

Advanced Parking Management Systems for Transit

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United States Department of Transportation
Federal Transit Administration



Research and Innovative Technology Administration

Agenda

- Overall goals of national evaluation
- Montgomery County project
 - Background on parking management system
 - Evaluation approach and findings
- Chicago RTA / Metra project
 - Background on parking management system
 - Evaluation approach and findings
- Lessons learned
- Overall conclusions from the evaluation

Overall Goals of National Evaluation

- Assess the impacts of real-time transit parking information
- Understand how real-time transit parking information can contribute to corridor management
- Document “lessons learned”



Glenmont Metro Station Parking Management System

Evaluation Approach



Evaluation Objectives

- Determine quantifiable system impacts
 - Impact of system on:
 - Circulation / time savings
 - Transit ridership
- Determine customer perception of the system
 - Awareness of the system
 - Understanding of the system
 - Satisfaction with the system / sign placement
 - Impact of the system on mode choice and parking choice
- Document lessons learned

Evaluation Challenges

- Is Norbeck a viable alternative to Glenmont?
 - People may not know where it is and/or location may not be convenient
 - Parking at Wheaton Station may be a better alternative to Glenmont for most
 - Bus service may not be appealing because it...
 - Does not run late enough in the evenings and/or does not offer mid-day service
 - Takes too long / is not a shuttle service
 - Is not reliable?

Data Collection Activities

- Hourly in/out counts at Norbeck park and ride lot and Glenmont garage
 - Parking utilization / circulation within garage
- AM peak period boardings at Glenmont Station
 - Ridership
- Customer intercept surveys
 - Customer feedback on system
- Agency interviews
 - Lessons learned



Glenmont Metro Station Parking Management System

Findings



Impact of System on Ridership and Mode Choice

- Survey showed that very few people use Norbeck for Red Line access
 - Norbeck not a viable option for most commuters
 - 50% indicated that Wheaton Station is their alternative
- No indication that weekday boardings at Glenmont have increased
- Very few survey respondents indicated that the signs have affected how often they take transit

Impact of System on Arrival Patterns

- 13% drop in the number of patrons arriving at Glenmont before 8am
 - Could be an indication that the system helps commuters better gauge when they need to arrive to get a space

Impact of the System on Circulation within Glenmont Garage

- 66% indicated trouble finding a parking space at Glenmont in the past
 - 16% of Glenmont respondents reported that they often spent time circling the garage looking for a space
- 25% reported that they feel that the signs have made a difference to them
 - Reduced the amount of time that they spend looking for a space
- Data show a significant reduction in circulation
 - 57 % fewer vehicles leaving Glenmont during peak hour

Impact of System on Awareness of Parking Alternatives

- About 20% of respondents indicated that the signs have improved their awareness of parking alternatives
 - However, 50 percent felt that they were already aware of parking alternatives

Customer Satisfaction with Signs

- Of those who were familiar with the signs, most were satisfied with the locations
- Most were satisfied with sign accuracy and agreed that they would like to see similar signs at other stations
- 25% agreed that the signs have improved their overall commuting experience

Chicago RTA/Metra Parking Management Guidance System

Evaluation Approach



Evaluation Objectives

- Document quantifiable system impacts
 - Impact of system on:
 - Transit ridership
 - Mode shift
 - Circulation in and between lots
- Determine customer perception of the system
 - Awareness of the system
 - Understanding of the system
 - Satisfaction with the system / sign placement
 - Impact of the system on mode choice and parking choice
- Document lessons learned

Evaluation Challenges

- Is parking really a problem?
 - Excess capacity at Tinley Park now, so parking availability is now less of an issue than it was previously
 - Is there enough demand that utilization will increase at both lots?
- Potential for improvements on adjacent Southwest Service Line to impact ridership on Rock Island Line
 - Service frequency was increased
 - Service hours were expanded

Data Collection Activities

- Parking utilization / circulation
 - Metra Rock Island line ridership figures (2002, 2006)
 - In/out counts from system
 - Parking utilization data from Villages of Mokena and Hickory Creek
- Customer intercept surveys
- Focus group
- Interviews with project stakeholders involved in the implementation



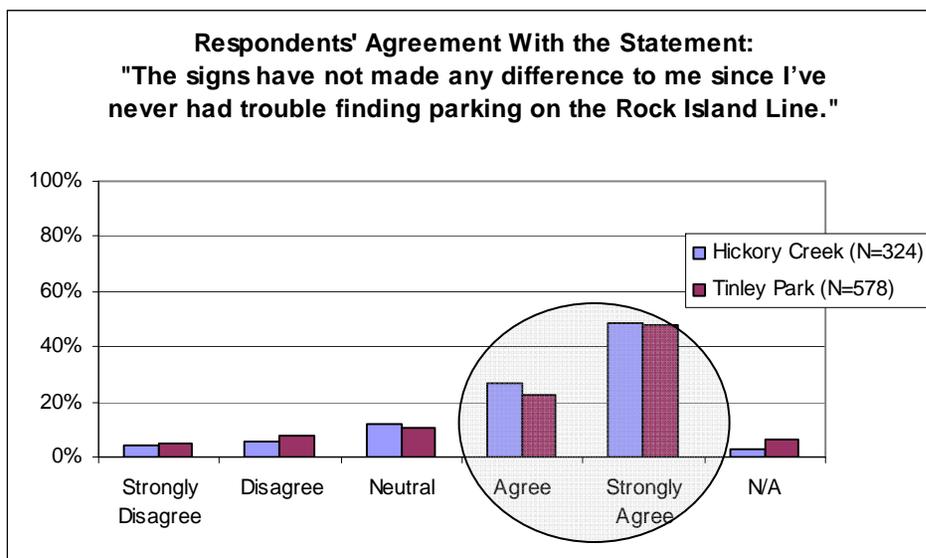
Chicago RTA/Metra Parking Management Guidance System

Findings



Impact of the System on Ridership, Parking Utilization, and Arrival Patterns

- No focus group participants indicated that parking is a problem
- 70% of respondents indicated that parking is not a problem
 - 20% of respondents at Tinley Park indicated problems in the past, but likely before additional spaces were added
- Neither lot appears to be near capacity
 - 75-80% capacity



Impact of the System on Ridership and Parking Utilization

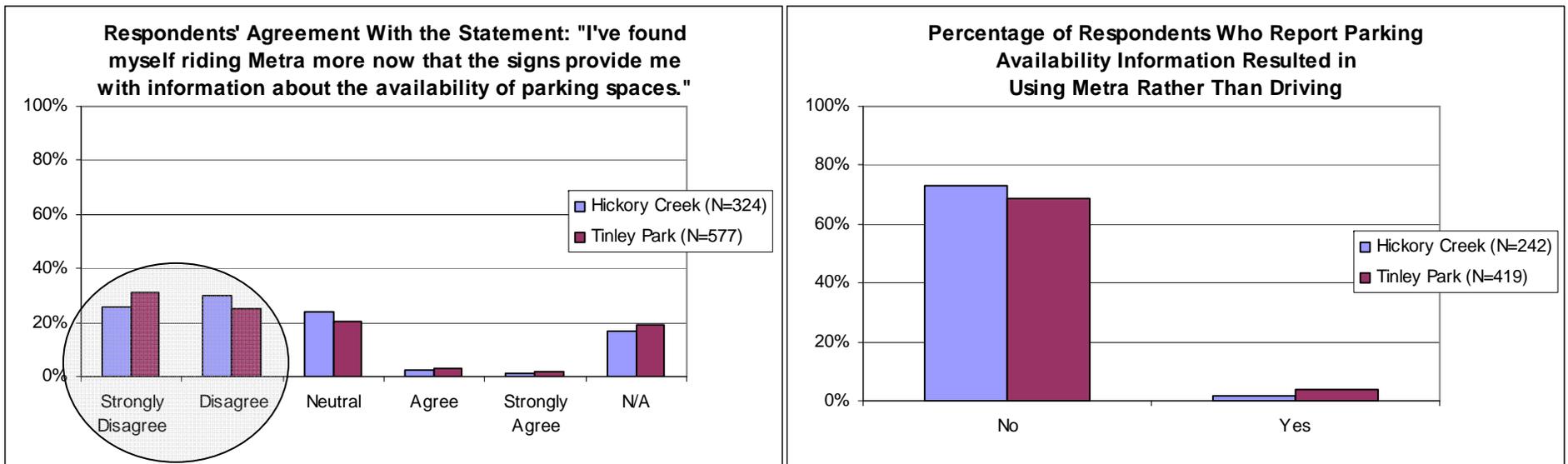
- Metra boarding-and-alighting data show increase
 - 7% increase in ridership from Fall 2002 to Fall 2006, but could be due to any number of factors
- Parking use indicates slight increase in utilization from Aug 2006 to Aug 2007
 - 5.5% at Hickory Creek / 1% at Tinley Park

Impact of the System on Arrival Patterns

- Very few boardings during mid-day and no increase in mid-day arrivals
- Slightly more late morning boardings at Tinley Park
 - Peak occurring about 1 hour later than previous year

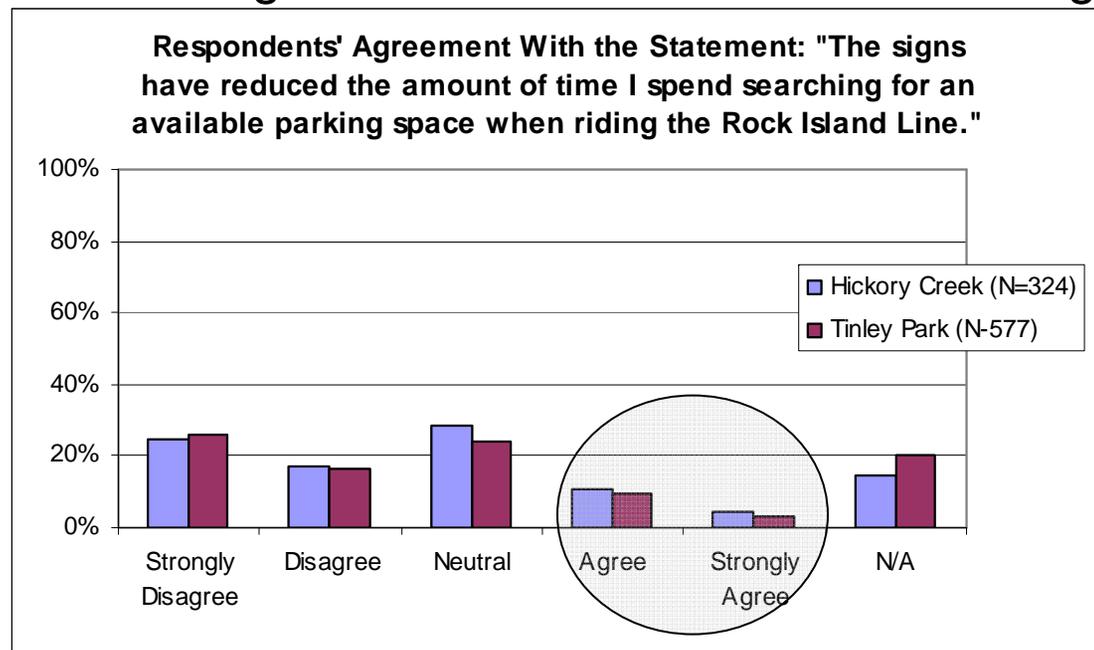
Impact of the System on Mode Choice

- Very few respondents indicated that the signs have affected how often they take transit
 - Fewer than 5% of respondents agreed with questions



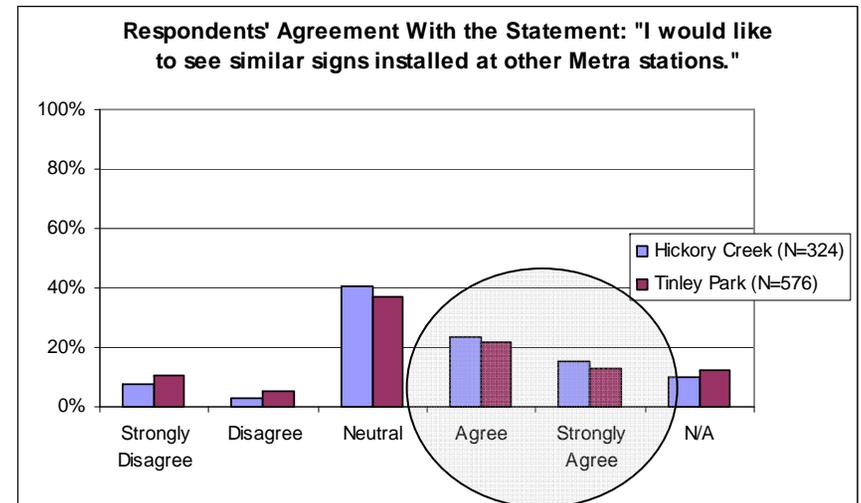
Impact of the System on Circulation within and between Lots

- Because finding parking is not a problem...
 - No change in number of vehicles leaving lots during AM
 - Most respondents indicated that the signs have not influenced them because finding parking is not a problem
- However...
 - Some did indicate that the signs have saved them time in finding a parking space



Customer Satisfaction with the Signs

- Majority of respondents satisfied with sign locations and accuracy
- Few feel that the signs have improved their overall commuting experience
 - However, as shown in graph, most said they would like to see similar signs at other stations
- Focus group participants felt that system would be valuable in the future
 - With increases in population density



Lessons Learned



Deployment Lessons Learned

- Important to conduct a field study of communications during the design engineering phase
 - Metra found that they needed repeater poles for uninterrupted communications
- Plan time for permitting issues!

Technology Lessons Learned

- Carefully consider system requirements before deciding to go with commercial off-the-shelf software (COTS) or custom software
 - COTS may not meet your needs
 - Montgomery County faced some limitations like being able to vary message sets by day of week
 - Consider customized software if the budget can accommodate it
- Be aware of the inherent limitations of the software
 - Video detection has weather limitations
 - Loop detectors can't anticipate spaces occupied with snow

Operations & Maintenance

Lessons Learned

- Staff should plan to monitor and manually update the system periodically
 - Identify who (what agency and what staff) are responsible for this
 - Require that the contractor provide training on the system
 - Build in a monitoring system
 - Clearly define a maintenance schedule



Contracting Lessons Learned

- Cost plus fixed fee contract may be more appropriate than lump sum for this type of work
 - Awarded to lowest bidder versus qualifications-based selection
 - No incentive to finish the project quickly when encountering problems – payment over time provides incentive to finish
- Design-build model might be more appropriate for this type of technology than design-bid-build
 - No continuity between those designing it and those deploying it

Institutional Issues

Lessons Learned

- Parking management systems often integrated into urban or neighborhood environments
 - Important to obtain formal endorsement from the leadership of all jurisdictions involved
 - Important to involve all appropriate stakeholders in a formal and collaborative manner throughout the planning, deployment, and operations phases
 - Late-breaking or unresolved stakeholder concerns can stall the effort indefinitely
 - Active coordination among the various levels of government can help stave off unnecessary future costs and potential relocation of systems

Conclusions



Conclusions

- Parking management systems can positively impact customer perception of transit and transportation services
 - If there is a need and if the alternatives are feasible
- Advertising and educating the public about the system is critical to success
- Combining travel times with transit information will be key to true corridor management

Final Evaluation Report

Evaluation of Transit Applications of Advanced Parking Management Systems



available online at

[http://www.fta.dot.gov/documents/
ParkingManagementEvaluationReport.pdf](http://www.fta.dot.gov/documents/ParkingManagementEvaluationReport.pdf)

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