


Barriers to Entry



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INTRODUCTION

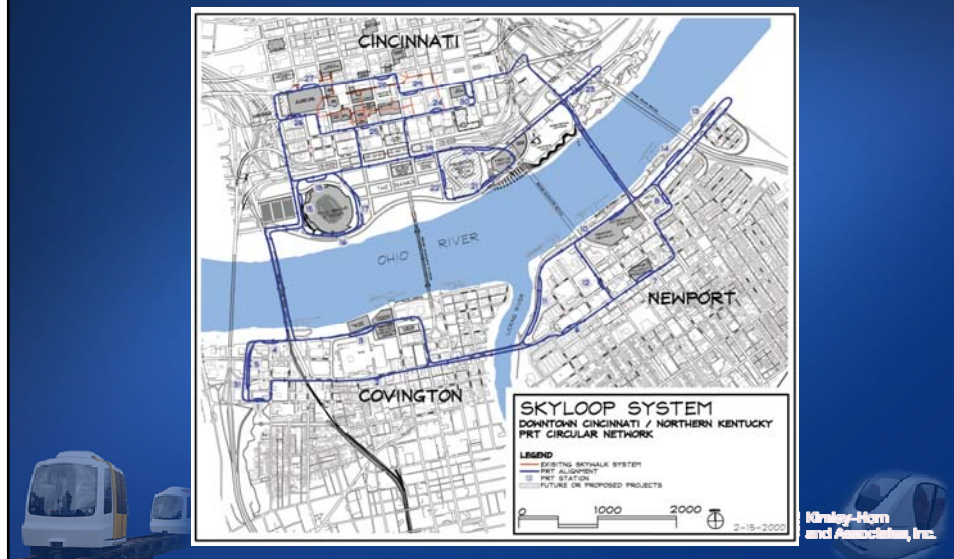


Perspective Comes From:

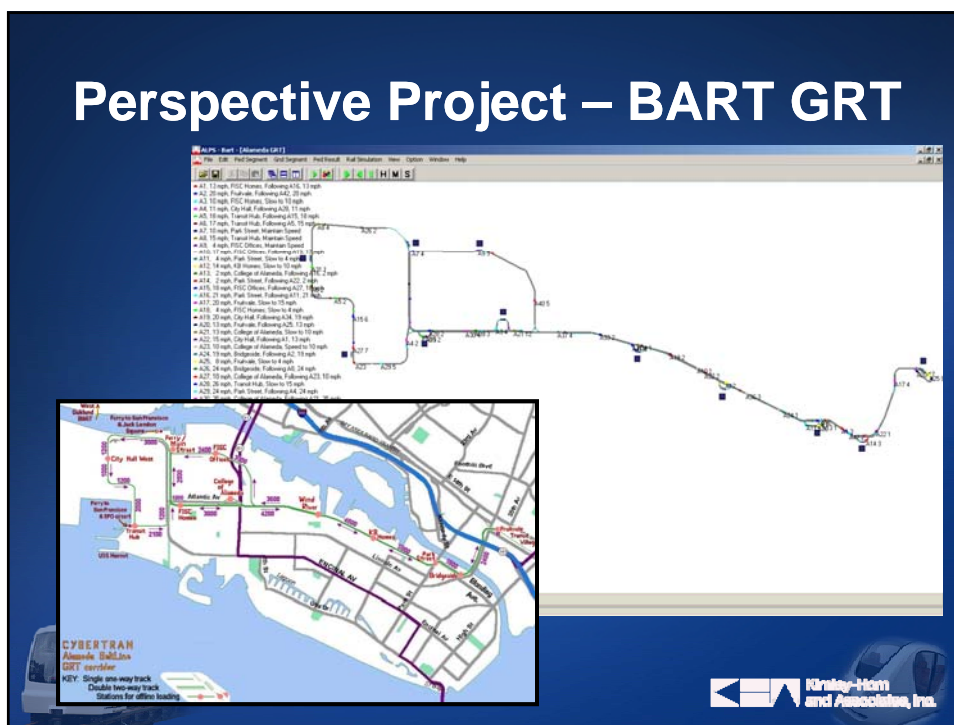
- 30 years of APM Industry planning/design
- Operational analysis of demand-responsive systems for multiple modes
- Insight into multimodal factors by which users choose transit/transportation modes
- Planning and design of major pedestrian systems and intermodal terminals



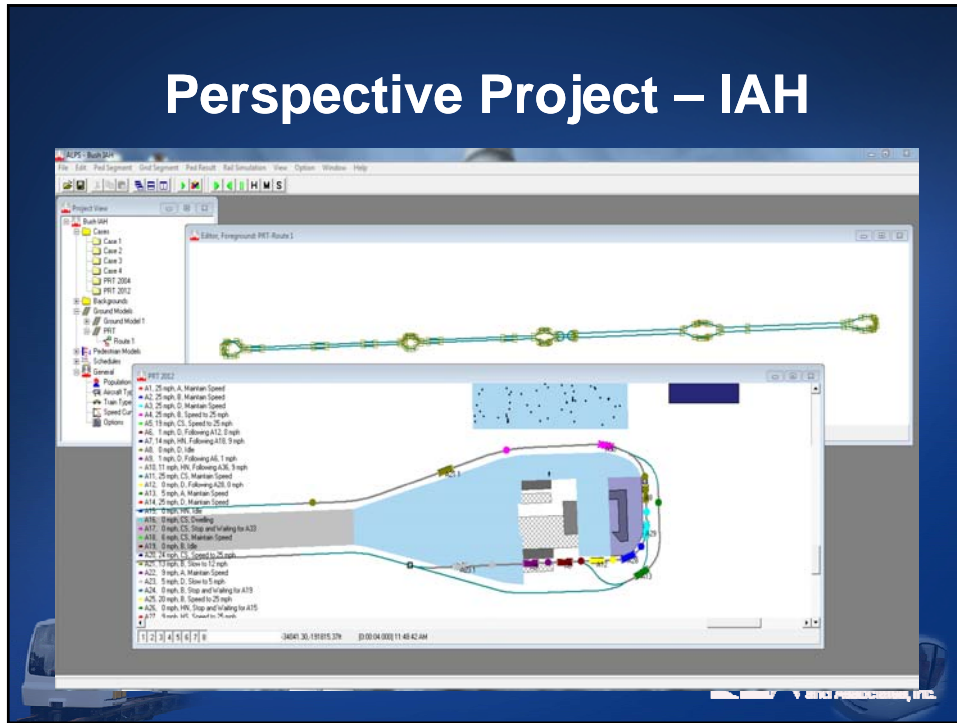
Perspective Project – Cincinnati Sky Loop System



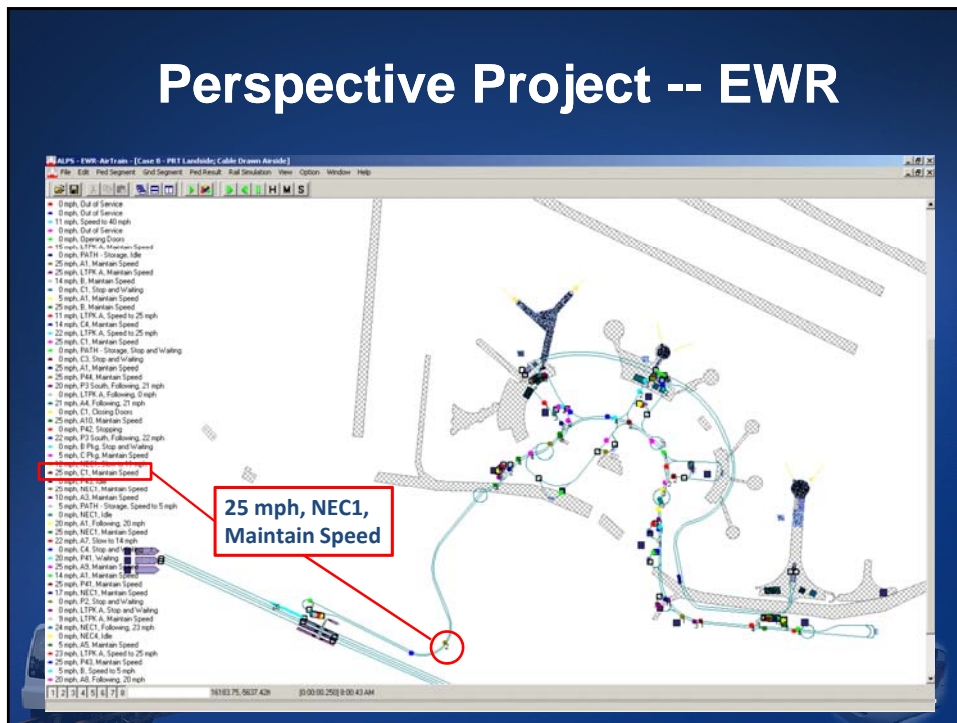
Perspective Project – BART GRT



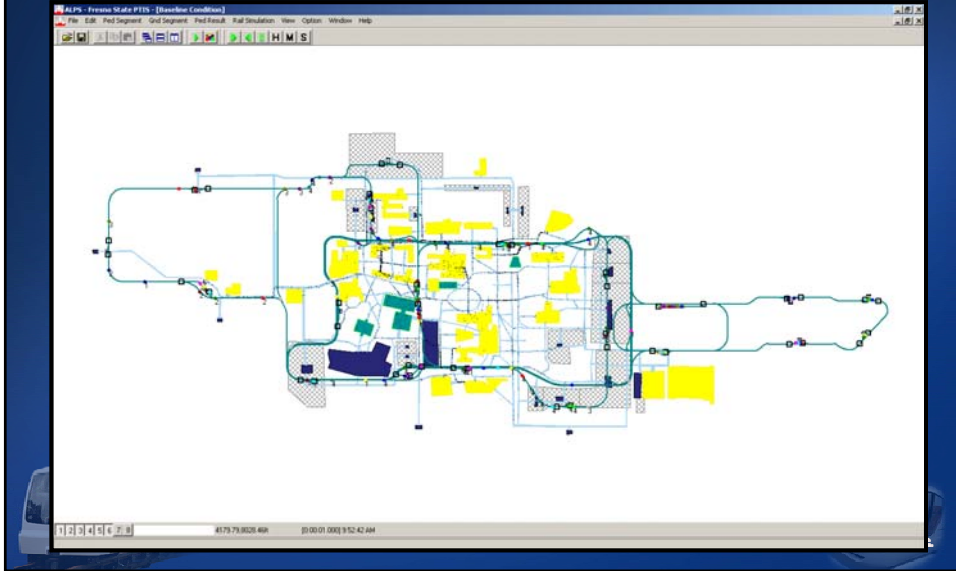
Perspective Project – IAH



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



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Consultants

- Tendency is to keep system suppliers at arms length during studies, rather than inviting them in to contribute – even in the feasibility stage of the project

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



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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

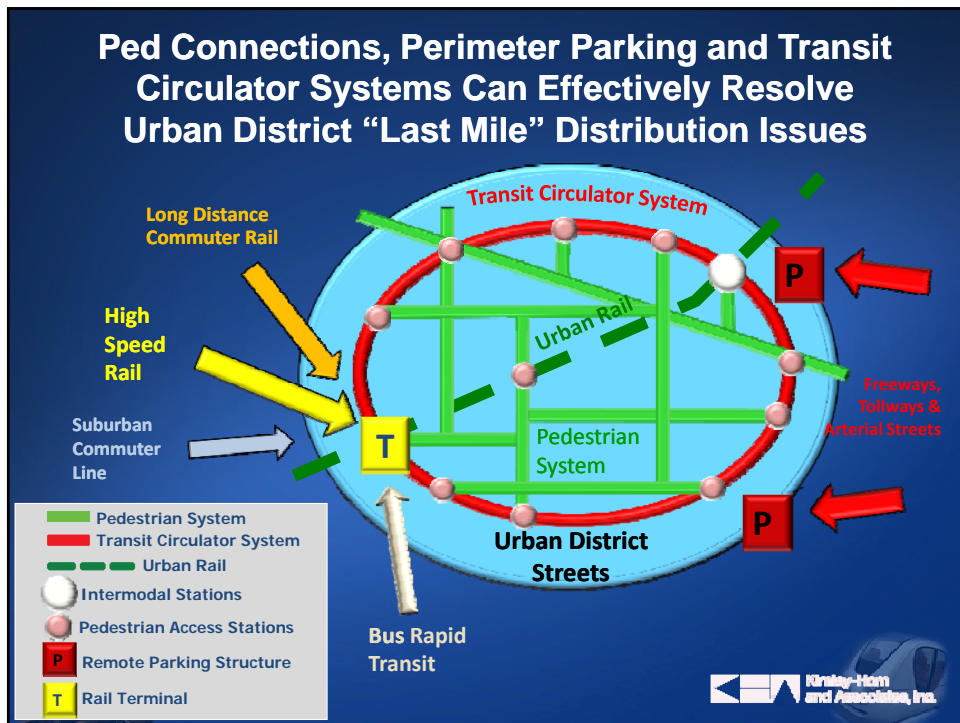
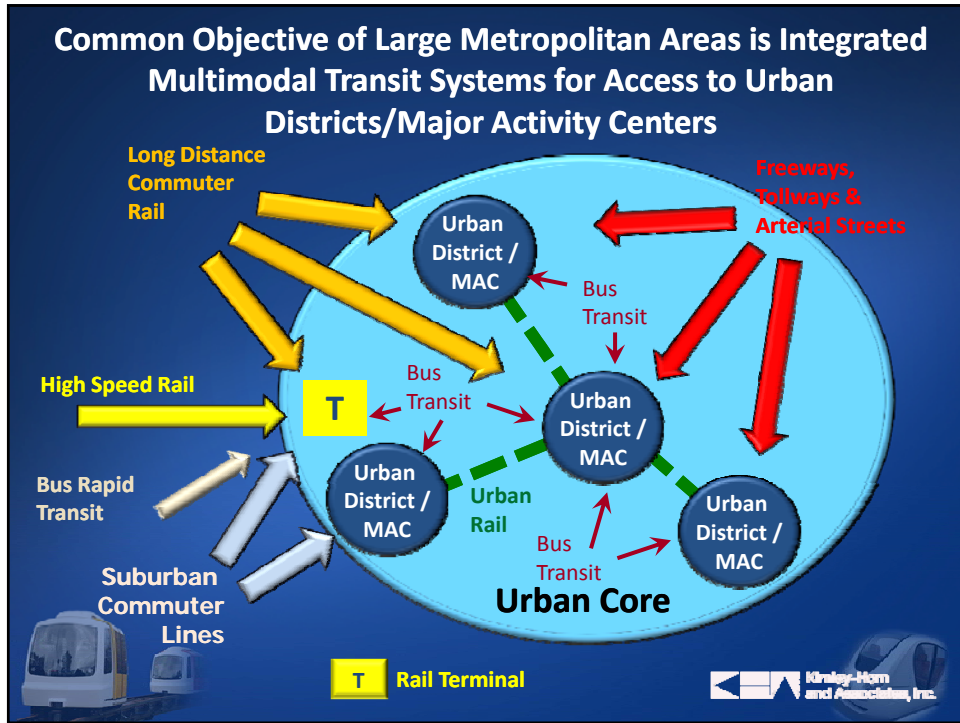
- Uncertainty about PRT/GRT technology leads to establishment of regulations during the project, rather than in advance of the project
- Lack of focus on providing the right technology for the right job, even if a new and different technology is required to be developed
- Unwillingness to provide a buffer 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



SEARCH FOR THE RIGHT PROJECTS





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)



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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



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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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