

## SPECIAL SECTION: SWEDEN

### SWEET SWEDEN

No other country in the world has studied PRT more than Sweden, a nation of only nine million citizens. Planning analyst Ingmar Andreasson, also a professor at Stockholm's Royal Technological Institute, estimates that some twenty cities have completed feasibility studies of PRT, now equally known as podcars. Or often just *Pods*.

Andreasson notes that a pod feasibility study is much more than an application proposal that minimally defines a network and then estimates cost and ridership. Many Swedish studies have been intermodal – comparing and combining PRT alternatives to buses, trams, no-build, etc. and calculating benefit/cost ratios.

In the US in the 1990s, PRT studies in SeaTac, Cincinnati, Albany, Irvine and Las Vegas were done, but to no result. There are more current efforts underway in Fresno and San Jose (see other article) in California. In Sweden, over a dozen municipalities have co-funded an association that meets regularly hoping to advance growing interest in a pioneer podcar project. Many *Kompass* members are small towns or suburbs of maybe 50,000 residents.

In the more populous British Isles, there are several studies in which PRT was applied and maybe compared. The same may be said of Korea. But none of this is of the same depth and precision as in Sweden – where there is a wide network of engaged, PRT-informed people, geographically and professionally. The party politics are a mystery to outsiders.

#### High-Standard Tolerance

Everyday life in Sweden is quite comfortable. The standards of industrial design and architectural quality are very high. Almost everyone speaks English, and getting around is easy and fun. People love to move about – brisk walks, gentle canoes and wind-challenged sails. There are mountain-climbing, skiing and ox wrestling for the hardy.

Swedes are very demanding of themselves and of others, but also graciously tolerant and open-minded. Maybe the PRT crowd is exceptional, but most Swedes seem very keen to hear out your ideas and discuss them.



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*Sweden boasts the world's only mobile PRT station display.*

**SWEDISH CITIES**

**290**  
number of municipalities queried

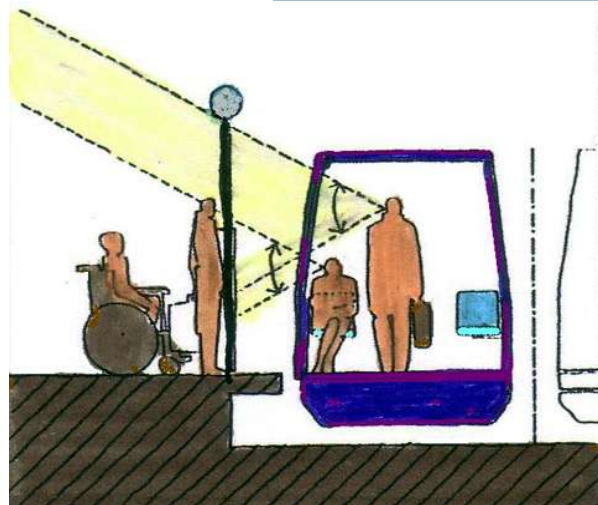
**29**  
expressed interest

**15**  
had pre-study, viable concept, & strong political support (2009)

- Are/Ostersund
- Eskilstuna
- Hofors
- Linköping
- Kiruna
- Malmö
- Mölnåhl
- Sigtuna/Arlanda
- Södertälje
- Stockholm – Academic District
- Trollhattan
- Uddevalla
- Umeå
- Upplands Vasby
- Uppsala
- Värmdö

Sweden is home a PRT test track because the Koreans who run *Vectus* are confident that Swedish standards would be valued in world markets. Indigenous *SkyCab* has independently run a technology development and integration program. *Beamways* has done substantive work in PRT software, investing in the fact that visualizing PRT is halfway there. Software can just as easily run vehicles on a guideway as dots on a computer screen.

Perhaps Ingmar Andreasson and his *LogistikCentrum* simulation software can inspire more efficient control strategies PRT/podcar system of the future. Investors would do well to seek out his advice!



**Aligning to 2012**

This year is one of consolidation. It will come together this September at **PCC5** in Stockholm. Hopefully impressive start of service recently seen at Masdar in Abu Dhabi (2getthere), at London’s Heathrow Airport (Ultra) and La Rochelle in France (Robosoft) will increase public officials and private investors.

In 2010 the *GTS Foundation* was established by Kjell Dahlstrom and Jan-Erik Nowacki. GTS refers to General Transportation System, a term they have developed to accommodate the majority of the nation’s personal travel and shipments into an efficient, environmentally friendly next-gen mode of ground transport.

What will they announce after the long-days of Scandinavian summer, when **PCC5** convenes in Stockholm? Register now at the lower rate at [www.podcarcity.org/Stockholm](http://www.podcarcity.org/Stockholm).

*Viewlines matter to civic designers and landscape architects.*

*Investing in your future*



*The European Union is sponsoring the 5th Podcar City conference, to be held September 6-8, 2011 in Stockholm.*

**SODERTALJE AND PRT**

Some thirty kilometers southwest of the center of Stockholm is the municipality of Sodertälje. It is known as a place dominated by immigrants, with large recent influxes mostly from Iraq, giving rise to its nickname *Little Baghdad*. The town of Sodertälje is one of the three final candidates for the pioneer PRT program undertaken by Sweden’s national government.

How do you say PRT in Arabic and Syriac? Will the assembly line workers currently making trucks for Scania there prefer to manufacture podcars, guideway sections and station shells?

### Long-Standing Interest

PRT interest is not new in Sodertalje. With a \$80,000 grant SkyCab developed plans for an installation and industrial development in 1995. A test track was envisioned but never realized. US defense contractor Raytheon also visited and explored opportunities. Attention focused on linking the town center to a remote rail station. More recently, Ingmar Andreasson has led another study and delivered a report in 2008. Preliminary engineering began the following year identifying and station column locations, necessary curvature and costs. Many numbers have been crunched.

No one yet knows how much can be expected from the central government to fund an installation. There is stiff competition from Uppsala and the Akademiska campus in central Stockholm.

Sodertalje's long-standing, pro-PRT mayor Anders Lago is leaving office for a higher post, Perhaps a group of Sodertalje immigrant entrepreneurs will pull the pieces together for a public-private partnership that will spark urban mobility breakthroughs without need for funds from Stockholm.



## LA ROCHELLE: PRT-ON-THE-STREET

On France's Atlantic coast in the small city of Rochelle, three robocars are now in regular service on an urban street mixed with pedestrian, bike and restricted vehicular traffic. This demo is done mostly with EU research funds. Last May 13-14, it was the focus of a conference of 120+ European researchers affiliated with the \$60 million, 5-year *CityMobil* program conceived and funded by the European Commission.

*CityMobil* has generated a large set of literature on innovative transit that ranges from socio-economic analysis to a demo of guided buses in two corridors in Castellon, Spain and documentation of *Ultra* still in trial service at London's Heathrow Airport. Another demonstration project is in planning for a Rome expo center. Information about many funding opportunities for further research and demos was shared in La Rochelle – the final *CityMobil* meeting. Details of a follow-on program are not yet available.

## Frustration with Policy Barriers

While Lowson labeled the gathering in La Rochelle “surprisingly successful”, Christer Lindstrom was more impressed by the passion of the discussions. It is clear now that new technologies with far superior service than conventional buses and trains are available. Why are they not better understood and embraced? How can these findings be better communicated? What are the next steps for France, so focused on driverless metros, and Europe in general – so diverse in its needs and cultural orientations?

The robocars-on-street in La Rochelle are another version of PRT Lite. *Ultra* and *2getthere* are both in service as battery-powered robocars not locked into a guideway as is the case in “classic” PRT and APMs in general, as well as 20th century rail. Classic here means tracked trains (even as taxi-sized cars) getting power and communication from the guideway with safeguards against “derailing” design in.

If a vehicle-guideway lock-in is not necessary, as shown at Heathrow, Rotterdam, Masdar and La Rochelle, at what point is it advantageous? In snow and ice, the advantages are obvious. The logistics (speed and range limits and recharging) and environmental impacts (disposal) of batteries clearly become an issue in larger applications.

### To Track or Not to Track?

Track-less APMs are cheaper, but their service limitations are real. That’s why the Vectus test track in Uppsala, Sweden, is more expensive but free of the speed and range limits of robocars as it runs locked into a track through the cold of Scandinavian winters.

Learn more at PCC5 in Stockholm in September. To get official news of the La Rochelle conference, visit [www.polisnetwork.edu](http://www.polisnetwork.edu).



*Low-speed robocars in La Rochelle need no aerodynamic lines.*



*Mid-sized APM visions of yesterday, this one envisioned for Orlando, Florida in the 1980s, were largely absent at APM11 in Paris last May.*

## APM11: MAINSTREAM GETS INNOVATIVE

Last month’s APM conference in Paris – the 13th of the long series of gatherings that began with stoic efforts by Ed Neumann and Murthy Bondada, both associated with West Virginia University and its cutting-edge PRT – drew many European transit officials. The main focus was on driverless metros so germane in Paris, with its Line 14, the current retrofitting of Line 1 and plans for a transformative 150km ring through the inner suburbs. Attendance was almost 300 – up from the 2009 event in Atlanta.

Summarized L+E principal Harley Moore — the only person who has attended all thirteen of the ASCE APM conference, “There was less emphasis on APM technology itself and more on automated metros and PRT, as well as serious eating and drinking even though a weak US dollar made it all very expensive.”

### PRT Workshop

Productive and constructive were words applied to a workshop for consultants organized by the PRT Vendors Group of ATRA-EU – a spin-off and affiliate now showing heightened levels of activity. The impetus came from *Ultra* founder Martin Lowson, who served

on the *APM11* Organizing Committee. A dozen consultants attended.

European transit officials, with deep and widespread political support compared to the US, are less resistant to “unproven” technologies like PRT. Their interest is significant – leading to programs to establish safer, higher-capacity, more comfortable, reliable and flexible metros with many stations fed by lighter, taxi-like local circulation services.

### American Future?

Few American transit or airport officials participated at *APM11* in Paris. There were many US consultants, mostly those already specialized in APM engineering. There were many vendors from Asia. But no PRT exhibits.



*Driverless metro projects multiply around the world, this one a rendering for Macao.*

Where will the 14th APM conference be in the US, where transit faces massive budget shortfalls and the airport sector is still in recovery mode? Neither transit nor airport sectors are optimistic about new APM projects for now. Where will their interests be in 2013?

## INSIDE PARIS and OUT

Paris-based globalist Eric Britton likes to rule the roost of urban mobility founded on a long career as a consultant in industrial strategies and public policies. From the 1960s until the present, from *EcoPlan* to *WorldStreets*, his projects and campaigns have been numerous. He loves to walk city streets, and tends to think that metros are for rats and other questionable species that mindlessly descend into dark tunnels.



American by birth, Britton has little patience for modal leaps forward that PRT enthusiasts and promoters talk about. He has invested time and budget in at least two broad studies of transit innovation whose range included PRT. He concentrates on bikes and feet.

*In China, large developments are increasing seen with APM elements.*

### Bad Boy, PRT!

Britton recently blogged that we are “wasting our time with these long disproven, whack-a-mole PRT proposals that clearly have no place in our cities.... How to get the message across to the policy makers and politicians? ... These PRT enthusiasts are distracting us at a time when we need all our brains and focus for the real stuff. Out they go.”

On his own website, someone aptly replied, “Who are they distracting? Scarcely anyone notices PRT. By far the worst distraction in transport is mass transit, especially urban railway systems. Railway enthusiasts are encouraging governments and municipalities to install boondoggle transit systems that waste many billions around the world every year, while barely making a dent, if even that, in our transport and energy problems.”

## Ignoring APM2011

One might expect so informed a technology guru to attend the recent APM conference that took place in Paris. Yet, no, Britton did not descend into that world. On with bikes and buggies!

At least the president of the *République Française* has vision to renovate the inner suburbs around Paris with a 150-kilometer driverless metro loop. La Rochelle just started a breakthrough application of robocars in urban traffic, mostly pedestrian. The French feast continues!

## PRIMO in SAUDI ARABIA

Within a large tract of desert outside Riyadh, the first Arab APM has opened to serve students, staff and visitors to the all-female campus Noura University, named after its benefactor princess of the House of Saud. The 11.5km loop with two branches and fourteen stations was built, equipped and debugged in two years by Italy's Ansaldo and the Bin Ladin Group. A similar Hajj 18km APM carrying pilgrims in and around Makkah (Mecca) opened last year, but its Thales controls will bring driverless operation to Chinese vehicles later this year.



This speedy and apparently unblemished opening at Noura University puts Ansaldo in a healthy position to capture more business in this fast-building oil-rich region. Bombardier just won a contract for Jeddah Airport (see *AIRPORTS*) to expand on its \$241-million contract for a 4km, 6-station installation in Riyadh's new Financial District.

Riyadh, Jeddah and smaller Saudi cities may well soon be building extensive lines and networks of urban APMs.

*The Noura University circulator has at-grade stations. - courtesy of Ansaldo.*

## SAN JOSE IN STEALTH MODE

Since 240 people from all over the world gathered in the capital of Silicon Valley last October for the 4th Podcar Cities conference, the City of San Jose's **Automated Transit Network System** (aka PRT) development and application work has proceeded quietly, with support from consultants Aerospace (technology integration) and Arup (airfront application planning). Last January they again requested information from potential suppliers. Eight responded by the March deadline. They were:

- Beamways (Sweden)
- PRT International (Minnesota)
- Roane Inventions (Texas)
  
- Skycabs (New Zealand)
- 2getthere (Netherlands)
- Ultra bullet (UK with Palo Alto rep)
  
- Vectus (Korea/Sweden)
- Zoeflig



Zoeftig is a Chicago company with a UK presence by that designs and manufactures airport and transit seating systems. Since San Jose's PRT is centered on airport connections, there may be continuity here!

### What is the PRT Industry?

What a spread of companies responding to San Jose! From Down Under to Korea and Europe and also San Jose's back yard! Are these seven or eight the fools of the night, who rush forth sharing their intellectual property while the trillion-dollar Silicon Valley powerhouses eye what is going on at City Hall?

Lacking confidence in the confidentiality of providing more system information? Taxi 2000 did not even make a submission. Nor Bombardier, who did provide qualifications for the first round of information gathering in 2008. Nor suppliers such as Coaster, Mist-er, Skycab, Skytran, Jpods and Alden – all struggling for start-up funds to get a demo built.

Will a Silicon Valley venture capitalist be impressed? Google is, after all, running robocars and investing in ways to bring trust to carsharing networks by underwriting Boston start-up *RelayRides.com*, which has moved to San Francisco with over a dozen staff. Almost like the story of Facebook as portrayed in the movie *Social Network*.

### Local Purpose

San Jose's ATN/PRT would connect Mineta International Airport to rail lines on either side of the Airport. The consultant team includes Arup North America Ltd. and Aerospace Corporation, a federally funded research and development center. Aerospace provides independent technical and scientific research, development, and advisory services to national-security space programs as well as projects for civil agencies like NASA and the NOAA (Oceanic + Atmospheric). Arup was a key consultant to BAA for Heathrow Airport's 3.8 lane-km (about 1.6km route-km), ~\$40m ATN from Terminal 5 to perimeter parking lots.

Arup is focusing on the transportation planning aspects of San Jose's project: identifying potential routing and station options, preparing ridership and revenue estimates, and assessing the business case. Aerospace is focused on the system engineering aspects of the project, identifying performance requirements, analyzing and evaluating technical options, and assessing acquisition issues.

Together, the two consultants will assist the City in determining the technical, programmatic, and financial feasibility of building a system that meets the City's goals.

The City anticipates the study will be completed by year end.

*Last spring at the University of Minnesota, interest in modal options was intense.*

## MINNESOTA MOVEMENT

It's a new ballgame for PRT visionaries.

There has long been a network of PRT-friendly residents in the Minneapolis-St. Paul metro area. *Citizens for PRT* was established around 1990. It was chartered in 1998 as a non-profit corporation. CPRT activity has waxed and waned, and today is clearly in growth mode. Several Board members tended CPRT's booth at the annual Living *Green Expo* this past spring. CPRT was also at the *Midwest Energy Fair* last month.

"It's a whole new ballgame," reports long-time ATRA



member Dick Gronning. The public ecology *Expo* was three times larger than last year. It is held at the Minnesota Fair Grounds as a major event in the civic life of the Twin Cities. This year interest in new-generation urban mobility was intense. For the first time ever, staff from Metro Transit visited CPRT's table. They even stayed a while and talked. Gronning was surprised at how open and helpful Metro Transit was.

Also for the first time, the influential 10,000 member group *Transit for Livable Communities* visited CPRT's booth. With a large grant to promote bike and walking programs, TLC was very positive, seeing PRT within their agenda. Founding ATRA member Ed Anderson also spent five hours at the booth on Sunday. That also was a first, and his presence was greatly appreciated.

**Look Out, Luddites!**

MnDOT's PRT program has been quiet recently, as shortfalls caused cutbacks in state and local budgets, including transit operators and MnDOT. Will uninformed union members and leftist bloggers counter CPRT advances in Minnesota? That remains to be seen. For now, CPRT is creating new connections and alliances with other like-minded metro and local organizations who demonstrate a surprising openness to PRT options and possibilities. For example, Metro Transit recommended that CPRT contact a bicycle organization for joint lobbying efforts seeing very similar goals and messages in both.

CPRT chair Drea Walker, with her sparkling new degree in Urban Studies from the University of Minnesota, is helping CPRT to grow its membership. It has jumped 70%.

**The New Viking Mobility**

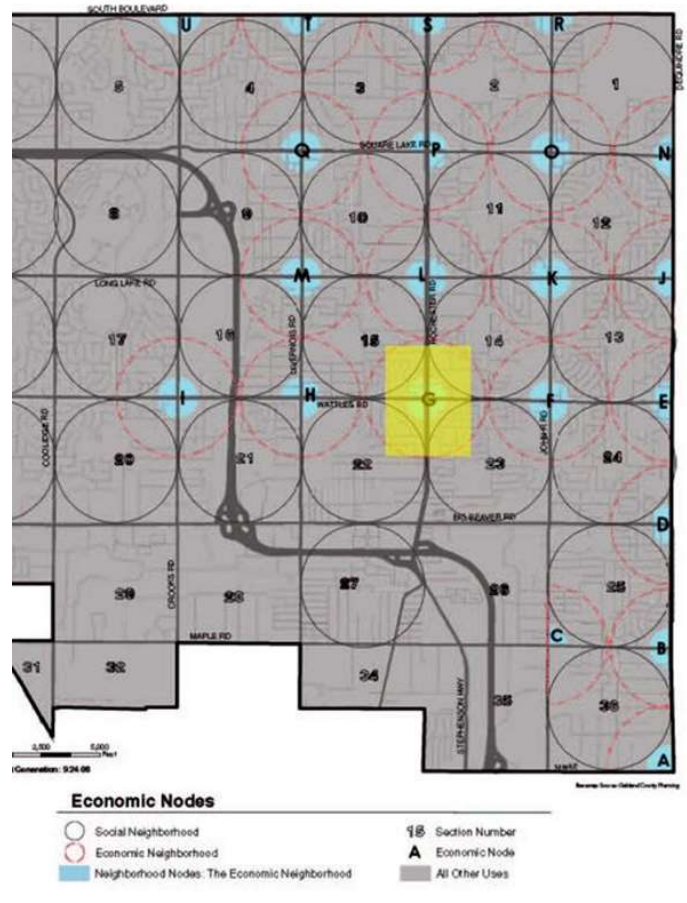
CPRT now has PayPal on its website [www.cprt.org](http://www.cprt.org). New memberships and donations – even from outside the Land of 10,000 Lakes – are welcome. Membership is only \$25 per year.

The organizers of the annual Building Community expo have asked CPRT to host a noon-hour workshop on PRT. This is an exhibition of visuals centered on the theme of *New Urban Community*. It will take place in downtown Minneapolis August 15-19.

Last May, Ferrol Robinson of the UMinn presented on "Viability of Modern Automated Rapid Transit (ART) Applications" at the Center for Transportation Studies' 22nd annual research conference. He defined ART as "similar to PRT" but not necessarily "personal". He said that ART works best within and between activity centers (niche applications) and provided balanced for / against arguments. Robinson emphasized "modern" advances, outlined next steps and answered challenging audience questions.

The Innovative Transit session attracted more than 50 people, some standing in the back. There were also presentations on safety and traffic flow, education and outreach, planning and the environment, infrastructure, public-private partnerships, and more.

Steve Elkins, a member of the Metropolitan Council, said privately that he would like to get ART built along a corridor in the Twin Cities soon for Ed Dr. Anderson to see! Other new Council members seem friendly to PRT. However, according to Joe Lampe, the chair is intensely opposed to PRT.



*What is the best modal model for Heartland cities?*



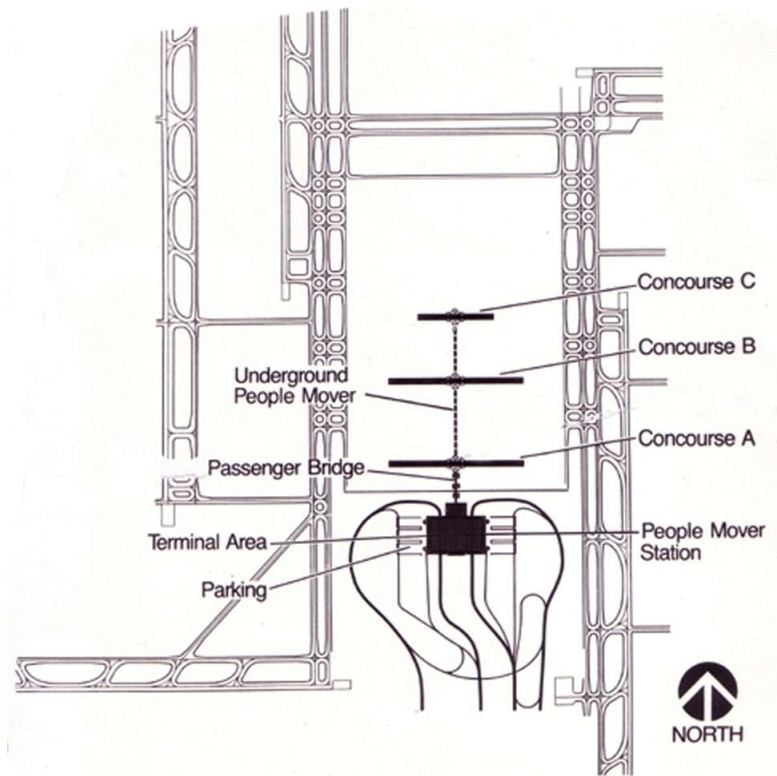
## AIRPORTS

**Atlanta, Georgia:** The airside APM by Bombardier that has served at the spine of world's busiest airport since the early 1980s is routinely in service. The service is round-the-clock, and breakdowns are rare. The new elevated landside APM supplied by MHI has yet to prove itself. Opened last year, there have been no major problems. The conference center and several hotels clustered around a midway station are open for business, well served by the APM now called *Train to the Plane* instead of its scary old label – CONRAC, engineer talk for consolidated car rental center, which is at the third station with Avis and friends plus lots of remote parking. About two million car rental contracts are written each year. That's four million rides.

**Chicago, Illinois:** The long-term operability of the Matra hardware and software running at O'Hare is little known, but impressive to those who look at how it interconnects terminals and connects them to remote parking and car rentals. O'Hare also has rail service to downtown Chicago, but it is far from express. With about twenty stops, the EI to O'Hare is not up to world standards. A blue ribbon committee has been established to get express service, and information and interest have been requested. To learn more, visit [www.ordexpressrail.com](http://www.ordexpressrail.com).

**Denver, Colorado:** Transit officials are having a hard time getting rail of any sort out to DIA, which opened in 1993 with an APM spine supplied by Bombardier. The airport layout is much like Atlanta. The distance from DIA to downtown Denver is 37km or so. So they have focused on "cheaper" commuter rail running for the most part on existing track. The plan is to cost \$1 billion or so, with Fluor-Macqarie in charge of finance + DBOM. Civil work includes the catenary needed to power the service. There is a 7km stretch with one-way track, limiting service possibilities unless funds for new track come available. Unable to tap future land value increases with access to the rail, they say now that adding stations will be too expensive.

**Jeddah, Saudi Arabia:** As part of a master plan by Paris airport consultants under a \$137m contract with the "private sector" airport, ADPi drew up technical specs for an APM, to serve a new passenger terminal. The 1.5km shuttle with ten vehicles will open in 2014. Bombardier recently signed a \$96m contract with the Saudi Bin Ladin Group last month. That includes four years of O&M services and a commitment to build local technical skills.



*Denver International Airport with its APM spine is now exploring landside access issues.*