



News of ATRA and IST

ATRA and IST members are encouraged to forward this newsletter to friends and colleagues or post it on appropriate websites.

July/August 2012

SEPTEMBER IN BERLIN

Innotrans is where the world rail and metro industries come together every other year. The venue is always the Berlin Messe. Over 100,000 registrants are expected for the next one taking place in three months — this time for the first time with a bright Podcar presence. Innotrans exhibit spaces were all booked last May. Combined with a hungry world rail market, this year will be big. It will also be better with **PCC6** — the 6th annual Podcar City conference — September 19-20 coinciding with it. Moreover, a September 18-19 workshop by IARO will explore excellence in airport-city express rail. IARO and PCC6 are cooperating.

The world the rail industry is healthy and growing. Large chunks of existing infrastructure are being moved into the cyber age. Saudi Arabia and Gulf states plan whole networks from scratch.

Outside the USA and the UK, the market for urban metros is equally robust.

Podcar City- Berlin Specifics

PCC6 will have a booth at Innotrans, which takes place at Berlin's Messe exhibit center. After an Icebreaker on September 19, there will be an intense one-day program ending with a formal dinner with keynote speeches and announcements that will set the tone for advanced transit as 2012 draws to a close.

Full registration is €550 (~\$690). Students get can attend for €25 (\$32). Register now at www.podcarcity.org. For assistance, email christerjplindstrom@gmail.com.

Some of the confirmed speakers at the conference:

Rod Diridon, Director, Mineta Institute, Silicon Valley

Hans Larsen, Acting Director of transport, San José, CA

Walter Kulyk, FTA Office of Mobility Innovation, DC

Alain Kornhauser, Princeton University, ATRA Chair



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This fall, ich bin ein Berliner!

Ron Swenson, President, of EcoSystems, Santa Cruz, CA

Tom Karlsson & Stefan Hanna, Uppsala Traffic & Member of Municipal Council

Jörg Schweitzer, Bologna University, Italy

Ingmar Andréasson, LogistikCentrum, emeritus Royal Institute of Technology, Sweden

David D. Little, Partner, Lea+Elliott, USA

David Holdcroft, consultant, former BAA Heathrow, UK

Nathan Koren, Capita Symonds, UK

Bo Olsson, Swedish Transport Administration, Sweden

Magnus Hunhammar, CEO, Institute for Sustainable Transportation, Sweden

Lawrence Fabian, Trans.21 and ATRA, USA

John V. Cole, COO, SkyTran, USA

Eugene Nishinaga, CyberTran International, USA

Alexander Kyllmann, Managing Director, ModuTram, Mexico

Hans Lindqvist, Chairman, KOMPASS network, Sweden

Bengt Gustafsson, CEO, Beamways, Sweden

A select group has been invited to continue on to Stockholm for technical workshops on control standards, station design, inter-governmental issues, and business models, and a visit to the Vectus track in Uppsala. For more information contact christerjplindstrom@gmail.com.

For background information, go to www.podcar.org to tune in. Breaking news of the growing smart urban mobility industry is regularly posted. Check out *PodMap* (a clickable map of world podcar news), *Calendar*, professional profiles and more.

WHERE IS PRT'S TRANSIT NICHE?

Swedish professor Ingmar Andreasson has analyzed and simulated applications of PRT for several decades. In fact, he has developed the *PRTsim* suite of software packages to do just that. He sees the visual intrusion of guideways, typically conceived as elevated, as the main barrier to public acceptance of advanced APM proposals in urban contexts.

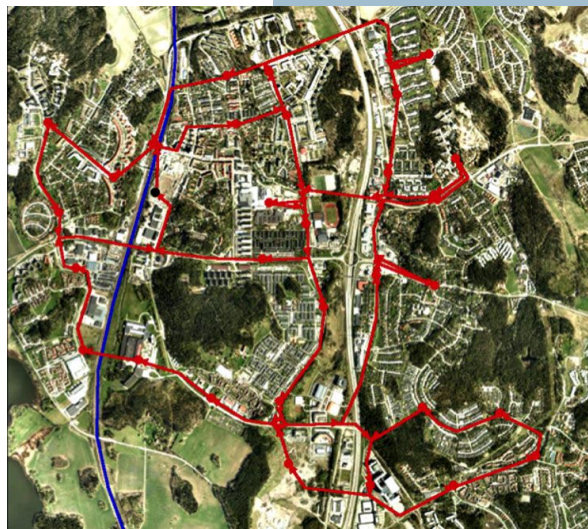
The appeal of taxi-like transit is the main benefit. More people will choose to use transit because getting to destinations without a car can be easier than with one. They will do so even in off-peak hours, when road congestion doesn't slow traffic and when parking may not be too bad. So where do PRT networks most effectively fit into the world of urban transit?

An Array of Smart Applications

The most obvious way is as a feeder to a line-haul rail service. A PRT network makes multiple sites an easy, non-stop ride away from the large station. This is what is planned for Uppsala, Sweden.

In small cities and towns where rail transit makes little sense, PRT can serve as the backbone – a sort of mini-metro or maybe a micro-metro. A major advantage is that it doesn't have to be linear. An array of trip-generators can be seamlessly interconnected. In this way, a PRT network can supplement bus services maybe even in dual-mode style.

In large cities with multiple rail corridors radiating out from the center, PRT networks



PRT has been designed to access and distribute from a major rail station in Upplands Vasby, Sweden.

can interconnect those radial corridors when lighter cross-corridor demand is evident.

Andreasson also discusses better known applications – airports and their surrounding airfront destinations, institutional retail campuses and theme parks. They are summarized in his recent paper entitled *PRT as a supplement to existing transportation modes*. To ask for details, email ingmar@logistikcentrum.se.

SUBSTANTIVE ADVANCE ARE HERE

by Alain Kornhauser, ATRA Chair

Humans have relied on actions performed by humans for the delivery of their mobility for most of history.

Pedestrians rely on themselves, as do bicyclists. People supervised and directed the horse, mule, camel and the automobile. Drivers supervise and direct cars, trucks and buses, while pilots and helmsmen perform these duties in airplanes and ships.

Trains are constrained mechanically in the lateral direction, and engineers have devised to control longitudinal motion. Similarly with elevators: the operator controls vertical motion while rails constrain the compartment in a vertical shaft.

Elevators may well have been the first to replace human operators in urban transport with automation in which the only functions by humans is to select the destination. Automatic controls do everything else. After a few decades, almost all elevators are automated.

Airplanes followed with electronic flight control systems which today readily outperform human pilots. The human(s) in the cockpit largely perform a supervisory oversight role, struggling to be vigilant for last-resort roles.

Replacement of human control in automobiles has been evolving slowly for some time. The starting point may have been the introduction of electric starters which replaced the hand crank in the 1920s. Hydraulic mechanisms that select the appropriate gear ratio were the next human function that was replaced. Then there was the replacement of other mechanical functions with electronic counterparts to control various subsystems such as air/fuel mixture ratios, window openings, seat position and climate control, to name but a few.

Advances in automating vehicle movements have been slowly forthcoming since the late 1980s. Anti-lock brakes are a noteworthy replacement of a human function because they perform a function that is typically contrary and corrective to a human action. They override the tendency to “slam on the brakes”. They recognize that some instinctive human reactions, if implemented, will actually create a situation that is contrary to what is best for the human. Anti-lock brakes are desirable because they say, “While I understand that you want to decelerate as fast as possible, the way you are trying to do it is sub-optimal. I know a better way to do it and I’m taking over”.

This is legally very significant. Owner-overriding anti-lock brakes have withstood all challenges in the legal system. This is indeed a watershed achievement for automatic controls!

Brakes and Cruise Controls Too

While not as unique, introduction of cruise control in which vehicle speed control is relinquished by the driver human was another major milestone. It “promoted” the human to a supervisory position in the vehicle, rather than a control position. Cruise control sets only the throttle position: the human driver must remain vigilant not only to implement braking, but also to perform the lateral control, lane-keeping function.

This has evolved to intelligent cruise control, which takes over forward collision avoidance as well as speed. Driver longitudinal control supervisory function is largely replaced by the intelligent cruise controls. There is every reason to believe that an intelligent cruise control system can better control the throttle and brakes of a vehicle in essentially all driving conditions, from open road to bumper-to-bumper, stop-and-go conditions.

These systems are new to the market. We'll see if consumer acceptance and appreciation make them a success in the market place. Basically, will Google's vision of intelligent cruise control resonate with the car buying public?

Longitudinal Too

Even intelligent cruise control is limited in that it "cruise control" and not true longitudinal controls. That is, they assume that there is a desired speed whose only limitations are objects in the traffic lane directly ahead. They have no awareness of traffic control devices or other external factors that might change the desired speed. Such factors remain the purview of the human operator.

The next step in automation of cars likely to hit the commercial marketplace is electronic lane-keeping that allows drivers to remove hands from the steering wheel, relieved to a supervisory role of determining which lane to be in rather than working to keep the vehicle in a particular lane.

Since lane departure is involved in the majority of highway deaths, there is enormous motivation for enhancing the lane-keeping function. Advances in detecting and monitoring lane edges have been made over the past 15 years. Such systems are very close to being ready for the consumer market place. They will enable drivers to take "eyes off the road" -- for periods of time. The robustness of these systems as well as their ability to adequately re-engage the user in a timely fashion will play a major role in market success.

The Future

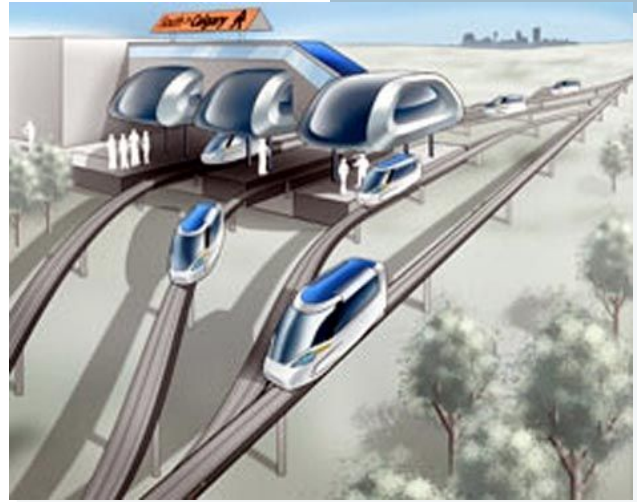
Intelligent cruise control and automated lane-keeping evolve the driver into an attentive and alert supervisory role. These capabilities should be common car features in at-least high end cars within the next few years.

Further down the road, so to speak, are functionalities that interface with external traffic and conditions. These will further reduce the role of car drivers. Early signs are popping up – the PRT-shuttles at LHR and Masdar are really driverless cars. They were demonstrated on a public street recently in La Rochelle, France. The driving public will become accustomed to such innovations. Expect them to creep into the world's fleet of a billion vehicles.

At some point, vehicles will no longer need a human driver. This will revolutionize mobility: the automobile will like an elevator waiting in the lobby of a tall building. Anyone can get to his or her desired floor. Citywide, one simply goes to the *e-cab* stand, wait a few seconds in case someone else arrives that can share the ride with you, then depart to where you want to go.

A Jersey-York Demo?

In the short run, lane keeping and intelligent cruise control systems could be implemented in the 3,000 express buses that bring commuters from New Jersey to the Port Authority



*How will automated road cars integrate with advanced transit visions?
— courtesy of Magnovate*

Bus Terminal every day. They could substantially improve fleet performance so that the capacity of the counter-flow exclusive bus lane on the "495 viaduct and helix" could be increased about 40 percent. This would allow another 15,000 Jersey commuters per hour to bus in each morning. On a cost-benefit basis, this is by far the most effective way to provide high-quality access to Manhattan in the morning peak hours.

ATRA @ IRVINE

Shannon McDonald and Stan Young will represent advanced transit interests at *Future of the Road Vehicle*, a professional conference organized by TRB. Several standing committees are organizing the program.

It will take place in Irvine, California July 25-26. The purpose is to generate research ideas hopefully to be incorporated into Federal policies and programs. Shannon will make a presentation.

For more information, contact Stan at seyoung@umd.edu.



MORGANTOWN CENTRAL

As it gears up for control upgrades, the Morgantown PRT has a new sense of purpose not only for the town and gown folks at West Virginia University, but also for the academics. WVU wants to be a center of PRT excellence. This is new. In the past, the PRT has been derided and snubbed.

Hugh Kierig, WVU director of parking and transportation, has a nice new office in the Intermodal Center – a bus and bike interface with lots of parking nestled up to one of the five PRT stations that has operated safely since the 1970s. During the 1980s and 1990s, the professors of the various schools at WVU – civil and environmental engineering, mechanical and aerospace, landscape architecture, etc. – took no interest in this unique piece of PRT equipment. Ed Neumann took refuge in Nevada and changed his field to prosthetics.

Kierig also wants to replace the obsolete fare collection equipment. It is deceptively linked to the PRT controls through destination selection. Lea+Elliott are providing expert advice, taking the lead on the specs, now in industry review. The state government is to provide funds, not Washington.

Talks are underway with the FTA and others in Washington with an eye to research funds. WVU already has a substantial alternative fuels institute. ATRA may play an advisory role.



Will advanced transit figure into South Shore Chicago development that may house Obama's Presidential Library?

The Morgantown PRT is now well integrated with parking and bus services at West Virginia University.

***A dynamic advanced mobility industry is emerging.
Be part of it by***

JOINING ATRA

DPMs 30 YEARS ON

In 1976 USDOT launched the Downtown People Mover program to demonstrate the viability of driverless transit in downtown (and by extension general urban) settings. Detroit, Jacksonville and Miami were funded and implemented. Miami opened first 1986. Detroit's one-way downtown loop started up the next year. Jacksonville followed in 1989.

Now they are facts on the ground. None of them gets a gold star. They are not sparkling success stories, especially in today's depressed economic and real estate conditions. No American cities are emulating this kind of transit project – a tangle of elevated guideway trying to interconnect parts of the urban core. Dozens were interested in the 1970s competition that led up the D-J-M trio. Only Norfolk pursued its DPM plans a bit in the 1990s, but instead built LRT that includes a downtown streetcar section with tamed traffic.

Detroit's Mover

Downtown Detroit still has dozens of vacant lots and buildings, including several boarded up skyscrapers. The one-way elevated DPM loops with ad-wrapped vehicles helps enliven the downtown scene, carrying 5000 or 6000 passengers per day, with crowds up to 50,000 when the Auto Show is on. It runs with a budget of almost \$12 million, and vehicles are being overhauled.

Much of Detroit is vacant and abandoned. Derelict buildings abound, often standing as islands surrounded by land where businesses and residences once thrived. The City teeters on the brink of bankruptcy. In a region whose largely suburban economy is starting to show signs of new life, Detroit squirms to stay alive. Its population was 1.2 million in 1980. It was 714,000 in 2010 and still falling. Downtown employment was 93,000 in 1990. It is 52,000 today.

Has the 'Mover saved downtown Detroit? The answer must be no, despite the addition of a stadium and three casinos and recent appearance of yuppies living in lofts downtown. However, gazing at the abandonment in Detroit's neighborhoods, we can say that the 'Mover has helped downtown from sinking further.

Jacksonville's Skyway

The DPM functions pretty regularly. The 4km network requires about \$5 million/year to operate and maintain. Ridership is low: downtown office vacancy rate is 25-30% and the number of workers has dropped from 75,000 to 51,000. The Great Recession hit Jacksonville especially hard. What is left, nonetheless, is an active place full of professionals young and old. As in other CBDs around the world, retailing has migrated to the suburbs and now onto the Internet. Still, Downtown Jacksonville is a livelier place than it was in 1989.

The fares were removed last February and more bus routes now terminate at Skyway stations. These actions have boosted daily ridership back to about 3,300. Use has been closely tied to remote parking. With zero-fares and plans to truncate more bus routes, ridership is expected to grow. Still, there are no plans to extend Skyway.



Detroit's "mover weaves through downtown's often-vacant buildings starting to see new signs of life.



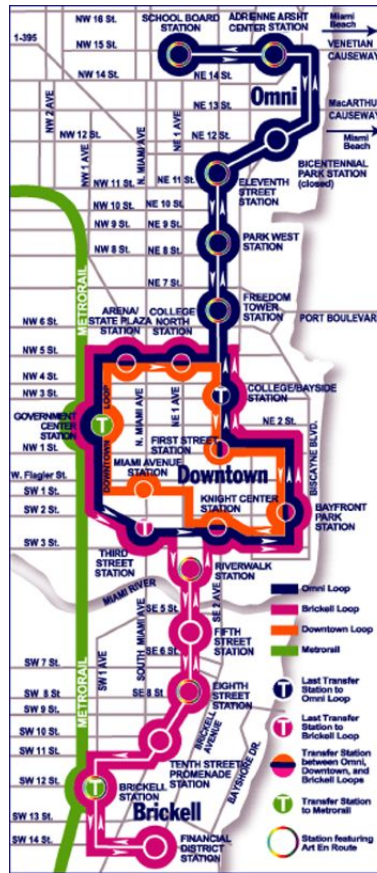
The DPM in Jacksonville: will it be extended?

MiamiMover

Much livelier too is downtown Miami, and much bigger — with high-rise apartments and condos up and down its coastline. Miami's *MetroMover* carries about 31,000 passengers a day. The key factor in higher patronage compared to Detroit and Jacksonville is that Miami's downtown loop, now with north and south legs, distributes from heavy rail -- the 22-station, mostly elevated and heavy Metrorail. Despite this much higher capacity and investment, the now-dubbed Green Line carries 68,000 per day -- hardly twice the number of smaller, nimble *MetroMover*.

Heavy rail and APM intersect neatly one atop the other at Government Center station. Over 90,000 a month board there. There is also a secondary interface at Brickell station on the south leg with monthly boardings of 10,000.

Bombardier about four years ago supplied new cars to replace the twelve originals from Westinghouse. Parts were stripped and the rest sold for scrap. The rest of the fleet is also being replaced. Capital improvement items on the wish list include better switch controls, data transmission, operational controls and fiber optics.



Miami's MetroMover is the largest and most utilized of the three DPMs.

AMERICA'S ANTI-BUREAUCRAT ANGST

The ranting and raving of the T-Party and much US political discourse these days is unsettling. Does it simply reflect a generalized level of discomfort in today's world? Isn't it naïve to think we don't need good governance? And does that mean we need good bureaucrats.

There are many good bureaucrats out there in all kinds of positions, doing things every day — or at least every workday. Some slack off. Some have bad attitudes, or at least bad days. But we need them.

Gary Huttman is a conscientious MPO official in Orlando, Florida. He easily lists off the transit projects in their pipeline: anew commuter rail in an old railroad corridor for \$1.2 billion (100km), the International Drive-airport corridor, US 441, US 192 and State Route 50.

Lean Times in Civil Service

Our financial malaise has led to severe budget cuts in human services of all kinds and at all levels. Europe too has entered into budgetary disruptions and political kickback. Public budgets have already been trimmed in previous rounds of cuts. Now



Transit officials and urban planners face head-on the realities of street life.

most are being pared to the bone. The public feeling the brunt of this is not happy.

How true of mass transit services so vital to so many without cars! Services are being cut at the same time that fares are being raised. How can the public be happy?

APTA and the mass transit industry it embraces have responded in the old ways. We need \$80 billion to repair our infrastructure, rewire and upgrade to modernity.

Transit Extended by Cyber-Smarts

ATRA stands ready to work with transit people of all kinds – operators and bureaucrats, suppliers and civic supporters. We understand advanced modes of transit and can explain their unique characteristics and the public benefits they can bring.

Advanced transit can effectively extend the range of transit-oriented development – the TOD so often heard in urban planning and transit circles. Miami's Metrorail is effectively extended by its smaller-scale and nimble MetroMover. New York City's Skytrain effectively extends the subways reach to include JFK Airport.

San Jose hopes to do the same with PRT, preferring to call it ATN to make support from Washington and Sacramento more palatable and more interesting to Silicon Valley.

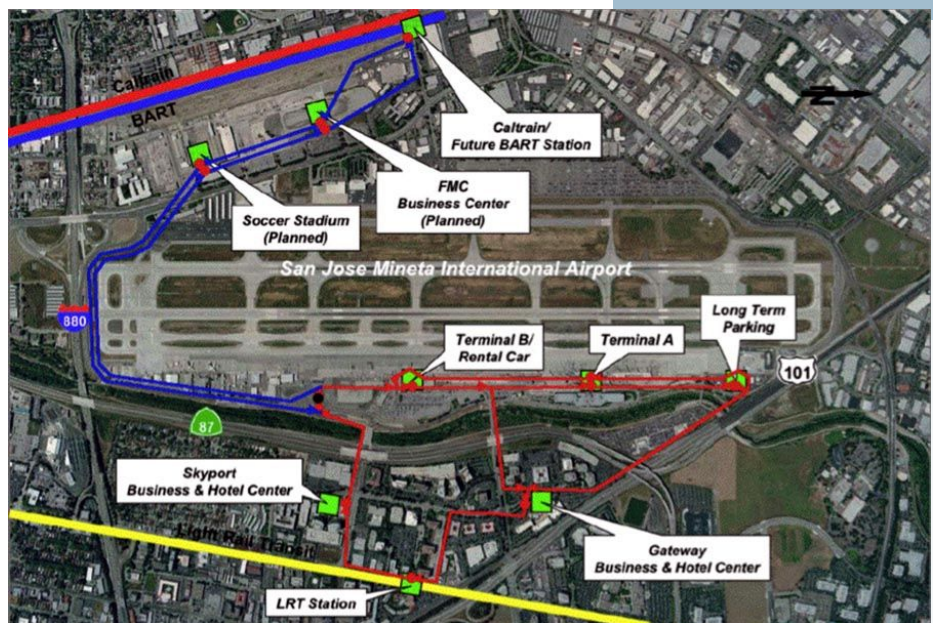
Please consider joining ATRA. Become a member and let us serve you.

GUIDEWAY-LESS PRT

Is the future of driverless cars a nation-wide upgrade of the Interstate befitting the Age of the Internet? Or is the street-side emergence of dual-mode PRT?

Some 200 mobility entrepreneurs gathered in the heart (kind of) of Detroit last month. The venue was and is a dying city on the verge of bankruptcy. Their passion was making money and bringing safety, security and order to our society. The background of many registrants was military and security. The name of the group that organized it was the Association of Unmanned Vehicle Systems International. What a mouthful! Even its abbreviation AUVSI isn't pronounceable.

ATRA Chairman Alain Kornhauser sees driverless cars as a great assist for advanced transit. The benefit is vehicle redistribution – necessary for sound fleet management when systems get large – such as handling a 20-station network as in San Jose. The key seems to be creating mobility watering spots, where people of all sorts can comfortably access when they need to go somewhere.



Will San Jose move forward with a smart, wealth-generating network at its airport?

What's in a Name?

AUSVI and ATRA have in common a tendency to spin wheels over the name of their passion. If PRT is poison, will calling it podcars or ATN or hyper-mobility make a difference?

AUSVI has a bigger problem. It chose “driverless” over the “unmanned” in its name. But the leadership stuck to another word that is quite wrong and misleading. What is an “autonomous vehicle”? Autonomous means without influence from outsiders -- having the right or power of self-government. I'd hate to see vehicles running down my street or highway in that fashion! Can you imagine hordes of aggressive autonomous vehicles making everyone get out of the way? All would be crushed!

Suggested as better labels were auto-car, automated cars, or empowered vehicles smart cars or green cars.

But “autonomous driving” and “autonomy” ruled the platform June 12 and 13 in Detroit. From a military point of view, this may make sense in that driverless vehicles are controlled by “the system”. GM and others made it clear that the legally responsible agent must still be the driver – the one who flicks his car into driverless mode.

Step-wise Evolution

AUVSI dogma is that there are five levels of driverlessness for passenger vehicles:

1. driver-assisted
2. driver –monitored
3. driver intervention

A bright red separate the about trio from the more complicated realms that require societal – meaning public sector and therefore political arenas:

4. system control with driver override
5. full “autonomous” system control

The complexity of all five of these levels of automation is greatly affected by the context in which they are applied. I large parking lot is one thing. The 50,000 miles of the US Interstate network through dense cities and over long stretched of sparse prairies are another.

Human Contexts

What seem to be missing from the thinking of AUVSI and most of the two-hundred in Detroit last month are similar categories for the range of complexity of application contexts:

- private property of a single owner
 - in a private campus with public access
 - such as a university or medical district
 - in a managed urban district, e.g. a CBD



Students envision a network of advanced transit in the protected grounds of Guadalajara Zoo in Mexico.

This can cross the red line, to:

- community circulation services

- metropolitan mass transit

It was impressive to see that several states have taken the lead in the wake of Washington dithering and distraction. Michigan has allowed experimental vehicles on its roads for 65 years, and highly automated ones are just a new kind. Nevada last year passed an enabling law focuses on certification. Florida is interested for its large senior, often mobility-starved population.

How do we proceed?

VIEW FROM ENGLAND

by Martin Lawson

Independent studies by Arup and ITS Leeds show significant benefits to existing bus & rail services when they are supported by an on-demand PRT network.

- Cardiff (UK): A PRT system covering the last 2km to the Bay area would increase patronage by >100% on existing bus & rail services.

- Gateshead (UK): a 21km PRT network serving the inner city would increase the use of rail travel by 168% in the peak and 232% in the off-peak.

PRT is complementary to conventional rail.

LHR UPDATE

by Stan Young, ATRA President

On April 22, David Holdcroft formerly of British Airports Authority (BAA), and David Little of Lea & Elliot spoke at a University of Maryland-sponsored seminar on Automated Transit Networks (ATN). Holdcroft provided an overview of the Ultra PRT system installed at Heathrow terminal 5. As the BAA project manager during the inception, build and eventual opening of the project, David shared the entire story, both technical and programmatic. His outlook on the prospects of expansion are bullish – sharing that BAA has fallen in and out of love with the system, but is generally very positive now that the system is operating consistently.

Little shared a perspective of the use of ATNs to enhance landside mobility at airports, and thus increase landside value through better development opportunities. Many more airports are open to the new ATN systems demonstrated at BAA and Masdar, but due to the recent recession both in the US and Europe, capital investment has been limited across the board in people mover systems. So as the economy improves opportunities to enhance airport landside development may consider the utility and value of that ATN has to offer.



Ultra chalks up good O&M experience at London Heathrow Airport.

After the UMD seminar, Holdcroft traveled to Princeton University, where he spoke for a much larger and livelier audience that included several elected officials. This sensitive and affluent town is familiar with PRT. News of LHR reportedly encouraged several people to include ATN options in a current update of Princeton's transit needs.

LEGENDARY LATINO AIRFRONT

South Florida officials know how important MIA is to their economy of trade and tourism. Miami International Airport is a gem that services large volumes of people and goods every day. Smart decisions made in the 1990s now make it the only aviation boasting three separate APMs Tampa, Orlando, Las Vegas, Heathrow and others have pairs of shuttles that work together to connect concourses to the main terminal. Atlanta, Hong Kong, Tampa and Minneapolis have two APMs. Viva Miami!

MIA already had a classic shuttle that opened in the 1980s serving Concourse E off the dense horseshoe of terminals. The new ones (a) stretch across the roof of a new North Terminal and (b) zip out to the huge Miami Intermodal Center (MIC – a mass of car rentals, metro and eventually HSR), thereby de-clogging the main terminals roadway and its precious curb space. They are both cool and work well. Mitsubishi Heavy Industries has scored twin feats, solidly planting its feet in the reviving US airport market.

MIA air traffic was 39 million passengers (in and out) last year, up 6 percent from 2010. Adjacent to MIA are large districts of small import and export shops handling large shares of US-Latin American trade. American Airlines accounts for 70 percent of MIA's traffic.

AA's Northern Terminal

Delivered late and not without some embarrassment on the faces of AA executives, the new North Terminal is made up of old Concourses A-D. Is exclusively AA turf. It was approved as a \$900 million project in 1999. By 2004 that figure had ballooned to \$1.5 billion. By 2010: \$3,065,000,000. The APM didn't account for much of that inflation. It has four stations and two kilometers of length. The \$86-million system supply contract signed in 2000.

There were major delays and problems in the whole project, not helped by the shocks of 2001 and 2008. Sumitomo-MHI delivered on time to a late North Terminal, and MIA had to pay their diligent contractor \$2 million to hold trains in Japan and "exercise" them.

AA is happy with the APM's critical role in the smooth functioning of their business heart. They pay a staff of 30 to run it with a \$5.5 million annual budget. That doesn't include power or stationing cleaning, by the way.



Young technicians monitor the MIA mover at Miami International.

MIAMover's Sharp Welcome

MIA's new landside APM was also supplied by Sumitomo-MHI. It is longer: 2 kilometer. There are only two stations: it currently operates as a back-and-forth shuttle. In the future at a place reserved along the guideway, MIAMover will stop for an office-conference center and hotel(s) *muy grandes*.

Airport officials estimate that MIAMover removed about 30 percent of the car, taxi, limo and shuttle traffic that used to swirl through its limited roadways. The APM system cost about \$270 million and opened last September. Daily ridership is growing fast. It will jump this fall when a 4-kilometer extension brings Metrorail riders to the MIC, most then taking MIAMover to the airport. In the long-term, high-speed rail will add to the flows, expected to reach 48,000 per day by 2020.

Tourists can go to airports and resorts all over the sunny, sandy stretches of Florida. Fort Lauderdale is only a half-hour north of Miami. A bit further is Palm Beach. Two hours across the Everglades is Naples and SW. Even Orlando and Tampa aren't that far away. MIA has become a legendary success. North Terminal and the decongesting *Mover* give two extra draws to a warm *Benvenido i Miami!*