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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.

September/October 2011

A WAY OUT OF THE FINANCIAL CRISIS

Recent news has been dominated by depressing talk of government debt, budget cuts, panicked stock market reactions and economic woe. Long-term strategic planning is being side-tracked by these immediate fiscal concerns, and this is unfortunately true of urban transportation where we need long-term thinking to guide us to real solutions.

ATRA's modal innovation vision stands in sharp contrast to this pervasive short-sightedness. Hardly mentioned in all the debates and name-calling is our addiction to oil and the international consequences we become embroiled in when that oil supply is threatened. Indeed, our crippling need to import it in increasingly unaffordable volumes is at the very core of US and European economic problems.

Solar and other sustainable energy initiatives are encouraging, but substantially more are needed. Although no one likes to pay more at the pump, many economic models indicate that only increased cost will wean our nation from cheap oil to sustainable alternatives.

Oil Addiction is Crippling Us

It seems that in Washington no one is proposing the obviously useful step that anyone who has studied Economics 101 knows. Raising the cost of oil will reduce consumption. Raising tax on a gallon of gas – say $1 -- will do wonders. Will it cause pain at the pump? You bet! That's the tough love that we need from good leadership.

"Not only would it cause people to drive less, it will divert American ingenuity, capital and imagination into alternative fuels and modes - hopefully converging on many of the concepts ATRA has been promoting for decades," comments Stan Young, ATRA President. Alternative modes will become more competitive and create jobs. This will help conventional public transport, car-sharing, biking and, yes, walking -- which will make us healthier and reduce medical costs as a side benefit. It will provide superior ways for us to get around without guzzling gas.

It's the imported oil, stupid! That's what is causing our financial crisis. Think, without dependency on imported oil, would be in two wars in the Middle World? With the money saved, would be embroiled in the current economic crisis?

IN THIS ISSUE

Christer Lindstrom, left, is the Swede behind PCC5 and his country is set to be off oil by 2020.

ECOLOGICAL FLASHES

Intensified weather patterns are flashing warning signs around the world. Record heat in some places compete with exceptional drought in others. Intense rainfall brings flooding in stark contrast to a spring season of unusually high tornado devastation. Glaciers retreat and polar ice breaks off in huge chunks. Are these random swings of a normal cycles of nature, or is something fundamentally changing?

Only visionary projects such as this one for Fresno, California, can shift us to more sustainable lifestyles.

Politicians are cautious to sound too alarmist and corporations tend to diminish these matters that may threaten their market positions. Scientists have the great claim to objectivity, and they are consistently sounding alarms that are for the most part ignored.

Our Atmosphere and Our Oceans

A recent current warning has come from marine biologists. Reflecting on a 2010 accord to put 17% of the world's land and 10% of the oceans under environmental protection, an article in the *Marine Ecology Progress Series* concludes that this strategy is not enough to slow the accelerating extinction of ocean species. The "evidence is clear": a major shift is needed to deal with the roots of the problem according to Peter Sale, a co-author of a current article. With seven billion people now living on Mother Earth, we need a major shift of resource use, but Sale laments that public awareness of the significant is "shockingly low".

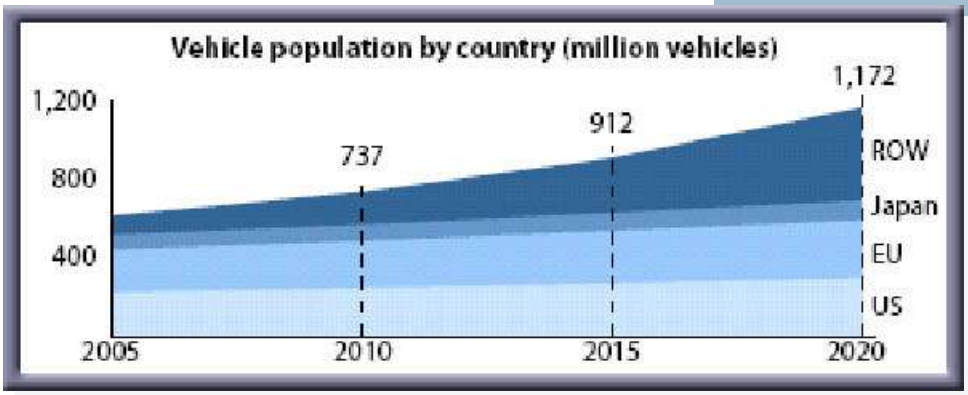
As a billion cars and other roads vehicles burn oil to move around and the takeoffs of thousands of aircraft pour more and then do on to streak the upper altitudes every day, the collective effects of rising carbon dioxide levels may soon reach a tipping point.

President Obama and other leaders around the world, the change we need is not a resuscitation of car production to keep assembly workers, car mechanic and gas station attendants happy.

WORLD CAR FLEET SOARS

Growth in car ownership in the US and Europe has moderated over recent years – partly due to lower population growth but also to some extent because of life-style shifts. However, the global picture is one of continuing expansion. China, India, the oil-rich Middle World and other urbanizing, industrializing nations provide robust markets for more passenger boxes on wheels. They spew out tons of carbon dioxide that accelerate the climate change. Scientists overwhelmingly recognize this as a serious problem. Other toxic emissions have a more immediate effect on the lungs that breathe them.

The *Automotive Digest* using data from Forrester Research gives numbers that shock. The world car fleet was estimated at 737 million in 2010. It is projected to grow to 1172 million by 2020 – an increase of 59 percent!



Global car ownership as estimated by one source.

Energy expert Robert Q. Riley estimates that 800 billion barrels of oil have been burned in recent decades. About 800 billion more remain as "proven" resources. Sixty percent of oil is used for transportation.

Aware that gasoline prices will rise dramatically over coming years, American auto executives are tripping over each other to catch up with Japanese and European companies putting electric cars on the market. While this may seem like a sound solution, the economics and environmental impacts of battery use and disposal on a massive scale are largely explored.

Dual-mode systems, where cars are driven on local streets but engage into guideways of some kind to supply power and intelligence for automatic control, may be a partial solution. A more meaningful strategy is to engender a significant shift to green modes – urban planning and car-sharing support to lifestyles that rely on walking, biking and transit such as can be enhanced with driverless operation and PRT networks.

FINLAND'S STRATEGIC POSITION

Linguistically Finland is not part of Scandinavia despite a north European geography similar to Sweden. Finnish is a language more closely related to Hungarian and Turkish than to Danish and Norwegian. Finland is a latecomer to modern industry: it was largely agricultural until the 1950s with a population today of only 5.4 million,

The capital Helsinki has a modern metro – a forked line of 21km and 17 stations. In 2006 a policy decision was made to upgrade to driverless controls – a progressive move matched by only a few other *metro retro* projects in France, Germany and maybe Belgium. Recently it obtained European financing to add a 14km extension that is to be fully automated by 2015. Another extension to the airport is in planning.

By technical precision and marketing savvy, this demographically small country established itself as a world leader in cell phone manufacturing. Airport and local

officials now have plans for an airfront center called Marja in the town of Vantaa to eventually house 30,000 and have employment of 25,000. The airport handles about 14 million passengers a year and traffic is growing.

Eying this opportunity and at least four more good PRT applications in and around capital as well as vast growth potential around the globe, a small start up company is advancing its version of PRT. Called BM Design, it will present at PCC5 in neighboring Sweden September 6-8, adding to a surge in Nordic innovation that may transform the world of urban mobility.

BM Design's vision of the future of PRT.

SOUTH OF THE BORDER

Quiet work on PRT is underway in Mexico, and you will learn first hand if you invest in a ticket to Stockholm to attend PCC5 September 6-8. A German-Latino named Alex Kyllmann since 2009 had been heading up efforts in collaboration with Mexican auto companies looking for future growth markets. His background is in electrical engineering with years of industrial experience with Siemens in both Germany and Mexico. He has degrees from Rice (Houston) and Stanford Universities as well as a MBA from Guadalajara, where he is now based.

Modutram's Alex Kyllmann, in gray coat, at the San Jose Podcar conference. Crop off a few inches from the top and left.

Kyllman attended PCC4 in San Jose last year. Come learn what progress he and his company *Modutram* have made in our fast-changing global world.

PRT UNDER DOWN UNDER

Historically Australia has felt isolated from the rest of the world, especially from Mother England. While this is changing in a world of instant global communication and modern air travel, remoteness is even more intense for New Zealand. The area of its two main islands is much smaller than that of Australia, and likewise its population of 5.4 million is one-fourth that of Australia.

New Zealand's capital Auckland is big enough (1.4m) and geographically constrained enough to have congestion and transit needs. Consultants are studying a 3.5km rail tunnel as part of a $8 billion master plan of rail and busways. Will Wilson has been advocating implementation of PRT as part of a more modern mix of mobility services

for many years. So far his friendship with Ed Anderson hasn't been enough to rouse political interest to advance the idea.

Ollie Mikosza of the Polish PRT developer Mist-er spent many years in New Zealand over the interesting course of his professional life. His daughter is now based in Auckland and may help stir up interested and move Kiwis into the 21st century.

ATRA VENDORS GROUP

by Martin Lowson

With the operations of the world's first Personal Rapid Transit systems at Masdar and Heathrow having commenced, and a third system in realization at Suncheon in South Korea, the concept of PRT is quickly gaining more attention. At the same time however, there are still many key decision-makers who are unaware of the concept, its abilities (and restrictions) and design considerations.

The three major PRT suppliers — 2getthere, ULTra PRT and Vectus — have come together to form the new ATRA Vendors Group. Within this group the vendors co-operate to set up and provide information to those companies and agencies involved in the market place, allowing all to make better informed assessments of the applicability of PRT in particular settings. The ultimate goal is that through the combined effort, the market will mature more rapidly.

These three European vendors have already agreed to provide a description of their vehicles on a common basis. This is given in the accompanying separate section. They are also developing, on the basis of advice and comments from consultants active in the area, a series of reports giving a view on the advantages and disadvantages of PRT. This promises to be documentation that can be of key value to those thinking about the possibility of a PRT application in their area.

Each of the three vendors also agreed to provide presentations for the ATRA Vendor Group, indicating the capabilities of the PRT industry. The first presentation was given in Liverpool, UK at a Plenary Session of the 2011 Transport Practitioners Meeting, immediately after a presentation by Norman Baker, Member of Parliament and UK Transport Minster. This was very well received by an audience who knew comparatively little about PRT before the presentation.

This initiative has been welcomed by both consultants and potential customers of PRT and is very positive for the fledgling PRT industry. It is part of a drive to create a wider ATRA industry activity, involving consultants, academics and the vendors.

ATRA Europe is an active partner of PCC5, contributing through the organization of several sessions. One of these will provide further insight into findings generated as part of the ATRA Vendor Group discussions.

In addition ATRA EU is working together closely with the existing ATRA Board to realize an updated website in terms of lay-out, content and look-and-feel. The first version of the new site is now being built (off-line) with the expectation that the new site will be on-line in the next few months – providing a fresh basis for the growth of ATRA in the coming years.

David Holdcroft, previously PRT Manager at Heathrow, is acting as secretary to this group and can be contacted at david.holdcroft@gmail.com

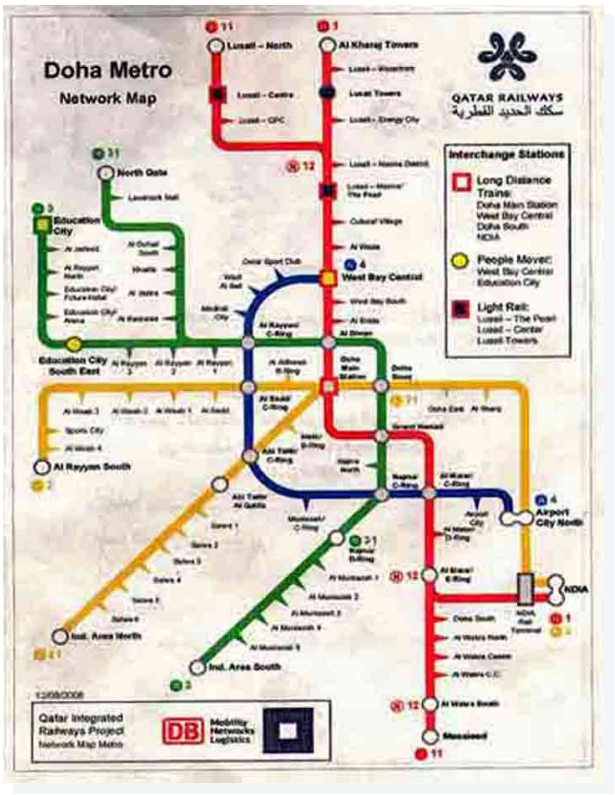
PRT CHARACTERISTICS

Important Note: Stated characteristics reflect systems as designed for current applications; there is scope for tailoring parameters and performance of each system as required for future applications.

	Data Basis	Masdar Application	Heathrow Application	Suncheon Applicaton
Key system design aspects				
Vehicle Power principle		Battery stored electric	Battery stored electric	Electrical
Power Transfer method		Automatic charging via automated connection at berths and in maintenance facility	Automatic opportunity charging via automatic connection at berths and in charging lanes	Current collection
Drive principle		Electric motor driving vehicle wheels	Electric motor driving vehicle wheels	Linear motor
Vehicle Support Method		Semi-solid tyres on level road surface	Pneumatic tyres on level road surface	Proprietary low friction solid polymer wheels on steel track
Vehicle Guidance Method		Dead reckoning with reference magnetic markers	Kerb referenced electronic controlled steering	Captive to steel track
Vehicle Emergency Evacuation	-	Both sides	Front hatch (onto passive guideway)	Both sides
System specifications & performance characteristics				
Vehicle Size & Accessibility				
Dimensions LxWxH	mm	3920x1460x2010	3700x1470x1800	3600x2082x2421
Floor Space	m^2	1.7	≥1.7	2.7
Door opening area (HxW)	mm	1750x1050	≥1500x900	1950x900
Level entry		Yes	Yes	Yes
Number of passengers per vehicle	-	4 adults, 2 children	4 adults, 2 children	6 adults or 4 adults and 4 children
Wheelchair accommodation capability	-	Yes (ADA compliant)	Yes (RVAR/ADA compliant)	Yes (ADA compliant)
Luggage	-	Between seats	Between seats	Between seats
Weight - empty and (maximum)	kg	1400 (2050)	850 (1300)	1500 (2500)
Payload	kg	650	450	1000
Performance characteristics				
Maximum Speed	km/hr	40	40	70
Maximum speed in curve (with radius: 20/50/100m)	km/hr	16/26/36	18/28/40	16/26/36
Typical Acceleration and Deceleration	m/s^2	0.8	1.25	1.2
Maximum Emergency Deceleration (current/projected)	m/s^2	4.7	2.5 / 5	5
Maximum Range (at maximum payload)	km	60	20	Not applicable
Platform Gap	mm	< 30	< 20	< 30
Platform Step	mm	<10	5	< 10

Energy Usage				
Energy Consumption @ 30 km/h (empty vehicle)	kWh/km	0.17	0.09	0.23
Energy Consumption @ 30 km/h (full vehicle)	kWh/km	0.19	0.13	0.24
Equivalent Carbon usage (full vehicle @30km/h, and 0.545kgCO2/kWh)	gCO2/passenger km	0.023	0.018	0.022
Control System				
Controls concept		Asynchronous / Synchronous	Synchronous-based, asynchronous aspects	Asynchronous
Controls Topography		Distributed	Distributed	Distributed
Automatic Vehicle Protection system		Fixed Block in combination with obstacle detection	Fixed block system	Radio based Dynamic Moving Block
Obstacle Detection	-	Front and Rear	Operator monitored CCTV	Optional front
Dynamic rerouting		Not currently	In stations	Yes
Emergency recovery		Manual drive (joystick) + tow bar	Reduced speed recovery mode + dedicated tow vehicle if necessary	Reverse operation + Push/Tow with other vehicles
Current application headway	seconds	5	6	4
Infrastructure				
Max. Track Gradient	%	10	10	10
Minimum Radius (centre line)	m	5.5	5	5
Track Width (at grade / elevated)	mm	1750 / 1850 without walkway	1750 / 2100	1400/1400
Typical system (track and vehicle) square clearance envelope (W*H)	mm	1750 - 1850 / 2300 without walkway	1750 / 2100*2000	2100 * 2500
Berth concept(s)		Angled independent or straight in-line	Angled independent or straight in-line	In-line
Maximum throughput 1 berth/hour	Vehicles	~120	~120	160-200
Minimum multi berth station length per independent berth	m	Depending on angle of the berth @Masdar: 4.3 at 30degrees	3.2	4.5
Minimum multi berth station width per independent berth (inc vehicle and passenger areas)	m	Depending on angle of the berth	4	NA
Interaction with passengers				
Information		Touch Screen with audio and custom defined content	Automated interactive display and audio at berths and in vehicles.	Information display, Audio
Communication initiation		CCTV, Intercom, Medical Assistance request button, Emergency Stop button	Information and Emergency Assistance request buttons in vehicles and stations	Information and Emergency Assistance request buttons in vehicles and stations
Communication		2 way audio intercom and CCTV monitoring at berths and in vehicles	2 way audio intercom and CCTV monitoring at berths and in vehicles	2 way audio intercom and CCTV monitoring at stations and in vehicles
Destination Selection		Application Dependent	Application Dependent	Application Dependent
Facility for ride sharing		Yes	Yes	Yes
Emergency response				
CCTV		Yes	Yes	Yes
Intercom		Yes	Yes	Yes
Operator		Yes	Yes	Yes

DRIVERLESS METRO NEWS



Doha has a grand scheme for rail developed with German support.

Dubai expects to open its second driverless metro this month. The first segment of the first line came into service on September 9, 2009 – or 9/9/9 — adding to the drama in a small powerhouse of a nation now boasting the world's tallest building, artificial islands shaped as a palm tree and the map of the world, and other urban fantasies.

As extensions to the Red Line were brought into service, many were anxious to claim that this is – would be – the longest driverless metro network in the world, outdoing the earlier networks in Vancouver (where expansions are planned) and Lille, France (where the world's first was launched in 1983). Dubai's Red Line now carries about 120,000 passengers a day, and transit's share of total travel has jumped from 2% to 6%.

Soon thirteen MHI trains will be automatically guided over the length of Dubai's 22km Green Line. A more dramatic impact on urban life is expected with a goal of 34% by transit in 2020. Such aggressive promotion of transit over cars may be the reason UITP (Int'l Mass Transit Assn, headquartered in Brussels) opened a branch office here several years ago.

Moscow Too?

The list of driverless metros is getting long. It was originally dominated by French cities and Vancouver. It has expanded to other European countries and many spots in Asia. Recently Latin America has joined in. If Honolulu's wobbly metro plan holds, the US will finally add its name to 21st century transit world.

The Russian capital recently announced a long-term plan to add a driverless operation to its extensive metro network. The Solntsevo Branch is a concept to serve a newly developing section of the region. Maybe Timbuktu and Bishkek will be next!

MODE BY MULLER

Colorado-based PRT consultant and experienced airport and civil engineer Peter Muller has surveyed various groups about preferences for urban mobility. What are the most important factors in decisions of whether to travel by different modes? Do considerations of cost and time dominate, or do security and private have major influence? How onerous are wait time and transfers? Some findings from preliminary work can be seen in the accompanying Table 1.

ATRA has agreed to support and cooperate with Muller's desire to expand the survey base of this work. Workshops in various settings are envisioned – big cities and small, sun-belt and wintry climates, etc., with an intent to discover how the results might vary. In addition, the workshops will attempt to apply the results to different modes (Table 2) and obtain a sense of the likelihood of people switching to modes that better meet their desires.

Anyone interested in details of these preliminary findings or plans for continued work can contact Peter at pmuller@prtconsulting.com.

Ordered Travel Preference Survey Analysis Results

Reliable	**13.22**
Flexible Departure Arrival	10.22
Low Cost	9.50
Easy to Use	9.22
Short Walking Distance	7.72
Short Waiting Time	7.61
Energy Efficient	6.72
Short Travel Time	6.39
Low Emissions	4.56
No Transfers	4.39
Consistent Travel Time	4.17
Safe	3.72
Comfortable	3.44
Visually Appealing	2.67
Seated Travel	2.28
ADA Compliant (disabled persons access)	1.94
Personally Secure	1.94
Private	**0.28**
Total	**100.00**
Median	**4.47**
Mean (Average)	**5.56**
Average Deviation	**2.91**
Standard Deviation	**3.48**

Highest priority Lowest priority

An example of the questions asked in Muller's workshops.

BUILDING A FUTURE IN MINNESOTA

The Building Community Exhibition is an annual week-long, public event in Minneappolis that offers a sneak peek at the future of urban communities. The Chamber of Commerce participates along with architects and state and local agencies. This year organizers wanted to include innovative transportation and asked ATRA to help. The local chapter Citizens for Personal Rapid Transit (www.cprt.org) responded by organzing a special session and staffing a table top display for a total of 43 hours over five days.

The exhibition took place August 15-19 in the Crystal Court of the IDS Center in downtown Minneapolis.Over 300 people stopped by the exhibition each day and expressed great interest. Most were unfamiliar with the concept. Staff at the expo estimated that over 75% of questions regarding specific exhibits were about PRT including many enthusiastic responses. Over 75 copies of *Rethinking Transportation* and 150 of *Smart Urban Mobility* were distributed.

Minnesota CPRT's display in downtown Minneapolis last month.

There were scale models, renderings, computer animations and multi-media displays of planned, ongoing, and recently completed construction projects. August 18 was a "Transportation Day" that featured ATRA's noontime speaker session, where an ATRA representative spoke alongside other preminent transportation policy-makers. Around 70 people heard the presentation on PRT. A video of the presentation, shot by Ken Avidor, the anti-PRT blogger, can be seen at *prtboondoggle.blogspot.com/2011/08/hilarious-personal-rapid-transit.html*. CPRT chair Andrea Walker felt that this was a highlight of her summer — a wonderful response from the business community and general public. The PRT message was heard by many, many supportive people.

AIRPORTS

A recent study by a company specialized in "life assistance" concluded that four million former air passengers now find travel through airports and airplanes so stressful that they no longer opt to fly. Partly due to security measures and trimmed budgets that have eliminated many free amenities, reduced quality of airports also plays a role in this dramatic shift. Tattered furniture and dirty floors and toilets also take their toll.

Use of APMs to reduce walking distances broke the mold of airport planning in the 1970s in Tampa, Orlando, Seattle and other innovative settings. Now short-sighted officials are prone to cut costs by using moving walks or by forcing long walks. The air travel industry in North America has lost its pioneering spirit.

Retrieving baggage is the least of the drudgeries of post-9/11 air travel.

Minneapolis-St. Paul, Minnesota: MSP already has two APMs – airside and landside – to make getting to and from flights easier for passengers. Handling 33m in 2010, it is projected to serve 55m by 2025. Innovative use of PRT could maintain and improve passenger satisfaction, and the state DOT has looked seriously at building on the many private sector initiatives in this area. However a recent study on PRT at MSP by UMinn's Center for Transportation Studies could only conclude that a conclusion was difficult. It was led by Ferrol Robinson, a career researcher known more for his caution than creativity. He basically looked for examples elsewhere and found what everyone already knew – there are few. Contact him at *robin684@umn.edu*.

Phoenix, Arizona: In addition to Miami and Las Vegas where APMs are being added to others already in service Phoenix and Sacramento (see below) are the only US airports building new systems. In Arizona's capital, the first phase will be 3.5+km connecting terminals to remote parking. System cost was originally announced as $186m with a 2012 opening, but this may have escalated to $260m. The supplier is Bombardier. The contract was signed mid-2009. and eventually it will be extended to a car rental center. That phase is not yet been funded.

Sacramento, California: A bright bit of news comes from California's capital, where a $43m APM by Bombardier is part of an expansion that is coming in early and cheaper. The total project was to cost $1.3B with a finish date of 2012. It is scheduled to open this fall for $1.1B. A ~350m shuttle will soon link an airside concourse to the main terminal.