Analysis of Alternative Funding Sources

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Summary of Findings

Given the available information currently accessible to UTRC, we have estimated that there is the likelihood of an $8 billion shortfall in the revenue available to fund the 5 year NYSDOT Capital Plan presented for 2010-2014 equating to an approximate shortfall of $1.7 billion annually. NYRIC has requested UTRC analyze a variety of possible funding sources which could provide revenue support to NYSDOT's capital plan. We have presented potential alternative funding sources as individual mechanisms. Within the body of our report there exists an in-depth and thorough explanation of principles, assumptions, concepts, analyses and thought processes that reinforce the development of our findings. Please refer to each section of our report for explanations and rationale of individual revenue streams. Our findings should in no way be interpreted as advocacy for any particular policy or mechanism, but rather as an assessment of possible alternatives.

We have presented our findings both qualitatively and quantitatively. Highlight Table 1 presents a matrix arraying funding mechanisms and the likelihood of those mechanisms meeting certain objectives, such as equity, stability and matching users with benefits. Highlight Table 2 presents our research quantitatively and offers revenue currently collected by NY State and by what measure the revenue source is derived from, including per mile traveled, per gallon sold and per pound of CO2 generated. These tables can be utilized by NYRIC in multiple ways in order to develop various scenarios to answer such policy questions as the following: What is the mechanism which will generate the most dollars? What mechanism would be the most stable in an uncertain economy? Or even, what mechanism could be applied almost immediately with the least amount of administrative/start up costs? Highlight Table 3 creates examples, where applicable and available, as to what level of increase would be needed to generate new revenue of approximately $1.7 billion annually. Again, it is not UTRCs position to advocate for any one mechanism but simply to provide insight into levels required. This table could also be employed to develop numerous funding scenarios. For instance, NYRIC can measure, sort and rank different revenue sources or combination of sources which could be employed to meet the NYSDOT's capital plan shortfalls. Our tables are presented below.

ANALYSIS of ALTERNATIVE FUNDING SOURCES

UTRC HIGHLIGHT TABLE 1 - Revenue Source Rating by Objectives

Objectives

Revenue Source	Adm. Cost	Potential New Revenue	Equity	Evasion Rate	Stability	Matching User/Benefit	Comments
Fuel Tax	Very low	Moderate	Regressive	Very low	Moderate to high	Clear match	Could tie to rate of inflation, also fuel economies
Tolling	High 14-22% of Revenue	Variable might need to redesign overall tolling	Variable, depends on transport alternatives	Moderate	Variable, heavily used facilities greater stability	Depends upon amount of revenue diversion to other uses.	Issues with regional competitiveness and economic outcomes
VMT	Very high, high start-up costs	Very high once fully implemented	Mixed	Variable, though declining when fully implemented	Variable	Potentially very high	Technology is not a fully developed or tested. Not deployed yet in the United States.
Vehicle Registration	Moderate to high	Relatively small given size of revenue base	Low	Very low	High	Moderate	Low administrative cost if added to existing fees
Licensing Fee	Moderate to high	Relatively small given size of revenue base	Low	Very Low	High	Moderate	Low administrative cost if added to existing fees
PPP	Highly variable		Highly variable	Highly variable	Highly variable	Highly variable and deal. Specific	

Revenue Source	Adm. Cost	Potential New Revenue	Equity	Evasion Rate	Stability	Matching User/Benefit	Comments
Bonds	Not applicable		Not applicable	Not applicable	Varies according to revenue stream	Variable	Not a new revenue source – a financing mechanism. Need revenue source to support, limited by state or agency debt load
Local Options Sales Tax	Need to Assess on Individual Project Basis						Most appropriate for funding local projects
Green Taxes	Variable depending on tax mechanism	Very high	Low	Variable	Variable	Very high, beneficial social costs	Depends upon behavioral change
Freight Weight Fees	Relatively high	Modest	Relatively high if properly designed	Very high	Relatively stable	Theoretically	Increased collections from existing potential tax base reasonably large
Dedicated payroll Taxes	Incrementally minimal	Potentially high	Tending toward Progressivity	Potentially high as base expands	Uneven and highly procyclical	Very low	Up in up economy, down in down economy
Capital Gains Tax	Incrementally low	Uneven due to procyclicality	Relatively progressive	Potentially very high	Highly procyclical	Low	Potentially high revenue

ANALYSIS of ALTERNATIVE FUNDING SOURCES

UTRC HIGHLIGHT TABLE 2 New York State Revenue Sources Overview

30-Dec-09

Highway and Transportation Funding

Revenue Source	Current Revenue ($ Millions)		Current Fees Per Unit ($)		Measure Charged	Total Measures (Millions)	Potential Charge ($)	Expected Revenue ($ Millions)
Registration Fee	$ 748.0		$69.92	(1)	Registrations	10.7	$1.00	$ 10.7
Drivers License Fee	$ 602.0	(2)	$53.35	(1)	Licenses	11.3	$1.00	$ 11.3
Motor Fuel Excise Tax (2008)	$ 524.9		$ 0.08		Gallons	6,579.5	$0.01	$ 65.8
						2007		
VMT (2007)	N/A		N/A		Miles	136,740.0	$0.01	$1,367.4
Petroleum Business Tax	$ 1,154.7		$ 0.18		Gallons	6,579.5	$0.01	$ 65.8
Sales Tax on Motor Fuels	$ 947.3		$ 0.14		Gallons	6,579.5	$0.01	$ 65.8
Tolls	$ 1,987.1		Varies		Trips or Miles	Specific Routes	N/A	N/A
State Income Taxes (2008)	$36,563.9		4.60%		Income ($)	$794,274.0	N/A	N/A
Super High Income Tax (400K+)					Income 400K+	$38,328.4	1%	$ 383.2
Highway Use Tax	$ 147.9		Increased		Varies	Varies	50% Increase	$ 147.9
Truck Mileage Tax	111.9		Enforcement		Truck Mileage		in Revenue from	
Vehicle Permits	2.4				Truck Count		Higher enforcement	
Fuel Use	33.7				Truck Fuel Use			
Waste Tire Fee	26.8		$2.50		Tires Sold	10.7	$1.00	$ 10.7
Carbon Tax	0		0		Pounds CO2	130,677.6	$0.01	$1,306.8

(1) average fee
(2) Net of combined DMV Revenue

ANALYSIS of ALTERNATIVE FUNDING SOURCES

UTRC HIGHLIGHT TABLE 3
Examples of levels of new Charges Needed to Generate Revenue of approximately $1.7 billion/annually

Revenue Mechanism	Simple Additional Charge	Measure charged		Potential Revenue Applying Simple Charge (in millions)	Approx.Additional Charge Needed to reach $1.7 B annually	Potential New Gross Revenue (in billlions)
Fuel Tax	.01/gallon to any segment	6,579,515,000	gallons taxed in 2008	$65.8	$0.27	**$1.78**
Tolls	$1.00/MTA tolls	304,240,000	tolls collected in 2007	$304.2	$5.50	**$1.67**
VMT	.01/mile	136,740,000,000	vmt implied in 2006	$1,367.4	$0.013	**$1.78**
Registration	$1.00 additional	10,697,644	vehicles registered in 2008	$10.7	$165.00	**$1.77**
License	$1.00 additional	11,284,546	licenses in 2008	$11.3	$155.00	**$1.75**
Green Fee/Carbon Tax	.01/pound of CO2	130,677,635,468	est. CO2 Lbs 2007	$1,306.8	$0.013	**$1.70**

ASSESSING OPTIONS FOR FUTURE TRANSPORTATION FUNDING
ANALYSIS of ALTERNATE FUNDING SOURCES
Executive Summary

Introduction

The New York State Department of Transportation's Capital Program for 2010-2015 which was released on October 8, 2009 reports a $25.8 billion program. Highlights listed in that document include:

- $12.0 billion in State highway construction
- $2.4 billion for local roads programs such as Consolidated Local Highway Improvement Program (CHIPS) and Municipal Streets and Highway Program (Marchiselli)
- $2.2 billion in federal aid for local transportation
- $340 million for upstate and suburban transit
- $300 million to implement the State's high-speed rail initiative
- $300 million to address critical local road and bridge needs
- $101 million for airports
- $25 million for an initiative to support local Smart Growth and land-use planning

At this time, it is unclear where this funding will come from; Governor Paterson also issued a press release on that day that said, "Unfortunately this plan, and the plan the MTA submitted on October 1, are simply unaffordable given New York's current fiscal condition. I will not agree to raise taxes, which would be required to fund these plans, as Congress has not renewed the federal multi-year transportation program and State revenues continue to decline."

The University Transportation Research Center's (UTRC) client, the New York Road Improvement Coalition (NYRIC), requested a study to assess potential revenue streams along with an estimate of dollars that could be raised by each source. They plan to discuss these findings with legislative staff and recommend a course of action. UTRC's findings in this report, however, should not be viewed as advocacy for any particular policy, but rather as an assessment of a variety of alternative funding mechanisms with clear explanation of how the estimates were derived.

In most cases the revenue estimates are reported as an estimate of net increase in revenue or how much one unit of measure, i.e. a $1 increase in a fee, will add to the revenue collection after accounting for costs of collection. In addition to revenue generated, we evaluated the sources according to additional criteria: administrative costs, social equity, evasion rate, stability, and matching fees to user benefit. In several cases such as with the fuel tax, toll collection and registration and licensing fees, comparisons are made between the percentage collected in New York State and other states and/or with a national average. If possible, explanations are provided to explain significant differences between New York and other states both in terms of amount of fee collected or in how these collections are expended within the State budget. For example, New York State has a very high collection of toll fees compared with other states, but a

significant portion collected downstate from MTA Bridges and Tunnels and Port Authority facilities are used to fund mass transit expenses, which probably does not occur in other states or at least to the extent that occurs in New York. It is necessary to take these facts into account when evaluating whether it would be feasible to rely on increased tolling in New York.

When deciding which sources would be more appropriate, it is important to look at the sources with the most desirable objectives. Ideally, a source with the least administrative costs that is the most equitable with a high user match, and not regressive would be best. In addition, impact on transportation performance, i.e. reduced congestion, would also be a useful determinant.

Estimates of Potential Alternative Revenue Sources

This Study was requested primarily to estimate additional revenue that could be raised either through the implementation of new revenue sources or an increase in existing sources. This section will discuss and provide estimates for the revenue sources that were highlighted in Table 2 on page 8: fuel tax, tolls, vehicle mileage tax, vehicle registration fees, license fees, private investment, bonding, local options sales tax, green taxes and fees, freight weight taxes, dedicated taxes, high income tax, and capital gains tax.

I- Fuel Taxes

	Current Revenue (2008)	Current Fees Per Unit	Measure Charged	Total Measures	Potential Charge ($)	Expected Increased Revenue
Motor Fuel Excise Tax	$524.9 M	$ 0.08	Gallons	6579.5 M	$ 0.01	$ 65.8 M
PBT	$1,154.7 M	$ 0.18	Gallons	6,579.5 M	$ 0.01	$ 65.8 M
Sales Tax	$947.3 M	$ 0.14	Gallons	6,579.5 M	$ 0.01	$ 65.8 M

Fuel taxation has a long history of providing funding for the road network in the United States. The taxation of motor fuel has been proposed for a number of reasons. In particular, the revenue has been collected to provide for the provision of highways and local roads. The tax has a number of desirable qualities including a low cost of collection, difficulty in evasion and it also provides incentive to utilize fuel efficient vehicles.

The method of collection for these taxes depends on which tax is involved and whether the product is gasoline or diesel fuel. For gasoline sales and diesel sales, the federal fuel tax is charged at the rack (refinery or initial point of importation into the State) and remitted to the Internal Revenue Service. For gasoline, the state motor fuel tax and the state petroleum business tax are charged by the distributor of the fuel in New York State upon delivery to a retail gas station. The state sales tax is applied at the final retail sales point of the fuel. For diesel fuels, the

"Nozzle Rule" applies if fuel is delivered to a dispensing location that can fill a vehicle with fuel. In this instance, the diesel motor fuel excise tax, the petroleum business tax and the sales tax must be charged on delivery by the distributor.

This tax base currently yields approximately the following revenue for the State of New York and the Federal Government:

	Tax Per Gallon	**2008 NYS Revenue**
NYS Motor Fuel Tax	8.0 cents	$ 540,207,800
NYS Petroleum Business Tax	17.1 cents	$ 1,154,694,172
Capped Sales Tax on Gasoline	14.398 cents	$ 947,347,815
Federal Fuel Tax	18.4 cents	$ 1,242,477,940
Total Taxes on Fuel		$ 3,884,727,727

As already noted on UTRC Highlight Table 2 (page 8), a one cent increase per gallon of fuel would obtain an approximate increase in net revenue of $65.8 million either in the motor fuel tax or in the petroleum business tax. Revenues would still be collected from the sales tax, though it is unclear how much, if any, of the sales tax is devoted to highway and bridge improvements in New York State. Another important issue in terms of revenue from fuel taxes that is discussed below is the concept of indexing to account for inflation and fuel economy particularly since the current State motor fuel tax of 8.0 cents per gallon has not been increased since 1972**.**

In order to ensure steady levels of fuel tax revenue against losses as inflation grows and fuel efficiency increases, the following tax indices could be instituted:

Consumer Price Index (CPI): Fuel tax increases should be linked to the level of annual inflation as measured by the Consumer Price Index, currently approximately 2.88% per year.

Fuel Economy: The fuel tax could also be linked to improvements in fuel economy so that the number of dollars generated by sales of fuel does not drop as miles per gallon increases. Approximately a 0.50% increase in the states' tax rate would offset this change.

The combined effect of these two adjustments would increase the state fuel tax rate by 3.4% per year. This would result in the tax increasing from 8 cents a gallon to 8.27 cents per gallon in 2010.

The state may wish to consider indexing the Petroleum Business Tax as well to maintain the purchasing power of that revenue stream. By indexing either of these measures we could ensure a stable stream of revenue from the fuel/petroleum taxes for at least the next 10-20 years.

By increasing the tax to reflect the inflationary losses that have occurred **since the fuel tax was last increased in 1972**, we would restore the full value of the fuel tax funds. Based upon the Consumer Price Index changes from 1972 to 2009, this would create 1.502 billion dollars in additional funding for highways, bridges & transit. The fuel tax would be increased from 8 cents to 30.25 cents per gallon in 2009 under this plan.

It is also important to note that fuel taxes in New York State are much weaker on a per capita basis as compared to other states due to the significant number of mass transit riders – some that use their cars less than the national average per day and many who do not own or drive vehicles.

II- Tolls

Current Revenue	Current Fees Per Unit	Measure Charged	Total Measures	Potential Charge	Expected Increased Revenue
$ 1,987.1 M	Varies	Trip or Miles	Specific Routes	N/A	N/A

Tolls currently provide 5% of the Nation's transportation funding – Fuel and Vehicle taxes provide 53% with General Fund 14% and Bonds 11%. Many times tolls are called a user fee – or a tax. The northeastern states remain the center of toll collection in the United States, with 49.02% of the nation's toll dollars collected in the three Mid-Atlantic States of New York, New Jersey & Pennsylvania. (Federal Highway Administration) Roughly 30% NYS, 11% NJ and 8% PA.

Revenues generated from increases in tolls are reliant on the link taxed, i.e.: roadway or bridge, and the volume of vehicles traveling on or through those links. For example, an increase of $1.00 on the MTA tolls would yield an additional $304 million annually. A $1 toll levied at a single point on the Long Island Expressway could yield an increase of $73 million.

The potential to toll the East River and Harlem River Bridges has been discussed by the Ravitch Commission and it offers the opportunity for significant revenue generation. One concern with all new toll road/bridge proposals that should be evaluated is whether the imposition of tolls on a facility impacts the availability of federal highway funds for maintenance and capital expenditures.

III - Vehicle-Miles Traveled (VMT) Charge

Current Revenue (2007)	Current Fees Per Unit	Measure Charged	Total Measures	Potential Charge ($)	Expected Increased Revenue
N/A	N/A	Miles	136,740 M	$0.01	$1, 367.4 M

Currently, NY State does not tax or charge a fee based on an individual vehicle and the miles that vehicle travels. The concept of charging per vehicle mile traveled or VMT has been explored in other states and we have based our estimates of revenues and costs on these tests. While taxing VMTs could bring about large revenue streams, the capital cost for deployment of the system is also high. An initial capital investment of $1.4 billion is estimated. After the sixth year of such a system, from a charge of $0.01/mile for actual vehicle miles traveled of 136.7 billion, based on 2007 miles traveled, gross revenue of $1.4 billion is estimated. The net revenues based on almost an 18% cost to administer the program would be $1.1 billion.

When compared to other states, New York has the lowest VMT per capita. This is due to the significant use of mass transit, particularly in the heavily populated downstate region.

IV - Vehicle Registration Fees

Current Revenue	Current Fees Per Unit ($)	Measure Charged	Total Measures	Potential Charge ($)	Expected Increased Revenue
$748.0 M	$69.92	Registrations	10.7 M	$1.00	$10.7 M

Increasing vehicle registration fees by $1.00 in the state would lead to additional revenue of $10.7 million per year based on the 10.7 million vehicles registered in the state in 2008. The net revenue would be similar since there would be minimal increases in the costs of collection and administration since this infrastructure is already in place. Actual revenue gained from 2008 vehicle registrations was $748 million. The 2009-2010 Executive Budget Proposal includes a 25% increase in these fees, which is expected to raise an additional 35.0 million dollars in 2009-10.

V - License Fees

Current Revenue	Current Fees Per Unit ($)	Measure Charged	Total Measures	Potential Charge ($)	Expected Increased Revenue
$602.0M	$53.35	Licenses	11.3 M	$1.00	$11.3M

NY State collected $602 million in driver registration fees last year based on 11.3 million licenses at a cost of approximately $53/license. UTRC estimates that an increase of $1.00 charged to licensing fees could result in an increase of $11.3 million. The net revenue would be similar since there would be minimal increases in the costs of collection and administration since this infrastructure is already in place. The 2009-2010 Executive Budget Proposal includes a 25% increase in these fees, which is expected to result in 21.9 million dollars.

VI - Private investment

Funding streams derived from PPPs would not be considered revenue, but a funding mechanism. A PPP would be a separate entity which would remove the "cost" from a state budget. The question of how does this cost get repaid would still need to be answered but, a PPP would be exempt from any limitations linked to state debts. Privatization of existing assets could create a one time flow of revenue; however, the private operator will seek to recover this revenue through higher fees (tolls) on the PPP facilities.

VII – Bonds

Bonds are another type of funding mechanism that would not generate an actual revenue stream. By design, bond holders would need to be paid at some point –either from project revenue or from the general tax base of the State. Also, both general obligation bonds and revenue bonds have certain limitations. Bonds are tied to a state's debt ceiling and other ratios as enforced by law and/or demanded by lenders.

VIII - Local Option Sales Tax

Local-option sales taxes have been proposed in a number of jurisdictions. With recent reports indicating that the impact of transportation projects is largely local (Andrew Haughwout – Federal Reserve Bank of New York), local financing becomes an option as well as a system where the costs are linked more directly to the beneficiaries of the project. Goldman and Wachs provide a good overview of the regional and local taxes that have been used to fund transportation infrastructure.

Further analysis of this funding source would require specificity as to the project, location and funding mechanism. This set of mechanisms is most appropriate for funding local projects as opposed to funding the general operations of the NYS Department of Transportation.

IX - Green Taxes or Fees

	Current Revenue	Current Fees Per Unit	Measure Charged	Total Measures	Potential Charge ($)	Expected Increased Revenue
Carbon Tax	0	0	Pounds (CO2)	130,677.6 M	$ 0.01	$1,306.8 M

The utilization of fees that discourage the production of pollution or other social costs have been proposed for a number of reasons These taxes are commonly called green taxes or an ecotax and can cover a broad range of goods with either negative or positive externalities. These include carbon taxes, transit subsidies, electricity use tax, road pricing and other forms of green taxes. The key concept is that we will use the tax system to increase the cost of goods that have negative externalities with a tax that is scaled in proportion to the negative impact of the externality. Correspondingly, we may wish to provide a negative tax (a subsidy) to the production of goods that have positive externalities. To what degree these broader green taxes would generate revenue would be tied to the amount of output of each negative product and the level of taxation. With the exception of the carbon tax on vehicle pollution, it is not clear that any of these fees would be dedicated to investments in the transportation network. In addition, in many areas, the implementing of green fees has been discussed in linkages to lowering other existing taxes to make the shift to green taxation revenue neutral for the state. The expectation is that this would lower taxes such as income, sales or payroll taxes and replace them with green fees or ecotaxes.

Using methodology that was used by Bay Area Rapid Transit to estimate the reduction in CO2 due to transferring from auto to rail, we have estimated the amount of CO2 output from vehicle use in New York State and corresponding revenue based on a once cent tax per pound of CO2 emissions. The expected revenue is more than $1.3 billion annually.

X - Freight Weight Fees

	Current Revenue	Current Fees Per Unit	Measure Charged	Total Measures	Potential Charge ($)	Expected Increased Revenue
Highway Use Tax	$147.9 M	Increased	Varies	Varies	50% Increase in Revenue Due to Greater Enforcement	$147.9 M

A freight weight fee is a general term for a tax or charge that increases as Gross Vehicle Weight (GVW) increases. New York uses a type of freight weight fee known as a Ton-Mile Tax (TMT), which is calculated by measuring the weight of each truck for each trip, arriving at a gross weight which is then assigned a tax rate which is multiplied by the miles of travel. New York State is one of only four states in the country and the only one in the Northeast to currently collect a TMT. The levy is applied to vehicles with maximum gross weights of at least 18,000 pounds operating in the state.

Current levels of revenue from this tax have amounted to an average of $114.6 million annually from 2002-2005. However one study of New York's TMT finds high current levels of evasion amounting to close to 50% and a true tax base that should yield revenues on average closer to $250 million annually. Our estimate is that an additional $148 million dollars could be collected annually with improved enforcement, but implementation and enforcement costs could be high.

XI - Dedicated Taxes

One proposed method of financing the transportation system is through 'dedicated taxes'. The term is a bit broad but essentially refers to a budgetary arrangement whereby revenues collected from a given source or set of sources are directed to a particular purpose or entity.

- Dedicated Payroll Taxes

An example of dedicated payroll taxes to assist transportation is the recently implemented fund due to the MTA shortfall. Several dedicated taxes were implemented including a payroll tax of 34 cents for every $100 in wages, to be paid by employers in the 12 counties served by the transportation authority (and referred to as a regional 'mobility' tax).

A tax of this type could be expanded for other transportation uses, for example road improvements, and beyond the 12 downstate counties of the New York metropolitan area (though the bulk of State payrolls are in this area). To take a very simple example, a doubling of the current MTA charge from 34 cents to 68 cents per $100 of payroll would yield an upper bound of $1.3 billion additionally annually (an upper bound because there would certainly be some shifting of employment and evasion of tax as rates climbed).

However, the experience with the MTA package thus far offers many cautionary tales as well. Opponents of the tax have argued that a payroll tax is job destroying, especially in a recessionary environment and where there is interstate competition (or, in the case of the 12-county area currently bearing the surcharge, intrastate competition as well). There is not yet enough data to evaluate this claim but it certainly is an issue and to the extent it holds true, will lessen the potential revenue yield as time passes and as rates may climb.

- Capital Gains Tax

A capital gains tax generally is a tax on any gain made from a sale of an asset. More generally it is referred to as a transfer tax. As with a payroll tax, a transportation-dedicated transfer tax could be imposed to pay for transportation projects and operations. This type of tax could be imposed on any type of asset, i.e. real estate, equities, etc.

- **High-End Income Tax**

Assuming a high income percentage as is observed in the 1999 Census data, with 20.48% of income held in high income households, and a overall tax rate of 4.60% would then allow us to estimate the 2008 tax revenue from a 5% tax on income above $400,000. Our estimates indicate that the 5% additional tax would raise 1.916 billion dollars in 2008.

The bulk of the revenue from this tax would be collected from a small number of geographic areas that are generally concentrated in the downstate region.

Conclusion

The revenue stream analysis in this paper reveals that the various alternatives differ in the objectives they meet. The fuel tax in particular yields high amounts of potential revenues, costs very little to collect and is currently moderately taxed relative to international standards, but high relative to national standards. Licensing and registration fees do not have as extensive a base and are not nearly so cheap to administer. Tolls have potentially high revenue yields, however, the existing burden of tolling is already high, as many facilities, especially downstate, are already tolled. Additionally, tolls cost a fair amount to collect.

Indexation of the fuel taxes (fuel and Petroleum Business taxes) to correct for the inflation impacts that have reduced the purchasing power of these taxes since 1972 would create a significant amount of revenue and would fully fund the gap in the NYS DOT capital program.

Over the longer-term, and taking into account other policy goals, especially those of environmental improvement and remediation, green charges and VMT charges are especially promising. However VMT charging will be expensive to implement and will take much time to get up and running. A carbon tax applied through the purchase of fuel or through registration fees is a notable exception. Though they might not be viable options to meet the immediate funding needs, the charges should be considered as potential revenue sources 10 years out and beyond.

Also, equity considerations should not be ignored. Fuel taxes and tolls, for example, are generally regressive, though there is wide variation depending upon the users of a specific facility. In such cases equity concerns should be designed into the mechanism, such as providing subsidies for low-income toll road users or fuel tax rebates for low-income drivers.

Analysis of Alternative Funding Sources

Purpose

The 2010-2015 New York State Department of Transportation Capital Program released on October 8 reports a 25.8 billion dollar program. This plan does not specifically discuss funding sources or the potential funding shortfall, but the 2009 State Budget Briefing Document (December 2008) indicated that as a result of changes in the State budget to reduce the deficit, the five year capital plan would be the same as 2005 levels at 17.95 billion dollars. Since the current 2010-2015 Capital Plan totals 25.8 billion dollars, the funding gap could be approximately $8 billion dollars.

Our report seeks to understand the potential sources of revenue that might be used to fill this $8 billion five year gap ($1.7 billion/year) and provide a stable source of revenue for future transportation network improvements. There are four major sources of revenue in the state's Dedicated Highway and Bridge Trust Fund, including taxes and fees, bond proceeds, transfers from other funds, and miscellaneous revenue. Taxes and fees include funds raised from the 8 cent/gallon motor excise tax and the 17.1 cent/gallon Petroleum Business Tax and additional taxes and fees including the auto rental tax, the corporation and utility tax, the highway use tax, and motor vehicle fees. The full collections from the DHBTF sources are shared between the DHBTF and the Mass Transportation Trust Fund (63 percent Highway and Bridge and 37 percent Mass Transit.)

Our estimate of a gap of $8 billion dollars over the five years includes the following assumptions:
-The federal contribution of about $1.4 billion per year will remain at the same level as in the 2005/06-2009/10 plan.
-PBT will be approximately 1.125 billion dollars and the Motor Excise Tax will be approximately 540 million dollars per year
-Contributions from the General fund will be approximately $300,000 dollars per year.

Context

New York State is somewhat unique in terms of the relative opportunities for transportation fees and taxes as compared to other states due to a more diversified set of funding resources. From the revenue side, New York applies significantly more road pricing through the extensive use of tolls on bridges, tunnels and highways. Also, given the high level of mass transit usage in the downstate region, New York State contributes a lower dollar amount to the federal fuel taxes per capita than other states. Finally, the lower use of automobile travel in the downstate region also creates lower state revenues for transportation from the fuel tax.

To gain some perspective on the relative burden of different forms of transportation revenue, the following data from the Federal Highway Administration (FHWA) (2000) outlines the major sources of highway-user revenues for selected states and the nation:

TABLE 1

Highway- User Revenues, Selected States

	U.S.	NYS	NJ	PA	NV
▪ Federal Fuel Taxes –	$34.7B	$1.4B	.987B	1.405B	206M
▪ State & Local Fuel & Other-	$58.6B	$2.2B	1.173B	2.559B	438M
▪ Tolls –	$ 6.6B	$2.0B	.711B	.535B	0.6M
▪ Total	$99.9B	$5.6B	2.872B	4.500B	644M

It is clear that the Northeastern states are more reliant on toll revenue as a percent of funding.

In addition, the yield on the fuel tax is lower per capita than in other regions. Utilizing population data from the 2000 Census, we estimate the per capita revenue generated by each source of revenue for the United States and New York State. As we clearly observe, the Federal and State fuel and other taxes under perform as compared to the national average. Toll revenue is already much higher than national averages.

TABLE 2

Highway-User Revenues. NYS vs. US Per Capita

• Revenue Source	US Per Capita	NYS Per Capita
•Federal Fuel Taxes –	$123.30	$73.78
•State & Local Fuel & Other -	$208.23	$115.93
•Tolls –	$23.45	$105.39
•Total	$354.98	$295.10

Table 3 provides an overview of Population, Per Capita VMT, Fuel Consumption and Fuel Taxes by state for the year 2007 based on FHWA and U.S. Census data ranked by VMT Per Capita. While the results vary a bit from the reported revenue data, there is a general level of agreement as to the overall level of taxes and VMT by state. New York ranks last in terms of Per Capita VMT at 7,038 VMT per person and an annual contribution to the Federal Fuel tax of $63.79 per person.

TABLE 3

VMT Table by State

Vehicle Miles, Population, Fuel Consumption and Fuel Tax
Data By State - 2007

State	Population	Annual VMT Per Capita	Per Capita Fuel Consumed	Per Capita Federal Fuel Tax
Wyoming	523,252	17,900	881.75	$ 162.24
Mississippi	2,921,030	14,836	730.85	$ 134.48
New Mexico	1,964,402	13,668	673.31	$ 123.89
Alabama	4,626,595	13,273	653.86	$ 120.31
Oklahoma	3,608,123	13,185	649.49	$ 119.51
Vermont	620,748	12,395	610.58	$ 112.35
North Dakota	637,904	12,297	605.74	$ 111.46
Montana	956,624	11,820	582.25	$ 107.13
Georgia	9,523,297	11,817	582.14	$ 107.11
Missouri	5,878,399	11,764	579.49	$ 106.63
Arkansas	2,830,557	11,719	577.29	$ 106.22
South Carolina	4,404,914	11,603	571.56	$ 105.17
Tennessee	6,149,116	11,575	570.22	$ 104.92
North Carolina	9,041,594	11,458	564.43	$ 103.86
Maine	1,315,398	11,430	563.05	$ 103.60
West Virginia	1,809,836	11,362	559.72	$ 102.99
Kentucky	4,236,308	11,345	558.89	$ 102.84
Florida	18,199,526	11,326	557.91	$ 102.66
South Dakota	795,689	11,317	557.50	$ 102.58
Indiana 2/	6,335,862	11,281	555.74	$ 102.26
Minnesota 3/	5,182,360	11,044	544.03	$ 100.10
Delaware	861,953	11,002	541.96	$ 99.72
Nebraska	1,769,473	10,986	541.17	$ 99.58
Kansas	2,777,382	10,819	532.95	$ 98.06
Virginia	7,698,775	10,661	525.17	$ 96.63
Wisconsin	5,598,893	10,626	523.44	$ 96.31
Idaho	1,496,145	10,548	519.63	$ 95.61
Iowa	2,983,360	10,476	516.05	$ 94.95
Michigan	10,049,790	10,410	512.79	$ 94.35
Louisiana	4,373,310	10,376	511.12	$ 94.05
New Hampshire	1,312,256	10,256	505.24	$ 92.96
Texas	23,843,432	10,210	502.96	$ 92.54
Colorado	4,842,770	10,059	495.51	$ 91.17
USA	**301,290,332**	**10,056**	**495.38**	**$ 91.15**
Maryland	5,618,899	10,056	495.36	$ 91.15
Utah	2,668,925	10,053	495.25	$ 91.13
Arizona	6,353,421	9,910	488.18	$ 89.83
Ohio	11,477,641	9,639	474.82	$ 87.37
Oregon	3,735,549	9,303	458.25	$ 84.32
Connecticut	3,489,868	9,185	452.44	$ 83.25
California	36,377,534	9,025	444.59	$ 81.80
Washington	6,449,511	8,828	434.90	$ 80.02
New Jersey	8,653,126	8,801	433.52	$ 79.77
Pennsylvania	12,419,930	8,752	431.13	$ 79.33
Nevada	2,554,344	8,670	427.09	$ 78.58
Massachusetts	6,467,915	8,514	419.43	$ 77.18
Illinois	12,825,809	8,380	412.82	$ 75.96
Rhode Island	1,053,136	8,200	403.95	$ 74.33
Hawaii	1,277,356	8,099	398.95	$ 73.41
Alaska	681,111	7,566	372.69	$ 68.57
New York	19,429,316	7,038	346.68	$ 63.79
Dist. of Columbia	587,868	6,139	302.42	$ 55.65

Nationally, about 80% of this money is spent on Roads and 9% is spent on Mass Transit. NYS is 67% Roads and 26% Mass Transit. Pennsylvania is 84.2% Roads and 7.5% Mass Transit.

What these figures indicate is that New York State currently has a transportation revenue and expenditure pattern that is structurally different from the US as a whole; less of its current transportation revenues are collected from road-based sources and more of its transportation spending goes to mass transit. This structural difference presents particular challenges in meeting the road network funding shortfall that is the subject of this report.

Road Financing Principles

David Forkenbrock in his 2007 paper in the Transportation Research Record No. 1864 outlined the standards for the design of road user charges. A well-designed road user charge:

"(a) is capable of ensuring a stable stream of revenue to provide adequate funding for the U.S. road and highway system and (b) has a series of other desirable qualities. These other qualities include a low evasion rate, efficiency in relation to the cost of collection for the agency and the user, convenience and ease of use, and, above all assurance that the privacy of road users will be protected."

These principles apply to the efficiency of charges. In addition to Forkenbrock's metrics, we should expect that any transportation fee system that is developed must be equitable and fair as defined by Presidential Executive Order 12898 of 1994.

One might also consider how much new revenue a particular source might be expected to yield. Completely new mechanisms might seem innovative but might only result in relatively small additions to the public treasury. Increases in existing charges might have low marginal returns if current charges are already quite high. This dimension of incremental yield is particularly important when one is trying to close budget shortfalls.

Finally, there is the 'user pays' principle which holds that those who benefit from a given investment should be the ones paying for it. Road tolls are one obvious example of a revenue source that conceptually, at least, is a clear user charge.

Budget Allocation Principles

Revenue raising is only part of the transportation funding process. Equally important is how revenues are spent. Little is gained for the transportation system if, say, a road charge's receipts are not spent on road operations.

Generally it is seen as desirable to have a revenue source that matches closely with intended expenditures. For example, road tolls depend upon the level of usage of the road being tolled. There is thus a clear justification for plowing these revenues back into the road and hence a clear matching of revenues and expenditures. A toll also has the advantage of being consonant with the 'user pays' principle noted above.

It may not always be possible to have close matching between revenues and expenditures, even though a particular investment may be deemed desirable from a policy perspective. Some facilities and services may not yield sufficient revenues to cover their costs and may need subsidy. Fairness and equity concerns may also be important.

It is important to note that it should not be viewed negatively if the principles outlined here are not followed. These principles do offer advantages in efficiency and equity terms, however and it is useful to be explicit about how and why a given revenue source deviates from them.

Enforcement, Violation and Leakage from a Tax System

People do not like to pay taxes – much as many involved in revenue collection would like to avoid recognizing that reality, the fact remains that any taxation or revenue system will be subject to a certain amount of users who do not desire to pay. In addition, errors in the taxation system itself (failure to bill, failure to recognize a taxable event, failure to correctly record an event due to technical error etc. results in revenue not being realized. These occurrences lead to a certain amount of leakage of revenue from a taxation system. These issues are not unique to transportation funding mechanisms; corporations face many of these challenges as well.

Agencies or firms charged with managing revenue processes have to work to minimize leakage from the system to provide maximum revenue. This generally requires investment in enforcement or improved systems to minimize loss. Enforcement, while interesting in terms of improving the collections or reducing violation, is generally an expensive prospect where either the value is driven through an additional fine imposed for failing to pay a given charge or by the deterrent factor of a criminal/civil penalty that creates incentive for users to pay/comply with the taxation system. Violations in toll systems can be quite extensive and can undermine the revenue stream in a significant way as compared to other taxation systems. In particular, the high number of transactions (individual vehicles) makes the total number of error/violation events high and therefore the cost of error/violation management is expensive.

For example, the Garden State Parkway in New Jersey collected 203 million dollars in toll revenue in 2007 in 413 million transactions – the average transaction being 48.52 cents. Pursuing an individual violation is expensive and the yield of revenue without fines is low. With a 1.54% reported violation rate for New Jersey toll roads, the expected violation revenue is 3.1257 million dollars if fully collected, however that is on a base of 6.445 million transactions to pursue and resolve.

In some cases it may make sense to allow a certain amount of leakage to occur in the system as the cost of collection of the violation outweighs the revenue generated in the collection process. An important caveat emptor on this argument is that if it becomes known that violations are tolerated and not pursued aggressively, then the rate of violation may increase. Therefore the ultimate balance is to establish an acceptable rate of slippage and to manage the revenue stream to maximize useful revenue for highway and transit investments and maintenance. We do not want to spend more on violations collections than you yield in revenue.

Potential Alternative Financing Mechanisms

We will now look to examine other potential sources of revenue that could be used to fund road and transit infrastructure in New York State and consider some of the various efficiency and equity considerations that arise with each one of them.

No particular funding source is ideal: The use of each funding mechanism may in part be dictated by both State and National law as well as limitations based on market conditions and traffic loads. In addition, we need to continue to examine the overall level of costs of public transportation facilities and compare them to the costs in other states. We should be careful to consider the economic competitive impacts that additional transportation fees/taxes would have on regional competitiveness

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The alternative funding mechanisms discussed in this report include:

- Fuel taxes
- Tolling
- Vehicle Miles traveled
- Registration Fees
- Licensing Fees
- PPP with additional investment
- Bonds
- Local Options Sales Tax
- Green Taxes
- Freight Weight Fees
- Dedicated taxes
    - Payroll taxes
    - Real estate capital gains tax
    - High-end income tax

I - Fuel Taxes

Fuel taxation has a long history of providing funding for the road network in the United States. The taxation of motor fuel has been proposed for a number of reasons. In particular, the revenue has been collected to provide for the provision of highways and local roads. The tax has a number of desirable qualities including a low cost of collection, difficulty in evasion and it also provides incentive to utilize fuel efficient vehicles.

According to the FHWA, New York State currently charges 24.65 cents per gallon as a gasoline tax. This is actually composed of two parts – first, a motor fuel excise tax of 8.05 cents per gallon and second a 16.4 cents per gallon petroleum business tax. As of January 2009, the petroleum business tax increased to 17.1 cents per gallon.

If the fuel tax or PBT was raised by one cent per gallon, our analysis shows that an additional $65.8 million dollars could be raised per year from each tax based on a consumption of 6.58 billion gallons of fuel in 2008. The writing below discusses this issue.

Although not directly a fuel tax, gasoline in New York State is also subject to sales tax which would add approximately an additional 24 cents per gallon at between 7.00%-8.375% per dollar of sale, except that it is capped at 14.398 cents per gallon when the price of gas rises above $2.00 per gallon. (See Appendix 1 for calculation of the $415 million dollars per year in additional revenue that could be collected if there was no cap, which is based on a loss of $.0631 per gallon.) Finally, the federal fuel taxes of 18.4 cents a gallon are added to fuels. As a composite, gasoline is subject to an overall tax rate of 67.9 cents per gallon. It is also interesting to assess the impact of increased costs on a per vehicle or per household basis. Appendix 2 provides this analysis and indicates that a one cent per gallon increase would result in a per vehicle impact of an approximately an additional $6.30 per vehicle per year. For a two vehicle household, this would result in an increased tax of $12.59 per year for every one cent per gallon increase. These estimates are based on an average fuel economy of 20 gallons per mile for an annual consumption of 629.67 gallons.

Appendix 2 also highlights the amount of revenue that is not collected due to the sales tax cap when the price of gas exceeds $2 per gallon. This loss is $39.73 per vehicle or $79.46 for two vehicles annually.

This tax base currently yields the following approximate revenue for the State of New York and the Federal Government:

TABLE 4

Existing Fuel Tax Revenue

	Tax Per Gallon	**2008 NYS Revenue**
NYS Motor Fuel Tax	8.0 cents	$ 540,207,800
NYS Petroleum Business Tax	17.1 cents	$ 1,154,694,172
Capped Sales Tax on Gasoline	14.398 cents	$ 947,347,815
Federal Fuel Tax	18.4 cents	$ 1,242,477,940
Total Taxes on Fuel		$ 3,884,727,727

TABLE 5

Fuel Consumption and Vehicle Miles Traveled

Fiscal Year	Taxable Gallons (000) Gasoline	Diesel	Total	Vehicle Miles Traveled	Implied Miles Per Gallon	Annual MPG % Change
2008	5,662,484	917,031	6,579,515			
2007	5,564,169	912,735	6,476,904			
				136,740,000,000	21.11	-3.37%
2006	5,556,285	913,066	6,469,351			
				141,340,000,000	21.85	4.02%
2005	5,720,769	906,547	6,627,316			
				139,200,000,000	21.00	1.57%
2004	5,794,807	855,072	6,649,879			
				137,520,000,000	20.68	0.32%
2003	5,725,978	825,603	6,551,581			
				135,050,000,000	20.61	-1.19%
2002	5,602,828	775,609	6,378,437			
				133,060,000,000	20.86	1.13%
2001	5,490,630	851,544	6,342,174			
				130,830,000,000	20.63	4.17%
2000	5,572,647	926,622	6,499,269			
				128,700,000,000	19.80	0.28%
1999	5,585,511	820,201	6,405,712			
				126,490,000,000	19.75	

Sources: Historical Travel Trends in NY State - NYSDOT (May 2009)
2007-2008 Annual Statistical Report of NYS Tax Collections

In terms of consumption, the motor fuel consumption has been relatively flat over time with roughly 6.5 billion gallons of fuel consumed each year in New York State with an 86% Gasoline / 14% Diesel split. The current pattern of consumption implies a roughly 20.24 miles per gallon fuel economy for overall consumption of fuel. Table 5 provides an overview of fuel consumption, VMT and implied mileage. The highest observed rate of MPG was in 2006 where we had an overall MPG of 21.85.

One of the greatest threats envisioned for the fuel tax as a source of revenue is the increasing mileage per gallon for the vehicle fleet. However, fuel economy has not been rising dramatically over the last few years as the Federal standards for economy has not been increased dramatically since the 1990's. Also, the shift to the "light truck" category (aka SUV's) has undermined the automobile fuel economy increases by about 6.4% (from 8.5% increase in automobile fuel economy from 1995 to 2005 to 2.1% blended improvement rate for auto and light trucks). Finally, the improvements in the vehicle performance has been offset to a large degree by population growth in many counties, shifting demographics to suburban living and a general increase in vehicular travel.

It appears that the decline in fuel tax revenue caused by systematic improvements in fleet fuel economy will be offset to a large degree by other changes in fuel demand. Therefore the general

stability in fuel tax revenue in nominal terms (number of dollars) and a declining purchasing power of fuel tax dollars are largely linked to the failure to index the tax rate to reflect the impact of inflation on purchasing power.

A simple and lasting solution to this problem would be to index the fuel tax rate to the inflation measures (CPI or PPI*) one single time so that we preserve the purchasing power of highway fuel tax dollars. In addition, at the same time, one could apply a growth factor in the level of fuel taxation to counteract the increases in MPG. This could be either pegged at some constant growth rate or could be pegged to the implied MPG growth or decline as calculated above. These two actions should preserve the utility of the fuel tax as a funding mechanism for at least an additional 10-20 years. Based upon our analysis of national fuel economy trends and inflation rates, it appears that a 0.26% to 0.40% increase in the fuel tax per year would offset the improvement in fuel economy and an annual 2.88% cost of living increase would offset the impact of inflation. By indexing this measure, we could ensure a stable stream of revenue from the fuel tax for at least the next 10-20 years. Table 6 below provides an example which shows estimates of increased revenue due to indexing and also reflects an increase in the fuel tax rate by 20 cents per gallon to raise an additional revenue of $1.2 billion. It assumes an increase of 3.41% per year to account for the annual fuel index adjustment which includes CPI and fuel economy adjustments.

TABLE 6

Estimate of Indexed and Increased Sales Tax on Motor Fuels (to raise $1.2 billion)

Assumptions:
1) Need 1 Billion Dollars Per Year in Revenue
2) Annual Fuel Index Adustment = 3.41% Includes CPI and Fuel Economy Adjustment

Year	Fuel Consumption	Baselin Fuel Tax Rate	Indexed Fuel Tax Rate	Baseline Fuel Tax Revenue	Indexed and Increased Fuel Tax Revenue
2009	6,405,712,000	$ 0.08	$ 0.28	$ 512,456,960	$ 1,793,599,360
2010	6,425,699,534	$ 0.08	$ 0.29	$ 514,055,963	$ 1,860,555,450
2011	6,445,749,435	$ 0.08	$ 0.30	$ 515,659,955	$ 1,930,011,050
2012	6,465,861,897	$ 0.08	$ 0.31	$ 517,268,952	$ 2,002,059,466
2013	6,486,037,115	$ 0.08	$ 0.32	$ 518,882,969	$ 2,076,797,492
2014	6,506,275,285	$ 0.08	$ 0.33	$ 520,502,023	$ 2,154,325,530
2015	6,526,576,604	$ 0.08	$ 0.34	$ 522,126,128	$ 2,234,747,735
2016	6,546,941,268	$ 0.08	$ 0.35	$ 523,755,301	$ 2,318,172,146
2017	6,567,369,475	$ 0.08	$ 0.37	$ 525,389,558	$ 2,404,710,839
2018	6,587,861,424	$ 0.08	$ 0.38	$ 527,028,914	$ 2,494,480,070
2019	6,608,417,313	$ 0.08	$ 0.39	$ 528,673,385	$ 2,587,600,438
2020	6,629,037,342	$ 0.08	$ 0.40	$ 530,322,987	$ 2,684,197,043

*The Petroleum Business Tax has been indexed to the Petroleum Producers Index (PPI) since 2000 and is subject to a 5 percent change up or down per year. As such, the indexing mechanism has had a significant impact on the amount of revenue generated by the PBT, due to the high level of volatility of fuel prices. (See Appendix 2 for discussion of the impact of the cap on the PBT rate.)

Another alternative is to increase the fuel tax to reflect the inflationary losses that have occurred **since it was last increased in 1972** and thereby restore the full value of the fuel tax funds.

Based upon the Consumer Price Index changes from 1972 to 2009, this would create 1.502 billion dollars in additional funding for highways, bridges & transit. The fuel tax in 2009 would be increased from 8 cents to 30.25 cents per gallon under this plan.

Overall, the fuel tax has a low cost of collection. This is due to the fact that nationally, fuel taxes are collected high in the fuel distribution chain – generally at the refinery (rack) or distributor. As such, there are relatively few transactions to the collect the revenue, each transaction is large and the auditing and management of fuel tax system is generally low in cost. While there is some leakage through the purchase of out of state fuel, purchases of untaxed fuel on Native American Reservations and/or use of untaxed fuels (home heating oil or untaxed off road fuel fordiesel), in general, the avoidance of the fuel tax is difficult and a series of minimal improvements in enforcement and tracking techniques should improve the yield and maintain the efficiency of the tax.

There is also a significant budget allocation issue to mention. Some of these revenue sources are dedicated to highway funding in New York State and others are remitted to the general fund and/or the Federal Government. As such, we need to understand the allocation of fuel tax revenue within the highway/transit funding process. However, although not all fuel taxes may make it back into roads and transportation, there is a clear overall match between the source of revenue (fuels consumed in road travel) and the appropriate expenditure for such revenues (investment in the transportation system).

Considerable interest has been exhibited about the question of untaxed fuel sales on Native American tribal lands. The estimates of the impact of these sales on non-Native American establishments and on state tax revenue vary widely. The FHWA estimated that fuel sales in New York State from Native American Establishments was in the range of 0.5% of total state sales or $50 million dollars a year. While some fuel tax revenue may be slipping from the system, it is highly unlikely that this situation will be resolved in the current five year capital plan. In particular, this issue involves the United State Federal Government, existing treaties that date to the 18th century and a general resistance of Native American groups to submit to further regulation and taxation without considerable resistance. Further analysis of this issue could be conducted, however, it is clearly outside the scope of work of this project.

Summarizing this overall discussion, fuel taxes have the following characteristics as measured against the revenue and allocation principles presented earlier:

<u>Summary of Characteristics:</u>

- Stability: moderate, with medium term trends towards slow decline
- Evasion rate: very low
- Collection/administrative costs: very low
- Equity: generally regressive
- New revenue potential: moderate; current rates relatively moderate and unit increases can quickly and easily generate fair amounts of additional revenue, though constrained by medium term trends towards fuel efficiency and alternative fuels
- Matching/User Pays: High – clear match between user benefit and costs and sources and uses

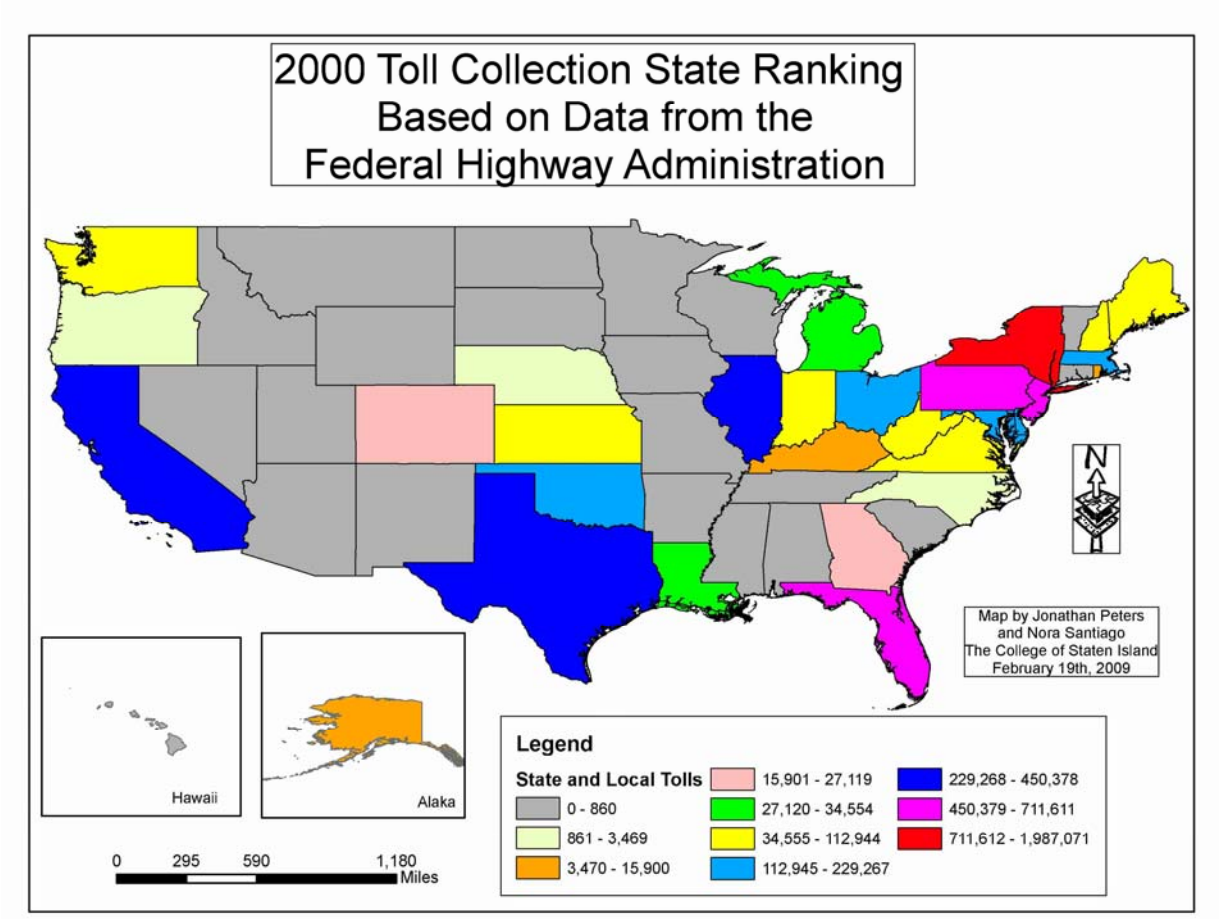
II - Tolls

Tolls are one of the oldest forms of road taxation. Prior to the 1920's tolls were a common form of road financing and they dwindled in use as the Federal and State Governments passed legislation authorizing and encouraging fuel taxation.

Tolls currently provide 5% of the Nation's transportation funding – Fuel and Vehicle taxes provide 53% with General Fund 14% and Bonds 11%. Many times tolls are called a user fee – or a tax. The northeastern states remain the center of toll collection in the United States, with 49.02% of the nation's toll dollars collected in the three Mid-Atlantic States of New York, New Jersey & Pennsylvania. (Federal Highway Administration) Roughly 30% NYS, 11% NJ and 8% PA.

A specific estimate of revenue that could be raised by increasing or implementing new tolls would vary by current fee and/or specific route. The discussion below highlights several issues pertaining to this revenue source in New York State compared with the Nation.

Map 1 provides an overview of toll collections by state as reported to the FHWA in 2000.



MAP 1

The Northeastern Toll Systems represent a historical artifact of the national funding system for highways. Prior to World War II, toll bridges were established in New York City under autonomous independent state sponsored authorities – most notably the Port Authority of New York and New Jersey and The Triborough Bridge and Tunnel Authority. Post World War II, a number of Highway Authorities were authorized to build and maintain toll roads. These authorities raised revenue through toll collection and self funded their facilities, in many cases borrowing funds in anticipation of future toll revenue. Often they continue to function in the same way today and some actually produce profits that are used in a variety of ways, not necessarily being recycled back into transportation uses. Generally, these facilities are excluded from receiving highway trust fund revenue; however, toll dollars collected can be used to provide matching state dollars for other projects.

Applying tolling to existing facilities is generally politically difficult, however, and thus the Federal Highway Administration has embarked on a number of programs that are encouraging tolling, time of day pricing and congestion pricing to be applied both for a revenue generation function as well as to attempt to control demand on congestion structures, facilities or regions.

In many states, based upon the shortfall of revenue, tolling and road pricing is both being considered as an alternative form of revenue for highway funding and as a tool to combat congestion. New York State leads the way in tolling in terms of dollars applied; however, New York suffers as the pricing has not been applied in any systematic way to both promote revenue generation as well as mobility outcomes. In some cases, the most poorly served corridors in terms of mass transit services are also the corridors most heavily tolled.

Currently, New York State collects over 2 billion dollars a year through road pricing – the highest level in the nation. On a per capita basis, New York State residents pay four times the national average in terms of toll dollars. The application of additional tolls and fees will have significant impacts on regional competitiveness and economic outcomes if this form of taxation is applied. Like all forms of taxation, the impact of any fee or tax is weighed by the residents or businesses and compared to the relative level of public services provided. In term of certain industries, the significant toll costs have apparently driven certain activities out of areas of New York State. For instance, there is almost no warehousing employment in the five boroughs of New York City while Central New Jersey is a top employer in this field. Spatial proximity to the ports are very similar, however Central New Jersey is located on the United States Mainland, and the New York City counties are located in the most part on islands, separated from the continental United States by corridors that are highly tolled.

Applying additional tolling to new facilities would require deployment of the systems related to toll collection – either electronic tolling or manual toll collection. The capital deployed in toll collection is significant and unless we manage the flow conditions through the payment mechanism, there exists the potential to disrupt traffic flow and increase air pollution. Management of toll systems is complex and between 12-25% of revenue is spent on collection and we generally observe a 2%-5% violation rate.

Table 7 from Peters & Kramer (2003) provides an overview of the relative collection costs as well as the social costs of various toll systems as well as the fuel and income tax.

TABLE 7

Peters & Kramer 2003

Table 6		Peters & Kramer 2003				
Toll System Performance Benchmarks						
Comparison to Alternative Taxation Systems						
Tax	**Year**	**Revenue**	**% of Federal Income Tax**	**Adminstrative Costs**	**Compliance Costs**	**Total Tax Collection Costs**
General Taxes						
Federal Income Tax	2001	$ 2,129,000,000,000	100.00%	$8,772,000,000	$ 69,831,200,000	$ 78,603,200,000
% of tax collected				0.41%	3.28%	3.69%
National Gas Tax	1996	$ 19,653,800,000	0.92%	$ 51,000,000		$ 51,000,000
% of tax collected				0.26%		0.26%
National Gas Tax	1999	21,236,659,000	1.00%	$ 55,107,389		$ 55,107,389
% of tax collected				0.26%		0.26%
State Fuel Taxes	1999	$ 29,000,000,000	1.36%	$ 290,000,000	$ 580,000,000	$ 870,000,000
% of tax collected				1%	2%	3.00%
Toll Systems						
Garden State Parkway *	2002	$194,851,414	0.01%	$36,317,215	$33,709,294.62	$70,026,510
% of tax collected				18.6%	17.3%	35.9%
Massachusetts Turnpike	2001	$ 214,352,000	0.01%	$ 39,835,440		$39,835,440
% of tax collected				18.6%		18.6%
New Jersey Turnpike	2001	$433,868,929	0.02%	$48,548,749		$48,548,749
% of tax collected				11.2%		11.2%
Pennsylvania Turnpike	2002	$375,750,731	0.02%	$54,700,000		$54,700,000
% of tax collected				14.6%		14.6%
Orlando - Orange Ct. Exp.	2002	$146,200,000	0.01%	$26,700,000		$26,700,000
% of tax collected				18.3%		18.3%
All Tolls	2000	$ 6,596,425,000	0.31%			

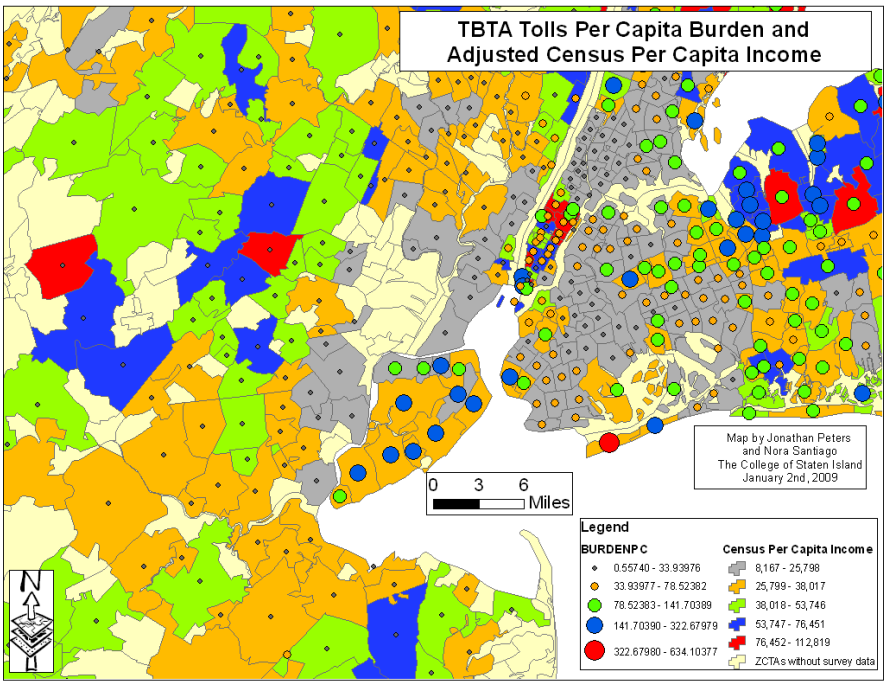
Peters and Kramer (2009) found that about 17.3% of the cost of collection was actually user and social costs caused by additional pollution caused by slowing vehicles and traffic delay, additional fuel consumption and additional pollution caused by the toll system.

Finally, toll systems are most viable in areas of high traffic flow. Many routes in New York State lack the traffic flow levels that would make deployment of toll systems financially attractive. This will mean that an alternative form of financing must be applied to fund these roads. In general, to be a viable toll road option, a road must have a high enough level of traffic volume and a price per vehicle that provides a revenue stream significantly greater than the ongoing cost of the toll collection technology. The Minnesota I-394 HOT (High Occupancy or Toll) Lanes project may be a success in terms of traffic flow, however, the project turns out little

excess revenue over the cost of operating the toll system – a failure in terms of revenue generation.

In addition, tolling has a strong spatial and regional bias, where individuals who lack transit alternatives or alternative free highway routes face strong burdens of tolls applied on their facilities. Peters and Gordon (2009) outlined the geographic impacts of the tolls on New Jersey Highways and have recently developed measures of cost burden for the MTA Bridges and Tunnels. Additional tolling would create similar questions that need to be analyzed fully prior to implementation.

As illustrated in Map 2 below, Peters and Kramer established the pattern of toll burden by Zip Code for the MTA Bridges and Tunnels. The map compares the per capita income by Zip Code from 2004 to the toll burden per capita by Zip Code. Given that the Per Capita Burden of the National Fuel tax is $91.15, clearly the impacts of tolls as a form of taxation is much greater than the fuel tax in certain areas of the New York Metropolitan region. In particular, the glaring difference between the high income Zip Codes on the Upper East Side of Manhattan where the per capita income is about $100,000 and has a toll burden of about $50 per person per year, as compared to the South Central part of Brooklyn, where residents have per capita incomes of about $14,000 per year yet have similar toll burdens. Many low and moderate income areas in the New York Metro areas have toll burdens higher than other areas of higher income. These results again confirm that the burden of tolling tends to be local and is linked strongly to the proximity to the facility tolled.



MAP 2

For implementation of additional toll systems or increasing revenue from existing systems through this mechanism would require further study. Identification of routes that are financially viable would require a full analysis of expected costs and revenue by route.

- **Congestion Pricing**

In 2007, Mayor Michael Bloomberg of New York City proposed in his PlaNYC 2030 master plan the creation of a congestion pricing zone in Manhattan south of 86th Street. The proposal included a charge for entering this zone on weekdays from 6:00 AM until 6:00 PM. The proposed fee was $8.00 for automobiles and $21.00 for trucks that enter the zone. The proposal included credits for payment of existing tolls and also a discount for vehicles that stayed within the zone. The proposal also included a ring route around Manhattan that was not subject to the congestion charge. Existing toll authorities would keep all of their current revenue and any additional revenue would be allocated to a proposed "Smart Authority" that would fund projects subject to agency requests. The Smart Authority was expected to raise 461 million dollars in additional net revenue per year. In addition, the original proposal was to be part of a U.S DOT Urban Partnership Agreement with the U.S. DOT contributing 354 million dollars in additional Federal funding to enhance mass transit options in the City as well as to pay the cost of the congestion charge collection system. The project was approved by the New York City Council on March 31, 2008, but the New York State Legislature had to approve the project. On April 7th, 2008, the New York State Assembly Democratic Conference decided to not have a vote on congestion pricing, so the measure failed and the Federal Urban Partnership money was allocated to other states. Recent discussion of MTA shortfalls has revitalized the discussion of the congestion zone. As an alternative, the Ravitch Commission Report proposed tolling the East River and Harlem River Bridges which produces many of the same impacts as the congestion pricing zone. Tolling the East River and Harlem River Bridges was projected to generate 600 million dollars annually.

A summary of the characteristics of tolling is provided below (if revenue is added to the facility used):

Summary of Characteristics:

- Stability: variable, depending upon facility. Heavily used facilities will have greater stability of revenue yields than more lightly used ones. Also macroeconomic factors can greatly affect toll collections since downturns and upturns in the economy can often greatly reduce or increase traffic.
- Evasion rate: moderate, depending especially upon enforcement capability
- Collection/Administrative costs: moderate to high as a percentage of revenues collected.
- New Revenue Potential: variable. Tolls are already very high in many parts of New York State, though some key facilities are low or untolled. Revenue potential would be maximized if overall tolling were redesigned in some regions, especially New York City.
- Equity: variable, depending upon the users of the roads and available transport alternatives
- Matching/User Pays: High matching on both counts

III - Vehicle-Miles Traveled (VMT) Charge

A vehicle-miles traveled (VMT) fee has been proposed as a solution to the funding gap at both national and state levels. A VMT charge applies a fee to all miles traveled in a vehicle through some form of a vehicle tracking. The widely studied Oregon VMT trial has been the basis of much discussion of this method in the United States. The authors used the Oregon test to develop an estimate of revenue from this source in New York. Revenue is reported as the net of collection costs and is based on a 1 cent per mile charge. Under this assumption, the VMT charge would yield over 1 billion dollars in net revenue. The analysis is discussed below.

Basically, the road user fee is based on how much you drive in terms of miles. It may also include an additional fee for travel during congested time periods and/or may include an additional fee for travel in congested regions.

The Oregon Department of Transportation conducted under a FHWA Value Pricing Program grant an experiment to study alternatives to the gasoline tax. They used an onboard mileage based system where there was a charge based on where and when you traveled. The usage fee was recorded at technology equipped gasoline stations in the state. The system utilized an onboard vehicle GPS system to track mileage and usage patterns and the data was retrieved from the onboard units at technology equipped gas stations. The test was conducted in Spring 2006 and involved 260 vehicles equipped with mileage recorders and two service stations equipped with readers. If the fuel pump detected that a road price onboard mileage recorder was present, the pump then deducted the fuel tax from the bill to the consumer and added the cost of the road mileage charge. This duel collection method allows the system to ramp up as we continue to collect fuel tax revenue from the vehicles without mileage recording systems and collect road fees from the vehicles equipped with tracking and recording hardware.

The Oregon project has a number of limitations with regards to its immediate applicability to transportation finance. First, the project assumes that the tracking technology on board the vehicle would be supplied by the auto manufactures at no cost to the state. Secondly, the test used volunteers that were willing participants in the project and no significant measures were used to prevent tampering or fraud in the system. Finally, the test utilized only two filling stations and also had a number of operational problems that occurred during the test. On the other hand, this test represented a good attempt to model the operational issues of VMT charging as well as provides a baseline estimate of costs to deploying this kind of system.

Based upon the Oregon test, deploying a full VMT charging system would cost 32.8 million dollars to startup with that cost largely concentrated in the cost of equipping the 1800 fueling stations with the reader technology. As stated above, they assume no transponder costs as they expect the vehicle fleet to come with the technology to perform this function. Ongoing management costs and operational costs are estimated at 1.6 million dollars a year.

The authors have utilized the cost estimates from the Oregon test and adjusted a number of items to reflect what we feel is a more accurate estimate of the true annual operating and capital costs of deploying a VMT type system in New York State. Our estimate uses a 6 year expected

lifespan for the collection technology based on an 5-8 year useful life. Fuel stations are projected at 6,967 stations for New York State and the vehicle count is 10,697,644 in 2008.

The key assumptions are as follows:

- Vehicle Miles Traveled is projected at 136,740,000,000 (based on 2007 reported VMT)
- Vehicle count based on NYS DMV is 10,697,644
- Onboard system costs estimated at $125 per unit to furnish, install and tamperproof
- Fuel Station count is 6,967
- Cost of station equipment is $15,000 per station
- Useful life of technology is 6 years
- System is phased in over a 6 year period
- Annual operating costs are prorated from the Oregon Study based on vehicle counts

An overview of the revenue, operational costs and cost of collection is presented in Table 8. Revenue is reported net of collection costs and is based on a 1 cent per mile charge. The VMT charge would yield $1,123,040,619 in net revenue for transportation investment. The cost of collection appears to be in line with existing tolling systems at 17.87% of revenue. The revenue stated is the revenue realized after 6 years of deployment with all vehicles equipped with transponders. If we wish to realize this amount of revenue during the initial year, then the capital costs to fully deploy the system would require 1.337 billion dollars for the onboard systems and 104.5 million for fuel station equipment. In addition, the estimate of the cost of the onboard system may be low as this is an unproven technology that must have a significant amount of investment to reduce the ability to tamper with the data contained in the onboard unit.

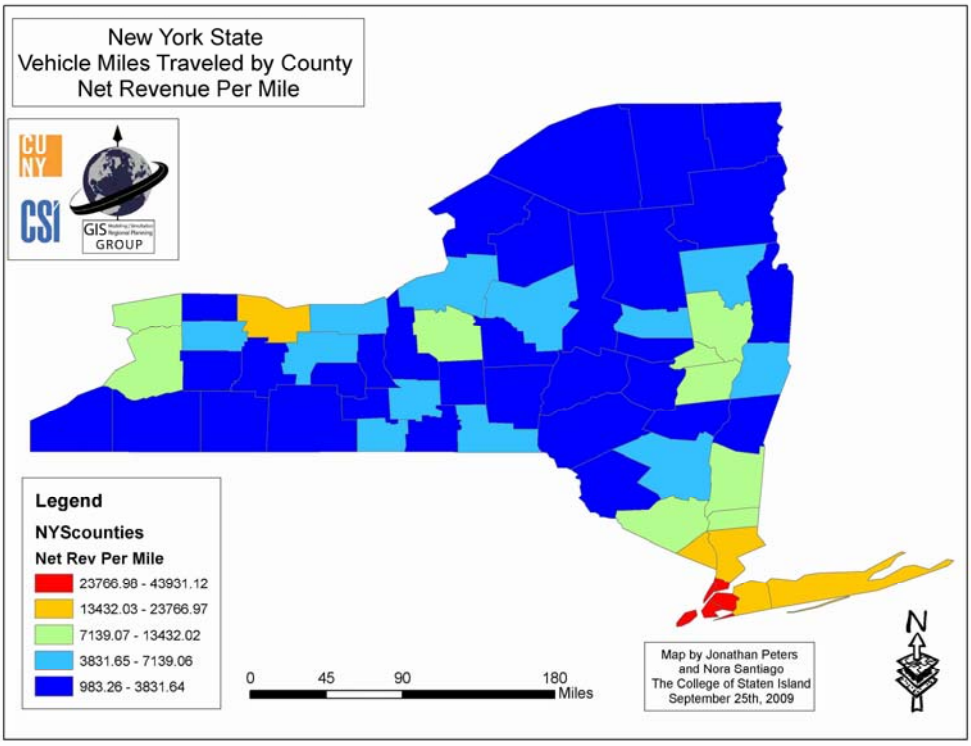
TABLE 8

VMT Estimate

Total Annual Cost for NY State VMT Charge System - In State Vehicles Only			
Vehicle Transponders	$	222,867,583	Based on NYS Vehicle Count and 6 Year Exp
Gasoline Station Equipment	$	17,416,750	Based on $15,000 per station for 6966 Statior
Operating Costs	$	4,075,048	Based on Oregon Plan Cost Estimates Scale
Total Annual Cost	$	244,359,381	Sum
Expected Revenue at $.01 Charge Per Mile	$	1,367,400,000	Based on VMT Estimates
Net Revenue	$	1,123,040,619	Net Revenue
Cost of Collection %		17.87%	Collection Costs as a Share of Revenue
User Compliance Costs		2%	Based on Limited Consumer Interaction with S
Social Cost of System		0%	No Expected Environmental or Traffic Delay C

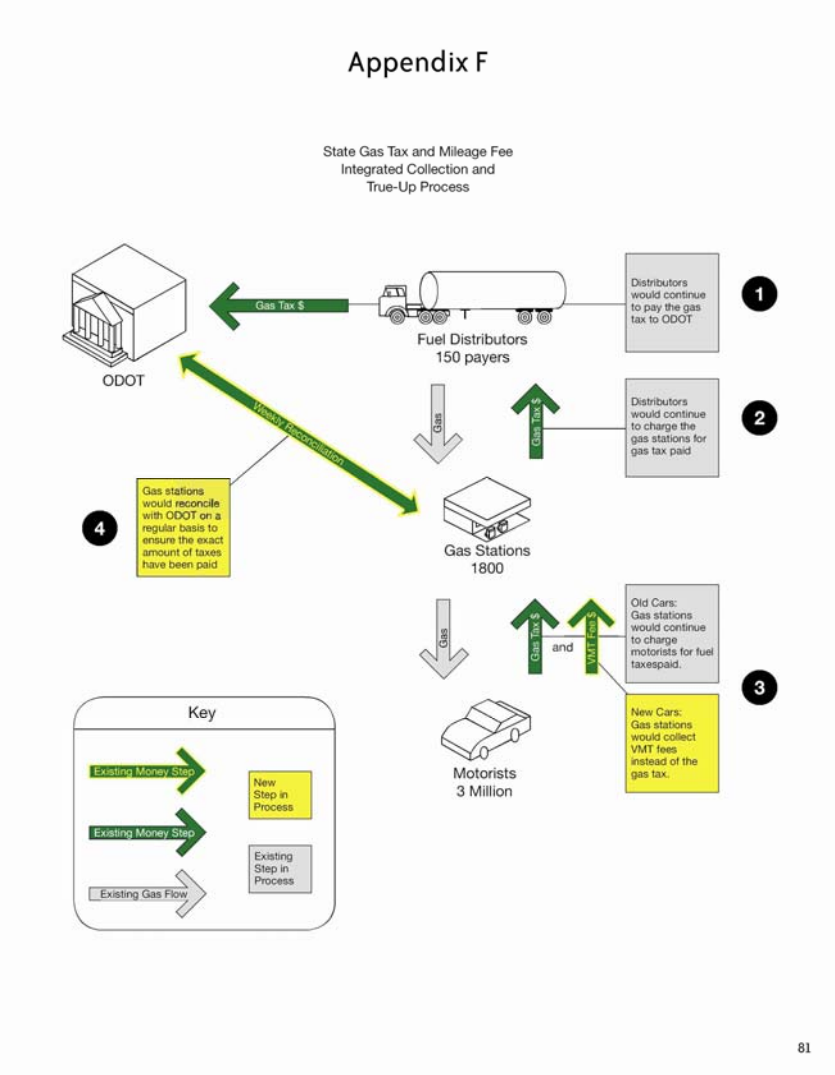
In addition, we estimated the user compliance cost as well as the social cost of deploying this system. Our estimates, based upon a well designed system should yield a 1%-2% user compliance cost and no significant social costs. This is based upon a system that utilizes the existing fueling event to collect the VMT data so that no additional trips or delay of vehicles occurs.

The spatial distribution of the VMT charges is very different by county for New York State. As with any mileage based charge, areas of high vehicle density and usage produce high levels of VMT. In particular, the downstate areas of New York City and Long Island as well as Westchester and Rockland Counties and the Rochester Region in Upstate New York produce a high level of VMT for every mile of road network. Large areas of the state produce relatively low levels of VMT per mile of roadway and that is concerning, as these areas will most likely not be self supporting on a VMT charge basis.



MAP 3

A copy of Appendix F is reproduced from the report of the results of the Oregon VMT test. As is clear from the Oregon DOT report, VMT charges suffer from some of the same cost structure issues as tolling. VMT charges as a percentage of revenue were generally high as compared to fuel or income taxation. The large number of users to be monitored as well as the large number of payment sites create a generally high cost structure.



Summary of characteristics :

- Stability: Variable, depending upon the charge and its impact on VMT. General predictions are for continued VMT growth and if these hold then a charge of this sort should yield growing revenues
- Evasion rate: Variable, it may decline to reasonable levels when fully implemented.
- Collection/Administrative cost: Very high, especially start-up costs.
- Equity: Mixed: Potential to adjust behavior to minimize tax.
- New Revenue Potential: Very high once fully implemented
- Matching/User Pays: potentially very high

IV - Vehicle Registration Fees

New York State, like most states, applies a number of fees to users of vehicles. One source of revenue for transportation funding is thus registration fees for vehicles. In particular, New York State currently collects 748 million dollars in registration fees on 10.7 million vehicles in New York State. The average fee is currently 69.92 dollars per registration. Increasing vehicle registrations by $1.00 would yield 10.7 million dollars each year. The cost of collecting this fee

overall is relatively high – reported at about 20% of revenue collected. However, adding to the existing fees would have minimal cost impacts. Another positive point is that the Department of Motor Vehicles provides a number of services and management tools in addition to collecting revenue. Increased revenue is expected from this source in the 2009-2010 Executive Budget Proposal, which includes a 25% increase in these fees. This increase is expected to result in an additional 35.0 million dollars.

One key advantage of a vehicle registration fee is that this fee could be used to offset some or all of the loss in motor fuel taxes created by hybrid or alternative fuel vehicles. Used in conjunction with the fuel tax, and indexing the fuel and registration fee for inflation and fuel economy should result in a stable source of transportation funding for the next 20 years.

Summary of characteristics:

- Stability: High
- Evasion rate: Very low
- Collection/Administrative Costs: Moderate to high, though proper cost allocation might lower current estimates.
- Equity: Low, since it is a flat fee regardless of income
- New revenue potential: relatively small given the size of the revenue base.
- Matching/User pays: moderate. Vehicles incur a registration fee but level of usage not taken into account.

For comparison purposes, Table 9 reflects registration fees by state for a typical vehicle. New York State's average registration fee for a typical vehicle of $24.85 is less than the national average of $32.06, but it ranks relatively high when compared with the average fee of 19 other states. The table also indicates that the upper end of the range of $37 is lower than the upper fee charged in 18 states.

TABLE 9

Vehicle Registration Fees by State

Vehicle Registration Fees				
State	Approximate Range		Fee for Typical Vehicle	Basis
	From	to		
Alabama	$24.25	$24.25	$24.25	Yearly
Alaska	35.00	35.00	35.00	Yearly
Arizona	8.00	8.00	8.00	Yearly
Arkansas	17.00	25.00	17.00	Yearly
California	28.00	28.00	28.00	Yearly
Colorado	19.00	28.20	25.80	Yearly
Connecticut	70.00	70.00	70.00	2 Yea
Delware	20.00	20.00	20.00	Yearly
District of Columbia	55.00	88.00	55.00	Yearly
Florida	27.10	45.10	35.10	Yearly
Georgia	20.00	20.00	20.00	Yearly
Hawaii	63.82	114.31	88.70	Yearly
Idaho	25.25	49.25	37.25	Yearly
Illinois	48.00	48.00	48.00	Yearly
Indiana	12.75	12.75	12.75	Yearly
Iowa	14.00	428.00	27.00	Yearly
Kansas	27.25	37.25	27.50	Yearly
Kentucky	14.50	14.50	14.50	Yearly
Louisiana	10.00	41.00	15.00	Yearly
Maine	23.00	23.00	23.00	Yearly
Maryland	35.00	48.50	35.00	Yearly
Massachusetts	30.00	30.00	30.00	Yearly
Michigan	29.00	211.00	58.00	Yearly
Minnesota	35.00	475.00	35.00	Yearly
Mississipi	23.75	23.75	23.75	Yearly
Misouri	45.00	51.00	51.00	Yearly
Montana	10.25	15.25	15.25	Yearly
Nebraska	21.50	21.50	21.50	Yearly
Nevada	33.00	33.00	33.00	Yearly
New Hampshire	19.20	31.20	31.20	Yearly
New Jersey	25.00	50.00	25.00	Yearly
New Mexico	23.00	42.00	23.00	Yearly
New York	**17.25**	**37.00**	**24.85**	**Yearly**
North Carolina	20.00	20.00	20.00	Yearly
North Dakota	36.00	90.00	60.00	Yearly
Ohio	21.50	21.50	21.50	Yearly
Oklahoma	42.25	483.75	100.75	Yearly
Oregon	30.00	30.00	30.00	Yearly
Pennslvaniya	24.00	24.00	24.00	Yearly
Rohde Island	30.00	30.00	30.00	Yearly
South Carolina	24.00	24.00	24.00	2 Yea
South Dakota	21.00	40.00	21.00	Yearly
Tennessee	23.00	23.00	23.00	Yearly
Texas	40.80	58.80	50.80	Yearly
Utah	14.50	14.50	14.50	Yearly
Vermont	42.00	42.00	42.00	Yearly
Varginia	26.50	31.50	26.50	Yearly
Washington	23.85	23.85	23.85	Yearly
West Virginia	30.00	30.00	30.00	Yearly
Wisconsis	40.00	40.00	40.00	Yearly
Wyoming	15.00	15.00	15.00	Yearly
Min	$8.00	$8.00	$8.00	
Max	$70.00	$483.75	$100.75	
Average	$27.71	$64.13	$32.06	
Standard Deviation	12.90	105.59	18.33	

V - License Fees

Fees for the licensing of drivers also serves as a potential source of revenue. Currently, the New York State Department of Motor Vehicles collects 602 million dollars in licensing fees on 11.3 million drivers in New York State. The average license fee is currently 53.35 dollars per license. Increasing license fees by $1.00 would yield 11.3 million dollars each year. The cost of collecting this fee overall is relatively high – reported at about 25% of revenue collected. However, the Department of Motor Vehicles provides a number of services and management tools in addition to collecting revenue. The 2009-2010 Executive Budget Proposal also includes a 25% increase in these fees which would result in an additional 21.9 million dollars.

Summary of characteristics:

- Stability: High
- Evasion rate: Very low
- Collection/Administrative Costs: Moderate to high.
- Equity: Low, since it is a flat fee regardless of income
- New revenue potential: relatively small given the size of the revenue base.
- Matching/User pays: moderate. Drivers incur a registration fee but level of usage not taken into account.

A comparison of drivers' license fees is provided in Table 10. New York's estimated average annual cost for a driver's license fee ranges from a minimum of $12.85 to a maximum of $21.00, which is above the averages nation- wide of $6.40 - $9.41 annually.

TABLE 10

Comparison of Drivers' License Fees by State

Analysis of Driver's License Fees

State	Approximate Range			Estimated Annual Cost	
	From	to	Time Period	From	To
California	$22.00	$28.00	5 Years	$4.40	$7.00
Connecticut	$66.00	$77.00	5 Years	$13.20	$19.25
Florida	$20.00	$20.00	5 Years	$4.00	$4.00
Illinois	$30.00	$30.00	5 Years	$6.00	$6.00
Louisiana	$24.50	$28.50	4 Years	$6.13	$7.13
Massachusettes	$70.00	$75.00	5 Years	$14.00	$15.00
Michigan	$25.00	$35.00	5 Years	$5.00	$7.00
New Jersey	$24.00	$24.00	5 Years	$4.80	$4.80
New York*	**$64.25**	**$105.00**	**5 Years**	**$12.85**	**$21.00**
Ohio	$23.00	$24.25	N/A	N/A	
Oregon	$59.00	$59.00	8 Years	$7.38	$7.38
Pennsylvania	$28.00	$33.00	4 Years	$7.00	$8.25
Tennessee	$17.50	$19.50	N/A	N/A	
Vermont	$45.00	$62.00	4 Years	$11.25	$15.50
Virginia	$4.00	$4.00	1 Year	$4.00	$4.00
Minimum	$4.00	$4.00		$4.00	$4.00
Maximum	$70.00	$105.00		$14.00	$21.00
Average	$34.55	$41.35		$6.40	$9.41
Standard Deviation	$20.58	$27.64		$3.75	$5.86

* Range based on age. Younger drivers fees are higher.

Sources: Individual DMV of each State.

VI - Private investment – PPP with additional fees such as tolls

Public Private Partnerships or PPPs as they are more commonly known are arrangements for procuring goods and services by Government through a joint venture with a private sector provider. A PPP can be defined as an arrangement between government (or other public sector body) and a private sector party, resulting in the private sector party providing infrastructure and/or services that are traditionally delivered by the public sector.

Many transport PPPs around the world have involved the transfer of existing assets that were publicly built and operated and then leased to the private sector. Such transactions involving existing assets are referred to as a 'brownfields'. Other transport PPPs have involved the building of new facilities using private shareholder money. These projects are called Greenfield Projects. Transfers there also typically involve some kind of long-term lease.
Whether brownfield or Greenfield, a fundamental issue concerns the terms and valuation of the lease. The basic concept is that the capitalized value of the free cash flows is equal to the net present value (NPV) of the lease which, in turn, is the true economic value of the lease.
This fact raises a few questions --

- What are all the relevant cash flows? (a cash flow identification problem)
- When do cash flows occur? (a timing problem)
- Who actually gets to use and benefit from those cash flows? (a beneficial ownership problem)
- To what use are cash flows put and by whom? (a reinvestment problem)
- How are the asset and the lease itself financed? (a financing problem)
- What are the risks associated with each cash flow and who bears those risks? (a risk problem)

These questions are raised here because they point to a basic fact that PPPs do not represent 'new' money but financing mechanisms for tapping into pools of money outside general tax revenues but which do so only by being secured by revenues produced by the asset being built or transferred.

A simple example is a toll road. If New York State wants to build a new toll road it could do so by traditional mechanisms, i.e. raising proceeds from bond issuance and the use of general tax revenue to build the road and then covering debt service and principal repayment by the use of toll revenues generated later, using general tax revenues to make up any shortfall. No private party need be involved in this type of transaction but if one does get involved that party will want to have access to the toll revenues, or possibly additional governmental subsidy that will allow that private party to recover its investment and make a fair rate of return. PPPs therefore might offer many advantages but ultimately the user of the facility will have to pay ultimately for the cost of that facility and that user may well be a State taxpayer.

PPPs can still offer significant operational benefits in some circumstances, especially where a private operator is more efficient or expert at delivering a facility or service. Risk-transfer is also often mentioned as a benefit, i.e. a private entity might be willing to take on the risk of building a new facility which a more risk-averse public sector might demur from. And where a governmental tax based is limited in its capacity, a PPP get around the capacity constraint if private investors find a deal attractive enough to invest their own money in.
But private investors will ultimately demand a return, and proceeds raised by private shareholders will have to paid back, directly or indirectly, which means that revenues raised from a PPP are essentially transfers of future project or facility revenues into a present capitalized sum. Negotiations over the terms of the lease or sale will be key to ensuring that at least this sum fairly captures all the relevant revenues. The best protection against a bad deal is to negotiate a 'fair' lease. Once a lease is negotiated, it is very hard to change.

New York State has had very limited experience with transportation PPPs (though if one considers contracting out, there is extensive use of private service providers to deliver transportation services). Stewart Airport was briefly privatized in 1999 under a special federal pilot program but reverted roughly 8 years thereafter back to State ownership. Air traffic and business development did not live up to expectations and the private operator also decided to get out of airports a business line. In 2007, the Port Authority paid the private lessee $78.5 million for the remaining 93 years on its 99-year lease. The original lease had netted the State $35 million (as well as 5% of annual revenues). (Herald Record)

While one example should not be used to make a general decision, the Stewart Airport case does provide some cautionary tales. In particular lump sums raised through PPPs do imply giving up future control of revenues and if things do not go according to plan there may be significant costs to changing lease arrangements at a later time. While privatization has been used extensively in other countries, its use in the US is still limited and federal law limits the use of PPPs for facilities where federal money has been used.

The applicability of PPP as a source of transportation funding depends upon the potential revenue stream from the project as well as the long term prospects for revenue growth. It is highly likely that many transportation facilities would be of little to no interest to private owners, as the revenue streams generated from their operations are unlikely to cover the costs. In these cases, the potential to use PPP's to provide items such as rural roads, low volume highways or transit services is limited unless the state or locality provides some sort of ongoing subsidy to the PPP owner. This may be useful if the state has a limited ability to bond for new or existing projects, as the PPP owner's debt is not part of the state debt load. Therefore, a partial subsidy for the cost of operation of a PPP project may be less expensive than the state carrying the full cost of the project.

Recent PPP privatizations in Chicago, Indiana and proposed projects in Pennsylvania and New Jersey were designed to maximize the up front payment for the leasing of the project. The local/state governments would realize a significant one time cash payment for the lease. The potential to privatize certain existing facilities in New York State – the MTA Bridges, NYS Thruway and the Port Authority Bridges and Tunnels for example – would create a large one time payment for the state/local government, however, the lease holders would expect to recover that payment cost over the life of the lease through increases in the toll rates or other revenues from the facility.

Summary of Characteristics:

- Stability: Highly variable, depending upon specific facility being privatized and deal being struck.
- Evasion rate: Highly variable and dependent upon specific transaction. However, management and operational issues are the responsibility of the private lease holder - so evasion and violation are not a matter for the State
- Collection/Administrative costs: Highly variable depending upon deal
- Equity: Highly variable, depending upon deal. If purely profit driven likely to be inequitable
- New Revenue Potential: Generally a shift of future revenues to the present rather than generation of completely new revenues.
- Matching/User Pays: Highly variable and deal-specific

VII - Bonds

Purchasers of State and local governmental bonds and certain types of 'private activity' bonds are allowed to exclude the bond interest from their gross incomes on their federal income tax returns. This tax exemption represents a significant federal subsidy to state and local governments in that states and localities can borrow at reduced rates since the buyer of the bond will be earning interest free of federal tax and so will be willing to accept a lower before-tax bond rate.

From a national perspective the federal tax-exemption is simply a transfer from one level of government to another. However, from a New York State perspective this tax-exemption does represent a gain in revenue in terms of lowered borrowing costs. The value of this gain essentially equals the total interest cost of deductible New York State bonds given the tax subsidy versus the interest cost that the State would have borne had no such subsidy was available.

The US Congress Joint Committee on Taxation measures this subsidy as a "tax expenditure" i.e. federal revenue foregone. In 2006, this amounted to roughly $12 billion for all tax exempt bonds. (JCT) In 2006 the total amount of tax-exempt debt issued in the US was $87.6 billion. Of this amount, $38.4 billion was issued for transportation purposes, almost 44% of the total. In 2006, New York State was the third largest issuer of new tax exempt debt in the country, with just over $15 billion issued, 17% of total bond issuance in that year. Of this amount, $4.7 billion, 31.5% of New York's issuance for that year, was dedicated to transportation. (SOI) Using the tax expenditure estimate cited above, New York State's share of the federal tax subsidy amounted to 17% of $12 billion, or $2.1 billion. This is a crude measure and an overestimate since the tax expenditure number includes the federal revenue lost from interest exemptions on outstanding as well as new debt, but it provides an overall order of magnitude.
Although a significant subsidy, the federal tax exemption on New York State governmental debt does not represent revenue in the strict sense of the word since is a subsidy to borrowing rather than a direct tax or expenditure grant. Borrowing must occur for the subsidy to be obtained and this subsidy only lowers borrowing costs rather than adding revenue to State coffers.
New York State is already making more than full use of that interest cost break. The New York State Comptroller notes that total New York debt more than tripled between 1990 and 2006, rising from $14.4 billion to $48.5 billion. $44.6 of this amount was issued through public authorities which also had an additional $81.5 billion in debt not supported by State revenues. (NYSC)

This level of indebtedness raises some obvious concerns. New York State now has the second highest per capita debt burden in the country (Alaska being first), which implies that the amount of funds required to service outstanding debt rather than go to needed transportation services is necessarily higher than it would be if borrowing was more constrained.
High debt levels also have potential impacts on perceived creditworthiness. As of October 2008, the major ratings agencies put roughly a double A rating on New York State obligations, with a 'stable' outlook. That is a fairly good rating which enables the State to borrow at lower rates and take full advantage of the federal tax subsidy. But a level of indebtedness that becomes too high can threaten the State's rating and raise its borrowing costs, nullifying the subsidy.
Transportation investments, being generally long-lived facilities with high up-front costs and deferred benefits, will generally require some sort of bonding and good projects should get that type of financing. Given the State's current creditworthiness governmental purpose bonds will continue to get a borrowing subsidy and that can add up to significant amounts in terms of interest savings. To take a simple example, a $1 billion bond with a 10% annual interest rate without the federal tax exemption versus a 9% rate made possible by the tax exemption would result in lowered annual borrowing costs to the State of $10 million ($1 billion x (0.10 – 0.09) = $1 billion x 0.01).

But the State's already high debt levels do not recommend increased borrowing for the sake of obtaining the federal subsidy. And tax exempt bonding is not new revenue for it must be serviced and paid back, even if at reduced interest rates.

Bonds are generally issued either against future taxes or fees and the bonds are backed by the revenue streams of the project or the general tax base of a region/state. The amount of revenue collected due to bonding would depend on how expensive it is to borrow funds; it is possible that there can be a liability in the future. For clarity, we can demonstrate the pros and cons of utilizing bonding to provide funds by providing an example based on certain assumptions.

The assumptions of the following example are 1.7 million dollars a year for 5 years at 4% interest, paid off over 20 years. Under this analysis, there is a payment of only $535,500 per year for this funding, but at the end of 5 years, 6.2 billion dollars is still owed on the bond that would presumably have to be paid for during the subsequent five years. (See Appendix 3 for more detail on this analysis.) We also would expect another five year capital program to be deployed in 2015 to 2019, and the 2010 bond issue resources would not be available - so you would have an additional 6.2 billion dollars in debt to pay off as well as the need to issue further debt to fund the 2015-2019 program.

Summary of Characteristics:

- Stability: Varies according to revenue stream being bonded.
- Evasion rate: not applicable
- Collection/Administrative Costs: not applicable
- Equity: not applicable
- New Revenue Potential: Not new revenue in a strict sense but leveraging of future revenues
- Matching/User Pays: Variable, depending upon structure of bonding

VIII - Local Option Sales Tax

Local-option sales taxes have been proposed in a number of jurisdictions. With recent reports indicating that the impact of transportation projects is largely local (Andrew Haughwout – Federal Reserve Bank of New York), local financing becomes an option as well as a system where the costs are linked more directly to the beneficiaries of the project. Goldman and Wachs provide a good overview of the regional and local taxes that have been used to fund transportation infrastructure.

Further analysis of this funding source would require specificity as to the project, location and funding mechanism. This set of mechanisms is most appropriate for funding local projects as opposed to funding the general operations of the NYS Department of Transportation.

IX - Green Taxes or Fees

The utilization of fees that discourage the production of pollution or other social costs have been proposed for a number of reasons. The economist Arthur Pigou proposed these types of taxes to provide an offset to control for the negative externalities created by the pollution. A negative externality is a cost that is borne not by the consumer of the good, but by others individuals that are not a part of the goods transaction. These taxes are commonly called green taxes or an ecotax,

Pigouvian type taxes can cover a broad range of goods with either negative or positive externalities. These include carbon taxes, transit subsidies, electricity use tax, road pricing and other forms of green taxes. The key concept is that we will use the tax system to increase the cost of goods that have negative externalities with a tax that is scaled in proportion to the negative impact of the externality. Correspondingly, we may wish to provide a negative tax (a subsidy) to the production of goods that have positive externalities. As a simple example (not related to transportation), perhaps we should apply a health care tax on fast food and provide a subsidy for fresh vegetables. This concept has recently been proposed for soft drinks in New York State, with Governor Patterson proposing an 18% tax on soda sales with an expected tax revenue of 500 million dollars.

Pigouvian type taxes may create some significant management challenges if they are not uniformly applied. One key concern is that if the tax is applied in one market and not in others then there will be incentive to create a black market in the product and encourage smuggling of the good from the low tax market into the high tax market. This is commonly observed in products such as cigarettes and in alcoholic beverages. In addition, the new tax may disproportionately burden low income users if these users have a higher consumption pattern of these types of goods.

A commonly discussed potential green fee would be a carbon tax applied to all forms of carbon production. This would impact the cost of operation of vehicles and would therefore discourage their use. By applying a tax on the carbon produced in the use of vehicle, we could create a significant revenue stream. Currently, the Bay Area Rapid Transit estimates CO_2 production that is avoided by rail passenger travel. Utilizing their estimates of average fuel economy and CO_2 production per gallon of gasoline consumed, they estimate $C0_2$ output avoided per mile of rail transit trip. Using the same methodology, we can convert our VMT estimates to a CO_2 output and then apply a tax to that production. To avoid the administrative cost of a carbon tax collection system, we suggest that the carbon tax is appropriately applied to the fuel of use in each vehicle, with a fuel taxation increase for conventional vehicles and a tax on electricity consumption or through the registration fee for alternative fuel vehicles. Our estimates are included in Table 11.

TABLE 11

NYS CO2 Output from Vehicle Use Based on Bay Area Rapid Transit Model

NY State CO2 Ouput from Vehicle Use Based on Bay Area Rapid Transit Model			Metric
CO2 Output Per Gallon of Gasoline Used (pounds)			19.4
Average MPG			20.3
CO2 Output Per Mile of Travel (pounds)			0.9557
NTS VMT	2007		136,740,000,000
NYS Vehicle C02 Output (pounds)	2007		130,677,635,468
NYS Vehicle CO2 Output (tons)	2007		65,338,818
Tax Rate Per Pound		$	0.010
Tax Rate Per Gallon of Fuel		$	0.194
Expected Revenue		$	1,306,776,355

Based upon the current pattern of VMT and the resulting CO_2 output (65 million tons in 2007) and a one cent per pound CO_2 tax, the revenue raised would be 1.3 billion dollars per year. Since the $CO_{2\ output}$ per gallon of gasoline is 19.4 pounds, a one cent per pound tax applied as an additional fee to the fuel tax would be 19.4 cents per gallon. This tax could be indexed for inflation and fuel economy to preserve the purchasing power of the tax for infrastructure repair and improvements.

Carbon taxation offers a unique opportunity to apply an environmental tax using an existing tax mechanism. By utilizing the fuel taxation mechanisms that are already in place, the taxation of carbon can be applied at close to zero net administrative costs. Taxation of carbon would provide an additional source of revenue as well as promote the reduction in greenhouse gases. Given the direct relationship between the utilization of hydrocarbon fuels and the production of atmospheric carbon, we can tax the carbon as a surcharge on the existing fuel tax system. To do so, we convert the carbon tax per unit of output (say pounds of carbon) back into the equivalent amount of fuel consumed (say gallons of fuel) and tax that amount of fuel with an additional carbon charge.

Other green fees that have been proposed include mining and extraction fees for minerals, forest products and energy, import duties on goods produced in areas without proper environmental controls (to level world playing field in terms of costs), taxes on waste production, taxes on pollution output, taxes on effluents and taxes on hazardous wastes.

While not always stated as an ecotax, vehicle registration fees pegged to fuel efficiency are utilized in a number of European countries (Spain, Portugal, Finland, The Netherlands and Austria) with hybrids getting lower fees and in some cases SUV's and 4 wheel drive vehicles taxed at a higher rate. This proposal is counter to the proposal made earlier in this report to provide a tax on hybrid vehicles to offset their low contribution to road fees through the fuel tax. A full discussion of the public policy goals of our taxation system would be appropriate prior to setting registration fees.

To what degree these broader green taxes would generate revenue would be tied to the amount of output of each negative product and the level of taxation. With the exception of the carbon tax on vehicle pollution, it is not clear that any of these fees would be dedicated to investments in the transportation network. In addition, in many areas, the implementing of green fees has been discussed in linkages to lowering other existing taxes to make the shift to green taxation revenue neutral for the state. The expectation is that this would lower taxes such as income, sales or payroll taxes and replace them with green fees or ecotaxes.

Summary of characteristics (of green fees generically; might vary depending upon the specific type of charge):

- Stability: variable, depending upon behavioral change in response to the charge. If effective in reducing polluting behavior, expectations would be for declining revenues.
- Evasion rate: variable, depending upon type of charge and ability to monitor and enforce.
- Collection/Administrative costs: Very high in general
- Equity: Low
- New Revenue Potential: Very high
- Matching/User Pays: Very high, especially in relation to internalizing social costs being imposed by user/polluter.

X - Freight Weight Fees

A freight weight fee is a general term for a tax or charge that increases as Gross Vehicle Weight (GVW) increases. Gross Vehicle Weight (GVW) refers to a fully laden weight of a truck and its payload and because of this is sometimes referred to as a Gross Combination Weight (GCW). States, by regulation, set maximum registered gross weights that vary according the type of vehicle.

This type of tax can take a number of different forms. One type is a weight-distance tax (WDT) in which the charge is calculated as a fee per mile on the registered gross weight of the vehicle. Total tax liability is calculated by multiplying this rate times miles traveled. A second type is Ton-Mile Tax (TMT) which is calculated by measuring the weight of each truck for each trip, arriving at a gross weight which is then assigned a tax rate which is multiplied by the miles of travel. A WDT is a cruder type of tax since it relies on registered GVW regardless of the actual amount of freight being carried on a given haul. A TMT is obviously more refined since it accounts for measured hauling weight. The tradeoff is that a TMT will have a greater monitoring and collection burden since actual weights must be measured across a large number of trips.

Freight weight fees have a basic policy justification: they aim to pass on the cost of wear and tear that heavier loads impose on roads and in so doing internalize that cost to operators. There is also some ancillary benefit to road safety if operators have incentives to manage loads and avoid overloads. Finally revenues raised from such a fee can be ploughed back into maintenance and renewal of infrastructure.

Federal and State approaches to freight weight have emphasized regulations and standards more than taxes and fees. (FHWA 2004). However, many authors have argued in favor of imposing fees instead as being a more efficient way to manage and limit the external costs imposed by carriers (Small et. al. 1989). These arguments, however, may not fully account for the capital and ongoing operational costs that a full freight weight fee might require for collection.

New York State is one of only four states in the country and the only one in the Northeast to currently collect a TMT. The levy is applied to vehicles with maximum gross weights of at least 18,000 pounds operating in the state. The TMT is not collected on miles traveled on toll roads. The tax has been collected within the state for over 60 years (OOIDA, 2009).

Because the TMT is collected in only a few states, there are some concerns distorting behavior and moving trucking activity out-of-state. This is the justification offered for a recent NYS Assembly bill calling for its repeal: "New York State is the only State in the region to employ a Ton-mile Tax. This factor produces an undesirable distortion of business decisions including the relocation of trucking fleets out-of-state, the location of distribution centers out of state, the alteration of shipping routes for tax-based considerations, and the evasion of the Ton-mile and \Fuel use Taxes entirely." (NYS Assembly, 2009). These concerns may, however, may be somewhat mitigated by the fact the New York State is such a major freight market, both as a destination and a transshipment point. Truckers thus may not have as much liberty to shift operations out of state as in the other states with a TMT, i.e. KY, NM and OR (OOIDA 2009).

Current levels of revenue from this tax have amounted to an average of $114.6 million annually from 2002-2005. However one study of New York's TMT finds high current levels of evasion amounting to close to 50% and a true tax base that should yield revenues on average closer to $250 million annually. This is higher than some earlier estimates but consistent with those studies which showed lower but similar orders of magnitude for evasion rates. For purposes of our analysis, we have estimated that with increased enforcement, approximately an additional $148 million could be raised.

Part of this high rate has to do with carriers that cross in and out of New York State for only small segments on their way to other destinations in the dense Northeastern corridor (such carriers, especially small ones, might be less likely to be compliant, much as an out-of-state driver might ignore a parking ticket issued in state where the driver does not normally live). Additionally, this is not an easy tax to assess properly given existing collection and monitoring technologies utilized within New York. There is, no doubt, an additional complication in that the TMT is not collected in most of the rest of the US. (ATRI, 2008).

Given the already high levels of evasion to the TMT, a simple increase or expansion in it is probably not likely to result in much additional revenue. It is possible that a redesign of the

charge, including a simplification of the fee tables and reinstitution of a sticker system which many analysts believed was more effective in ensuring compliance could boost yields from the existing levy. If estimates of net lost revenues are correct at approximately $148 million annually, measures that would collect even 10% of that loss would yield over $10 million, though this simple calculation does not net out additional costs of enforcement and collection that might be incurred by the State. Another possibility is to revert to a cruder freight weight fee such as a WDT, which would have lower enforcement costs but also would be less accurate in internalizing costs. However the objections made above to this type of fee, at least in the current state-by-state environment, would still apply in either case.

Summary of Characteristics:

- Stability: relatively stable
- Evasion rate: very high, though possibly amenable to some lowering with redesign.
- Collection/administrative costs: relatively high due to high violation rates.
- Equity: If properly designed, relatively high in terms on proper allocation of cost on those who impose such costs.
- New Revenue Potential: modest. Increased collections from existing potential tax base could be reasonably large.
- Matching/User Pays: Theoretically high, though high evasion rates minimize this.

XI - Dedicated Taxes

One proposed method of financing the transportation system is through 'dedicated taxes'. The term is a bit broad but essentially refers to a budgetary arrangement whereby revenues collected from a given source or set of sources are directed to a particular purpose or entity.

Dedicated taxes are already widely used in the field of transportation. The federal Highway Trust Fund (HTF) is an example whereby revenues from the federal taxes on motor fuels and a few other transportation-related charges are allocated to transportation uses. The HTF's purpose is to set up a close link between the sources from which revenues are collected and the uses to which those revenues are put and in so doing support the 'user pays' principle.

- Dedicated Payroll Taxes

However dedicated taxes can be from any source and put to any purpose, and need not use a trust fund. The recent package of New York State taxes that were created to fund shortfalls in the MTA budget serves as a prime example. That package included a payroll tax, of 34 cents for every $100 in wages, to be paid by employers in the 12 counties served by the transportation authority (and referred to as a regional 'mobility' tax). Also included were a series of fees on drivers and vehicles, a 50-cent surcharge on taxi rides, a $25 surcharge on vehicle registrations, a $2 fee on drivers licenses and an additional 5 percent tax on car rentals. The whole set of revenue measures was estimated to yield a total of $1.9 billion annually, with the largest portion of that – approximately $1.3 billion – coming from the payroll tax (NYT May 6, 2009). These revenues were dedicated to the MTA's budget.

A tax of this type could be expanded for other transportation uses, for example road improvements, and beyond the 12 downstate counties of the New York metropolitan area (though the bulk of State payrolls are in this area). To take a very simple example, a doubling of the current MTA charge from 34 cents to 68 cents per $100 of payroll would yield an upper bound of $1.3 billion additionally annually (an upper bound because there would certainly be some shifting of employment and evasion of tax as rates climbed). This is a sizeable amount of annual revenue and would be increased if the payroll tax were applied statewide.

However, the experience with the MTA package thus far offers many cautionary tales as well. Opponents of the tax have argued that a payroll tax is job destroying, especially in a recessionary environment and where there is interstate competition (or, in the case of the 12-county area currently bearing the surcharge, intrastate competition as well). There is not yet enough data to evaluate this claim but it certainly is an issue and to the extent it holds true will lessen the potential revenue yield as time passes and as rates may climb.

Additionally, payrolls are especially sensitive to macroeconomic conditions, as are some other taxes such as sales taxes. Estimates of the MTA tax package earlier this year suggested that it would yield $200 million less than forecast in total and further declines in the economy could make this shortfall worse (NYT April 13, 2009).

An additional problem is that although these tax revenues are 'dedicated' to the MTA (and could be 'dedicated' to other transportation uses in the case of new payroll taxes), there is nothing stopping the government from cutting other disbursements to the MTA if policy prerogatives dictate. This is often referred to as the 'substitution' problem, in which new dedicated revenues are then sometimes used in lieu of existing discretionary allocations which are phased out as a result. Recently a proposed cut of $113 million to State expenditures on the MTA was being floated, cutting back the net impact of the dedicated taxes on that agency's operating deficit (NYT October 18, 2009). This very dynamic would be present in any other proposed transport dedicated payroll tax.

Summary of Characteristics:

- Stability: Uneven and highly pro-cyclical (i.e. going up in an up economy, down with a down economy).
- Evasion rate: Potentially high as tax rates climb or base expands.
- Collection/administrative costs: Incrementally minimal since existing collection mechanisms are well established. However could increase if taxpayers seek to minimize or evade the tax.
- Equity: Tending towards regressivity since it covers salary and wage income, not unearned income or compensation paid in other ways such as stock options.
- New Revenue Potential: High given the size of the base, though with potentially diminishing returns as rates climb.
- Matching/User Pays: Very low. Payrolls are driven by many taxable factors beyond MTA services.

- Capital Gains

A capital gains tax generally is a tax on any gain made from a sale of an asset. More generally it is referred to as a transfer tax. As with a payroll tax, a transportation-dedicated transfer tax could be imposed to pay for transportation projects and operations. This type of tax could be imposed on any type of asset, i.e. real estate, equities, etc.

The issues surrounding this type of tax would be very similar to those surrounding a dedicated payroll tax, i.e. high new revenue potential, low matching between sources and uses of funds, and possibility of substitution of dedicated revenues for existing budget allocations.

A transfer tax could be potentially more progressive because generally high-income people earn more of this type of income than lower income earners. However this type of tax is much more subject to evasion and behavioral adjustment since the timing and place of asset sales can be much more easily manipulated than payrolls. And such sales are even more affected by macroeconomic conditions and much less stable in their annual yields.

Summary of Characteristics:

- Stability: highly procyclical; in the current environment likely to be below expectations.
- Evasion rate: potentially very high
- Collection/administrative costs: incrementally relatively low since they piggyback off of well-established collection systems.
- Equity: relatively progressive
- New Revenue Potential: Uneven because of procyclicality though potentially very high
- Matching/User pays: low

- High-End Income Tax

Taxing high income individuals tends to be a popular idea, given the need for revenue and a desire to keep the burden of taxation more progressive. The current income taxation system in New York state is progressive, with the tax rate increasing from 4% up to 6.85% for incomes greater than 20,001 dollars per year. One potential source of revenue for transportation could be a tax on high levels of income. As is the question in any revenue generation system, the questions of the potential revenue that could be generated by the tax and the cost of administration need to be fully understood.

The authors utilized data from the Census 2000 that provides the number of households by income class and reported income in 1999. The Census reports data in 16 income classes ranging from 0-9,999 dollar per year per household for the lowest class to $200,000 plus for the highest class. The Census Bureau also reports per capita income and median family income. Table 12 provides household counts by income class for New York State. Using all three of these metrics and the household and population counts grouped by Zip Code, the authors are able to estimate the total income held by each cohort. The last cohort – 200,000+ households is not fully defined by the income classes, so this is the area where additional income is expected to be located.

Solving for the total income in New York State using the Per Capita Income and Population, we find that the total NYS Income was $443,843,064,187 in 1999. When we calculate the income by income class, we find only $ 423,411,002,500. Based upon this difference, we can estimate that the income captured in households above $400,000 a year is $20,432,061,687 in 1999 (Table 13). This represents 4.6% of NYS income in 1999. While there are 234,852 households in the $200,000 plus income category or 3.35 percent of households, as a group they receive 20.48% of NYS household income. In 1999, the NYS Department of taxation reported a personal income tax total collection of 20,576,067,716. This represents an overall tax rate of 4.60% on income.

The very high income households are not distributed evenly across the state, with 31 (1.9%) of the 1675 zip codes containing 38.34% of the $200,000 plus households. These zip codes are largely located in the downstate region.

This method of estimation gives us a good estimate of how much income is captured in high income households. In addition, the Median Household income is $51,691 and the mean based upon the per capita estimate is $62,862 – confirming that the income data has a positive skew in the data and that significantly more income is captured in high income households. In addition, the mean family income is $94,970, this again is a very positive skew. So, we do find a significant amount of income that could be taxed in high income households. Taxing the household income above $400,000 at a 5% additional tax rate would have produced 1.021 billion dollars a year in 1999.

In 2008, New York State collected $36,563,948,528 in personal income tax revenue. This represents 62.5% of NYS tax collections in 2007-2008. Income taxes are generally very efficient in terms of collection, generally costing between 0.4% to 1% of a given tax for collection costs. In addition, any new taxes would be applied by a system of collection and enforcement that is already in place. Therefore, we assume no significant additional costs for administration, and a

normal rate of costs for enforcement and the revenue collection process. Assuming a high income percentage as is observed in the 1999 Census data, with 20.48% of income held in high income household, and a overall tax rate of 4.60% would then allow us to estimate the 2008 tax revenue from a 5% tax on income above $400,000. Our estimates indicate that the 5% additional tax would raise 1.916 billion dollars in 2008.

TABLE 12

High-End Income Tax

NYS Household Income - 2000 Census							
Income Group	Households	Class Mark	Total Income	% of Households	% of Income	% of Inc. incl. Super High	
LT 9999	809,507	$ 5,000	$ 4,047,535,000	11%	0.96%	0.91%	
10000 - 14999	453,320	$ 12,500	$ 5,666,500,000	6%	1.34%	1.28%	
15000-19999	408,841	$ 17,500	$ 7,154,717,500	6%	1.69%	1.61%	
20000-24999	413,770	$ 22,500	$ 9,309,825,000	6%	2.20%	2.10%	
25000-29999	407,864	$ 27,500	$ 11,216,260,000	6%	2.65%	2.53%	
30000-34999	399,179	$ 32,500	$ 12,973,317,500	6%	3.06%	2.92%	
35000-39999	374,292	$ 37,500	$ 14,035,950,000	5%	3.31%	3.16%	
40000-44999	357,153	$ 42,500	$ 15,179,002,500	5%	3.58%	3.42%	
45000-49999	315,556	$ 47,500	$ 14,988,910,000	4%	3.54%	3.38%	
50000-59999	591,627	$ 55,000	$ 32,539,485,000	8%	7.69%	7.33%	
60000-74999	706,085	$ 67,500	$ 47,660,737,500	10%	11.26%	10.74%	
75000-99999	746,384	$ 87,500	$ 65,308,600,000	11%	15.42%	14.71%	
100000-124999	420,885	$ 112,500	$ 47,349,562,500	6%	11.18%	10.67%	
125000-149999	218,640	$ 137,500	$ 30,063,000,000	3%	7.10%	6.77%	
150000-199999	202,640	$ 175,000	$ 35,462,000,000	3%	8.38%	7.99%	
200000+	234,852	$ 300,000	$ 70,455,600,000	3%	16.64%	20.48%	
Total	7,060,595		$ 423,411,002,500	100%	100.00%	$ 443,843,064,187	
			$ 59,968.18				

TABLE 13

Super High Income Taxation Calculation

Super High Income Taxation Calculation			
2000 Census Reported 1999 Income Total Income based on Per Capita Income		2000 Census Reported Median Family Income	
$ 443,843,064,187		$ 51,691	
Estimated Total Household Income		Reported Families	
$ 423,411,002,500		4,673,485	
Difference		Implied Total Income	
$ 20,432,061,687		$ 241,577,113,135	
High Income Chort Income Above $400,000 in Income Per Year		Based on Median Family Income	
Tax Income above $400,000 at 5% Rate		Reported Households	
$ 1,021,603,084		7,060,595	
HH Size	HH Mean Income		Per Capita Income
2.6877	$ 62,861.99		$ 23,389.17
Family Size	Family Mean Income		
4.0604	$ 94,970.47		

Conclusions

New York State is currently facing a roughly $1.7 billion – $8 billion hole in its current five year transportation capital plan. This hole needs to be filled with new revenues. This report has reviewed various options for new revenue mechanisms, or expansions of existing mechanisms which might be used to meet the shortfall. Equity and efficiency principles for revenue collection, generation and allocation have been applied to each mechanism to weigh its relative strengths and weakness.

A few broad conclusions can be reached about the options that New York State might best use to raise the necessary revenues. First, transportation system investment and maintenance must be paid for by someone. This may seem an obvious point but politically there will likely be much opposition by those who will be required to pay more than they do now. There is a tendency to avoid such opposition by seeking to get revenue from sources that do not involve taxes, fees or

tolls, such as PPPs and bonding. However options that do not directly involve increases in charges to users and/or nonusers will ultimately nonetheless have to be paid for by constituents. It is more efficient and effective, even if politically painful, to recognize this fact up front and design revenue mechanisms that are fair and achieve desired revenue generation and policy goals at minimum cost.

Second, transportation is a discrete and tangible service. The best option for paying for the system is to have revenue sources that are closely tied to the transportation system and to have such revenue plowed back into that system and where the 'user pays' principle applies. The current debate over the existing NYC Public School MTA subsidized Metrocard program is very illustrative of these issues. The key question is not whether the program is good public policy to provide subsidized transportation services for students to travel to school, where it is clearly good policy, but rather, who should pay for these services. Currently 417,243 students receive free Metrocards, in addition, 167,917 receive half fare cards. This program was funded in part by both NYC and NYS funding, however, NYS recently cut their contribution to the program from 45 million dollars a year to 6 million dollars. The unilateral decision of NYS basically crammed down the funding gap into the budget of the local transit provider.

Third, stability of revenues and low-cost of administration and collection are, from a pure revenue point of view, highly desirable since these characteristics ensure that most revenue collected is actually available to be used for transportation purposes. Closely tied to this, especially for the forthcoming budget gap which is short to medium term, is capacity to raise new revenues relatively quickly.

The revenue stream analysis in this paper reveals that the various alternatives differ in the objectives they meet. The fuel tax in particular yields high amounts of potential revenues, costs very little to collect and is currently moderately taxed relative to international standards. The state may wish to consider indexing the Petroleum Business Tax as well to maintain the purchasing power of that revenue stream. By indexing both of these measures we could ensure a stable stream of revenue from the fuel/petroleum taxes for at least the next 10-20 years. The combined effect of these two adjustments would increase the state fuel tax rate by 3.38% per year. This would result in the tax increasing from 8 cents a gallon to 8.27 cents per gallon in 2010.

Further, by increasing the fuel tax to reflect the inflationary losses that have occurred **since the fuel tax was last increased in 1972**, we would restore the full value of the fuel tax funds. Based upon the Consumer Price Index changes from 1972 to 2009, this would create 1.502 billion dollars in funding for highways, bridges & transit. If fully indexed from the 8 cents per gallon in 1972, the 2009 fuel tax would be 30.25 cents per gallon.

Taxation of high income individuals (household income above $400,000 a year) would produce $1.916 billion dollars per year if taxed at a 5% additional rate above existing rates. This tax would be generated in large part in high income areas and would be largely collected in the downstate region.

Licensing and registration fees do not have as extensive a base and are not nearly so cheap to administer. Tolls have potentially high revenue yields, though perhaps not as much as might be thought because tolls on many facilities, especially downstate, are currently very high. Additionally, tolls cost a fair amount to collect.

Over the longer-term, and taking into account other policy goals, especially those of environmental improvement and remediation, green charges and VMT charges are especially promising. However these are quite expensive to implement and will take much time to get up and running. Though they might not be viable options to meet the immediate funding needs they should be considered as potential revenue sources 10 years out and beyond. A notable exception in a carbon tax applied through the purchase of fuel. A 1 cent per pound tax on carbon output would yield 1.306 billion dollars per year in additional revenue and be very cost effective to collect.

Finally equity considerations should not be ignored. Fuel taxes and tolls, for example, are generally regressive, though there is wide variation depending upon the users of a specific facility. In such cases there equity concerns should be designed into the mechanism, such as providing subsidies for low-income toll road users or fuel tax rebates for low-income drivers.

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Appendices

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Appendix 2 – Estimate of Household/Vehicle Cost
Appendix 3 - Discussion of Indexing PBT Rate
Appendix 4 – Estimated Bond Financing

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NYS Net VMT Change Per Capita by County
NYS Annual Fuel Tax Per Capita by County
NYS Federal Fuel Tax by County
NYS Implied Fuel Consumption by County
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New York City Percentage of Households $200,000+ Income by Zip Codes
New York State Percentage of Households $200,000+ Income by Zip Codes

Appendix 1- Impact of Fuel Sales Taxation Cap

Impact of Fuel Sales Taxation Cap **23-Nov-09**
New York State Fuel
J. Peters - UTRC II

Source	Tax Rate - Per Gallon	Implied Tax
Petroleum Business Tax	$ 0.1710	$ 1,125,097,065
Motor Fuel Excise Tax	$ 0.0800	$ 526,361,200
Capped Sales Tax - 14.4 per Gallon	$ 0.1440	$ 947,450,160
Federal Fuel Tax	$ 0.1840	$ 1,210,630,760
Total Tax Package	$ 0.5790	$ 3,809,539,185
Reported Gallons - 2008	$ 0.6320	Reported Rate - API
Fuel Taxed - 2008 Reported NYS Division of Taxation 6,579,515,000	$ 0.6320	$ 4,158,253,480
Gap in Reported Tax Rate - API vs NYS Tax	$ (0.0530)	$ (348,714,295)
Sales tax on $2.51 in Fuel Value at 8.25%	$ 0.2071	$ 1,362,453,069
Capped Sales Tax at 14.40 Cents Per Gallon	$ 0.1440	$ 947,450,160
Gap in Funding Caused by Sales Tax Cap	$ 0.0631	**$ 415,002,909**

Fuel Value = November 16, 2009 Reported NYS Fuel Price of 290.5 cents per gallon from the U.S Department of Energy and Fuel Taxes from The American Petroleum Institute (API)

Appendix 2

Estimate of Household / Per Vehicle Cost

Fuel Tax Increase				Vehicle Registrations
Annual Miles per Registered Vehicle	12,782			10,697,644
Annual Miles per Licensed Driver	12,117			
Average Fuel Economy	20.3 Gallons			
Fuel Consumed Per Vehicle	629.67			
			Proposed	- 1 Cent Increase in the Fuel Tax
Implied Taxes Per Vehicle	Tax ($)	Revenue	Taxes	
State Fuel Tax	$ 0.080	$ 50.37	$ 0.090	$ 56.67
State Petroleum Business Tax	$ 0.171	$ 107.67	$ 0.171	$ 107.67
Federal Fuel Tax	$ 0.184	$ 115.86	$ 0.184	$ 115.86
State Sales Tax on Motor Fuel	$ 0.144	$ 90.66	$ 0.144	$ 90.66

Existing Tax Revenue		New Tax Revenue	**Impact per Household**
Fuel Tax Burden Per Vehicle	$ 364.57	$ 370.86	**$ 6.30**
For a Family of Four with 2 Vehicles	$ 729.14	$ 741.73	**$ 12.59**

Appendix 3- Discussion of Indexing and PBT Rate

The rate of the PBT has been indexed to the Petroleum Producers Price Index, subject to a maximum 5% change per year (up or down). As such, this indexing mechanism has had a significant impact on the amount of revenue generated by the PBT, due to the high level of volatility of fuel prices.

Since 2000, the failure to allow the PBT to rise and fall with the average rate of the change in the Petroleum Producer Price Index has resulted in an impact in terms of revenue of over 2.7 billion Dollars per year. The current proposed 2010 PBT is 16.3 cents per gallon, down 5% from last year's rate of 17.1 cents per gallon.

To examine the impact of the cap on the PBT rate, we have to decide the point at which the cap would have been removed. The PBT has been subject to the change in the annual Petroleum Produce Price Index change of the prior year from Sept 1 – August 31 lagged by 6 months. If we had removed the cap in 2002 and allowed the PBT to rise from the 2002 rate of 14.65 cents per gallon based upon the Petroleum Producer Price Index over this period, then the 2010 PBT would be approximately 58.4 cents per gallon – or about a 400% increase in the tax. The current yield of the PBT is 1.15 billion dollars per year. At 58.4 cents per gallon, the annual revenue would be 3.8 billion dollars per year.

The current year impact of the cap reduces the 2010 PBT revenue by 52.6 million dollars. If moved to an uncapped impact, the PBT would fall from 17.1 cents per gallon to 11.1 cents per gallon due to a 35.09% reduction in fuel prices during the 2008/2009 index period. This reduction would be worth 395 million dollars in reduced tax revenue.

Appendix 4-

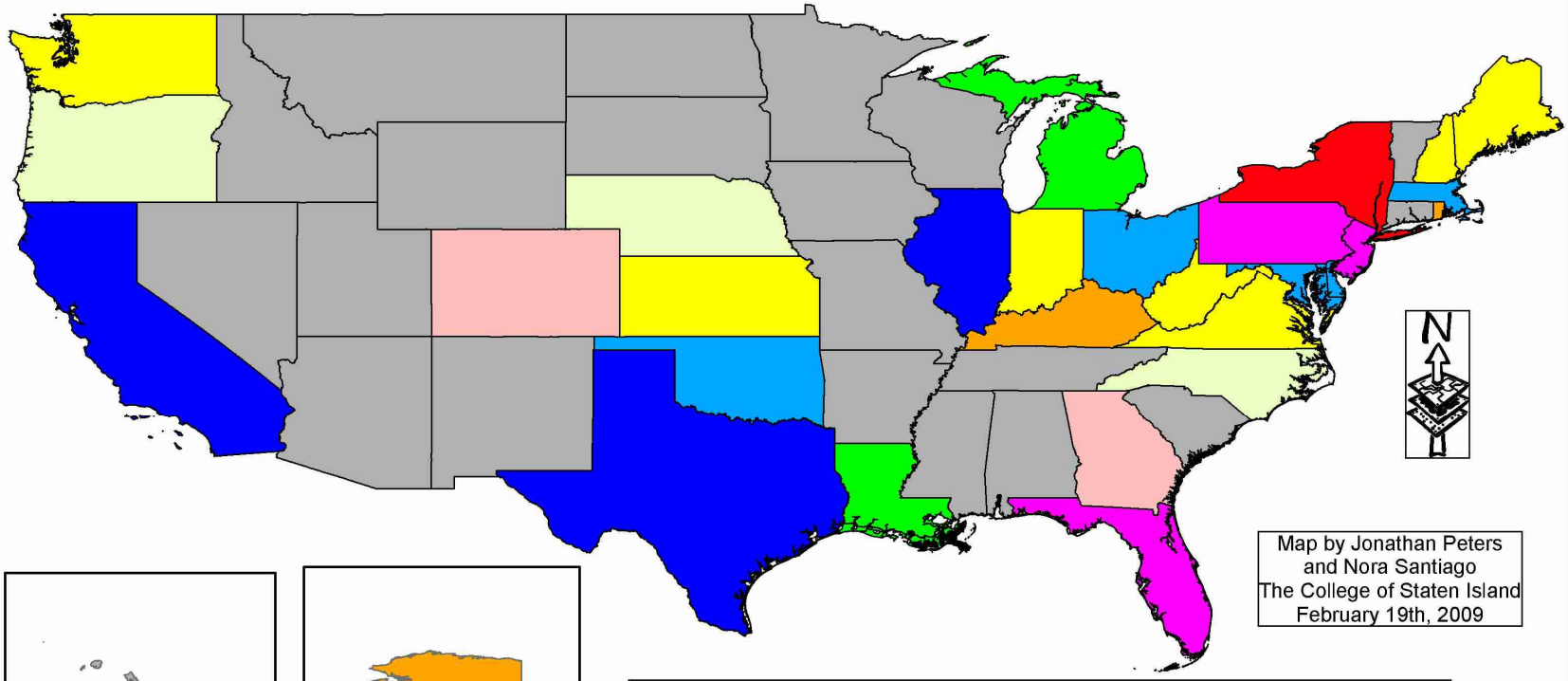
Appendix 3____
Estimated Bond Financing for 1.7 Billion Dollars Per Year for NYS DOT - 20 Year Bond
Based Upon Costs of Triborough Bridge And Tunnel Authority Rates - 4% Revenue Bonds

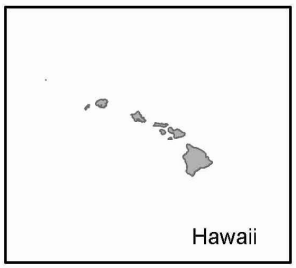
Year	1	2	3	4	5
Desired Payments	$ 1.700	$ 1.700	$ 1.700	$ 1.700	$ 1.700
Interest Rate	4.0%	4.0%	4.0%	4.0%	4.0%
(1+r)	1.04	1.04	1.04	1.04	1.04
Future Value Interest Fa Factor	1.04	1.0816	1.124864	1.16985856	1.216652902
Present Value Interest Factor	0.961538462	0.924556213	0.888996359	0.854804191	0.821927107
PV of Payments	$ 1.635	$ 1.572	$ 1.511	$ 1.453	$ 1.397
Total Value To Be Bond Financed	$ 7.568	Billion Dollars			

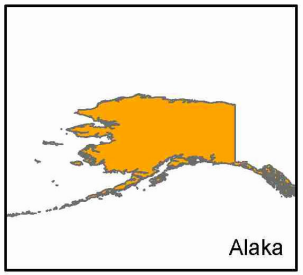
Present Value of Financed Amount	$ 7.568

Year	Rate	Principal	Payment	Net	Interest	New Principal	
1	4.00%	$ 7.568	$ 0.5355	$ 7.033	$ 0.281	$ 7.314	
2	4.00%	$ 7.314	$ 0.5355	$ 6.778	$ 0.271	$ 7.050	
3	4.00%	$ 7.050	$ 0.5355	$ 6.514	$ 0.261	$ 6.775	
4	4.00%	$ 6.775	$ 0.5355	$ 6.239	$ 0.250	$ 6.489	Still Owed
5	4.00%	$ 6.489	$ 0.5355	$ 5.953	$ 0.238	$ 6.191	$ 6.191
6	4.00%	$ 6.191	$ 0.5355	$ 5.656	$ 0.226	$ 5.882	
7	4.00%	$ 5.882	$ 0.5355	$ 5.347	$ 0.214	$ 5.560	
8	4.00%	$ 5.560	$ 0.5355	$ 5.025	$ 0.201	$ 5.226	
9	4.00%	$ 5.226	$ 0.5355	$ 4.690	$ 0.188	$ 4.878	
10	4.00%	$ 4.878	$ 0.5355	$ 4.342	$ 0.174	$ 4.516	
11	4.00%	$ 4.516	$ 0.5355	$ 3.981	$ 0.159	$ 4.140	
12	4.00%	$ 4.140	$ 0.5355	$ 3.604	$ 0.144	$ 3.749	
13	4.00%	$ 3.749	$ 0.5355	$ 3.213	$ 0.129	$ 3.342	
14	4.00%	$ 3.342	$ 0.5355	$ 2.806	$ 0.112	$ 2.918	
15	4.00%	$ 2.918	$ 0.5355	$ 2.383	$ 0.095	$ 2.478	
16	4.00%	$ 2.478	$ 0.5355	$ 1.943	$ 0.078	$ 2.020	
17	4.00%	$ 2.020	$ 0.5355	$ 1.485	$ 0.059	$ 1.544	
18	4.00%	$ 1.544	$ 0.5355	$ 1.009	$ 0.040	$ 1.049	
19	4.00%	$ 1.049	$ 0.5355	$ 0.514	$ 0.021	$ 0.534	
20	4.00%	$ 0.534	$ 0.5355	$ (0.001)	$ (0.000)	$ (0.001)	

2000 Toll Collection State Ranking Based on Data from the Federal Highway Administration







0 295 590 1,180
Miles

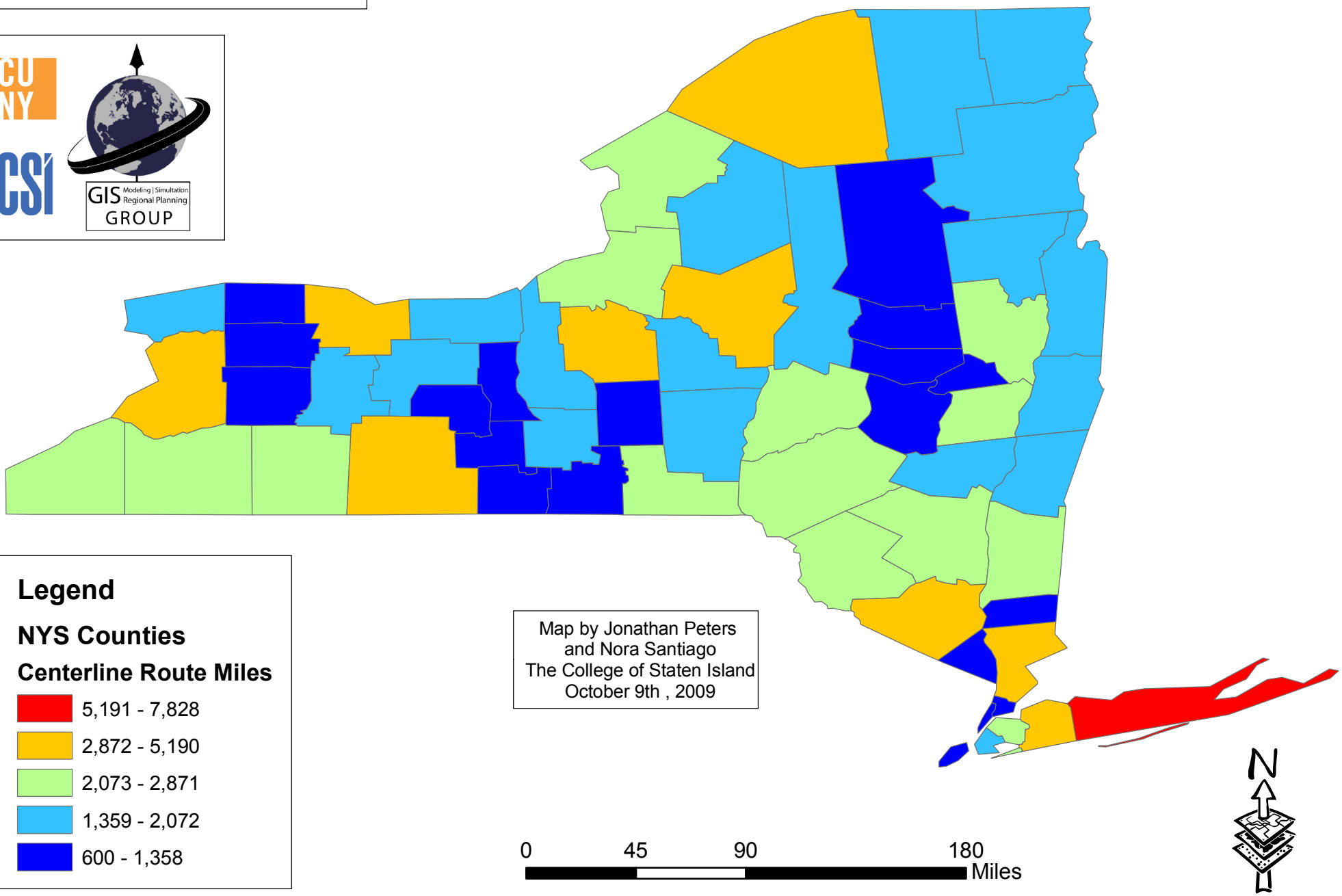
Map by Jonathan Peters
and Nora Santiago
The College of Staten Island
February 19th, 2009

Legend

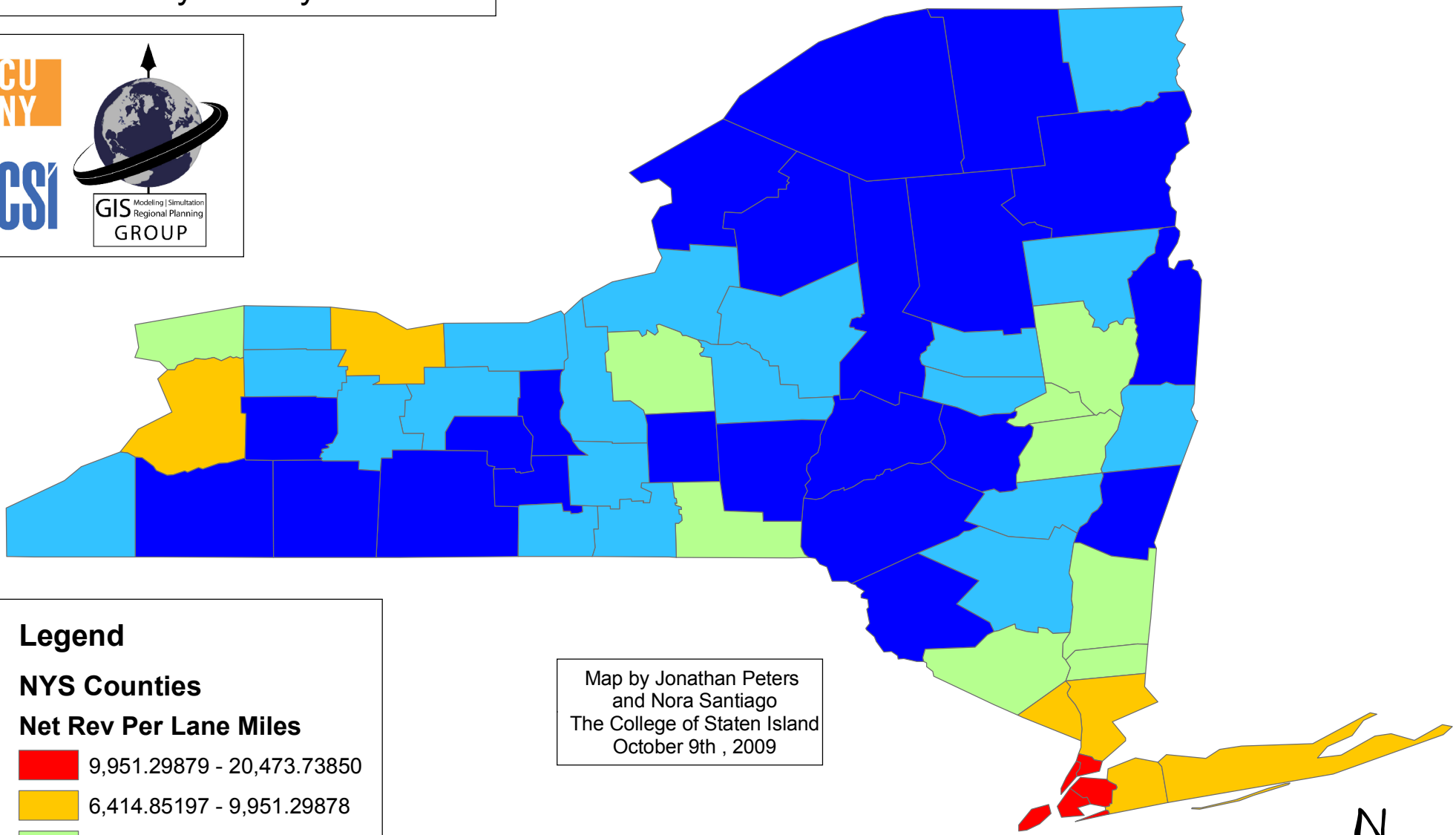
State and Local Tolls

- 0 - 860
- 861 - 3,469
- 3,470 - 15,900
- 15,901 - 27,119
- 27,120 - 34,554
- 34,555 - 112,944
- 112,945 - 229,267
- 229,268 - 450,378
- 450,379 - 711,611
- 711,612 - 1,987,071

New York State Centerline Route Miles by County



New York State
Net Revenue Per Lane Miles
by County



Legend

NYS Counties

Net Rev Per Lane Miles

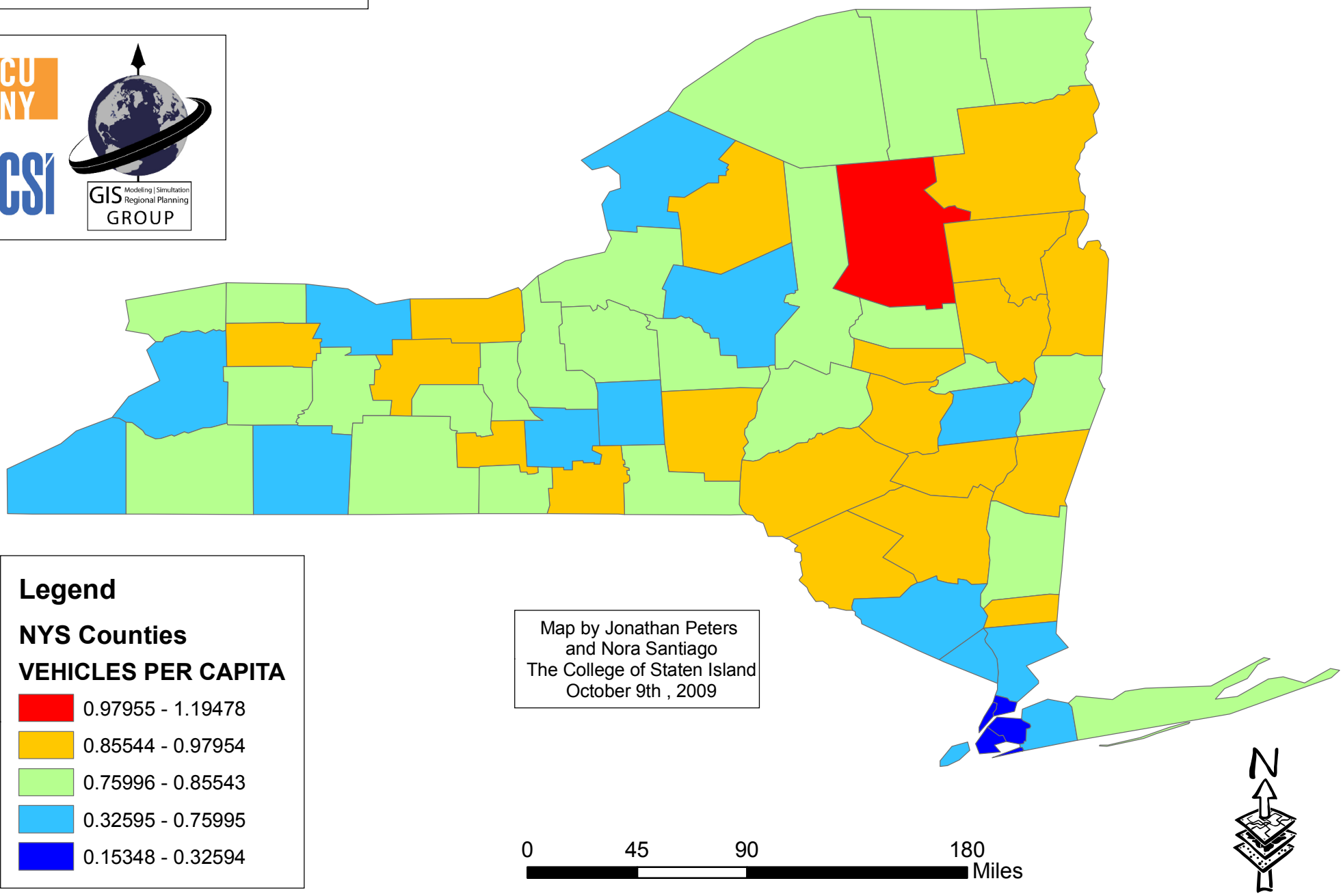
- 9,951.29879 - 20,473.73850
- 6,414.85197 - 9,951.29878
- 3,526.66806 - 6,414.85196
- 1,935.86182 - 3,526.66805
- 678.81361 - 1,935.86181

Map by Jonathan Peters
and Nora Santiago
The College of Staten Island
October 9th , 2009

0 45 90 180
Miles

N

New York State Vehicles Per Capita by County



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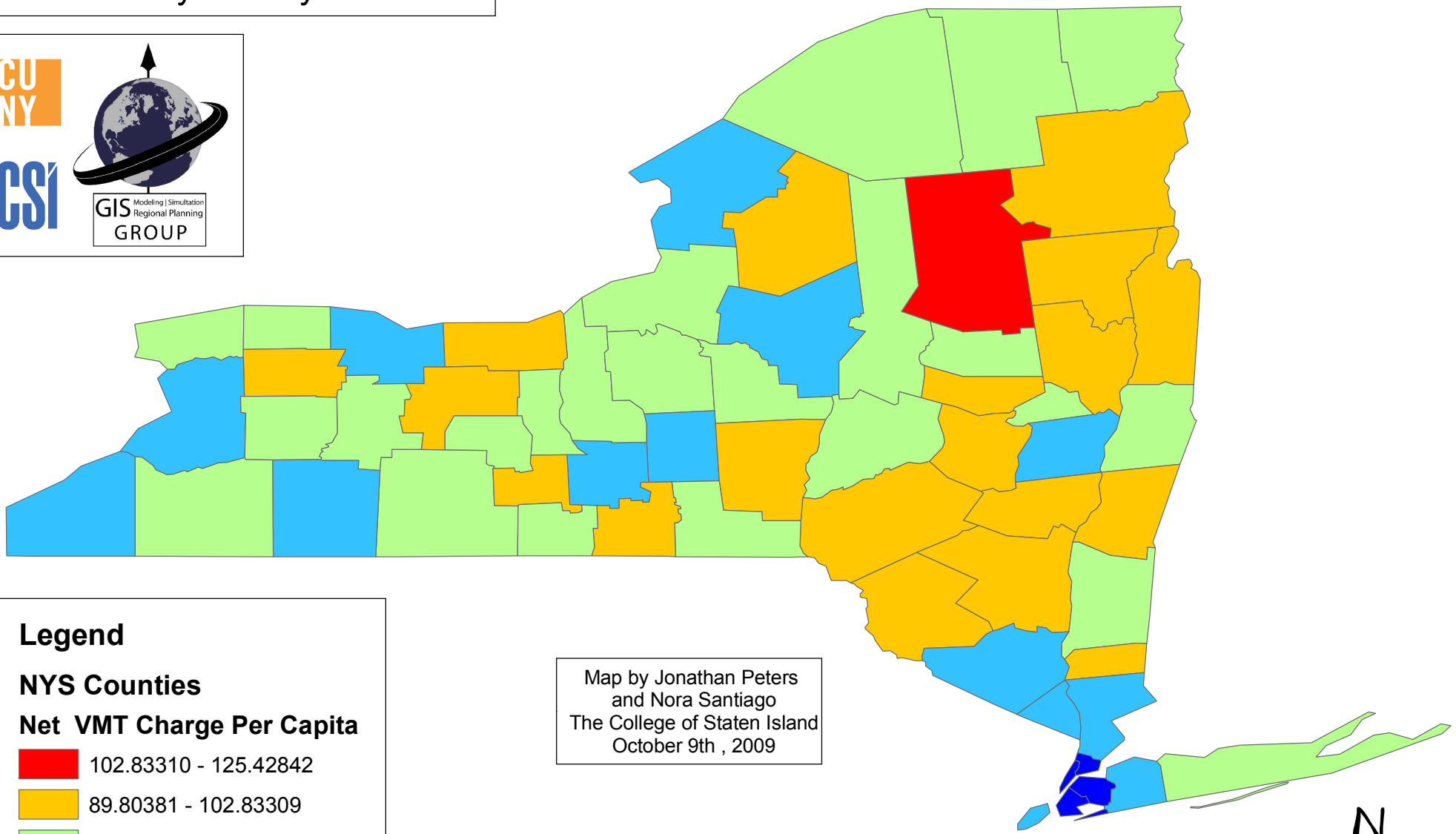
New York State
Net VMT Change Per Capita
by County



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NYS Counties

Net VMT Charge Per Capita

- 102.83310 - 125.42842
- 89.80381 - 102.83309
- 79.77974 - 89.80380
- 34.21818 - 79.77973
- 16.11279 - 34.21817

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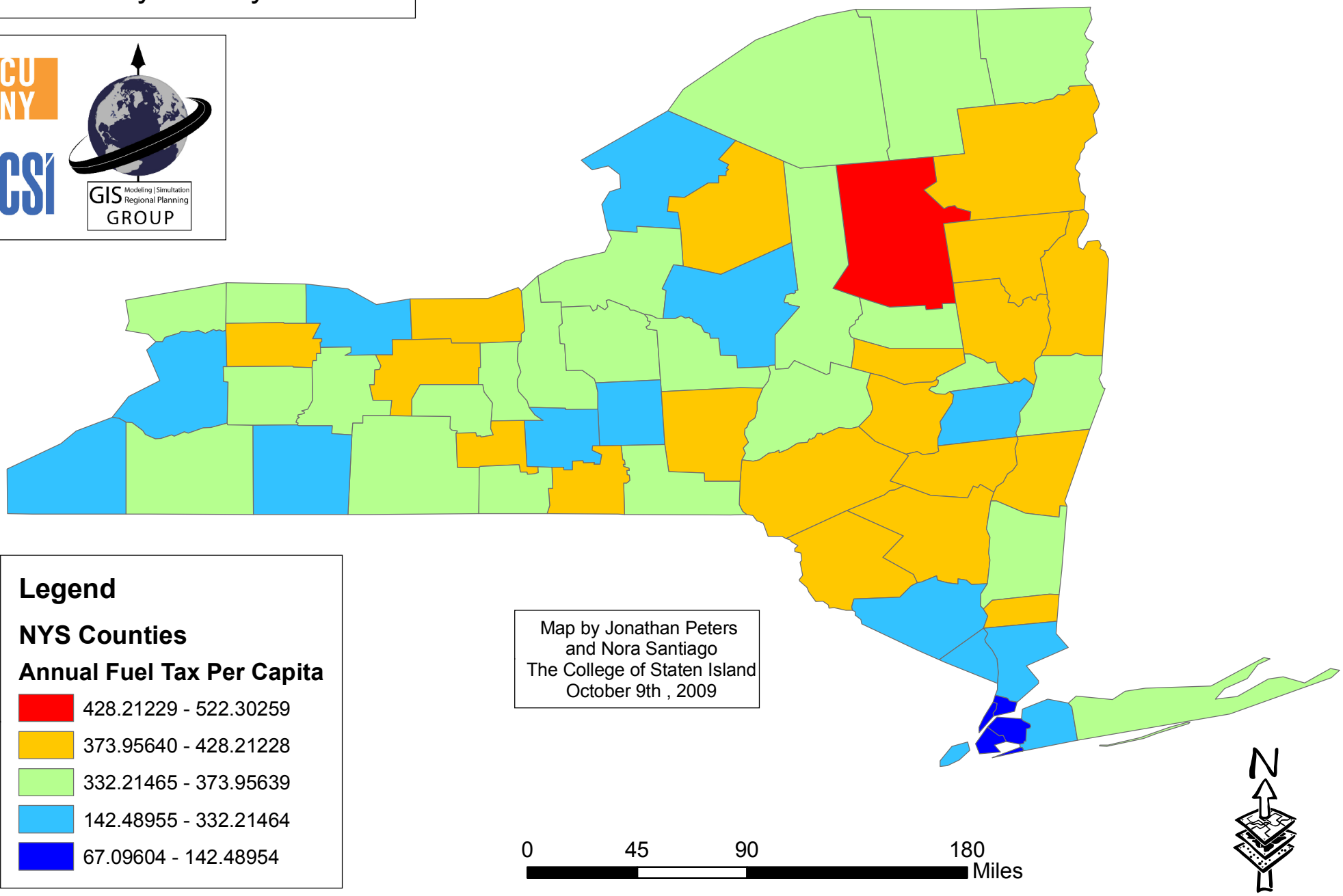
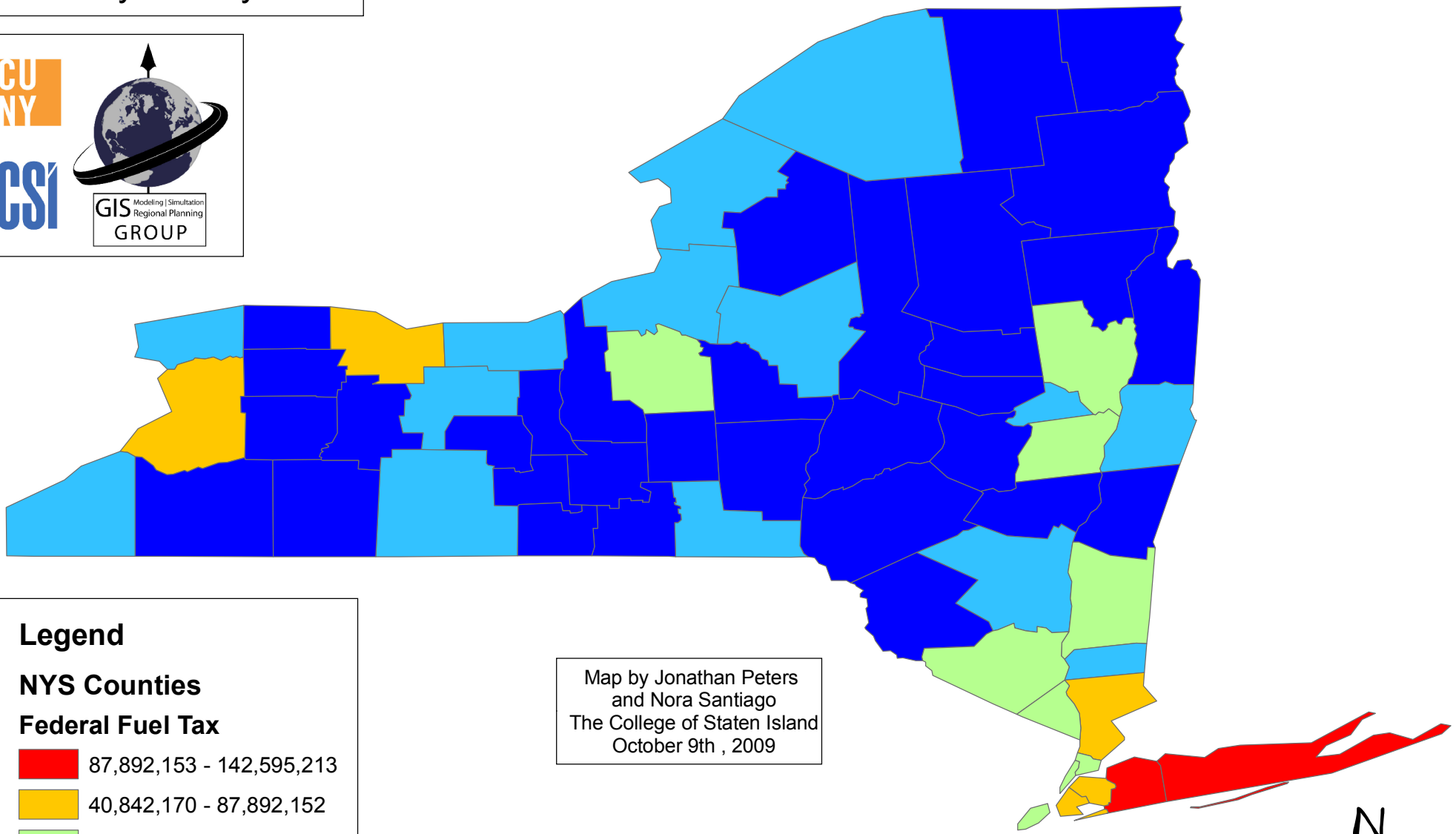
0 45 90 180
Miles

N

New York State
Annual Fuel Tax Per Capita
by County



New York State Federal Fuel Tax by County



Legend

NYS Counties

Federal Fuel Tax

- 87,892,153 - 142,595,213
- 40,842,170 - 87,892,152
- 20,578,959 - 40,842,169
- 8,088,422 - 20,578,958
- 705,463 - 8,088,421

Map by Jonathan Peters
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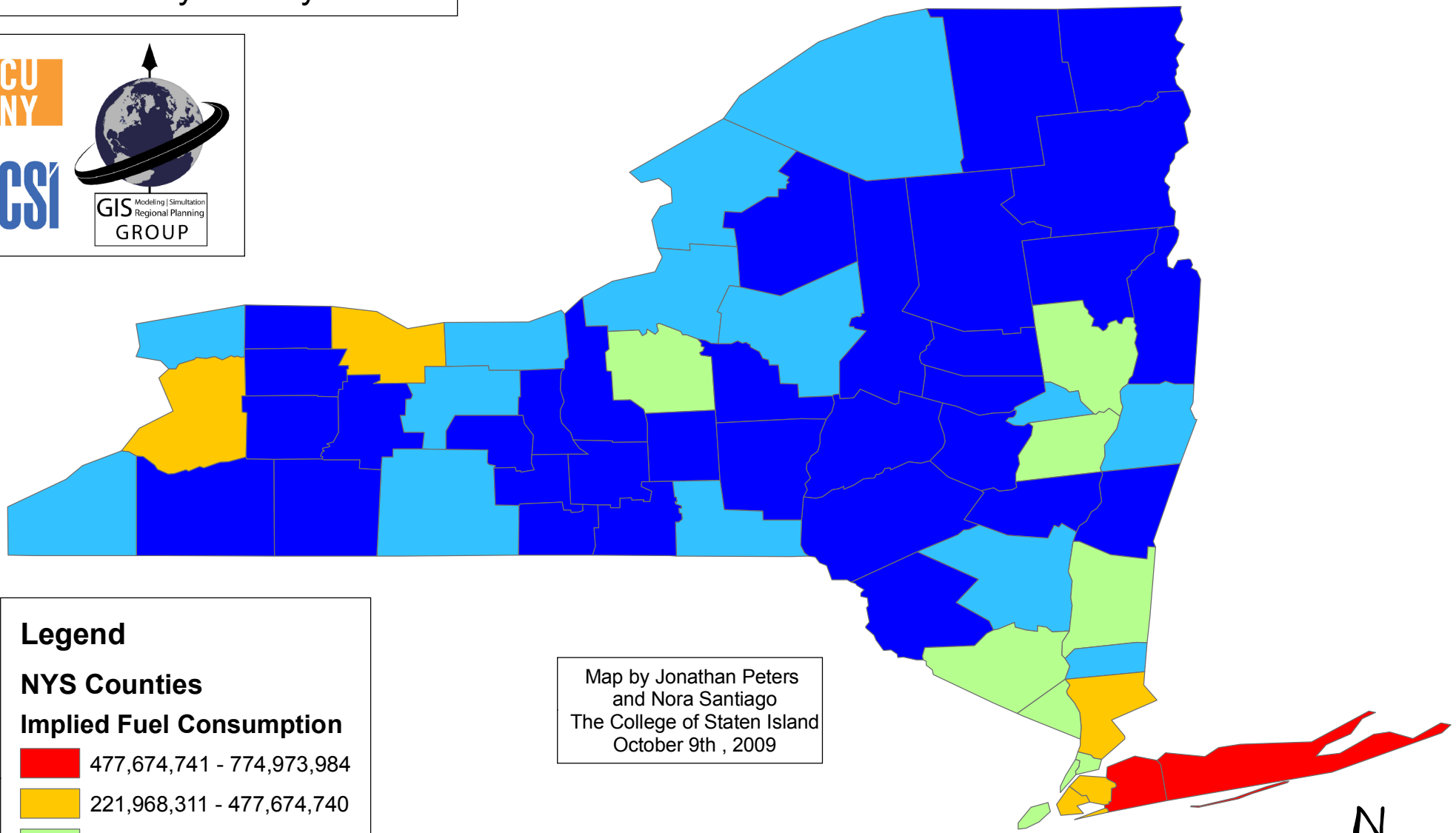
The College of Staten Island
October 9th , 2009

0 45 90 180 Miles

N

New York State Implied Fuel Consumption by County



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NYS Counties

Implied Fuel Consumption

- 477,674,741 - 774,973,984
- 221,968,311 - 477,674,740
- 111,842,165 - 221,968,310
- 43,958,811 - 111,842,164
- 3,834,037 - 43,958,810

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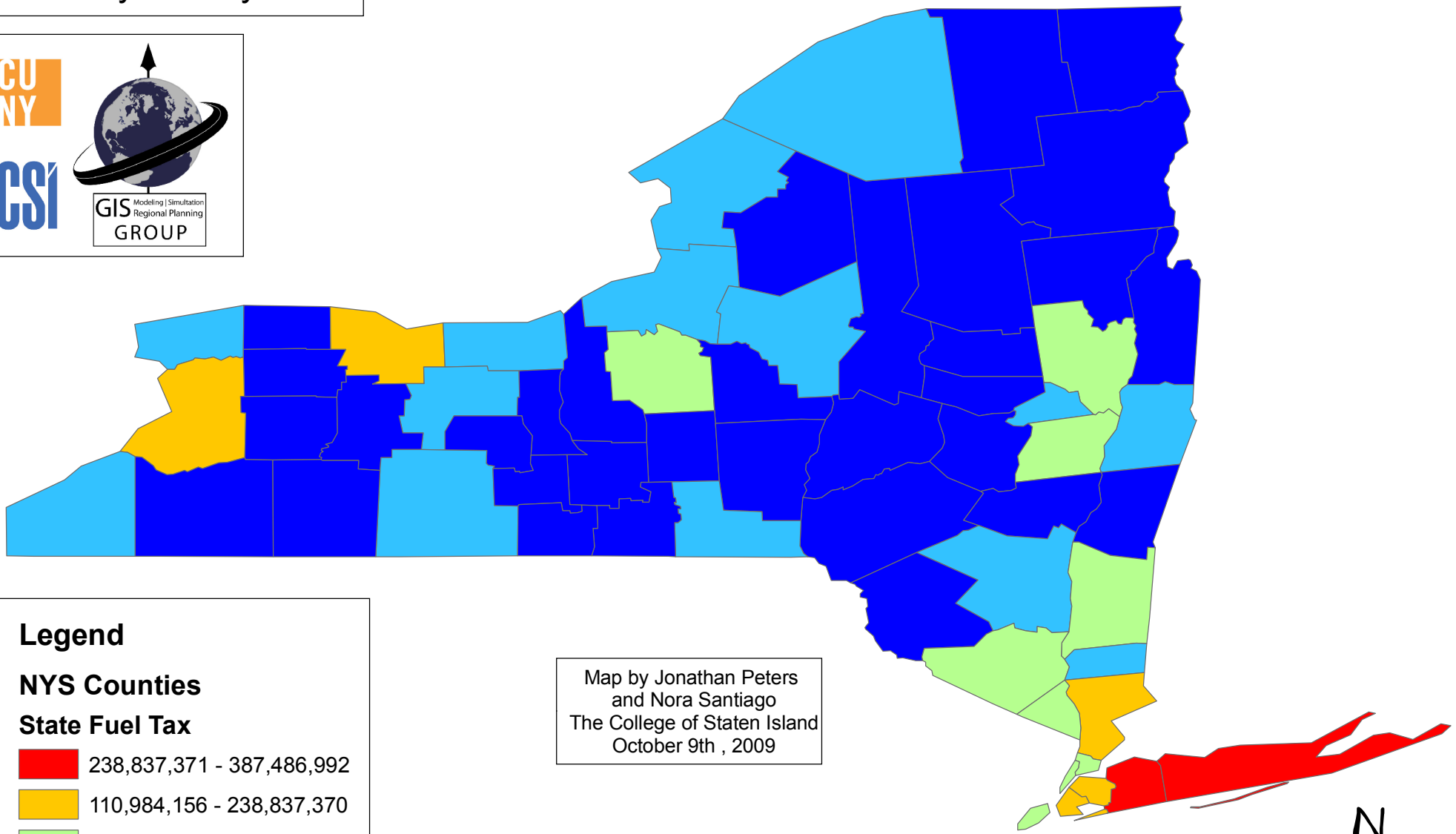
October 9th , 2009

0 45 90 180
Miles

N

New York State State Fuel Tax by County



Legend

NYS Counties

State Fuel Tax

- 238,837,371 - 387,486,992
- 110,984,156 - 238,837,370
- 55,921,083 - 110,984,155
- 21,979,406 - 55,921,082
- 1,917,019 - 21,979,405

Map by Jonathan Peters
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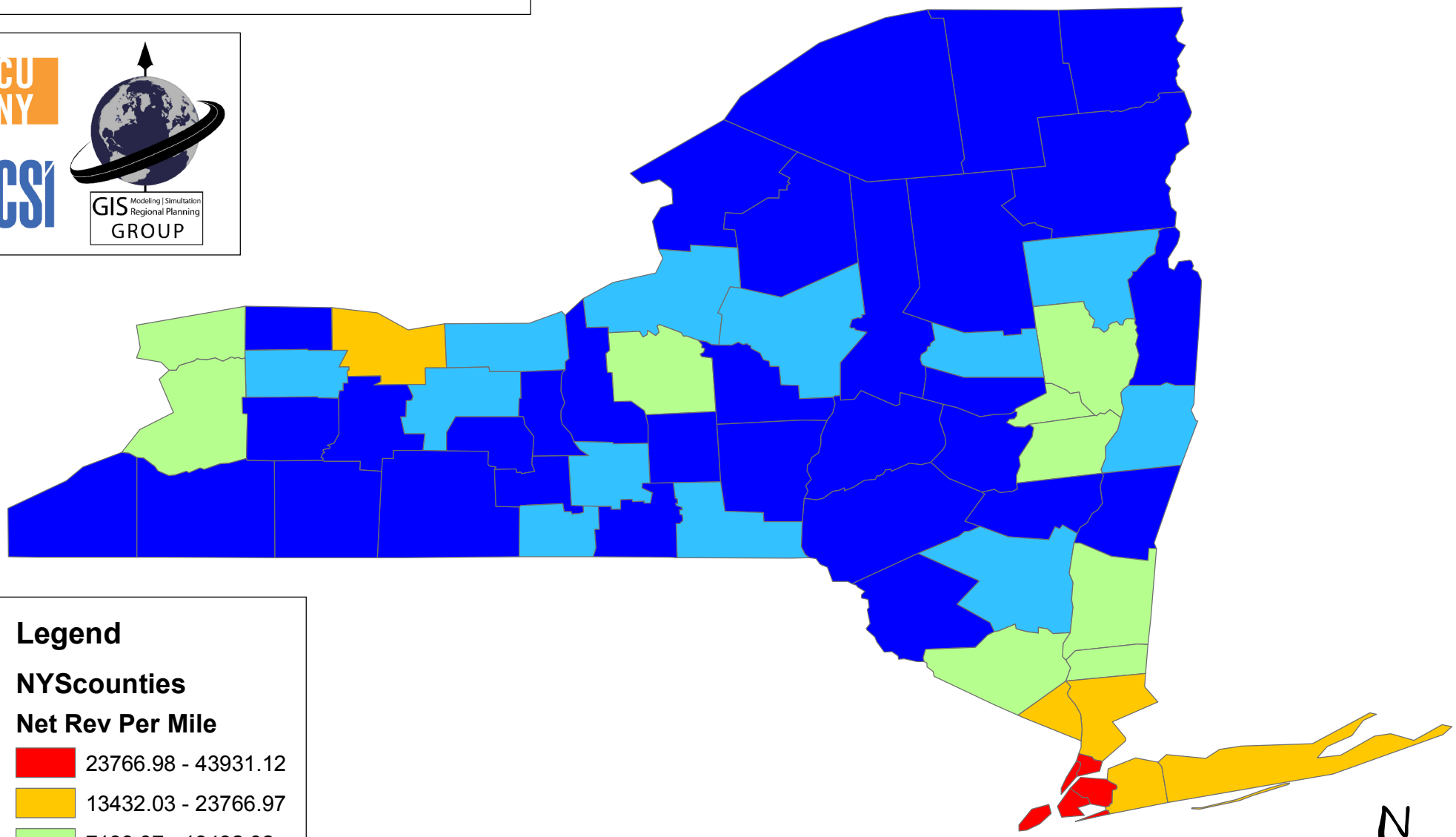
October 9th , 2009

0 45 90 180
Miles

N

New York State
Vehicle Miles Traveled by County
Net Revenue Per Mile



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NYScounties

Net Rev Per Mile

- 23766.98 - 43931.12
- 13432.03 - 23766.97
- 7139.07 - 13432.02
- 3831.65 - 7139.06
- 983.26 - 3831.64

0 45 90 180 Miles

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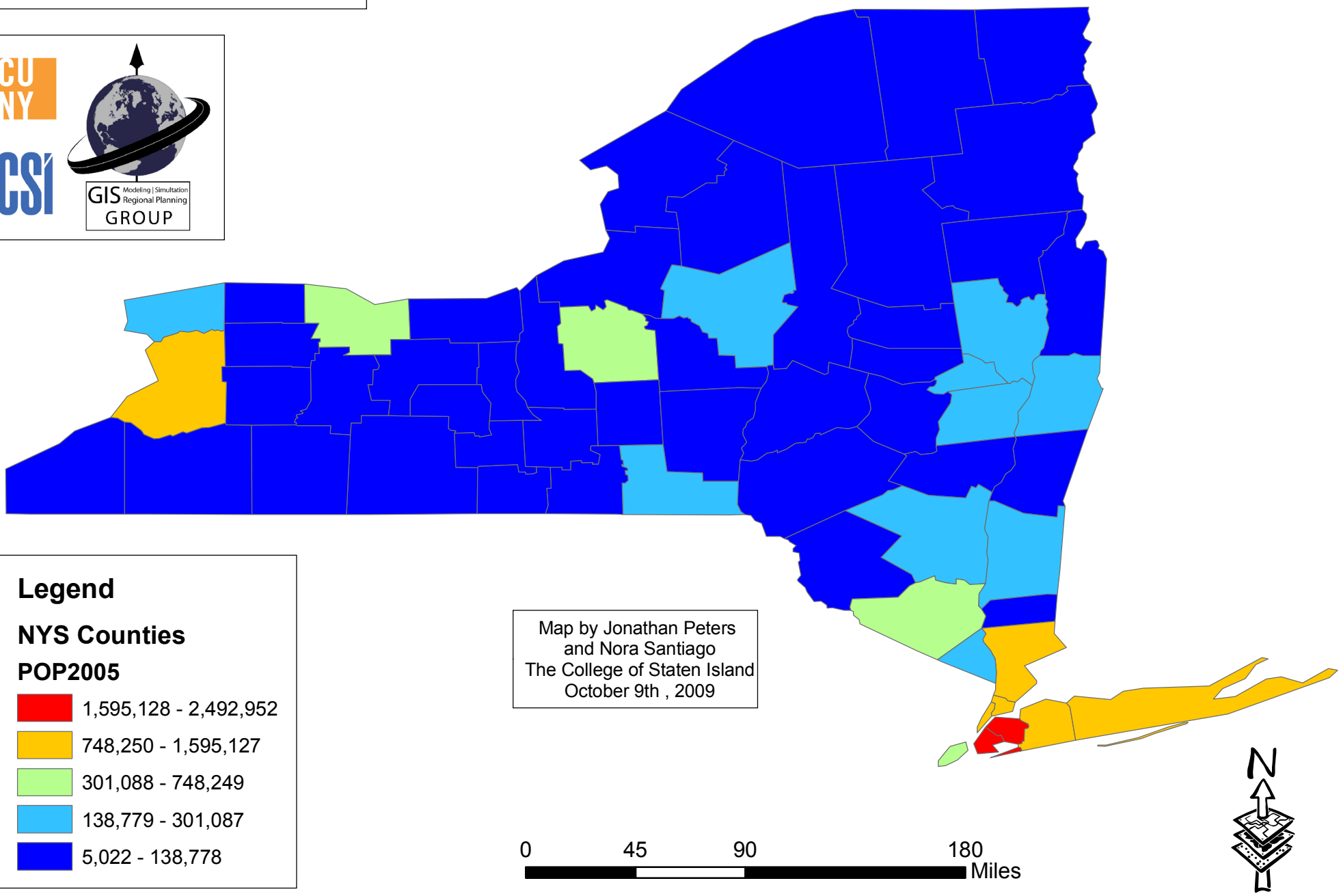
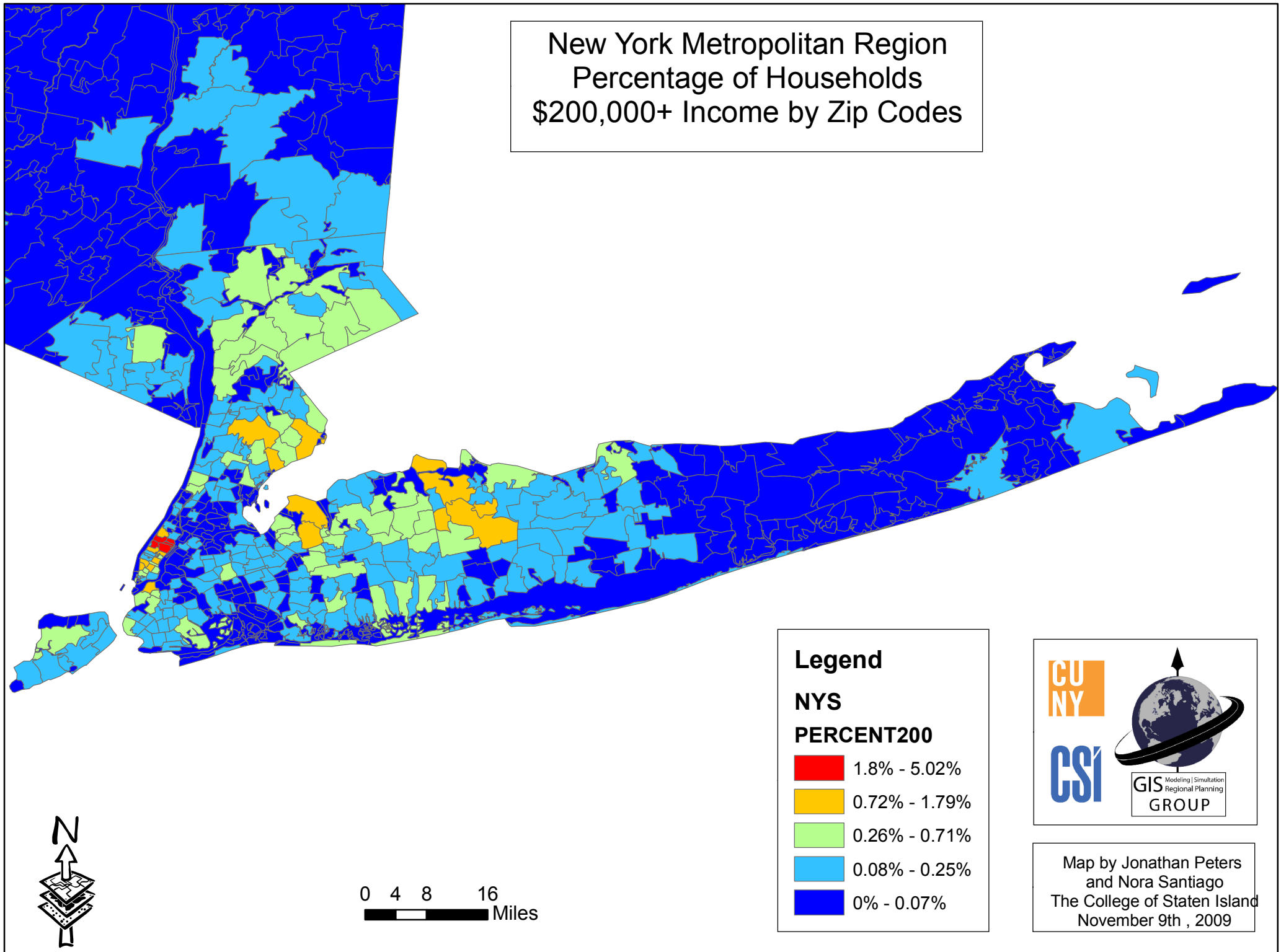
The College of Staten Island
September 25th, 2009

N

New York State Population by County




New York Metropolitan Region
Percentage of Households
$200,000+ Income by Zip Codes
Legend
NYS
PERCENT200
1.8% - 5.02%
0.72% - 1.79%
0.26% - 0.71%
0.08% - 0.25%
0% - 0.07%
N
0 4 8 16
Miles
CUNY
CSI
GIS Modeling | Simulation Regional Planning GROUP
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November 9th , 2009

New York City
Percentage of Households
$200,000+ Income by Zip Codes

Map by Jonathan Peters
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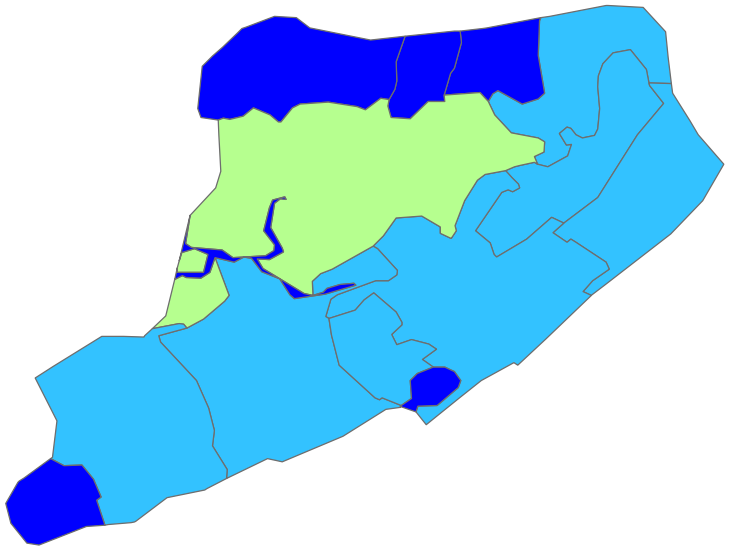
The College of Staten Island
November 9th , 2009

Legend

NYS

PERCENT200

- 1.8% - 5.02%
- 0.72% - 1.79%
- 0.26% - 0.71%
- 0.08% - 0.25%
- 0% - 0.07%



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Miles

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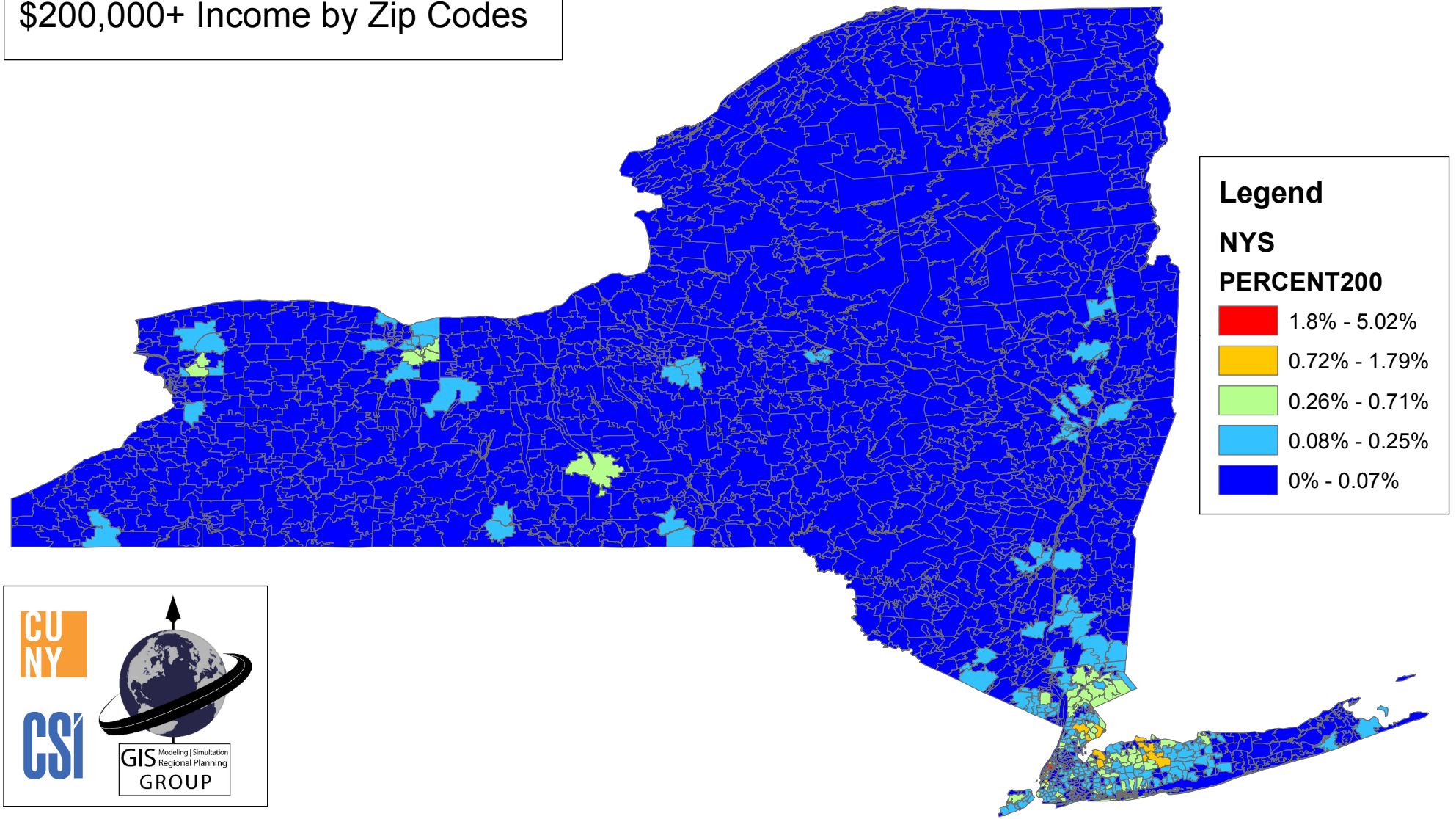
New York State
Percentage of Households
$200,000+ Income by Zip Codes



CUNY CSI
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0 20 40 80
Miles

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