINAL ASSESSMENT	AIPLAN SUPPLEMENTAL ASSESSMENT
Gross School Capital Needs [1]	365	365	365
Net School Capital Needs [1]	288	278	279
School Capital Cost [2]	$5,296	$5,115	$5,123
Difference from TREND			
Net School Capital Needs [1]	—	– 10	– 9
School Capital Cost [2]	—	– $181	– $173

[1] in thousands of pupil spaces

[2] in millions of dollars

GENERAL QUESTIONS ASKED/ANSWERS PROVIDED

The main questions asked with regard to school capital facilities concerned the identification of excess capacity and the sensitivity to higher urban school costs.

The State Plan Impact Assessment used the best source available for measuring school capacity: local determinations. A 1990 survey had been conducted of all school districts in New Jersey where enrollment was related to each district's identified level of capacity. These survey results are incorporated in the Impact Assessment. Thus, excess capacity is used where local school officials indicate that their district's physical plant could accommodate additional pupils.

With respect to the remaining question, that concerning the accurate determination of urban school capital costs, the State Plan Impact Assessment had several factors that allowed needs and costs to vary by location. First, if urban areas had a larger starting need for schools, this deficiency would be incorporated into the analysis using the local survey of school capacity. Second, the cost parameters applied in the assessment as a general rule built in higher costs for urban schools (i.e., land improvement and construction costs per square foot were set 10 to 20 percent higher for urban locations).

MONITORING/EVALUATION RECOMMENDATIONS

School costs can be lowered by encouraging the regionalization of school districts. Additionally, within a given district, certain design approaches are more efficient than others (i.e., building one 600-pupil elementary school as opposed to two smaller-sized facilities). It is likely that in the future some of these economies could be achieved under the State Plan because intergovernmental cooperation is encouraged in this document and somewhat larger schools might be built to accommodate the increase in population in Centers. These potential economies should be monitored to determine whether there is both an appetite and willingness on the part of the general public for different approaches to providing the capital needs for school children.

DESIRABLE CHANGES TO BE INCORPORATED INTO THE STATE PLAN

By all calculations, New Jersey faces a multi-billion dollar future school capital cost. The land-use and intergovernmental policies mentioned above that can provide for school capital savings should be emphasized in the State Development and Redevelopment Plan.