Advanced Transit Association

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SMART URBAN MOBILITY

Summary of the ATRA Seminar at Harvard's Graduate School of Design August 22, 2008

The purpose of this seminar was to introduce the concept of Smart Urban Mobility. In a SUM strategy, the managers of a district or campus creates and maintains a predominantly pedestrian core. Densities are high to locate most internal destinations within walking distance. Parking, service access and goods deliveries are carefully managaged. Various modes of personal travel – bikes, devices for the mobility impaired, internal circulation services, ride-sharing, zipcars, and mass transit interfacing with the larger metropolitan areas – are coordinated to enhance mobility.

SUM also takes full advantage of various kinds of PRT (personal rapid transit) as a new infrastructural element. The topology of PRT configuration and urban design guidelines have not yet been well explored, and this seminar was a small step in that direction. The technical and economic feasibility of PRT was not questioned. Instead the physical dimensions of establishing PRT operations in real-world settings were explored. A large institution or its franchisee will own and operate PRT, most likely integrated with parking. University campuses are relevant settings, as are medical complexes (the two often overlapping).

ON OUR WARMING GLOBE, YOUR DISTRICT MATTERS

On national and global scales, SUM can be seen as a tactic to reduce traffic (measured as vehicle-miles traveled or VMT in the US). An alternative objective is to reduce greenhouse gas emissions. Electric propulsion can do this without reducing VMT. Some forty architects, planners, landscape architects, urban designers and students participated in the seminar August 22 at Harvard University's Graduate School of Design. They came from all corners of the US, France, the UK and the UAE.

The first three panelists explained the potential of SUM to affect a major modal shift away from street and highway traffic. If replicated around the world, SUM can help protect, sustain and create a healthy and sustainable global environment.

ARMANDO CARBONELL said that recent past growth of cities has been largely uncontrolled and unsustainable. In the face of global warming, we need a different or smarter way to plan regional and urban areas all around the world. For instance, over 25% of our consumption of fossil fuels is related to transportation. He ended on a positive note by suggesting that global warming can be an impetus to gain political consensus for more effective regional and urban planning focused on "smart growth".

RICHARD DOBER spoke about the need for "smart campus mobility" especially for mega-campuses (enrollments over 10,000). Most campuses are dominated by one form of transportation, the private car. He said in the US there are 326 mega-campuses that recognize their need for "metro-connections" which involve all modes of mobility within and between campuses and their surrounding communities. There are important public health and safety benefits to smart urban and campus mobility. He described by way of example one opportunity for SUM is in St. Paul, MN where several institutions are scattered along a central route.

NADER ADALAN made a plea for a "new paradigm for urban development." He observed that US schools and professional offices have trained most of the world's planners, architects and other designers to create auto-dominated "unsustainable development." If we continue in this way we will need three earth's to sustain our present life styles. The current growth models in United Arab Emirates (UAE) with population foreseen to grow to 6.2 million as it evolves into a global economic and cultural crossroads is environmentally unsustainable. He professed a four-pronged approach to urban design based on balanced attention to function, environment, culture, and technologies. He believes too many contemporary urban designers and planners have underplayed or ignored environmental and cultural factors. The world needs a more balanced approach to achieve sustainability.

PRT GUIDELINES & PARAMETERS

LAWRENCE FABIAN provided an overview of advanced transit options and trends around the world. There are over 132 automated people movers (APMs) currently operating around the world. APMs are typically used to haul groups of people in a simple shuttle configuration or along a route. In the US, they typically operate at airports and amusement parks. In Europe, there are many "driverless metros" with examples in France, Denmark, Italy, Germany, Singapore, and Malaysia. Personal Rapid Transit (PRT) has a solid technological base in the 30 year-old prototype still operating at West Virginia University (Morgantown) and several current R&D programs. PRT is appropriate for special urban districts and campuses. PRTs are similar to horizontal express elevators that take 1-3 passengers non-stop to a specific destination. A prototype will open next year at London Heathrow Airport and a demo operates today in Uppsala, Sweden. “Lite” versions of PRT are emerging based on robotic vehicles that can be automatically controlled without an exclusive guideway. There have been several studies in the US, UK, Sweden and UAE that establish the feasibility of the PRT system to serve a range of mobility needs.

RICHARD CRAPPSLEY presented an interesting concept of a "High Street spur”. In this, PRTcould have low speeds and multi-stops along an "off-line” segment or spur. He showed several graphics of how PRT systems can be used within or connect to central business districts (CBDs). He also showed concepts for using color and lighting to soften the visual impact of PRT guideways and stations.

LAWRENCE FABIAN addressed the growing need for planning and design guidelines and parameters for APM and PRT systems. Sound design approaches based on the new topology of PRT should first seek to locate stations and estimate passenger demand at each one. For conventional rail, all stations must be sized for maximum train requirement. This is *not* the case for PRT. The starting point is a minimal PRT station. Only if higher demand is foreseen should the capacity (and dimensions and cost) be expanded. Once all desired service nodes are identified, then network connections should be explored and defined. Both one-way and two-way segments can be considered. We need more creative design studies to demonstrate how PRT can be skillfully integrated into existing and new urban districts and campuses. He showed a few innovative examples.

SHANNON McDONALD pointed out that most auto parking is "destination-based." Drivers go to parking places nearest their destination and walk to it, or they park + ride some distance by other means, typically feeder or shuttle

buses or heavier modes of transit. Most parking needs to be linked to other modes of mobility for movement within an urban district or campus. These transfer points become important urban spaces for social interaction, public information and retail trade.

PRT CASE STUDIES

MASDAR (UAE) by Nader Ardalan. His primary example was the proposed new town of MASDAR as part of Abu Dhabi in the UAE. It is to be compact a mixed-use area for 50,000 residents and 40,000 commuters. Its overall objective is to have "zero" (low) carbon emissions, zero waste, and maximum use of renewable energy. A 6 meter above-ground-level platform is planned as a car-free pedestrian zone upon which the new community will be built. Parking, PRT and private transit (taxis, etc.), all utilities, and "service activities" will take place at this lower level. On the platform, commercial and residential units are planned using traditional town building forms and styles of the region: low-rise and compact development with extensive gardens and attractive public spaces.

DAVENTRY (UK) by Richard Crappsley. Daventy is a proposed "pilot project" which would have a 4.9km PRT network with 7 stations. It is not to be started until 2012. A second example is Cambridge where a private group has undertaken a PRT study focused on serving a large development site that will have 10-12,000 housing units and 4-5,000 jobs. It would have a PRT network of 17km and 20 stations. Another example is Bath, a historic town where strong local opposition to a PRT is expected.

MICROSOFT (US) by David Maymudes. About 30,000 people work on this large sprawling and still evolving campus located near Seattle. Presently Microsoft operates its own fleet of 20 buses. The original PRT study was performed by David and his group at Taxi 2000. It was not solicited or commissioned by Microsoft. They developed planning software and made a video simulation to show how PRT system might work and appear. One question raised was whether service might be extended to surrounding neighborhoods. This effort is presently on hold.

CONCLUSIONS

Several speakers and participants expressed the need for more and better examples of smart regional, urban, and site planning, design and development around the world. Many felt the US was not providing leadership, instead fostering unsustainable development. We have far to go to get the public or even most of our professional colleagues to recognize the future benefits of SUM to create more sustainable urban and campus development.

SUM is an expansion of the concept of "Smart Growth" (a term widely used in the US today). It entails the careful balancing of all modes of mobility including electronic communication. The basic goal is to expand the consideration of all modes of mobility and communication and to coordinate them to reduce vehicular traffic in urban districts and large campuses. Ways to identify and measure the benefits thereof must be established.

A fuller and more rigorous definition of SUM is needed. Invitations to participate in this effort should be made to various professional organizations such as ASCE, AIA, ASLA, AMPO, and their international counterparts.