Proposed Traffic Solution for Route 18 in New Brunswick

80 Lake Avenue
Watchung, NJ 07069

February 26, 2007

Joseph Cooney
P.O. Box 7113
Watchung, NJ 07069

Dear Mr. Cooney,

The mission statement of the New Jersey Planning Officials is to "to promote public interest in municipal and regional planning; to foster the cooperation of planning boards and boards of adjustment throughout New Jersey in furthering the aims of planning; to assist local planning boards and boards of adjustment with advice; and to encourage the development of regional, county and state planning as an aid to local planning" (qtd. http://njpo.org/about.htm). Route Eighteen in New Brunswick has a traffic congestion problem at peak hours due to the flood of traffic that needs to access the New Jersey Turnpike. The New Jersey Planning Officials would be needed to help the local and county planning boards with the proposal and execution of my plans to help limit the congestion on Route 18. Route 18 and the New Jersey Turnpike are state roads so I chose to propose my plan to you because you are the state level planning board and would be able to assist the local municipality of New Brunswick with the project. My proposal is to add a new on ramp and off ramp to the New Jersey Turnpike above exit 9 at county route 514.

Problem

Route 18 is able to handle the traffic loads that it is presented during off peak hours, but when it hits peak hours the number of cars that use the road cause congestion outside of the city of New Brunswick. This is mainly due to people using the Turnpike coming from New Brunswick. Using line graphs from the New Jersey Department of Transportation it shows that at the intersection of route 18 and route 27 outside of the city of New Brunswick the traffic volume for both ways on route 18 on average is 84,856 cars every 12 hours (http://www.state.nj.us/transportation/efidata/sldia/00000018__-pdf). When this is looked at you divide that by two and get that there is roughly 42,428 cars going each way every half day. For a four lane highway, with two lanes going in either direction every hour would be two thousand cars every hour (Pignataro 186). However, taking that 42,428 and dividing by 12 so that we get how many cars are using route 18 every hour we get 3536 cars every hour. An unstable flow is defined as 3600 cars every hour (Pignataro 186). That means the flow coming down Route 18 is approaching an unstable flow outside the city of New Brunswick. Ideally, we would want to have a stable flow on route 18 which is 2,000 cars going either way at any given time during every hour (Pignataro 180). To do
Before the New Jersey Turnpike the straight line diagrams provided show that there is a total traffic volume of 96,128 cars for every twelve hours (http://www.state.nj.us/transportation/refdata/sldiag/00000018--.pdf). After converting this to traffic volume for every hour we get a flow of 4,005 cars every hour which is substantially higher than the 2,000 cars an hour which is a stable flow (Pignataro 180). This is designated an unstable flow because an unstable flow is defined as 4,000 cars every hour on a four lane highway (Pignataro 186). This is a major traffic congestion issue because it is too small of a highway to handle this amount of traffic flow. A six lane highway would be the highway needed to handle this much traffic. A six lane highway does not reach an unstable flow until 6000 cars are flowing down it every hour (Pignataro 186). A stable flow rate for a six lane highway is 4,000 cars every hour which is about what is faced by route 18 near the New Jersey Turnpike presently (Pignataro 180). Broadening route 18 to three lanes in either direction however, would be an expensive procedure to go through and would hurt route 18 congestion during its construction.

Most of this traffic is being directed from the city onto route 18. This can be shown by the same straight line diagram used to retrieve the data used for the original traffic volume at the intersection of route 27 and route 18. Farther up route 18 above the exit for George Street there is a total traffic volume of 41,947 (http://www.state.nj.us/transportation/refdata/sldiag/00000018--.pdf.) This shows that at this point after cutting the volume down to how many cars an hour that there are only 1,747 cars an hour passing this point. That means that there are 1,789 more cars entering route 18 between George Street and the intersection of route 27 and route 18. This is a substantial traffic volume increase. At the point where the George Street exit meets route 18 we are under the 2,000 limit of a stable flow (Pignataro 180). That means that the flow of traffic becomes unstable between this point and the intersection of route 27 and route 18. We would have to find a way to divert this traffic volume increase coming out of the city of New Brunswick because this is where most of the problem is occurring.

Farther down the stream of traffic using route 18 at the point where Race Track Road intersects Route 18 there is a decrease in traffic also. Using the same straight line graph as used before it shows that there is only a total traffic volume of 56,800 cars using route 18 every twelve hours (http://www.state.nj.us/transportation/refdata/sldiag/00000018--.pdf.) After converting this to traffic volume per hour we get 2,366 cars passing this point every hour on route 18. Compared to the intersection of route 27 and route 18 traffic volume of 3,536 cars every hour we lose over a thousand cars between that point and this one. The exact number is 1170 which is a substantial traffic flow to be lost over roughly six miles. Most of this is due to the New Jersey Turnpike exit being placed between these two points. That means that finding an alternative route to the New Jersey Turnpike could theoretically reduce the traffic volume substantially by 1170 cars every hour and by 14,040 every twelve hours. This would be a good way to cut down on congestion on route 18 being that 2000 cars an hour is already a stable flow in itself and 1170 would be almost like losing a stable flow of traffic to other roads in the area (Pignataro 180).
This set of data and information provided by the New Jersey Department of Transportation clearly shows that the majority of the traffic volume is concentrated to and from the city of New Brunswick and following down route 18 till the exit of the New Jersey Turnpike. The heavier congestion is shown from the intersection of route 27 and route 18 and till the Turnpike. That means that a heavy amount of the traffic is involved with the New Jersey Turnpike exit along route 18 outside of the city of New Brunswick. Therefore, to solve the congestion problem we would have to address the majority of the traffic flowing from the city to the Turnpike.

Models of Success

Bypasses and rerouting have been used in previous traffic congestion problems in order to limit the amount of cars on any given congested highway. Around Manassas, Virginia traffic was a problem in the city due to it being a major town in northern Virginia. Newspapers from this town discussed a traffic problem and the effect that a new road used as a bypass helped the traffic. The newspaper stated that traffic on the new Route 234 Bypass west of Manassas has nearly doubled since the road opened a year ago, helping funnel vehicles from clogged thoroughfares elsewhere in the city and the county, according to recent surveys (qtd. in Dan Eggen). This is an example how a bypass to a major road can help relieve congestion by diverting traffic and spreading it out across the roads in an area.

Plan

Your job as New Jersey Planning Officials is to help municipalities and county planning offices with future construction jobs. Since this job is more of a state level planning job due to its involvement with the New Jersey Turnpike and New Jersey's route 18 it would be more of your level of planning then the county of Middlesex or the municipality of New Brunswick alone. I am proposing a rerouting and solution to the traffic congestion around the city of New Brunswick on route 18 and you could aide the municipality and county with planning and zoning that is needed in the construction to solve the problem that is evident on route 18.

The plan for relieving traffic from the intersection of route 27 and route 18 all the way down to the exit for the New Jersey Turnpike will be to redirect a volume of this traffic along a different route to get to the turnpike at another location. Since so much of this traffic volume is coming from the city at route 27 onto route 18 the logical thing to do would be to direct the traffic from this point on route 18. This would take care of 1,789 of the cars that are entering route 18 found out from the NJDOT data (http://www.state.nj.us/transportation/refdata/sldiag/00000018--.pdf). Route 27 connects to county road 514 with a current traffic volume of 14,799 cars traveling every twelve hours (http://www.state.nj.us/transportation/refdata/sldiag/00000514--.pdf). Since the flow of traffic is 352 cars an hour on county road 514 which is well below the stable flow rate of 2,000 cars an hour it can accommodate the traffic redirected onto it (Pignataro 180).
Directing traffic onto county road 514 would cut the traffic volume on route 18 down roughly 1,000 cars an hour. This would place the traffic volume at roughly 2,500 cars traveling down route 18 every hour one way making it a little over the stable flow rate of 2,000 cars for a four lane highway (Pignataro 180). This would greatly reduce the congestion experienced on route 18 because it is not as close to an unstable flow of 3600 cars an hour (Pignataro 186).

The second part to this proposal would be to build a new on ramp for the New Jersey Turnpike between exits nine and ten. Since around 1,170 cars are lost to the New Jersey Turnpike every hour on route 18 according to the New Jersey Department of Transportation straight line diagrams having this alternate entrance to the Turnpike would entice people to take this alternate route on county road 514 (http://www.state.nj.us/transportation/reldata/sldia/00000018__.pdf). The new route and ramp would benefit people going north on the Turnpike, while solving traffic issues on route 18. People going north on the Turnpike would benefit because it would replace traveling down route 18 then back up and instead cut straight across route 27 to CR 514 and to the Turnpike. This would bring traffic from route 18 to CR 514 with the new ramp and Turnpike entrance making it possible.

Other then just the ramp design we have to take the installation of tolls and buildings for the collection of money for the New Jersey Turnpike. Also the planning officials would have to look at and consider access requirements for maintenance and rehabilitation in all aspects of highway location and design? (http://www.usroads.com/journals/p/rej/9711/re971104.htm). Other then that all the specific road requirements must be met for the New Jersey Department of Transportation. The New Jersey Department of Transportation would have jurisdiction over a job such as this because they maintain all aspects of the New Jersey Turnpike including maintenance and planning. They also maintain data from county road 514 and route 27 so their specifications and concerns must be addressed when completing this proposal.

I hope you will take a look at the proposed solution that will solve the traffic congestion problem on route 18 outside of New Brunswick. This proposal will greatly affect the traffic use of route 18 and help people of the surrounding are reach the New Jersey Turnpike in a quicker fashion. Your help in the planning of this major project would be greatly appreciated. If you have questions or need any details regarding my data made more clear I can be reached at [email protected] or be reached via email at [email protected].

Thank you for your time.

Sincerely,


Visuals
graphs/charts of data
line graphs or diagrams
or screen-shots

Maps
schedule of work
pic of best practice
highway ramp
construction (and/or method of)

Budget pre-plant
your ramp diagram with
dimensions

Your logic is very good
but please don't show
me the full of

your reasoning of each decision is
preferable.

Please don't write
"we"

You have a few sentences
of paradox 1 and it is
embedded in your plan
And you have about 2 pages
of quantification of the
problem. You should
pull out that paradox
and expand it for your
project proposal
and condense your
quantification. Include
other discussion of the
problems of traffic
congestion in general