BEYOND DRIVING AND FLYING:

A REPORT OF A WORKING GROUP FOR THE

AMERICA 2050’s

STRATEGIC INVESTMENT FRAMEWORK

For Presentation at Pocantico Conference Center

December 10 – 12, 2008
INTRODUCTION

If one wishes to travel between metropolitan areas today there are, at least theoretically, four choices – drive, fly, take a train, or take a bus. In fact, in many cases all four choices may not be reasonable or even available options. Where distances are long, driving may be too arduous and time consuming and flying too expensive. Where distances are short, flying may be impractical, while drivers must face mounting highway congestion within and between metropolitan areas. Meanwhile, the intercity rail option may be non-existent, or it may be slow, infrequent or unreliable, a result of years of under-funding. And the choice of intercity bus travel, while less expensive than flying or even the railroad, faces the same relatively long, slow and unreliable options that the driver experiences, albeit with someone else doing the driving. Thus, while driving or flying exists as an option for travel between most metro areas, rail or bus is either non-existent or woefully inadequate as a competitive choice in many markets.

This report presents a first vision of what might be done to remedy this imbalance by designing and implementing a robust national network with emphasis on the intercity bus and rail networks that could connect to metropolitan transit systems, thereby creating a vibrant, multimodal and intermodal passenger system. To be sure there are steps that should be taken to optimize all modes of intercity travel, including highway and air travel which today carry the bulk of interstate travel.\(^1\)

Steps to address the rail and bus networks will require addressing issues as to how we pay for, price and manage all these other networks to create a multimodal and intermodal system that meets the challenges of anticipated growth. And taken together, these four modes of transportation can become a network of mobility that will benefit a nation whose population will be approaching a half billion people by mid-century.

\(^1\) Today, there are approximately 700 million trips per year made by air, 600 million by intercity bus and 30 million by rail. Intercity auto trips are not counted, but that number is likely to exceed the other modes by many times.
WHY CHANGE?

Individuals today do not always have an alternative to flying that is less expensive and more reliable or and an alternative to driving that is less time consuming, less stressful, more reliable or that provides an opportunity to work, rest or read while traveling. And they seldom have a reasonable option that is more reliable than today’s modes.

Intercity rail and intercity bus travel today do not always provide these options but they each can.

- Rail and buses could and sometimes do provide relief to overcrowded airports and airspace;
- Rail and buses are more energy efficient and produce fewer carbon-based emissions than air or auto alternatives; and
- Rail, and particularly buses can serve smaller towns and smaller markets not served by air; moreover, buses can supplement intercity rail to offer more frequent service and connections to smaller towns and to local transit systems;

Both these modes can also offer benefits that go beyond the individual:

- They can provide an economic boost to cities, deter land consuming sprawl and dampen vehicle travel growth in metropolitan areas with related social and equity benefits to urban areas;
- They can save energy, reduce carbon emissions and lower the threat of global warming; and
- Given the expected growth in population and employment in the United States – possibly by as much as 50 percent between now and 2050, and in particular in the megaregions, it is unrealistic and unwise to ignore the optimization of all modes through both capacity and management measures.

BARRIERS

Even if there was full agreement on the premise of this paper that significant investments in infrastructure and changes in current policies should be made to support intercity
passenger rail and bus travel, there are many barriers to the successful implementation of such a strategy.

For rail travel these barriers include (with no pretense of suggesting that the order of presentation represents their level of importance or any priority for addressing them):

1. Intercity passenger rail rights-of-way are shared with rail freight operations. Fully 97 percent of Amtrak used rights of way are owned by freight railroads. This leads to less than ideal operations of passenger rail service, which often do not have operational preference or the ability to upgrade the lines on which they operate.

2. Related to this is the current mission of the federal agency in charge of federal policy regarding rail service, the Federal Railroad Administration, which divides its attention between the often competing needs of passenger and freight. Moreover, they have traditionally been limited to a safety and security function rather than long range planning.

3. Under-investment in passenger rail service has left Amtrak, the only intercity passenger rail carrier in the United States today, with a backlog of capital investment, including older rolling stock, out-of-date signals, aging rail, structures and power supply subject to breakdowns, with resulting delays and unreliability.

4. The lack of rail capacity to absorb growth, most notably in the Northeast Corridor, has resulted in Amtrak being unable to add capacity to handle diversions from air travel.

5. There is an inability to plan for new or expanded services which cross state lines because of the absence of appropriate institutional arrangements.

6. The competition between intercity rail and commuter rail services for track capacity and preferences, where they often operate over the same track. Typically, the commuter rail services have a higher volume of riders and higher frequency of services, which puts intercity service at a disadvantage.

7. In many cities, particularly smaller ones, the withered state of the local transit system puts intercity rail at a disadvantage for the last (or first) leg for local connections for otherwise competitive trips by rail.
8. In a similar vein, the proximity of both the local transit systems and the intercity bus terminal can be a problem that weakens mobility options and the value of each mode for the other.

9. The vertical and horizontal alignments of the existing passenger rail rights-of-way prevent increases in travel speed of service.

10. The capital and human cost of relocating passenger rail lines to make higher speed service possible may be more than can be afforded or tolerated.

11. It is often difficult to make the case for intercity rail using standard cost-benefit techniques. But progress has been made in spelling out many benefits that had previously not been accounted for such as externalities related to mobility, the environment, climate change, impact on future land uses, and equity should be included in any analysis.

12. Funding for intercity rail projects is through the mechanism of separate funding for Amtrak on an annual basis, each time subject to Congressional approval and oversight. In contrast, funding for highways is distributed through a formula with the project decisions decided on at the state level with minimal metropolitan level oversight.

13. The justification for public investments in intercity rail (not unlike metropolitan transit) undergoes a degree of public scrutiny not experienced by highway and air modes of travel.

14. There is not now the travel demand data to develop credible market share models for intercity travel. Data for rail and air is proprietary, for bus diffuse and uncollected, and for auto trips it is non-existent.

15. There is no widely held vision of what the intercity system could become. Without this it is difficult to market a national network. A good point of departure is the Federal Rail Administration HSR Corridors and the series of maps created in “Vision for the Future: U.S. Intercity Passenger Rail Network Through 2050” submitted to the National Surface Transportation Study Commission by the Passenger Rail Working Group (PRWG).
Bus travel, while facing some of the same barriers as rail and also suffers from the perception that it is a mode with lesser comfort and less relevance in addressing the problems of intercity travel.

1. Bus terminals in center cities are often relegated to the unattractive and more economically weakened locations and may be distant from rail stations, reducing the opportunity for connecting between lines;
2. Similarly, terminals are not necessarily co-located with the nexus of the local transit system;
3. Bus routes face mounting traffic congestion as they approach metropolitan centers, and seldom have preferential treatments on the highways;
4. Where tolls are in place they are not relieved of that cost;
5. There is no governmental institutional voice for the bus industry nor a well organized user group to press for improvements;
6. And as with rail, there is no vision of what an attractive, high amenity bus network can become.

To be sure, some of this is changing as the bus industry modernizes. The success of bus service in the Northeast Corridor, in the Midwest, and in California has come about with new thinking and marketing. Private carriers are wooing customers who are increasingly facing the unreliability of air and highway travel, and the infrequency or absence of rail service with such amenities as internet access. The lower costs of these bus services can be an excellent option for those who cannot afford either rail or air travel. Bus travel can be especially relevant in smaller markets not served by air or without competitive rail service, and can provide more frequent service than rail.

RECOMMENDED ACTIONS
In this paper we suggest actions that could be taken at the federal level to overcome the barriers described here. Actions to overcome each of the barriers described above are presented below. To put forth an illustrative a national vision two maps are presented, one for rail and an illustrative one for intercity bus for the Piedmont mega-region to
demonstrate the possibilities for integrated rail and bus networks that focus on addressing the growth expected in the mega-regions and beyond.

**Passenger and Freight ROW Conflicts**

Congress has gone a long way to addressing these conflicts with the passage of the Passenger Rail Investment and Improvement Act of 2008. This law mandates investigation of conflicts between passengers and freight rail and where these conflicts arise the Surface Transportation Board must intervene. This process should go further by such measures as temporal assignments, jointly controlled train operations, infrastructure investments identified that are in the national interest and not assigned to either the passenger or freight services. Congress should mandate that USDOT establish a passenger and freight rail network, working with all interested parties that recognizes the important role that both freight and intercity rail travel play in the nation, the existing and potential size of markets, and the modal options to rail.

**Federal Institutional Structure**

An Office of Intercity and Intermodal Affairs should be established within the USDOT to carry out this activity, with representation of the existing modal offices. This office should also be assigned the task of address co-location issues among intercity rail, bus, airports and local transit.

**Funding**

As a short–term measure the federal transportation bill now being considered should identify a dedicated source of funds for Amtrak. In this way Amtrak could operate on a multi-year basis to fund its capital program. The level of funding should be based on bringing the existing Amtrak network to a state of good repair and maintenance and system upgrade that allows Amtrak to bring its core network (to be defined) by 2020. The federal match should be set as the same level as the highway and transit programs are set. Where projects may benefit states disproportionately, a mechanism to allocate the match in proportion to the benefit, perhaps by ridership, should be considered. Similarly,
funding to locate bus terminals more advantageously could also be included in an intercity passenger dedicated funding source.

Funding for new intercity rail lines (in contrast to state of good repair and maintenance) should be based on rigorous analysis of costs and benefits, but should include externalities both positive and negative. This approach should also apply to projects related to highway expansion and aviation system expansion. This will require a more nuanced approach – a public benefit model – that acknowledges not only cost but energy savings, decreased congestion (highway and air) decreased highway maintenance, among others.

Rail travel speeds by market and rail segment should be established based on the maximum market potential of rail based on distance, metropolitan area size and other factors determined to impact market size such as existence of local transit service and special market affinities. This too should account for externalities such as the environment and economic benefit.

Where the potential for new service exceeds the current capacity to serve it, an analysis of the full multimodal systems’ costs and benefits, including the use of new rights of way or dramatically upgrading of the existing geometry, should be mandated by federal law.

The identification of the governmental role here in no way suggests that a private sector role may not be possible. Private public partnerships should not be foreclosed, notwithstanding that to date these efforts for transit have not led to successes. Consideration of DBOM efforts should also be kept on the table. Funding that using revenues generated in corridors by VMT fees may also be possible.

**Institutional Barriers**

An initial first step to address institutional barriers is found in H.R. 2095, which calls for the Federal Railroad Administration to develop a national plan that is intended to
coordinate and integrate state rail plans. Issues of the appropriateness of the FRA and of the incentives for states to cooperate remain.

The institutional barriers to planning multi-state rail projects and programs should be addressed by establishing some equitable financial arrangement (see above) but also through a program of incentives for the states to participate. This would be administered (and the disagreements mediated) through the Office of Intermodal and Intercity Affairs, which would hold “power of the purse-strings.”

Similarly the competition between intercity rail and commuter rail services can be addressed by the Office of Intermodal and Intercity Affairs serving the same function.

To establish greater service and physical coordination between local and intercity services, an Intermodal / Intercity program should be created to encourage interstate compacts. Grants would have firm performance standards associated with them and non-achievement would result in non-renewal in future years. A manual of best practices would be written based on early success to help (and shame) the laggards.

The case for intercity rail in a corridor should be made on criteria beyond cost-effectiveness. Both quantifiable and less quantifiable criteria should be included. These should include mobility, the environment, climate change, and the impact on future land uses, all not often accounted for now.

**Data**

Use the Bureau of Transportation Statistics as the institutional base, modeling the effort through the National Personal Transportation Survey, design and carry out a data collection effort to capture the necessary data by mode to enable the construction of a model to estimate modal shares. This effort can be started by first collecting the data in the Northeast Corridor and then proceed to other corridors. The bus companies and the airlines, Amtrak, and the highway agencies would be assured that proprietary data will
not be revealed, but at the same time indicate that “a price will be paid” for failure to cooperate.

VISION
The last section of this draft presents a Regional Plan Association analysis that refines the findings of the Passenger Rail Working Group (PRWG) referenced earlier. The following maps represent the illustrative network of new, upgraded, and existing rail links for an intercity passenger rail network for the nation in 2050. The first map depicts the results of city pair analyses in which criteria were used to build an index for the evaluation of potential rail markets. The second map presented here takes account of the FRA high speed corridors and the recommendations of the PRWG and combines their results to produce a composite map. A third map uses the Piedmont mega-region as an example as to how the bus and rail network might be integrated to be mutually supportive.

The RPA mapping process began by selecting every incorporated place in the nation with 50,000 people or more. This yielded approximately 600 such places. Then city pairs were creating by connecting each one of these 600 cities to every other city that was between 100 and 500 miles from the originating city. This yielded approximately 27,000 city pairs. Eight distinct criteria were used to assess the potential viability of high speed rail between these identified city pairs. These criteria were:

- **City size:** Each city was assigned 0 points if its population was under 100,000, 1 point for population of 100,000 – 500,000, 2 points for population 500,000 – 1,500,000 and 3 points for population of over 1,500,000
- **Metropolitan area size:** Each city was assigned 0 points if the metropolitan area in which it was located had a population of under 250,000, 1 point for population of 250,000 – 1,000,000, 2 points for population 1,000,000 – 2,500,000 and 3 points for population of over 2,500,000
• **Distance between city pairs:** Each city pair was assigned a maximum of 2.5 points for a distance of 250 miles between cities. Awarded points fell linearly for distances greater or less than 250 miles and fell to zero at 500 and 0 miles between cities.

• **Existence of transit:** Cities were awarded 1 point each if it had a heavy rail transit system, light rail transit, or commuter rail.

• **Extent of transit system:** Cities were awarded between 0 and 3 points based on the extant (total number of miles) of its transit system.

• **Metropolitan GDP:** Each city pair was awarded between 0 and 3 points based on the average of its combined GDP. City pairs were awarded 0 points for average per capita GDP less than $20,000 and 3 points of average per capita GDP of greater than $70,000.

• **Megaregion:** Each city was awarded 1 point if it was located in a megaregion.

• **TTI congestion index:** Each city pair was awarded between 0 – 2.5 points based on the average of their combined TTI congestion index as defined by the Texas Transportation Institute.

These criteria were weighted and then summed into an index that scored the city pairs with the highest score representing the best potential market for high speed rail.\(^2\) This index placed the heaviest weight on whether a city was the largest municipality within its

\(^2\) The equation used to calculate this index was: One half times whether the origin city has a light rail system (1, 0 for yes or no) plus one half times the length of the light rail system (0, 0.5, 1, 1.5) plus One half times whether the origin city has a heavy rail transit system (1, 0 for yes or no) plus one half times the length of the heavy rail transit system (0, 0.5, 1, 3) plus a scale representing the metropolitan population in which the origin city is located (0,1,2,3) plus ten times whether the origin city is the largest city in its metro area (1,0) plus a scaled number for origin city population (0,1,2,3) plus whether the origin city is in a megaregion (1,0) plus one half times whether the destination city has a light rail system (1, 0 for yes or no) plus one half times the length of the light rail system (0, 0.5, 1, 1.5) plus one half times whether the destination city has a heavy rail transit system (1, 0 for yes or no) plus one half times the length of the heavy rail transit system (0, 0.5, 1, 3) plus a scale representing the metropolitan population in which the destination city is located (0,1,2,3) plus ten times whether the destination city is the largest city in its metro area (1,0) plus a scaled number for destination city population (0,1,2,3) plus whether the origin city is in a megaregion (1,0) plus continuous scale for length of corridor which peaks at 2.5 at 250 miles and descends to 0 at 0 and 500 miles plus the combined gdp of the two metro regions (0, 0.5, 1, 1.5, 2, 2.5, 3) plus combined TTI index continuous scale, 0 – 2.275.
metropolitan area. This concentrated results in the primary cities within the metropolitan areas and deemphasized independent suburban and satellite towns that would not be a major stop on a high speed rail system. The weighting system is such that large cities in large metropolitan regions within megaregions rise to the top of this index. To differentiate among these cities, transit systems and a measure of congestion further prioritized those cities with extensive transit systems and high rates of metropolitan auto congestion. Map 1 depicts the top 250 city pairs returned by this index. These corridors are heavily concentrated in the Northeast, California, and in the Chicago Hub system, with corridors also identified in Texas, Florida, and some selected cities in the south.

Map 1: Top 250 Rail Corridors

City pairs identified using this method were then used to prioritize routes on the proposed national intercity passenger rail network. This national network is a composite of
existing Amtrak intercity routes, the FRA HSR designated corridors, and the work of the PRWG. Map 2 shows the level of priority based on potential market demand between city pairs. The highest priority rail corridors exist in the Northeast, California, Texas, and the Midwest emanating from Chicago as well as routes connecting the Northeast and Midwest.

**Map 2: Priority Rail Service Routes**

Intercity bus service must be added to the network of high-speed, corridor, and long-distance trains, to create an integrated multimodal network. Bus service supplements intercity rail service between major markets as well as connects these major markets to smaller markets not served by rail. Showing these connections at a national scale is impossible, instead the Piedmont Atlantic megaregion was chosen to illustrate how bus service can integrate with a national rail service and provide increased internal connections with megaregions (Map 3). Intercity bus service connects the regional hubs
of 50,000 or more to the Megaregional hubs, the primary cities with the Megaregion, which are integrated into the national rail network. Local and regional bus service connects smaller towns and communities to these regional hubs. These services need to be integrated with national intercity bus and rail service with centralized information and through ticketing to truly integrate the local, regional, and national intercity passenger systems.

Map 3: Internal Connection in the Piedmont Atlantic Mega-region