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The "Rush Hour" is Neither – Will It Ever Be?

The Future of Transportation in the Washington D.C. Region in 2030

synopsis of the May 2005 WFS Washington DC Chapter dinner presentation, presented by a panel consisting of Ron Kirby, Gary Maule, Michael Huerta, and Patricia Nicoson (moderator) and hosted by the Greater Washington Board of Trade; summarized by Dave Stein

Once again, the greater Washington DC region has distinguished itself by winning the "bronze medal" (third place) for worst congestion in the United States this year. The ever-lengthening commutes exacerbate the challenges of living in what is already a "not enough hours in the day" society, especially in large metropolitan areas. Not surprisingly, the Greater Washington Board of Trade, government officials, private organizations, and corporations around the region have made transportation their issue for the present in order to manage what is already proving to be a difficult future. A panel representing both government and industry shared their findings, insights, and projections on transportation in the local area at the chapter's May 2005 dinner program.

TOMORROW'S TRAFFIC JAMS – COMING SOON TO A HIGHWAY NEAR YOU!

The National Capital Region Transportation Planning Board (TPB) is preparing a 30-year transportation plan for the region, which is approximately 3,000 square miles and includes 4.5 million people and 2.8 million jobs, began Ron Kirby. The plan takes into account the historical trend of employment growing faster than the local population, with the consequence of jobs being filled by people who live progressively further from the region. From 1970-2000, population has grown 50% (from 3 million to 4.5 million), but employment has grown 87% (from 1.5 million to 2.8 million). The forecast from 2000-2030 continues this relative growth.

To accommodate the ever-increasing number of commuters, planned improvements include construction of new roads, widening or other improvements of existing roads, and interchange upgrades, as well as new rail stations and other rail transit improvements. However, said Kirby, regulations prohibit planning that assumes that a given highway or other expanded capacity will be in place, if there is not a reasonable expectation of funding. As a result, only limited new road capacity is predicted. Furthermore, approximately 77% of the transportation funds are needed for maintenance, leaving only 23% for new road and rail capacity. With added pollution being another consequence of increases in

commute times and number of commuters, Kirby also pointed out that pollution predictions are pessimistic, because when the planning office predicts auto pollution 30 years from now, they must assume today's technology.

Added Kirby, the highway system won't keep pace with growth. The projected increase in daily vehicle miles traveled, from 2000-2030, is 37% (from 109 million to 150 million). For freeways and arterial lanes, a 16% growth (from 15,300 to 17,600 miles) is forecast. This period will see a substantial increase in the "stop and go" bottlenecks on the beltway. Kirby also noted that large cities do not change their relative congestion rankings appreciably – it's just that all cities get worse together!

The Metropolitan Washington Council of Governments has done a study of "what if?" scenarios. The specific questions: What if job and housing growth were shifted? What if new roads or transit were built? How would travel conditions be different in 2030? Also, what are the key issues that land use scenarios might address?

Issue 1: Job growth is outpacing household growth. As a consequence, the region must "import" workers from other states such as West Virginia and Pennsylvania. Asks one alternative scenario, "More Households," what if more people who worked here lived here? In this scenario, growth in the number of households occurs in "regional activity clusters."

Issue 2: Workers are living further away from their jobs. Most job growth is in the inner jurisdictions, whereas the growth in the number of households is primarily in the outer jurisdictions. Another scenario, "Households In," explores the possibility of people living closer to their jobs. In this scenario, household growth is shifted toward the innermost jurisdictions. A variant of this scenario, "Jobs Out," asks what would happen if jobs were located closer to workers' homes. This scenario moves the job growth to the outer jurisdictions, closer to new housing.

Issue 3: The divide is an East-West divide. Contrary to popular belief, the congestion is not primarily a matter of everyone converging on Washington DC in the morning and then leaving the area at night. It is actually more an east-to-west flow in the morning and the reverse in the evening. The scenario "Region Undivided" asks what would happen if job and household growth were shifted toward the eastern half of the region.

Issue 4: Most growth is located outside of transit station areas. Asks the "Transit Oriented" scenario, what if people lived and worked closer to metro rail, commuter rail, and bus stations?

Continued Kirby, the study then explores what would happen if land use changes are combined with better transit including bus rapid transit and light rail transit? The most dramatic changes in the study resulted from combing new transit with higher growth in households. The 16% increase in transit trips and 18% increase in pedestrian and bicycle commuting were accompanied by a 9% reduction in vehicle miles of travel per person and a 5% decrease in miles of morning congestion. However, the most recent baseline forecasts indicate an even greater imbalance between jobs and housing. To balance job growth in 2030, 2.9 million more households are needed. With 2.4 million more households projected for the greater Washington DC region, the shortfall is 480,000. The imbalance is greater in specific areas such as Reston and Tyson's Corner.

"WE'VE GOT ROOM FOR JOBS, BUT NONE FOR NEW HOUSING"

So where will the workers come from, if not from the next ring of suburbs? Kirby discussed several possibilities. One would be more workers per household, but that number (presently 1.57) is now decreasing. Another possibility is an increase in the number of households within the Washington DC

area and the surrounding suburbs. However, as he indicated, 72% of the households forecast for 2030 have already been in place since 2000, and another 13% will be in place by 2010 – leaving only 15% affected by the scenarios. Asks Kirby, what is the potential for redevelopment of the 72% – that is, converting dilapidated areas to new high rises? At the same time, he discussed the role of local jurisdictions in exacerbating the imbalance. Local governments are generally interested in attracting employers, thereby increasing the tax base, but they usually limit housing developments since they have less value from a tax base standpoint – and often one reason given for limiting housing is an interest in preserving green areas!

BETTER LIVING THROUGH TECHNOLOGY

Kirby concluded his portion of the program with a discussion of possible technology impacts. For example, he suggested that telecommunications can reduce the need for trips not related to working, such as banking, shopping, and schooling (perhaps even dating, he suggested half-jokingly). He further noted that offshore workers do not contribute to traffic jams. Turning to the demand side, Kirby discussed better demand management via electronic tolling. In this concept, tolls and transit fares can vary by congestion levels, time of day, and even vehicle type. There is the additional promise of new forms of transportation, noted Kirby, such as "smart cars," magnetic levitation transit (maglev), personal rapid transit, and the "driverless automatic taxi." Observed Kirby, one result of mitigating road congestion will be a reduction in the number of accidents.

But in addition to congestion, technology impacts highway safety and transportation finance, explained Michael Huerta. Presently, traffic fatalities are the leading cause of death in children and in young adults, and they cost $230.6 billion per year. Furthermore, two types of accidents, intersection collisions and running off the road, account for half of the traffic fatalities.

The vehicle integration initiative, a cooperative research program among the automotive industry, the US Department of Transportation, and state departments of transportation, has as its goal the reduction of the number of fatalities from intersection-related incidents. It does this with three kinds of communication – infrastructure to vehicle, vehicle to infrastructure, and vehicle to vehicle. This communication is based on the same wireless technology that is used in electronic toll collection, but it also uses the Global Positioning System (GPS).

Infrastructure-to-vehicle communication can provide warning if another vehicle is entering an intersection, thereby helping to avoid collisions. In addition, it can warn of road conditions such as work zones, potholes, and accidents. Even dynamic navigation, to suggest alternate routes if the intended route is congested, is possible, as are adaptive headlights. Infrastructure-to-vehicle may be a warning system or may even be an automatic control system.

Vehicle-to-infrastructure communication, already enabling electronic toll collection, can support intelligent traffic signals (to sense traffic cueing and optimize the traffic flow) and intelligent on-ramp metering (to facilitate traffic merging). An additional possibility is automated bypass of inspection and weighing stations for trucks that have pre-established safety record. There is also the possibility of signal pre-emption by emergency vehicles. Vehicle-to-vehicle communication can warn of road conditions and blind spots. In addition, it can support adaptive cruise control (to optimize inter-vehicle spacing) and even wrong way driver warning – for example, if an intoxicated driver is going the wrong way on the highway.

Elaborating further on electronic toll collection technology, Huerta emphasized that it provides a way to manage demand and provide a guaranteed level of service. The idea behind managed lanes is to sell excess HOV lane capacity to paying motorists and then build high occupancy toll (HOT) networks.

Under a managed lanes system, a variable message sign tells the driver the toll that he/she will pay for that time of day. The sign replaces toll booths, and the system works for vehicle speeds up to 120 miles per hour. The idea is gaining acceptance, and managed lanes are now operational in San Diego, Houston, Minneapolis, and also in Orange County, California. Maryland is looking at the possibility of managed lanes on I-270 and I-495 (the Capital Beltway). At the same time, Virginia is looking into the possibility of managed lanes on its part of the Capital Beltway and also on I-395.

In Huerta's view, technology will continue to drive improvements in all modes of transportation. At the same time, it will make the road network safer and make the most effective use of existing capacity.

THE BUCK STARTS HERE!

Impressive as these possibilities are, continued Huerta, there are deployment barriers. One such barrier is the cost and the issue of who pays. The position of the automotive industry is to install the systems on vehicles only if there is consumer demand – although seed money may be a possibility. In all likelihood, says Huerta, the public sector would most likely pay for the infrastructure. There are also the issues of privacy and data ownership, specifically that the technology can enable "Big Brother" government to know where one has been. Even the matter of liability – that is, who pays if one's vehicle control system malfunctions to cause an accident – needs to be addressed.

Turning to traffic congestion, Huerta quantified the economic impact at $63.1 billion per year. With travel time reliability becoming an increasing problem, Huerta stated that the nationwide average annual peak period delay per traveler was a whopping 47 hours in 2003, in contrast with a mere ten hours in 1982. At an average annual peak period delay per traveler of 69 hours, Washington DC ranks as the third worst area nationwide, exceeded only by Los Angeles and San Francisco. Baltimore comes in 17th at 50 hours. Furthermore, noted Huerta, the number of vehicle miles traveled is projected to increase by 50% over the next 20 years. Bottlenecks, an issue of baseline capacity, account for 40% of these traffic delays, followed in turn by traffic incidents (25%), delays due to weather (15%), work zones (10%), poor signal timing (5%), and special events (also 5%).

However, new highway capacity is expensive, and there are socioeconomic and environmental issues. In the near term, the only major new capacity project in the greater Washington DC area is the proposed inter-county connector (ICC) in Maryland.

So who pays? Huerta told the audience that at present, the primary revenue is a gallon-based fuel tax and that current revenues are not enough to meet the projected costs of maintenance alone. Moreover, there are concerns that this revenue base is becoming eroded, because of political reluctance to increase the gasoline tax, loss of purchasing power, and (ironically) increased fuel efficiency. Projections show revenues can erode by 15% or more in 20 years.

A new mileage-based system is being examined, continued Huerta. Under this system, the tax is based on the miles driven. A pilot project in Oregon imposes a per-mile charge based on the miles of travel within a given zone, the miles driven in state vs. out of state, and the time of day (whether rush hour or not). The cost is 1.25 cents per mile. The system requires that vehicles be equipped with electronic odometers plus a GPS system. When a driver refuels his/her vehicle, a per-mile charge replaces the gasoline tax. No location information is recorded.

NEXT-GENERATION NEIGHBORHOODS

A strikingly different perspective was provided by Gary Maule, who focused on urban issues. Said Maule, transportation is synonymous with urban design, from the standpoints of accessibility, noise, and the view, noting that green fields are diminishing and that the automobile is no longer convenient in a number of urban areas. At the same time, he dispelled the myth that cars are categorically bad, emphasizing that they are part of street activity and vitality in addition to being a fashion statement. Noting that at one time, it was possible to abandon and neglect run-down areas, Maule stated that quality of life, sustainable development, smart growth, rural preservation, and transportation are all now interrelated.

For example, real estate dynamics are changing. There is now movement back to the city, concurrent with the urbanization of suburbs along transportation corridors and especially at the "nodes" (transportation stations). Town centers and main streets are resurging – as in Reston Center. This leaves wedges for lower density development. Maule foresees smart growth, with live-work-play environments, and mixed land use and transportation, together with more travel choices. This contrasts profoundly with the present paradigm in which buildings are generally single-use – residential, retail, or office. Continued Maule, many times it is not possible to build the desired high density environment and then grow it. Smart growth can include re-zoning to obtain the right density and to create more public spaces in these new urban environments.

Maule envisions a network of well-planned main roads and cross roads, with the cross roads combining access with traffic calming, together with parking garages that are embedded into the urban architecture as opposed to stand-alone. Wall-able streets will maximize connectivity while also supporting self-policing.

Q&A (as best captured)

Q: How does security (defense against terrorists) impact the plans?

A: We are starting to see this in the recent Defense Department requirements that buildings be set back from streets. They don't want their buildings to be close to the sidewalks with street level retail. One must also remember that the terrorist have hit private sector targets as well as government targets. There are ways other than the building setback requirements to ensure security. For example, camera monitors as discussed in tonight's program can provide security – just as cameras can photograph the license tags of cars that run toll gates. We may also see airplanes become "democratized" so that people will use very small private airplanes to get around.

Q: How do we make housing that is closer to workplaces more affordable? Also, and has anyone looked at the impact of a possible collapse of the real estate bubble? What we're getting now is more unaffordable housing – "McMansions."

A: This goes back to the local governments. Housing costs money because it is a smaller tax base per acre. In contrast, local governments want to accommodate employers, since that bolsters the tax base. In addition, they sometimes want to preserve green space. Furthermore, developers sometimes want to develop an area, but the neighbors resist. However, one can find areas that need redevelopment.

Q: The three scenarios stories are driven by anticipated changes, and they are the least likely outcomes. You are still in a basic continuity model. What is missing is a study of "What Washington DC can be?" Why was such a normative study not included?

A: These scenarios are not modest scenarios. They may not look dramatic, but they are. They pushed the envelope.

Q: Decades ago, neural nets and self-learning systems were to be up and running, but that hasn't happened. Where are these traffic control systems that you discussed this evening really going?

A: The government spend a significant amount of money on IT but has not yet reaped the payback that they were expecting. Why not? In our case, we've not been able to convince everyone of the payback – for example, reduced traffic fatalities or commute time reduction.

Q: All of these scenarios are unpleasant. Every other city is competing to be a high tech city. At what point do you see major shifts in living patterns and jobs?

A: There are significant changes possible that can mitigate this. For example, combine the "what-ifs." We'll see change when people are charged to use the roads. Also, things don't just happen. You need incentives and disincentives. For example, in one case, the state government notified local governments that if they built beyond certain areas, the state would not help fund a new school, highway, or water treatment plant.

C: If the private sector sees the opportunity to leverage the new technology in cars to stream to you weather information, tour information, etc., then they may be more likely to invest in its installation.

*The panelists: **Patricia Nicoson**, the panel moderator, is President of the Dulles Corridor Rail Association. **Ron Kirby** is Director of Transportation, Metropolitan Washington Council of Governments (MWCOG) and is an authority on demographic trends and the current long range transportation plan for the region. Ron has directed the transportation program for a number of years and previously worked as a researcher at the Urban Institute. **Gary Maule** is Principal, RTKL Associates, Inc. and an expert on transportation's impact on urban form. RTKL has prepared the plans for the Reston Town Center and a number of transit-oriented development projects in the region including Moorefield Station on the future Dulles Metrorail line and Shady Grove. **Michael Huerta** of Affiliated Computer Services, Inc. (www.acs-inc.com) is an expert on the role of intelligent technology in transportation.*

***POINTS FOR THE CLASSROOM** (send comments to forum@futuretakes.org):*

- *Try being an urban or transportation planner. Which tradeoffs would you make regarding the needs of new residents, existing residents, environmental impact, and the tax base?*
    - *New residents (brought in by job growth) need places to live, but this aggravates road congestion.*
    - *Existing residents and environmental groups resist new development, although as costs of county government increase, then taxes must increase or services must be cut back.*
    - *Local governments want to maximize the tax base – which is larger for a given area if it is occupied by business than by private homes. However, local governments sometimes offer tax incentives to attract business.*

- *Also, what new metrics (if any) will you use in planning new communities or transportation networks, in addition to throughput, capacity, and investment potential?*

- *Will we see two types of road networks – smart roads and "other" – in 2020?*

- *If private airplanes become commonplace for everyday getting around, how will this change the various findings presented in this program?*

- *Will there be a transition to a steady state economy that does not require population growth, population density growth, or "sprawl and crawl"? How viable is a steady state economy at the various levels of government, especially the local levels?*

- *At what point will traffic blues be an impetus for new living and working patterns and a better quality of life, once the "misery index" is sufficiently high? Will increasing gasoline prices also be a driver (pardon the pun)? And, how will new living and working patterns, or the continuation of existing ones, impact family life and relationships with friends and neighbors?*

- *Do commute-related stresses such as commute times, road rage, etc. add to healthcare costs, both in the US and elsewhere?*

- *What are long-term consequences of people not being able to live where they work – a problem found in various US ski resorts? Also policemen, firemen, and teachers?*

- *Will the US still be an automobile society in 2040? Other countries? Why or why not?*