Barriers to Entry


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Session 181 – Ready for Automated Mobility

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INTRODUCTION

Perspective Comes From:

- 30 years of APM Industry planning/design
- Operational analysis of demand-responsive systems for multiple modes
- Insight into multimodal factors by which users choose transit/transportation modes
- Planning and design of major pedestrian systems and intermodal terminals
Perspective Project – Cincinnati Sky Loop System

Perspective Project – BART GRT
Perspective Project – IAH

25 mph, NEC1, Maintain Speed

Perspective Project -- EWR
Perspective Project – CSU-Fresno

ACTORS IN THIS DRAMA
### Actors Involved in Projects

- Inventors & Advocates
- Commercial Sales Agents
- System Suppliers
- Construction/Implementation Partners
- Consultants
- Customers
- Governments

### Inventors & Advocates

- Excited about the future of transit and push for applications of PRT/GRT technology that the industry is not yet ready to undertake – such as very large scale, high capacity mass transit.

### Commercial Sales Agents

- Some, through aggressive sales initiative, over-promise the capability of what the manufacturers can currently deliver.

**Result:** Criticism from within the Transit Industry and loss of credibility for all.
System Suppliers

• Focus currently is on customization/innovation and financial survival
• Unable to pursue (alone) bigger contracts due to bonding, liability terms and liquidated damages
• Some developers who don’t yet understand the market, are striving for the ultimate application, rather than what can be practically delivered in the near term
• Reluctance to pursue teaming with larger transit suppliers due to proprietary ownership of designs

Result: Stagnation of R&D for large scale, proof-of-concept applications

Construction / Implementation Partners

• Larger scale projects are not possible for smaller system supplier firms who are currently developing PRT/GRT without large corporate partners
• Construction partners on large projects insist on a mark-up of the price to cover the risk judged necessary for new technology
• Investment partners insist on sharing technology ownership and guidance of design (e.g., Raytheon)

Result: The “Business Deal” requirements stifle successful project pursuits
Consultants

- Advice to customers typically urges caution at best, and complete rejection of PRT/GRT option at worst – especially from large transit consultancies
- Misunderstanding of operational complexity may lead to confusion with what can really be built at the present time (both over and under estimation)
- Cost of fully automated, grade separated system is perceived to be much greater than conventional transit systems without a fair and reasonable assessment, so transit bias works against PRT/GRT
- When detailed cost estimates are performed, a variety of price factors for the whole project are included in order to compensate for customer’s potential risk while technology application is developmental level

Result: Suppliers are isolated from the customers, depriving alternatives analysis studies of their direct input and preventing suppliers from learning firsthand what the customers need and want
Customers

• PRT/GRT is relatively unknown – ATRA Industry Group found in a recent presentation at a general transit conference that 80% had no knowledge of the technology

• Attitude of most is a strong aversion to risk (even if only a perceived risk), and consider PRT/GRT as an “unproven technology”

• Often poor assessment of PRT vehicle costs due to unrealistic comparisons to autos and bus/BRT transit

• Consider the total area served by the investment – conclude BRT or LRT can serve more people throughout a whole corridor for the same costs as PRT/GRT serving a single district

Customers

• Uncertainty about ongoing O&M costs with a large PRT/GRT fleet, and especially the ridership fares – will revenues support operations and maintenance?

• Unless there is a credible and influential champion for PRT/GRT that continues involvement throughout the planning and design process, decisions made in favor of PRT/GRT will be challenged by those who follow

Result: PRT/GRT projects do not make it through the extended process required for expensive transit system investments
Governments

• Uncertainty about PRT/GRT technology leads to establishment of regulations during the project, rather than in advance of the project

• Lack of focus on providing the right technology for the right job, even if a new and different technology is required to be developed

• Unwillingness to provide a buffer to the customer’s (local agency’s) risk during this early technology development & proof-of-concept application period

Result: Customers, the public, technical consultants and governmental planners/engineers never understand, see or experience PRT/GRT technology.
Common Objective of Large Metropolitan Areas is Integrated Multimodal Transit Systems for Access to Urban Districts/Major Activity Centers

Ped Connections, Perimeter Parking and Transit Circulator Systems Can Effectively Resolve Urban District “Last Mile” Distribution Issues
Circulator Applications Small Car PRT is Typically Good At

- Continuous or periodic ridership demand rates that are not characterized by large surge flow conditions
- Distributed patterns of origin/destination trips within the PRT network spread of many stations throughout the system

Examples:
- Remote/perimeter parking lots in multiuse urban centers
- Pedestrian environments which are separated by physical barriers or by onerous traffic arterial streets
- Transit stations with moderate demands, with periods of both high and low activity service throughout the day (e.g., an end of line station with surrounding TOD)

What Small Car PRT is Typically Not So Good At

- High demand ridership flow rates, especially when large surge flow conditions occur frequently
- Concentration of a Point A to Point B flows within the network, creating very high demand conditions at only a few stations

Example:
- Employee parking lots serving shift-changes
- Campus circulator when heavy class-change conditions dominate the user trip patterns
- Major rail stations with large trains delivering heavy surge flow conditions of alighting rail passengers
Ultimate PRT/GRT Design Solution Could Be Hybrid Systems

- Both small-sized car PRT and medium-sized car GRT both operating on the same network
- Combined demand-responsive and fixed route operations within the same network
  - Demand-Response operations serving all stations
  - Fixed-Route operations serving a few high-demand stations with matching O/D trip patterns

CONCLUSIONS
Conclusions

1. A greater collaboration is needed between suppliers, consultants, customers and governments

2. Exposure to the public of PRT/GRT operating systems is essential – a suitable first build system is needed in the U.S.

3. When Customers and Governments perceive the public wants PRT/GRT technology, then barriers will be broken

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