A proposed
NATIONAL FREIGHT SYSTEM
Based upon a
National System of Interstate and Defense RAILROADS,

by J. William Vigrass, panel member,

to the

National Surface Transportation Policy and Revenue Study Commission,
USDOT Bldg., L'Enfant Plaza, 400 7th St. N.W. , Washington, DC, 20590,
March 8, 2007.

Background: Papers proposing a National Freight System as one entry and another entry proposing a National System of Interstate and Defense Railroads have been submitted to the Commission for consideration. In the kick-off meeting February 6th, 2007, Executive Director Mrs. Susan Binder requested "Bold New Ideas" that could be synthesized with other ideas for the betterment of the nation's transportation system. This paper is a result of that request.

A National Freight System has been proposed having several east-west corridors and several north-south corridors with intermodal nodes or hubs where the corridors intersect. The basic layout follows the concept of the original 1956 Interstate and Defense Highway System, with key east-west routes and north-south routes.

Above is the conceptual map of a National Freight System.

The National Freight System paper did not specify a mode for the principal routes but suggested that they might be highway, railroad or some other mode such as Mag-Lev (Magnetic Levitated Guideway). This paper will propose that railroads be the backbone of the system, but with operations modified from present practice.

Trucking has never paid the full cost of its use of public roads. This has been one of the great benefits by making trucking ubiquitous throughout the nation. There have been very few instances of a road being built solely for and funded by trucks. New Jersey's proposed Port Way and Los Angeles' Alameda Corridor are the only two that come to mind. It is very unlikely that an interstate freight system solely for trucks and paid for by truck user fees could be justified. (I have done no research in this area, so this is just an observation.)

The principal reason for using railroad for the backbone of the system is that the railroad mode responds favorably to volume, with lowered unit costs as volume increases. This is not true of the trucking mode which has costs per truckload or truckload-mile about the same for any number of trucks (within relatively small limits).

The Mag-lev mode remains unproven. Test tracks have existed in Japan and Germany for several decades. Only one line operating for the public has been put into use and it connects the Shanghai Airport with a terminal near downtown. It was funded by German interests as a demonstration project. Nonetheless, Chinese Railways decided on conventional high speed rail to connect Shanghai with Beijing. It also can be observed that every time the Germans set a new Mag-lev speed record, that the French arranged a highly publicized speed run of their TGV (Trains of Great Speed) that bettered the German mag-lev record. The primary objection to using Mag-lev or any other new innovative mode is that an entirely new guideway would have to be built at great expense. By using railroads or highways, some or perhaps much of the network could be upgraded from existing routes.

The up front costs of using Mag-lev would be enormous, and would be a deterrent from creating the proposed system. Takings of land would be another matter and could be a problem in urban areas.

Solution: The proposed solution is to use the railroad mode for the backbone of a National Freight System. Indeed that is more or less the case already. However, a change in traditional railroad operating practice would be needed to make a National Freight System work as proposed. At present nearly all railroad freight services are scheduled (if scheduled at all) on a once per day basis. Traditionally this has been done so that freight would leave its origin in the evening and arrive in time for delivery on a given morning, thus 2nd morning or 5th morning delivery would be specified for a given freight schedule or "symbol". While useful for point-to-point services, this could not fit the concept of the national freight system grid serving a multitude of origins and destinations.

Therefore it is proposed that scheduled container trains be operated more like commuter trains on headways. It is suggested that not less than three trains per day, one every eight hours, be operated, with more trains as volume permits. Ideally on heavy routes, hourly services might be provided. This would eliminate the problem of a container just

missing a train and being required to wait 23 hours for the next train. Frequent service would also make efficient use of train sets since idle layovers would be brief at terminals.

As suggested in the National System of Interstate and Defense Railroads, electrification of heavily used corridors would be in the national interest and probably in the railroads' interest. Traffic would be concentrated and train service would be frequent, ideal for electrification. This would eliminate the need to stop to refuel locomotives and would also provide faster acceleration from a stop or speed reduction and allow faster operation up grades. Regeneration of braking energy could recover some electric power.

Initial operations might well begin with conventional diesel-electric locomotives and that mode could continue on less used corridors.

Needless to say, fast frequent operation will require multiple track, with a minimum of double track with triple or quadruple where volume or mixed traffic might require.

It is likely that few entirely new railroad routes would be needed. Upgrading of existing routes ought to serve most needs. Takings of land would be minimized. Costs would be minimized. In all cases, grade separation would be included.

Connections from hubs to metropolitan areas would be mostly by truck but also by rail where volume and concentration would be attractive. Hubs would best be built at the edge or outskirts of metropolitan areas. Some such as Buckeye Yard just west of Columbus, Ohio, have already been built and may serve as examples.

Tri-modal hubs would be provided for water-rail-truck interchange. Major facilities already exist on all coasts. They will probably need regular upgrading from time to time.

Large scale container handling terminals would be built using whatever the current state of the art might be at the time. Steady progress is being made.

High Speed Ground Cargo: If high speed passenger train routes are created nationally, it might well be possible for them to handle air cargo as is being done in Europe. Different hubs or nodes might be appropriate, probably based at or proximate to airports. High speed ground freight for intermediate distances might be added to a National Freight System. Mutli-tracked lines handling fast (110 mph) or high speed (125-150 mph) passenger trains might also handle fast or high speed air-cargo container trains. Container cars might be operated as separate trains where volume justifies, or attached to passenger trains where volume is low. Intermodal makes sense here too! Indeed, intermodal high speed cargo may be what is needed to make high speed passenger trains viable over longer distances in the US.

Technical issues are relatively easy to solve.

Institutional Issues may well be more difficult. Which privately owned railroads would own and operate which corridors? What facilities would be publicly funded? How would the funding be handled? Precedent exists for facilities such as the Alameda Corridor in the Los Angeles area. Such issues may entail difficult negotiations but solutions have been found in the past. Freight rates would have to be set in an equitable way to allow shippers and/or forwarders or truck lines to use the container trains as a "level playing

field". Yet the rates would have to be compensatory for the railroads. These are not unique requirements and have been met in the past.

Conclusion: By combining existing railroads and highways (and perhaps airports and seaports) and upgrading selected portions to become a National Freight System appears to be a way to create such a system at an affordable cost. How the cost will be shared will be another institutional issue to be overcome. The need is there, and the means to do so appear to be self evident.

Research will be needed to delve into the various matters that will be needed to establish a National Freight System. Tasks would include, but not be limited to, the following.

1. Determine corridors by studying existing traffic flows. Much data exists. Some new data may have to be created.
2. Traffic volumes per route segment will be needed to estimate designs and costs of segments and hub terminals.
3. Determine which segments would be best suited to railroad or to truck, or in specialized cases to other modes such as water or air cargo.
4. Conceptual design of a system would be followed by an order of magnitude cost to construct and to operate and maintain.

The above study would be a major effort because of the large amount of data to be handled and analyzed. It would be well suited to a computerized logistic network solution.

Authorizing such a research effort could be, should be, an early result of the Commission's deliberations.

Respectfully submitted,

/s/ *Bill Vigrass*

J. William Vigrass,
Member of the Blue Ribbon Panel.

JWV/jwv/NatlComm
NatlFrtSysRR.
03.08.07