Ridesharing Methodology for Increasing PRT Capacity

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Outline

- Background
- Fixed zones
- Dynamic zones
- Preliminary operational analysis
- Advantages & disadvantages
- Conclusions
• Extensive ridesharing runs counter to original PRT vision
• “Brick wall” stop criterion currently limits PRT capacity
• PRT implementations in countries like India need high capacity
Urban Station L9 Evening (Inbound) Peak

Empty:  □  Occupied:  □  Boarding:  □  Exiting:  □

Main Guideway

Station Guideway

Pay per vehicle KK, HH, JJ, NN, OO

Pay per passenger AA, BB, DD, EE, HH

Closed CC, FF, GG, II, LL, MM

Exit Boarding Exiting

Ticketing System Map Ticketing
Dynamic Zones

- Determined in real time
  - All stations along route of first passenger
  - Can be expanded
- Pre-assembly still required
- Group members assigned a number matching an entrance lane number
• Ridesharing for trips entirely within origin zone is impractical
• Ridesharing for trip portion in destination zone \( \approx \frac{1}{2} \) maximum
• Ridesharing for remainder of trip = maximum
Preliminary Operational Analysis

- Analysis results for 5 minute wait times
  - 85% - 167% improvement in average occupancy
  - More effective with higher demand
- Practical considerations need to be considered
  - Desire to rideshare
  - Detailed station logistics
  - System operational requirements
Advantages

- Fewer vehicles for same demand
  - Higher capacity
  - Lower costs and/or fares
- Price-dependent level of service
- Adaptable to varying demands
- Promotes orderly and efficient vehicle boarding
Disadvantages

• Added level of complexity
• Requires increased platform area
  – Offset by reduced need for station bays?
• Must trade extra wait time for lower fare
Conclusions

• Potentially significant benefit when
  – Demand is high
  – Large proportion low income

• Larger vehicles in denser communities?
  – Requires further analysis

• Close station spacing could reduce ridesharing efficiency

• Further research is needed
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