



SHARED MOBILITY AND THE TRANSFORMATION OF PUBLIC TRANSIT

TCRP Research Report 188
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SHARED-USE MOBILITY CENTER

Connect public agencies and transit, community and private sectors to scale benefits of shared mobility for all

Conduct innovative research with practical results

Create tools for cities to share policies and best practices

Provide technical assistance for cities in testing and scaling shared-use programs

Project Overview

TCRP J-11/Task 21 Project Overview

Objectives

- Improve understanding of new tech-enabled mobility services
- Lessons for transit agencies from new mobility services
- Identify opportunities & challenges
- Cities: Austin, Boston, Chicago, LA, Seattle, San Francisco, Washington DC

Components

- Agency & operator interviews: 70 public officials/26 agencies, 5 private operators
- User survey (n = 4550) to understand choices & preferences around SUM and transit
- Transit/ridesourcing demand, capacity, and travel time analysis
- Assessment of practices/regulations relating to paratransit provision
- Business model review

Definitions

- Bikesharing
- Carsharing
- Microtransit
- Private shuttles
- Ridesharing
- Ridesourcing
- Ride-splitting
- Shared-use mobility (SUM), shared modes, SUM operators

Shared Mobility User Survey

Survey methodology

- Distributed September & October 2015
- Online survey
- Invitations emailed by private shared-mobility operators and transit agencies
- Adults who have used one or more shared-use modes, including transit

Sampling considerations

- Online survey implies basic levels of access
- Large, dense cities, likely over-represents some groups
- Convenience sample
- Small sample sizes in some markets
- Might miss those who use ridesourcing exclusively

Research Findings



1: Transportation & Lifestyle Choices Associated with Shared Mode and Transit Use

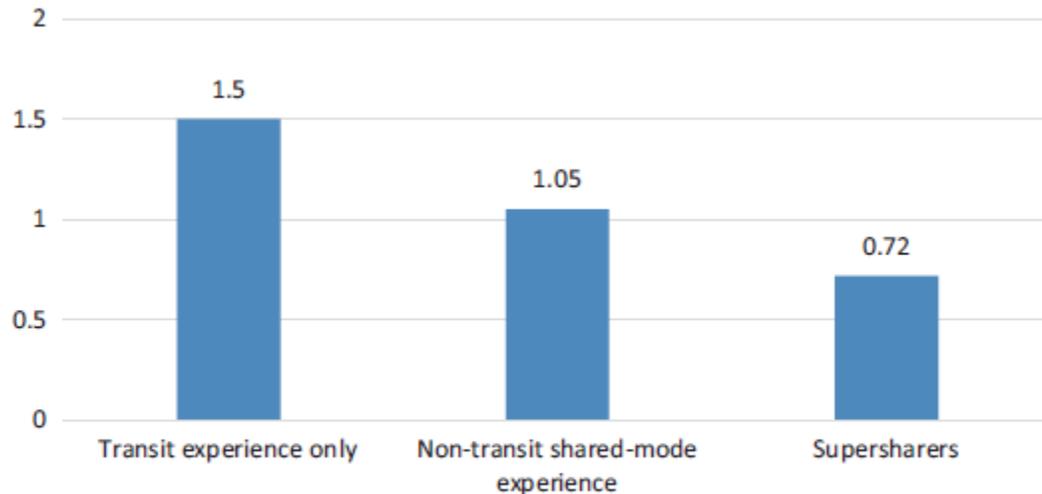
1: Transportation & Lifestyle Choices

Among survey respondents, greater use of shared modes is associated with greater likelihood to **use transit frequently, own fewer cars, and have reduced transportation spending.**



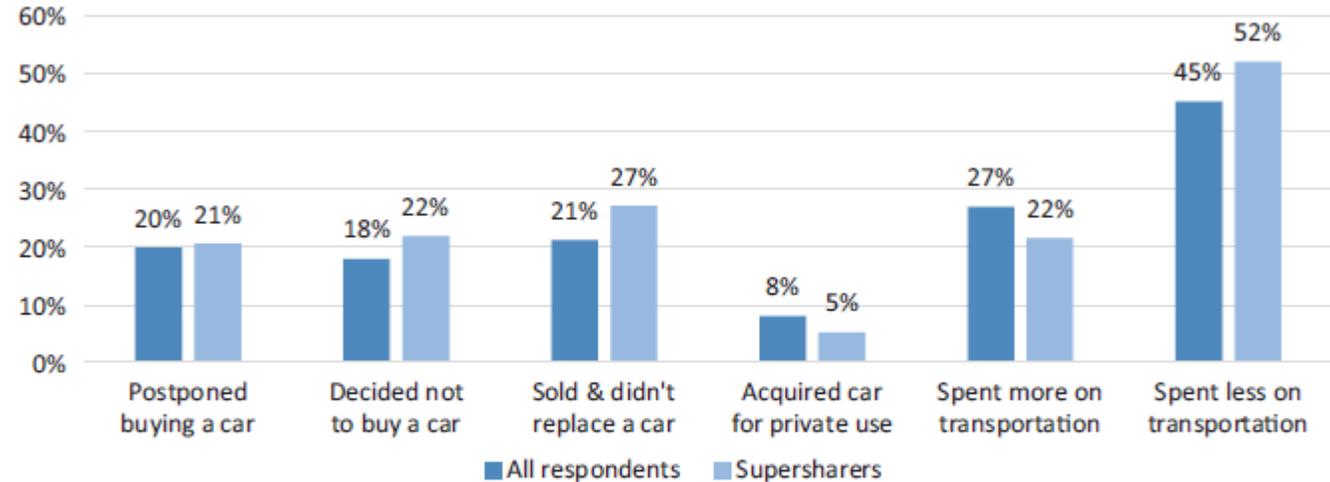
1: Transportation & Lifestyle Choices

Supersharers (people who routinely use several shared modes) report the greatest transportation savings and own half as many cars as people who use transit alone.



Source: Cross-tabulated responses to survey questions 19, 1, and 9 (see Appendix C).

Figure 5. Household vehicle ownership, by shared-mode experience.

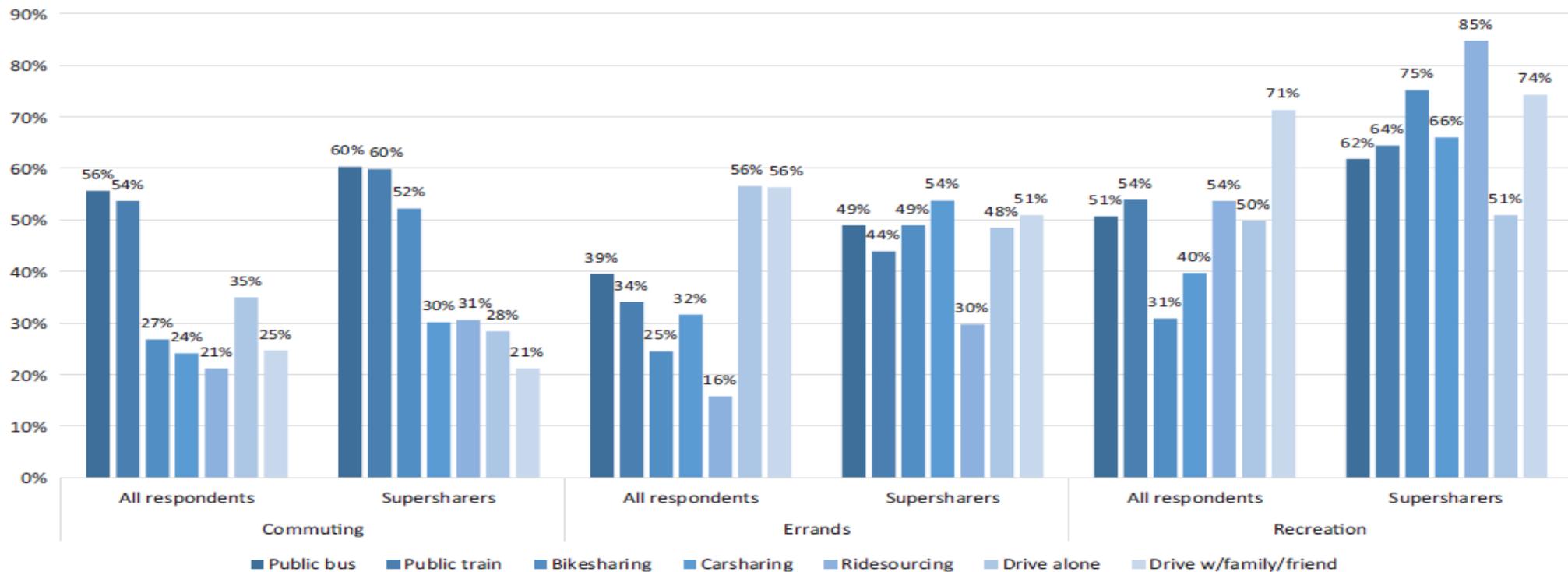


Source: Cross-tabulated responses to survey questions 11 and 9 (see Appendix C).

Figure 7. Household and financial changes since starting to use shared modes—supersharers versus all respondents.

1: Transportation & Lifestyle Choices

Transit forms the backbone of all respondents' mobility picture, but respondents who reported the heaviest use of shared modes also reported heavier use of transit.



Source: Responses to survey question 9 (see Appendix C).

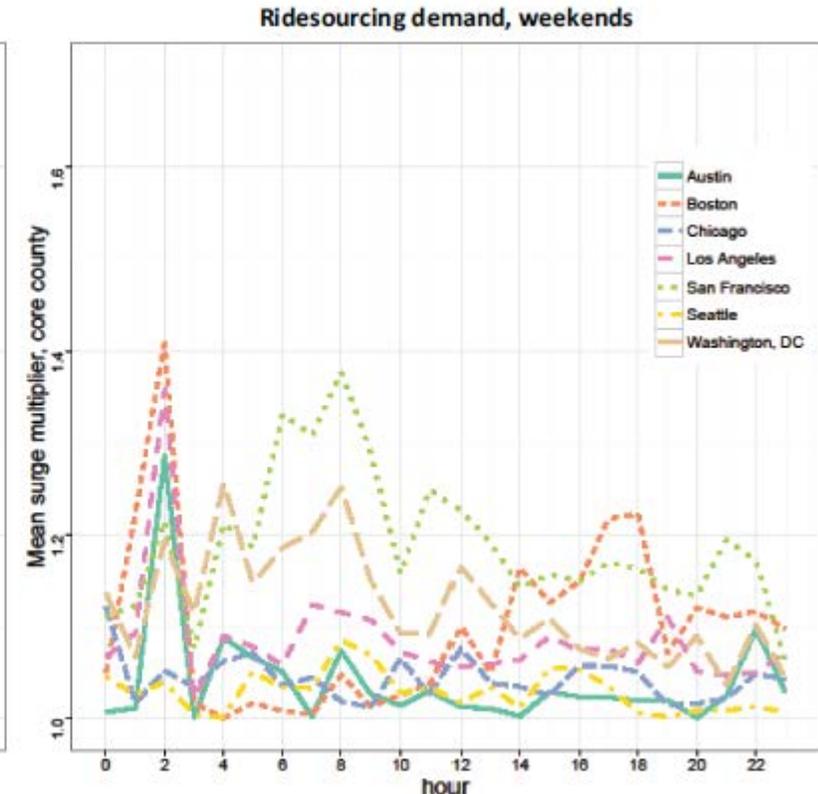
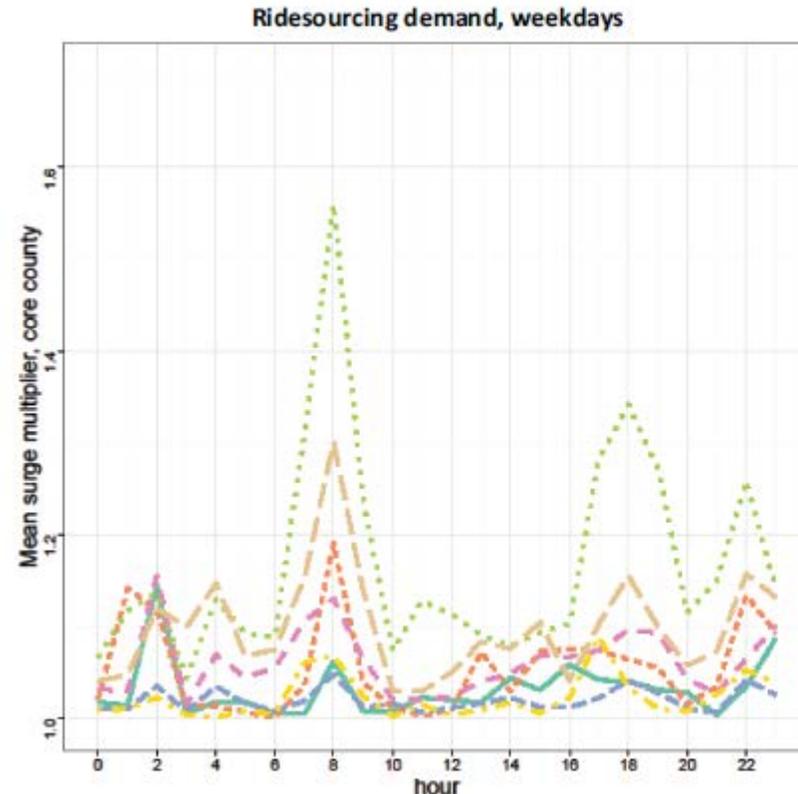
Figure 4. Mode use in last 3 months, by trip purpose—supersharers versus all respondents.

2: Shared Mode and Transit Usage Patterns

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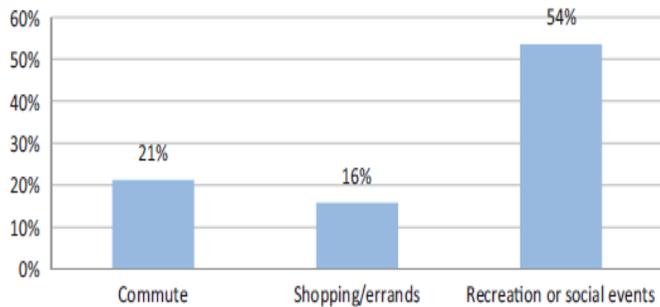
Shared modes largely complement public transit, enhancing urban mobility.

- May compete with transit on some routes/at certain times of day
- Ridesourcing: mostly social trips, 10 p.m. and 4 a.m.—when transit infrequent or unavailable
- Bikesharing: peak hour role augmenting transit systems
- Carsharing: mostly off peak



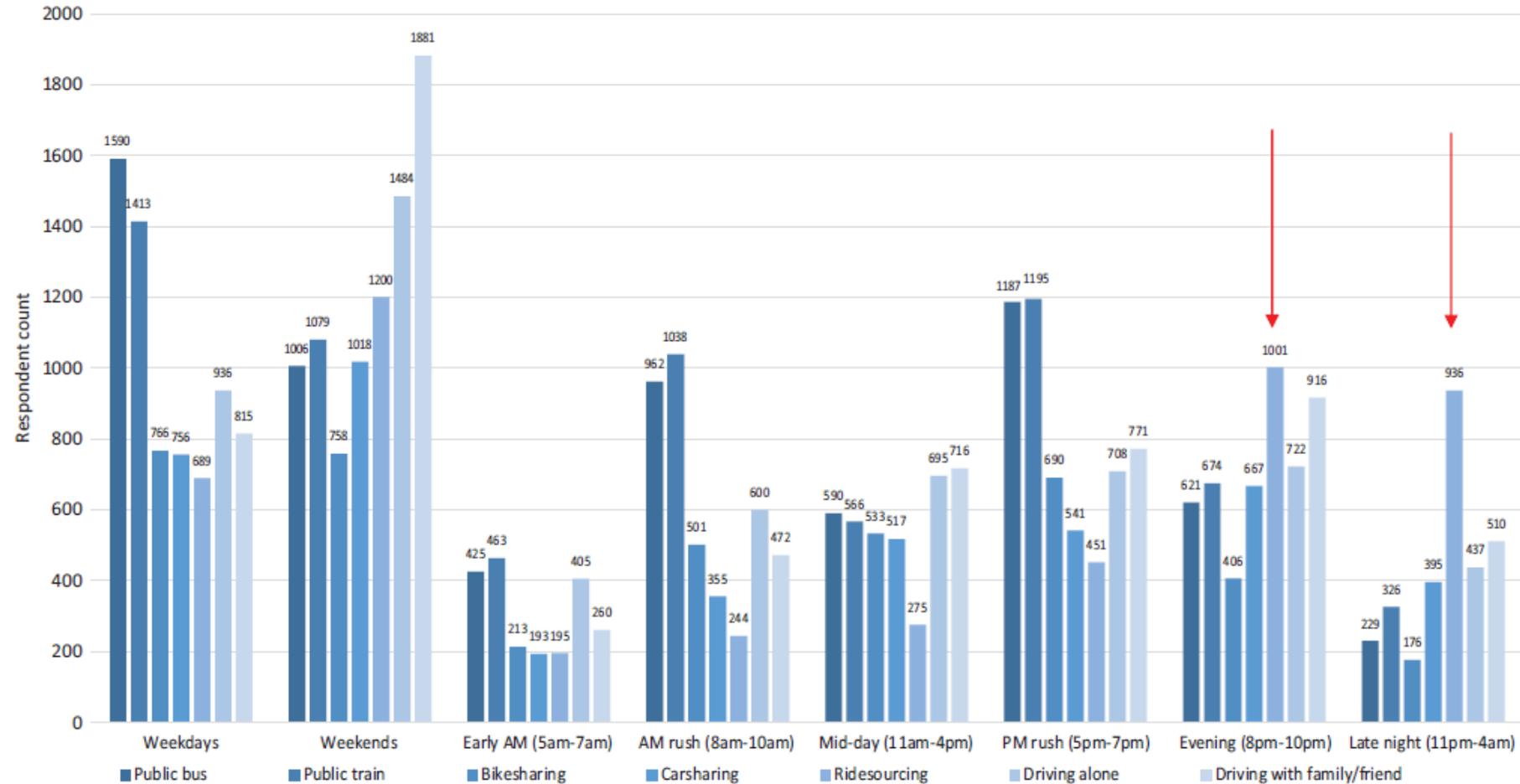
2: Shared Mode & Transit Usage Patterns

Ridesourcing is most frequently used for social trips, late at night, and often when alcohol is involved



Source: Responses to survey question 9 (see Appendix C).

Figure 8. Recent use of ridesourcing, by trip purpose.



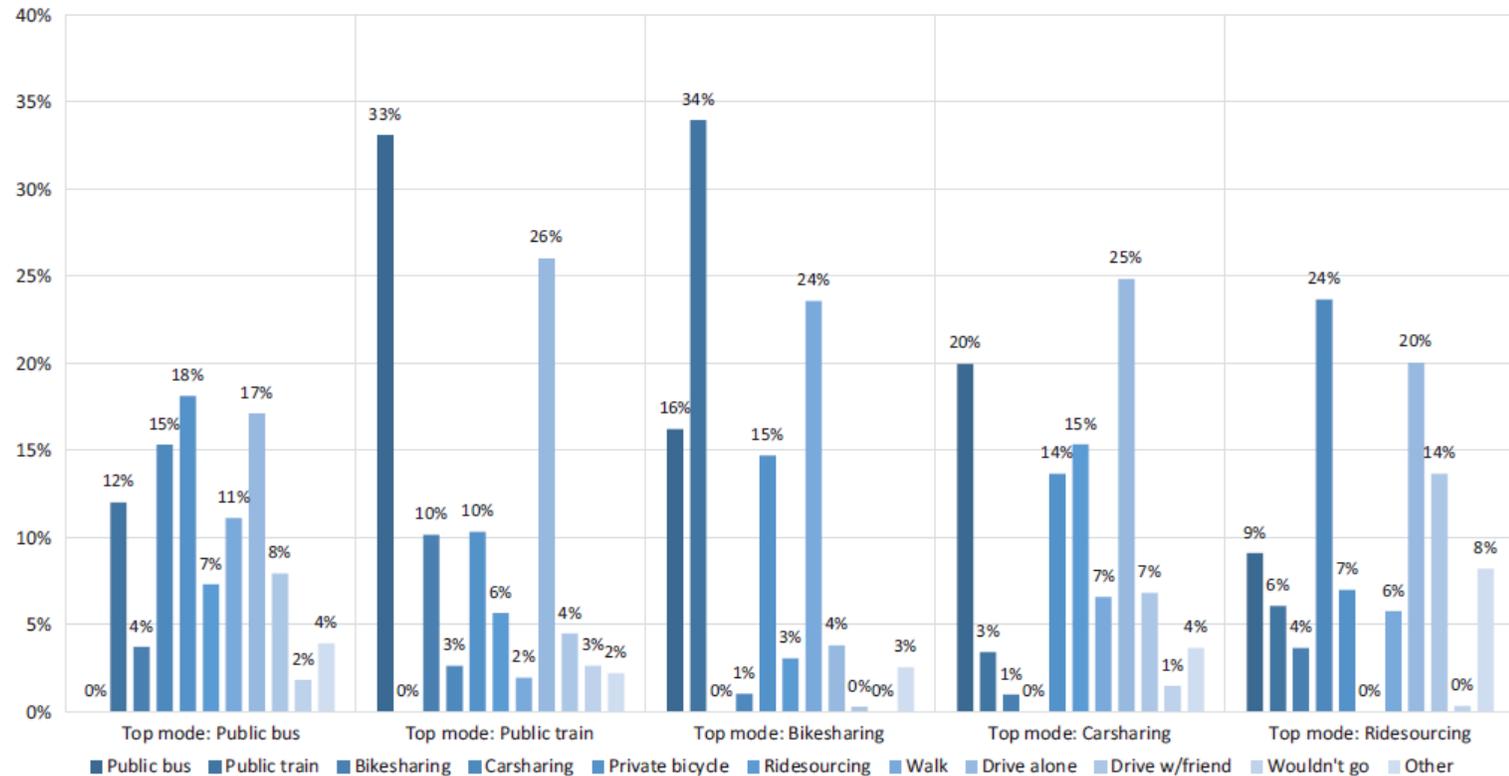
Source: Responses to survey question 14 (see Appendix C).

Figure 9. Mode preference by time of day and week.

2: Shared Mode & Transit Usage Patterns

Lifestyle clusters

- Active, transit centered (walking, transit, private bike & bikesharing)
- Auto-centered (personal vehicles, ridesourcing, carsharing)

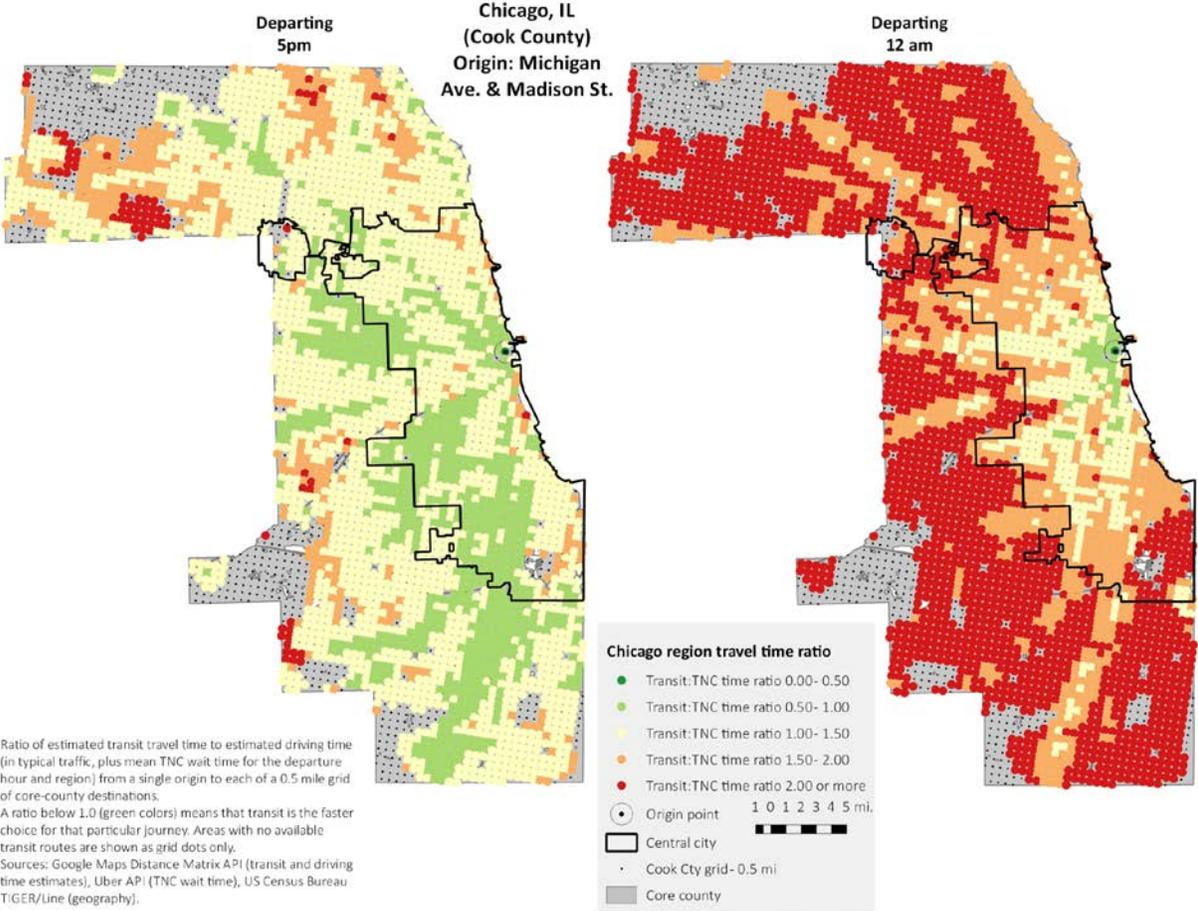


Source: Cross-tabulated responses to survey questions 5 and 4 (see Appendix C).

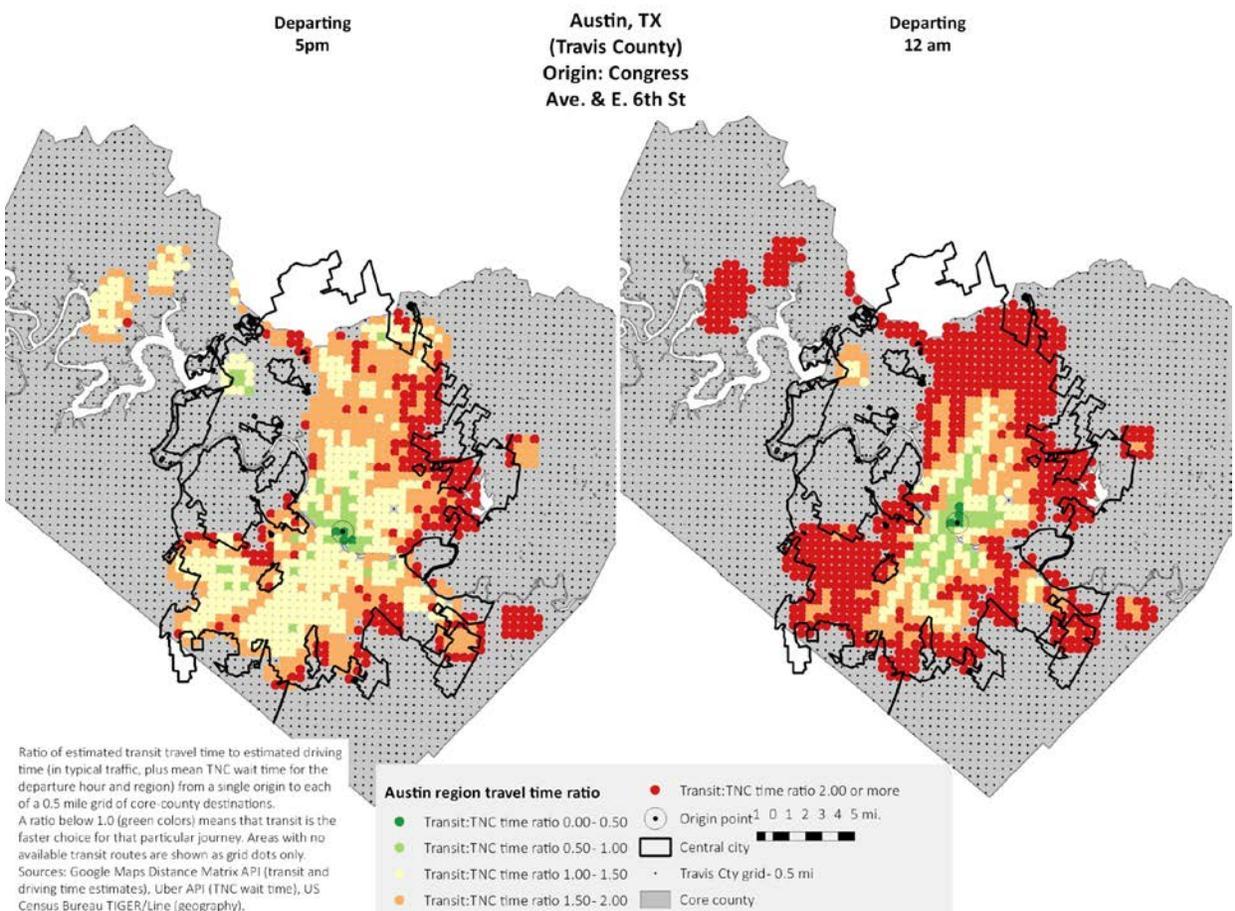
Figure 12. Alternative for most frequent shared-mode trip if that service was not available—by top shared mode.

2: Shared Mode & Transit Usage Patterns

Ridesourcing v. Transit: Travel Time Tradeoffs



Ratio of estimated transit travel time to estimated driving time (in typical traffic, plus mean TNC wait time for the departure hour and region) from a single origin to each of a 0.5 mile grid of core-county destinations. A ratio below 1.0 (green colors) means that transit is the faster choice for that particular journey. Areas with no available transit routes are shown as grid dots only. Sources: Google Maps Distance Matrix API (transit and driving time estimates), Uber API (TNC wait time), US Census Bureau TIGER/Line (geography).

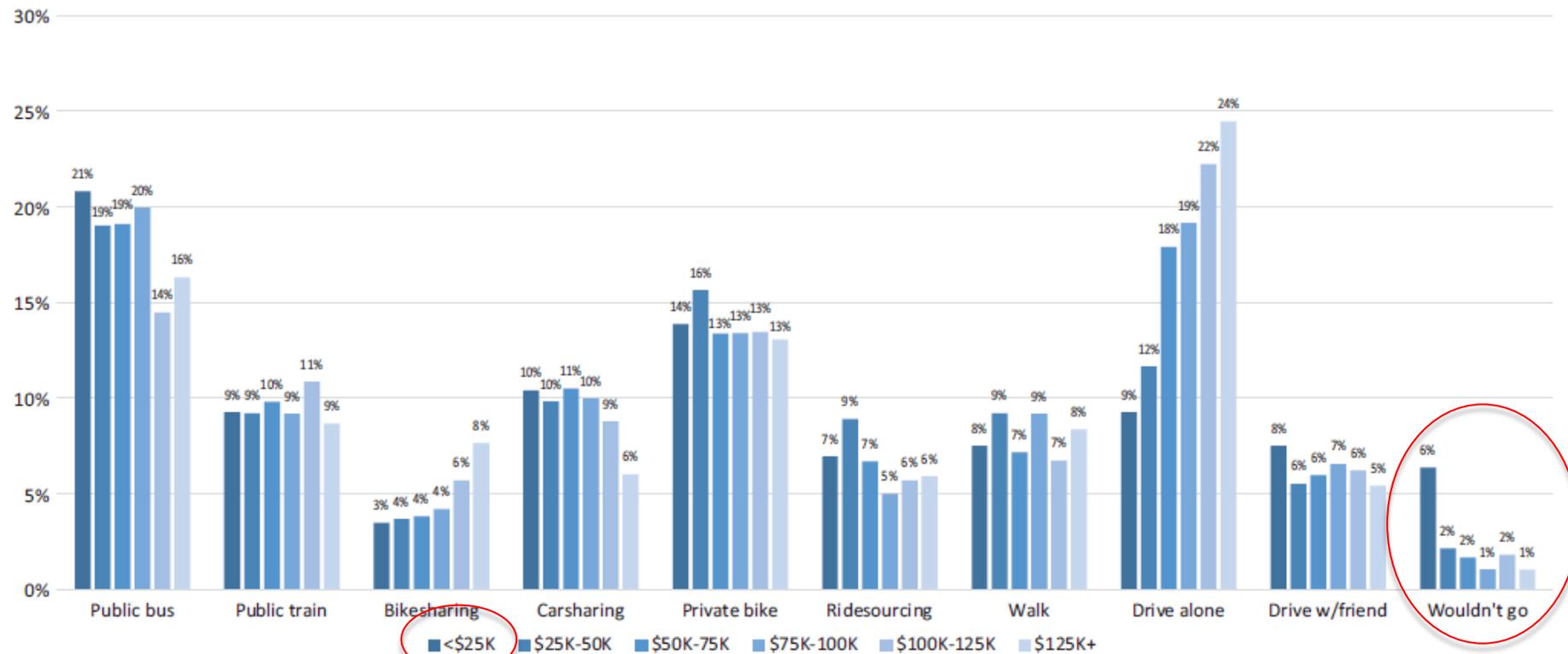


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3: Equity in an Expanding Mobility Marketplace

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Because shared modes are expected to continue growing in significance, public entities should identify opportunities to engage to ensure benefits are widely and equitably shared.



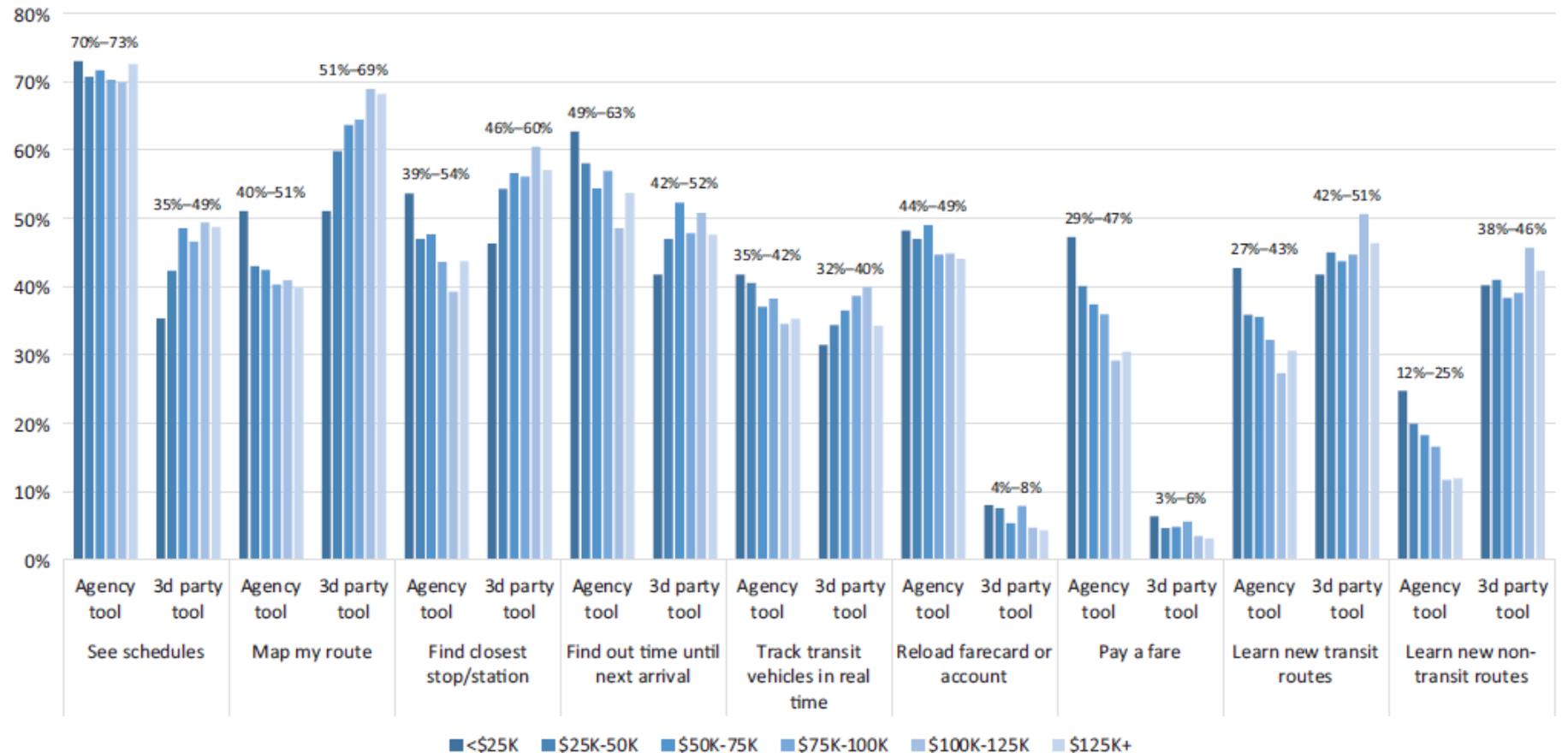
Source: Cross-tabulated responses to survey questions 5 and 22 (see Appendix C).

Figure 20. Alternative if top shared mode not available, by income level.

3: Equity in an Expanding Marketplace

Keeping service innovations fair and accessible

Access to information technology/smartphones still a potential barrier. Survey found differences in tools preferred by various groups, but transit information technologies are widely used across income and experience levels: **key role for agency-provided tools, ongoing investment in customer facing tech.**



Source: Cross-tabulated responses to survey questions 15 and 22 (see Appendix C). Data labels show ranges of responses.

Figure 17. Experience with transit applications and information services, by income level.

3: Equity in an Expanding Marketplace

Equity implications and other complexities of fare and service integration



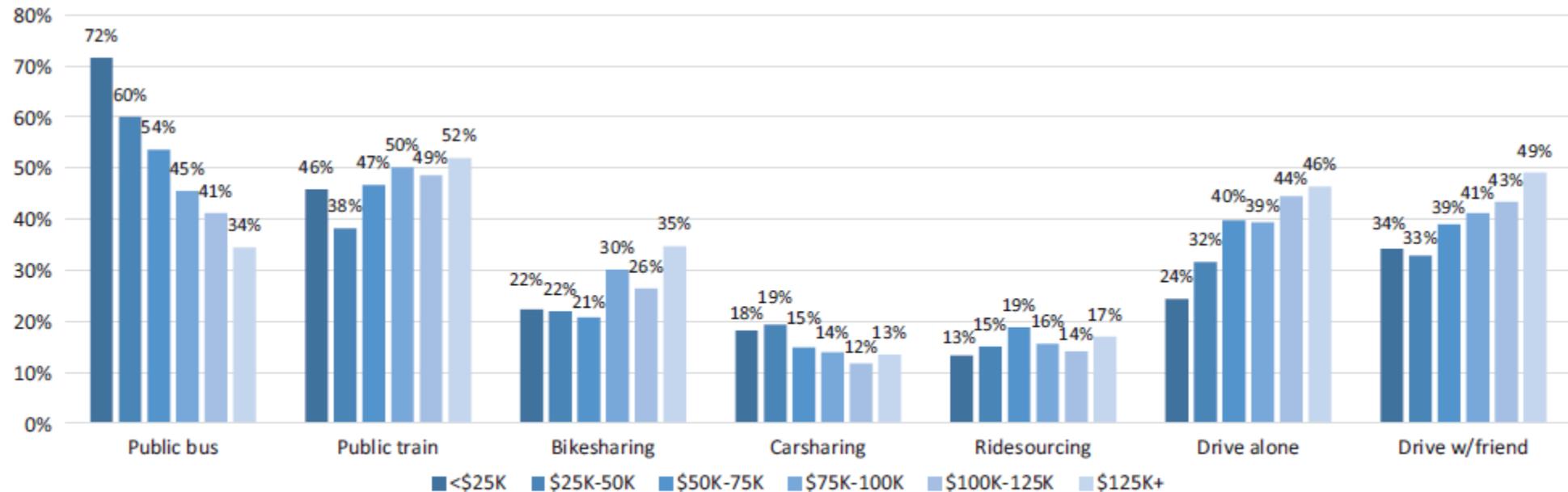
Agencies must **assess the impact of changes on minority and low-income customers as part of Title VI obligations, even without fare changes:**

- Maintain the ability for unbanked customers to purchase fares using cash or other means that do not require a bank account or credit card
- Assess whether proposed changes unduly burden disadvantaged communities

Also important: **ability to discern pre-tax/benefit/subsidy monies from other sources**

3: Equity in an Expanding Marketplace

Differing usage patterns across incomes: transit is top shared mode at every income level, but bus & train usage are inverse; penetration of other shared modes varies



Source: Cross-tabulated responses to survey questions 7 and 22 (see Appendix C).

Figure 19. Frequent use (once a week or more), by income level.

4: Public-Private Collaborations to Improve Paratransit

4: Public-Private Paratransit Collaboration

The public sector and private mobility operators are eager to collaborate to **improve paratransit** using emerging approaches and technology.



4: Public-Private Paratransit Collaboration



In interviews, widely expressed interest—public and private sector—in paratransit provision by shared mobility companies

- Potential to lower costs for agencies, improve experience for riders, increase utility of whole system
- Lack of federal guidance on emerging models—questions on how/which public obligations flow to private partners under new arrangements

4: Public-Private Paratransit Collaboration

Evolutionary path: Folding technology developed in new shared mobility services into existing paratransit/DRT operations

- Interactive reservation/scheduling etc. (voice and app)
- Dynamic vehicle dispatch/routing
- Route combination for similar origins/destinations
- App-based payment integrated into reservation systems
- Vehicle tracking, sharing trip details, ETA with caregivers, service providers, agencies
- Real-time customer feedback



4: Public-Private Paratransit Collaboration



More complex, but promising: Direct paratransit/DRT provision by shared-mobility companies. For TNCs, this comes with complexities once federal monies are involved, many rooted in contractor employment relationship and surge pricing:

- Drug & alcohol testing
- Liability/occupational safety for transfers/loading
- Requirements for accepting accessible rides/accommodating service animals
- Heightened insurance requirements, training

Even if that's resolved:

- Fleet-level accessibility requirements
- Fleet ownership prohibitions
- Buy America

4: Public-Private Paratransit Collaboration

Building on innovations of shared modes for paratransit

- MBTA “The Ride”: TNCs & taxi on demand, app hail, \$2 initial fare, \$13 subsidy
- WMATA RFP to add TNCs to MetroAccess taxi-on-demand service, reportedly subsidizing \$15/trip & \$12 WAV surcharge, will require 50 WAVs and service animal accommodation
- Centennial CO: free LyftLine rides to LRT, WAVs from Via, phone & app hail (RTD & Lyft)



5: Emerging Mobility Business Models and Partnerships

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Overview of key areas of collaboration:

- Cross-modal trip planning, reservation, and payment application integration
- Microtransit/dynamic demand response
- Private access to the public way
- Service links and handoffs



5: Emerging Mobility Business Models and Partnerships



Cross-modal trip-planning, reservation, and payment: partnerships to integrate existing transportation services with private mobility providers

- Buffalo Niagara Medical Campus GO BNMC program
- Go LA multimodal trip planning app
- TriMet-GlobeSherpa (moovel) partnership, Portland
- Twin Cities Hourcar/Metro Transit multimodal integration
- Ventra mobile app (CTA, Metra, Pace), Chicago

5: Emerging Mobility Business Models and Partnerships

Microtransit/dynamic demand response: extend reach of fixed-route transit into lower density areas/augment service in saturated corridors

- Denver RTD Call-n-Ride
- KCATA/Bridj pilot
- Santa Clara Valley Transportation Authority Flex
- West Salem Connector, Salem-Keizer Transit, Oregon

5: Emerging Mobility Business Models and Partnerships

Private Access to Public

Rights-of-Way: proactive policies to balance competing demands for limited street space while addressing broader mobility goals

- DC Carshare street space ordinance
- SFMTA Commuter Shuttle management pilot
- Seattle carsharing ordinance



5: Emerging Mobility Business Models and Partnerships

Service links and handoffs: last-mile linkages, emergency rides home, and service handoffs between public transportation programs & shared modes

- DART and MARTA TNC partnerships
- Pinellas Sun Coast Direct Connect TNC/taxi pilot
- King County Metro/Redmond Real-Time Rideshare and Emergency Ride Home programs

Carol Cooper
King County Metro

6: Conclusions: Suggested Opportunities

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Opportunities for cooperation, regulatory enhancements, institutional realignments, and public-private engagement that would allow innovation to flourish while **providing mobility as safely, broadly, and equitably as possible.**

6: Conclusions: Suggested Opportunities

- Change performance metrics to make efficient mobility the goal
- Extend fare integration and mobile payment beyond smoothing farebox interactions to goals such as subsidy administration, mode-shift, and gathering ridership data
- Keep information open and widely available for the broadest benefit



6: Conclusions: Suggested Opportunities



- Lay the groundwork for strong public-private partnerships and targeted investments in the mobility system, including public transit and shared modes
- Maintain accessibility and equity as central mandates for urban and regional mobility, especially with an evolving mix of public and private participants
- Transform public transportation agencies into mobility agencies

Next Steps – Phase II

Coming Soon:

- Origin and destination data from ridesourcing companies
- More survey data
- Additional travel time and cost analysis
- Greater depth of analysis for individual cities



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Thank you.



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A Transit Agency Perspective: King County Metro Shared-Use Mobility Initiatives

Carol Cooper
Supervisor, Market Development
September 29, 2016

Initial Pilot programs

- Expanded Home Free Guarantee service for selected pilots to include TNCs
 - *Goal is to improve response time, increase coverage.*
 - *Early results: High customer satisfaction, lower costs*
- Real-Time Rideshare/TripPool



Future Pilot programs

- Two emerging priorities:
 - *Explore role of partnerships with TNCs to improve first/last mile access to park and ride facilities, optimize capacity.*
 - *Test potential of new alternatives, such as microtransit and dynamically routed services in our network.*



Strategic planning efforts

- Shared-Use Mobility Study
 - *Partnership with Seattle Department of Transportation and Sound Transit.*
 - *Assess the potential role of emerging mobility services in the future of the regional transportation network*
 - *Begin development of a shared strategy.*



vehicle sharing



taxis, TNCs,
ride-sharing



micro transit &
shuttles



mass transit

Shared-Use Mobility Study

Phase I: Near-term Regulatory Considerations

- Strategically allocate regulatory responsibilities between city, county, state.
- Devise a broad regulatory umbrella for existing, emerging, and future shared mobility models.
- Explore a platform-based licensing model.
- Design strategies to enforce key regulatory positions and penalize violations.
- Develop better data collection and management processes.
- Develop policies and strategies to address accessibility concerns.

Shared-Use Mobility Study

Phase II: Opportunities for Integration

Initial Findings:

Car ownership: In King County, 17% to 27% of car owners could still satisfy all their trips needs and save money by using TNCs instead of owning and driving their own car.

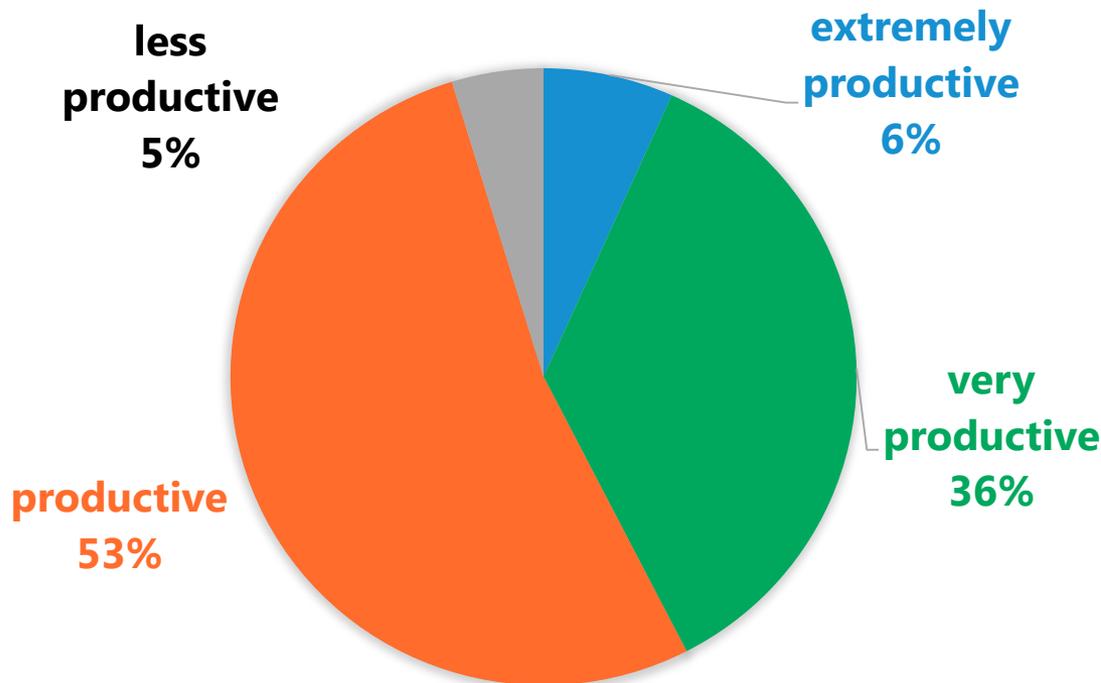


Shared-Use Mobility Study

Phase II: Opportunities for Integration

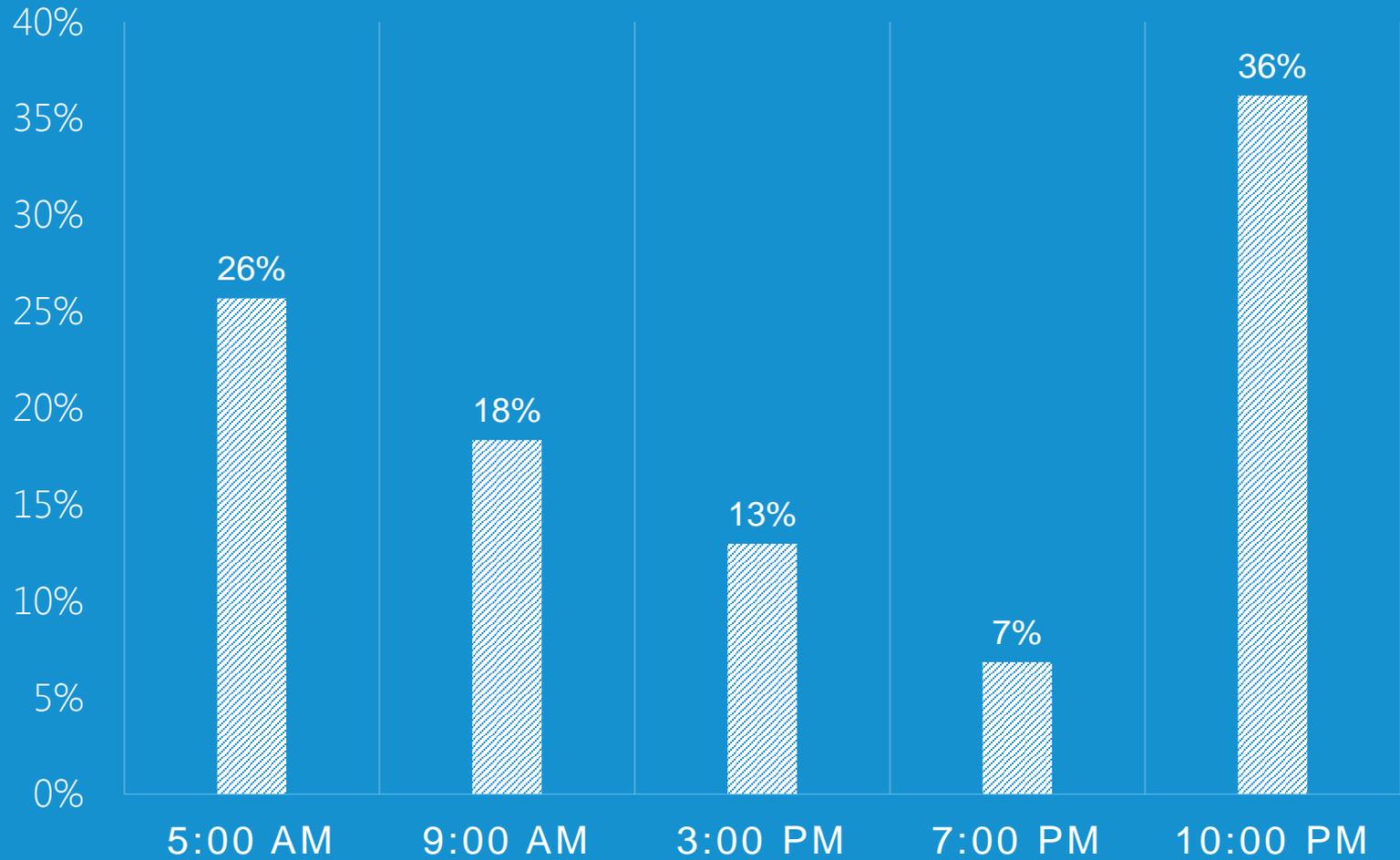
Initial Findings:

About 5% of King County Metro trips might be more effectively served by a TNC service.



*Analysis of ~80% of Metro service:
8,628 trips

DISTRIBUTION OF TRIPS



time distribution of that ~5% of service

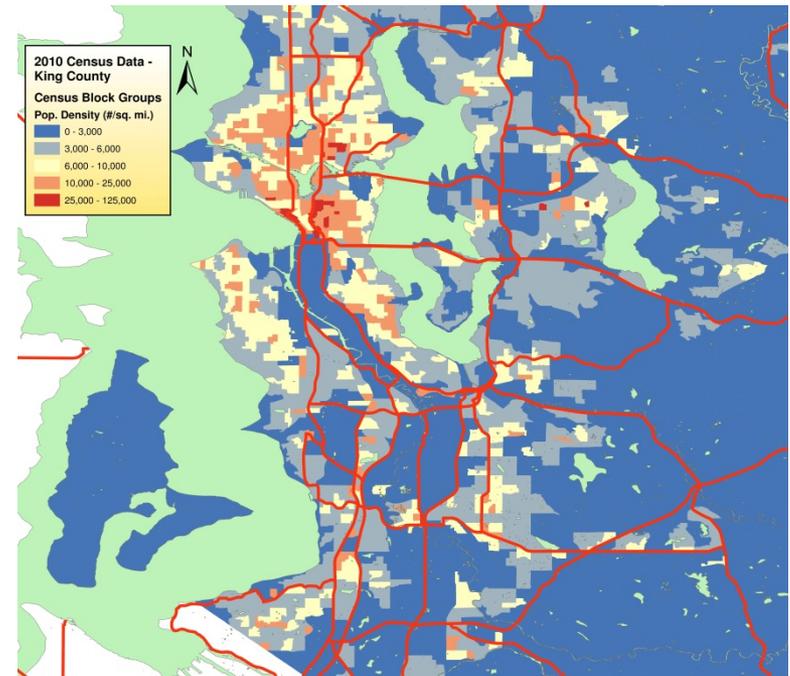
Emerging challenges

- Reconfiguring use of existing infrastructure
 - *Rights of way*
 - *Curb space*
 - *Park and rides*



Emerging challenges

- Addressing equity mandate
 - *ADA*
 - *Income disparities*
 - *Remote low density areas*



Emerging challenges

- Adapting Institutional Processes
 - *Rate of Change*
 - *Labor*
 - *Sharing as we Learn*

