

Feasibility of an Electric Car-Sharing Service in a Suburban Environment: Team Best Practices



Fall 2022

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The project on which this presentation is based was completed in collaboration with the City of Edina as part of a 2022–2023 Resilient Communities Project (RCP) partnership. RCP is a program at the University of Minnesota’s Center for Urban and Regional Affairs (CURA) that connects University faculty and students with Minnesota communities to address strategic projects that advance local resilience, equity, and sustainability.

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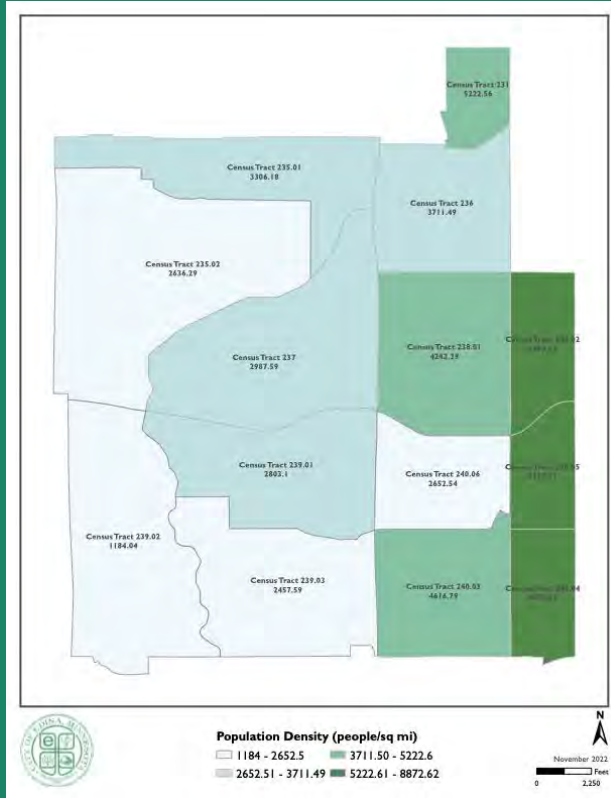
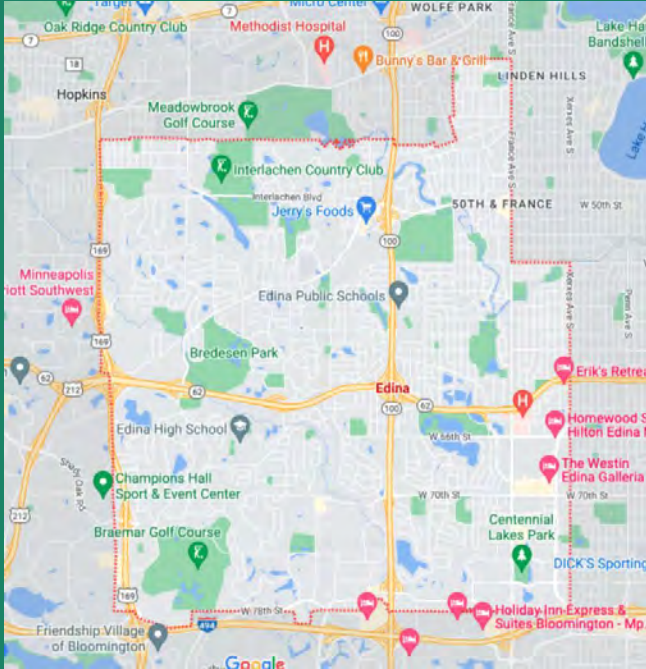


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Jacob Bransky, Jackson Cade, Jacob Margolis, Spencer Ziegler

December 12, 2022

Edina Today - Land Use & Density



Currently in Edina:

- 41.1%** of City-Wide GHG emissions in 2019 are from transportation
- 581,109,000** Vehicle Miles Driven in 2019
- 78%** Commuters drive alone
- 3.3%** Commuters use public transit
- 357** Electric vehicles currently registered

Research Questions:

- What are the best practices for an electric vehicle car-sharing program for Edina, given that it is suburb with a population of 52,857 where 78% of commuters drive single-occupancy vehicles?
- What model of EV car-share would be most effective in Edina?

1. Car Sharing Models

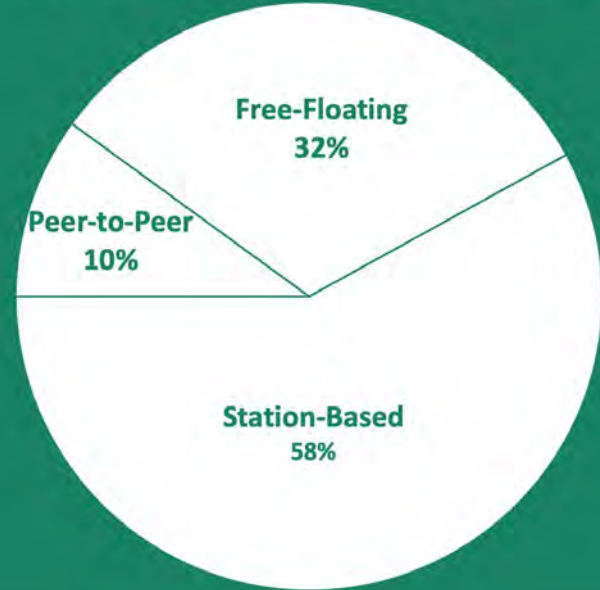
2. Case Studies

3. Car Share in MSP

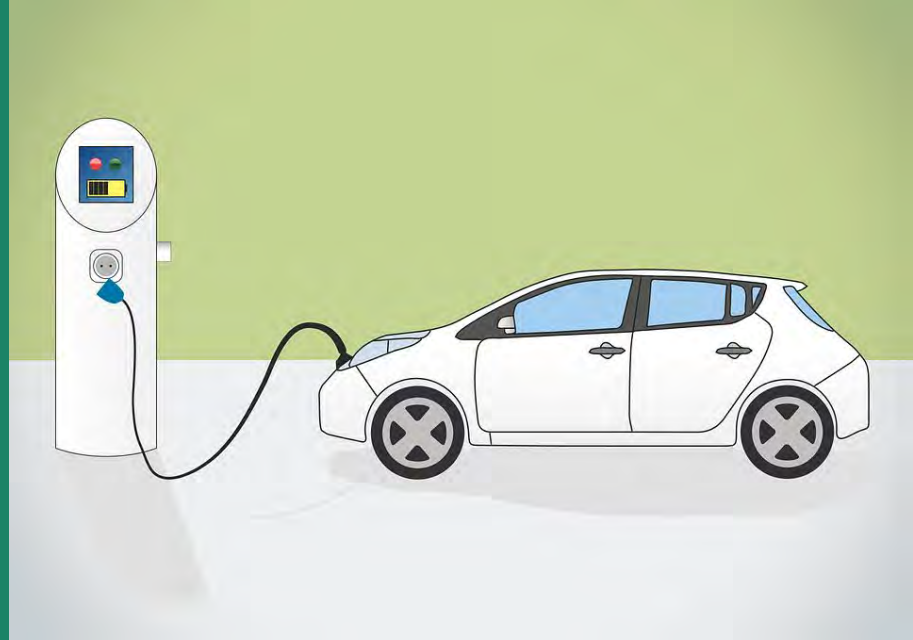
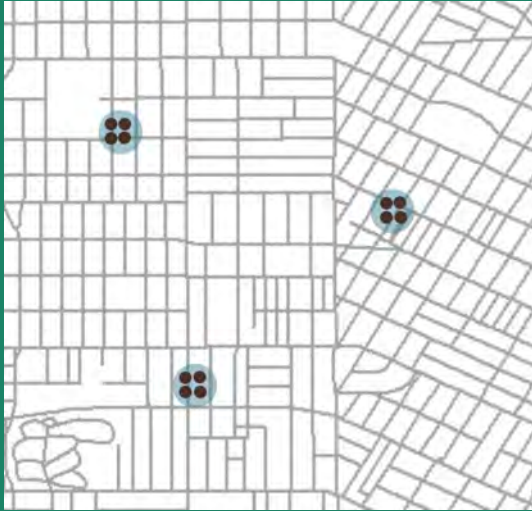
4. Recommendations

Car-Sharing Models

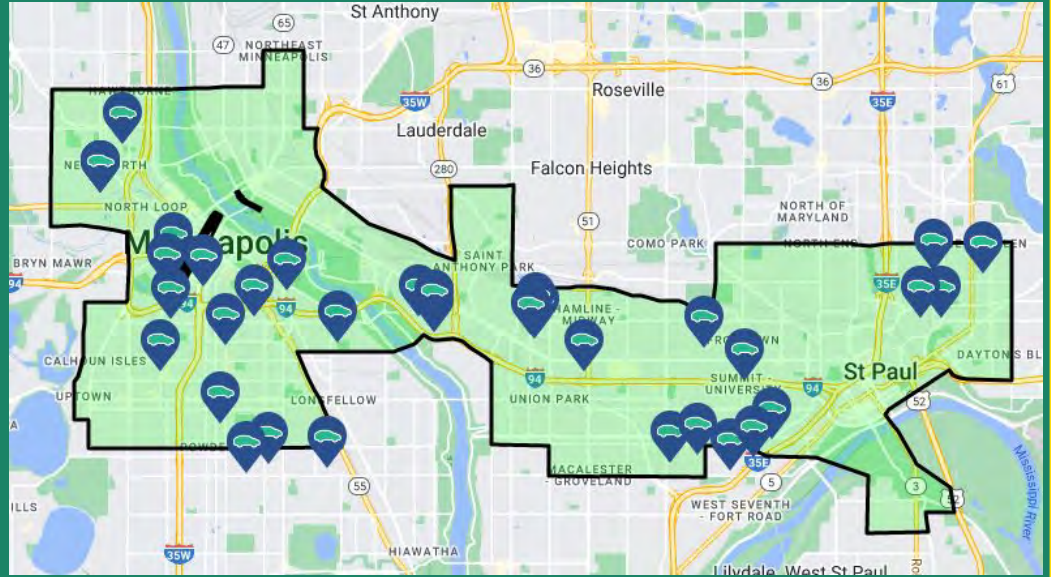
PERCENTAGE OF CARSHARING OPERATORS BY BUSINESS MODEL (2019)



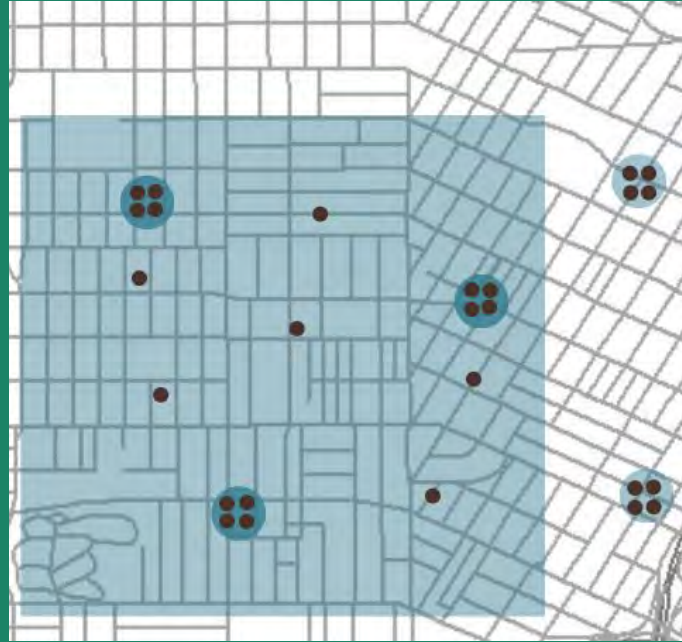
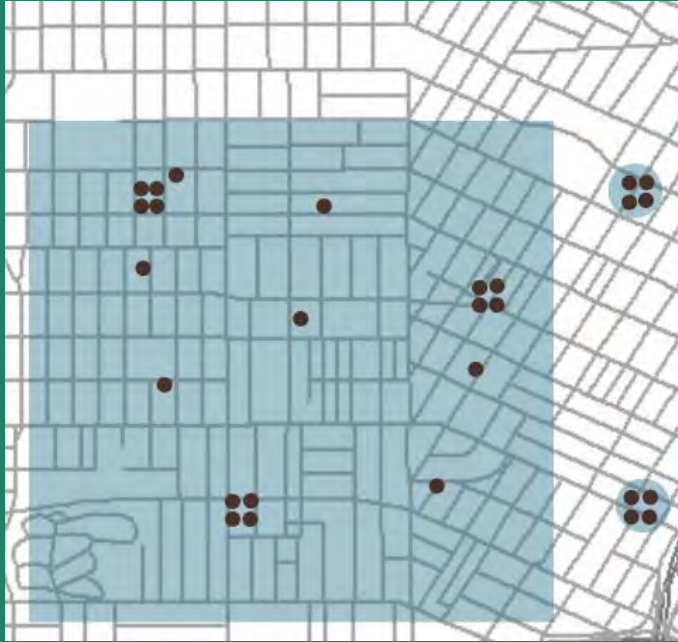
Station-Based or Hub-Based



Free-Floating



Mixed Method



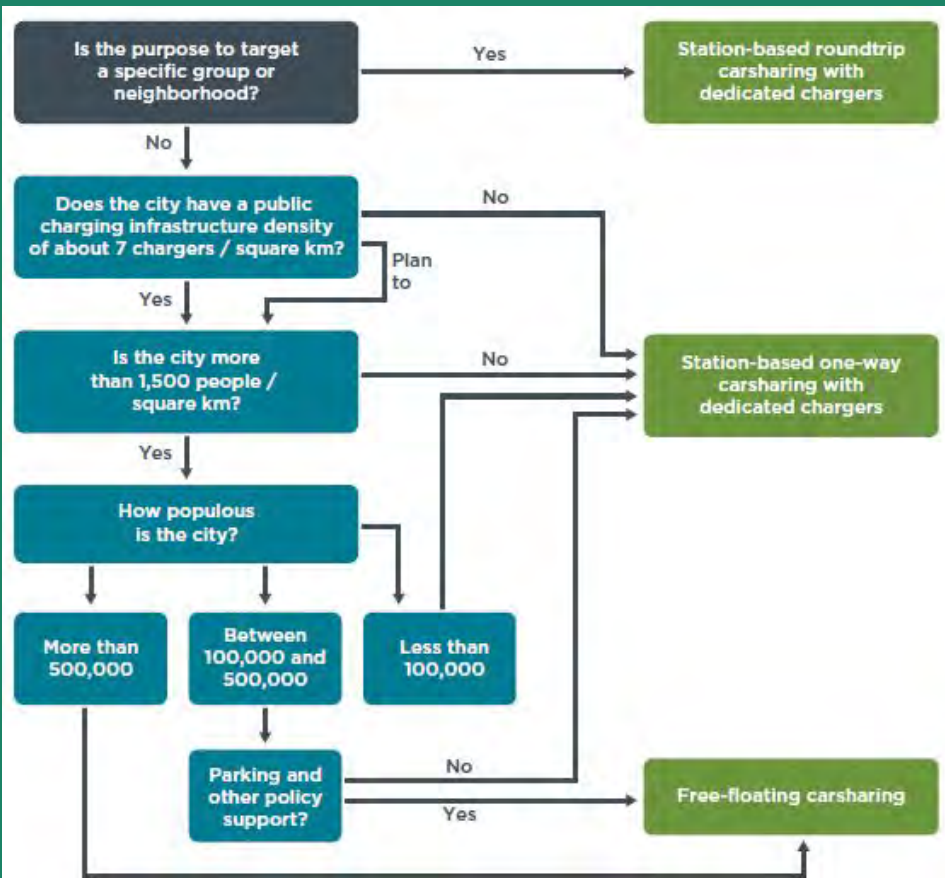


Figure 5. Flow chart to determine which business models are likely to be successful based on existing city conditions and city goals.

Peer-2-Peer Car-Share



Additional Rideshare Models

Carpooling: groups of seven or less traveling together in one car

- acquaintance-based, which consists of carpools formed by acquaintances
- organization-based, which require participants to join the service
- ad hoc, which involves more unique forms of ridesharing, including casual carpooling – also known as ‘slugging’

Vanpooling: The grouping of seven to fifteen persons commuting together in one van

Shared micro transit: use of smartphone technology lowers operating costs for services that target special populations, such as disabled, older adults, and low-income groups

- fixed route, fixed schedule: operates similarly to fixed-route public transit or even vanpooling. In some congested cities, micro-transit can alleviate overcrowding on popular bus routes or provide a feeder service to transit trunk lines
- flexible route with on-demand scheduling: operates more like ride-splitting; routes and scheduling are created on demand based on travelers’ requests
- both models can provide first- and last-mile services for public transit.

Case Studies



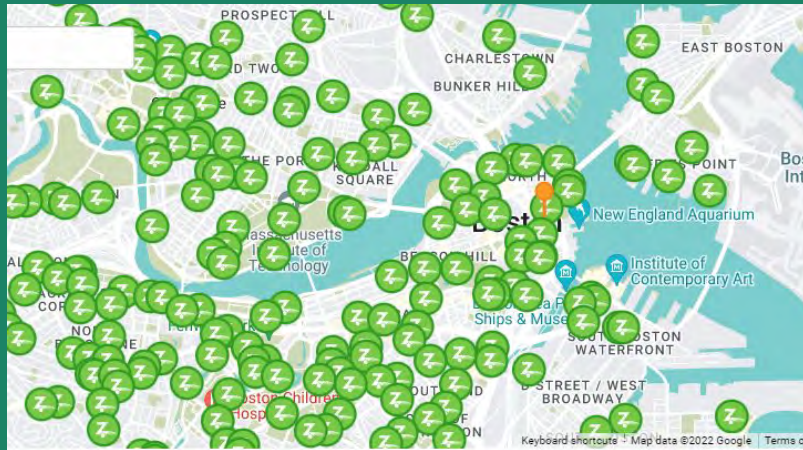
California Bay Area

- Emphasis on mobility hubs near BART and CalTrains stations
- Destination districts with good multimodal connectivity
- Previous model flopped in the early 2000s
 - Struggled with scaling
 - Mainly focused on commuters
- New carshare in past decade has come online



Northeast Suburbs

- Similar emphasis on Mobility Hubs near transit.
- Built near regional rail stations and historic city cores
- Many are old streetcar or rail suburbs to major cities
- Strong transit connections underlie infrastructure



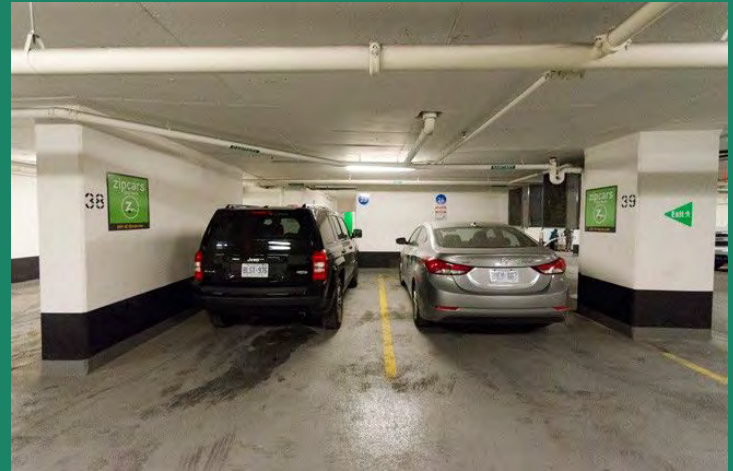
Oregon Examples

- Similar emphasis on mobility hubs near transit
- Several newly developed areas near light rail
- “Zip and Ride” partnership in smaller localities near Amtrak Station
- Significant churn in market
- Zipcar has maintained stability in hub based model
 - Transit stops
 - Multimodal friendly destinations



Metro Vancouver Apartments

- Suburban apartments are given parking reductions with car share implementation
 - Structure written into municipal zoning code
- Paid for by developer
 - Significantly decreases development cost
 - Amenity for renters
- Wide-scale benefits have led adoption and success



Suburban Cities

- Peer-to-peer car sharing has seen adoption
- Apps like Getaround and Turo
- Low capital and maintenance cost
- Has had success in locations where traditional car sharing struggled



Patterns

- Car share in specific situations
 - Transit stations
 - Mobility center
 - Destinations like downtowns
 - Conducive to diverse mode choices
 - Institutions of higher education
 - Multifamily development
- Hub-based model



Considerations

- Comparable Rideshare Locations To Edina
 - Less Established
 - For-Profit Model
 - Long-Term Feasibility Unclear
- Neighborhood Diversity In Edina



Car Sharing in MSP



What exists today within MSP?

Hourcar

- Station-based service operating out of Minneapolis and St. Paul
- Originally launched in 2005, gained Nonprofit status in 2017

Evie

- All-Electric free-floating car-share service operating out of Minneapolis and St. Paul
- Municipally-owned, Renewably-powered
- Launched in February 2022 with 101 vehicles
- Part of the EV Spot Network

Multifamily Project

- Hub-based EV service for low-income and market-rate apartment buildings around the Twin Cities, not only where Hourcar and Evie operate

Evie 6-Month Review

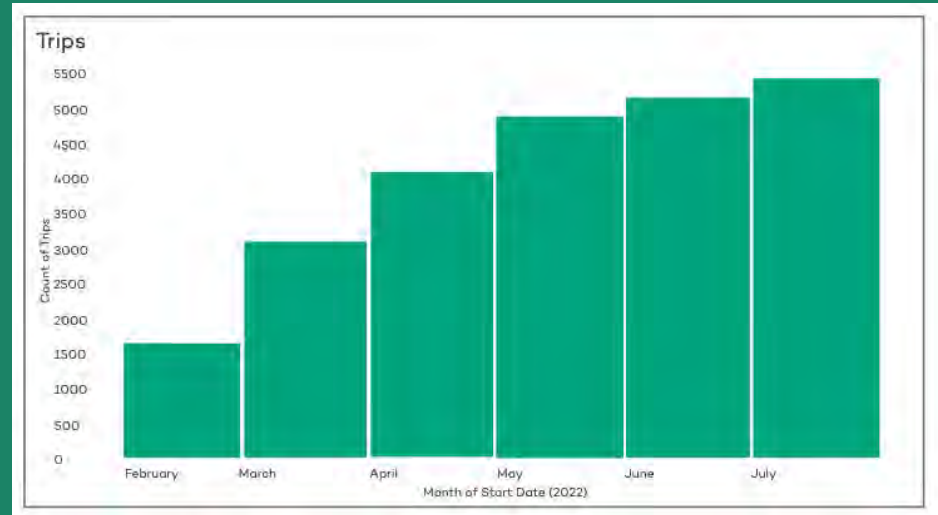


In first six months...

- 24,474 trips totaling 241,733 miles
 - Average trip was 9.9 miles
- 31,825 hours of vehicle usage
- Access PLUS accounted for 33% of total usage

Vehicle Drift: More one-way trips that started in St. Paul ended in Minneapolis than the reverse

- Required manual logistics to correct



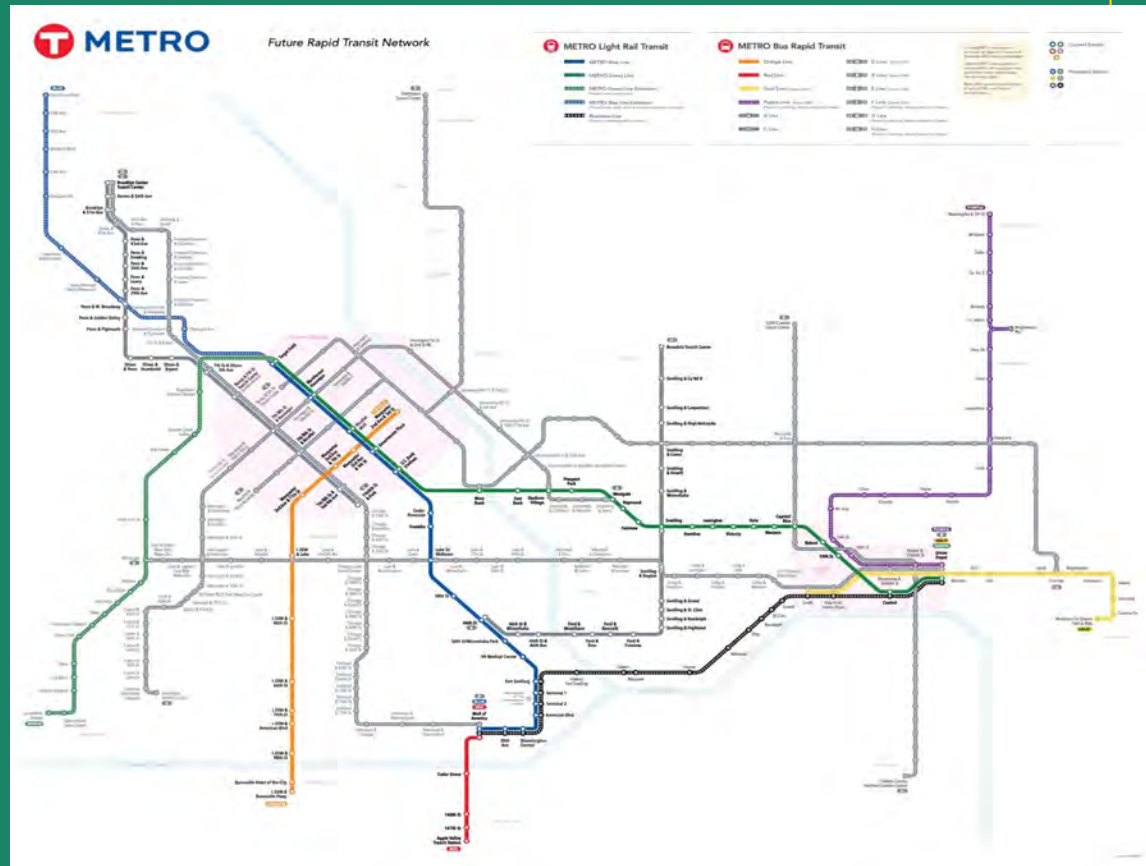
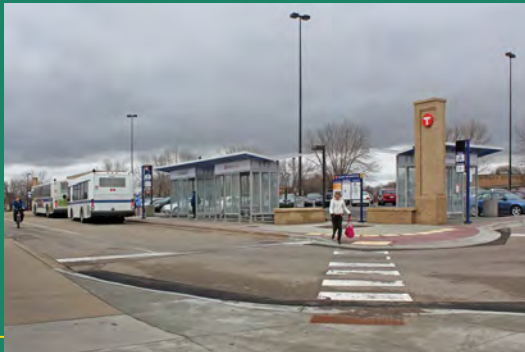
The Future

METRO Network

- METRO E Line opening in 2025 terminating at Southdale

Evie

- Additional \$1.4M in funding to come in 2023, plans to purchase 45 new vehicles and expand Home Area to East St. Paul

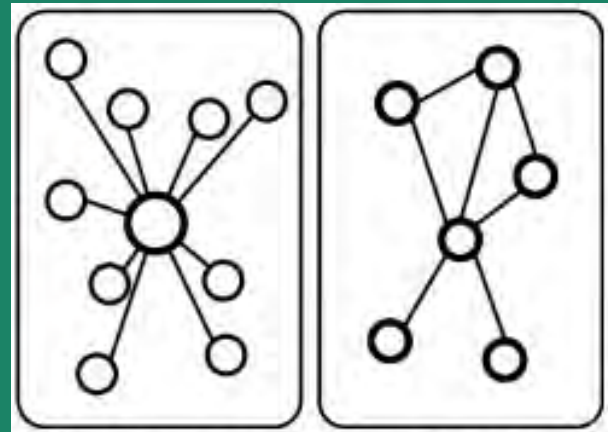
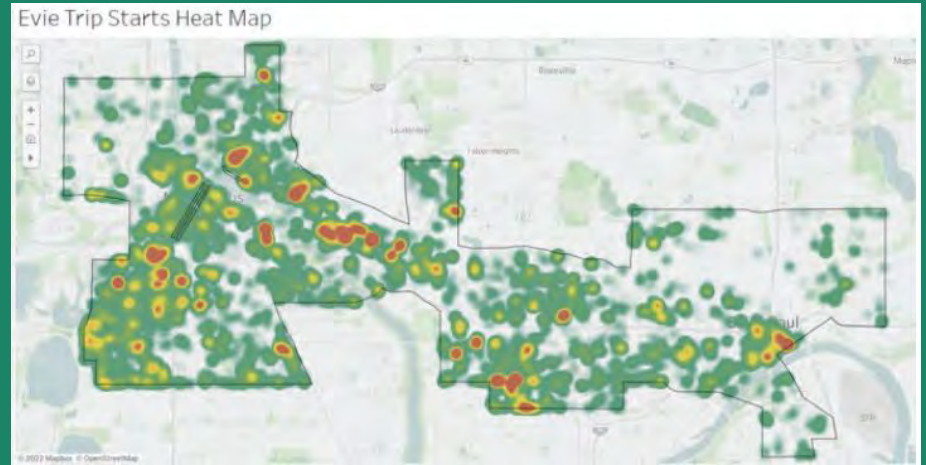


Recommendations & Conclusion



Details

- Don't skimp on the cars. Carshare is a **system**, not just one or two cars. It thrives when there is a density of cars and users.
 - Most people park right outside their residence, and this is still true for carshare
- Think about the demographics.
 - Who will use this? Is this targeting commuter trips or personal trips?
 - Is improving transit ridership a goal of the system?
 - All of these things can substantially change the operational format and requirements



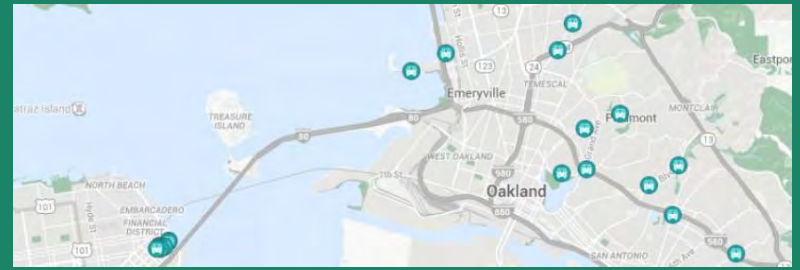
Option 1: Carshare

- Contract with Hourcar to provide EV cars in Edina
 - **Target** specific users, such as multifamily buildings or at the E-Line Transit Hub
 - **Accept** that people with a private vehicle are unlikely to pay extra for a shared vehicle
- Benefits from using existing infrastructure, as well as the already high quality of service that hourcar provides
- Limited in scope and use. As it is, shared EV is expensive enough that it is unlikely to affect daily commuters.

- Sub-option: P2P Carshare
 - Enables more efficient use of parking as cars spend less time sitting empty
 - Popular among lower-income people as a way to reduce their car payments
 - Enables a large car-share fleet with minimal investment



Option 2: Carpool



- Create and facilitate a system to encourage carpooling
 - Make it easier to find convenient, safe, fast carpools
 - Provide an incentive (e.g., vehicle registration fee discount) to push more people to carpool
- Benefits from using existing infrastructure and vehicles more efficiently
 - “Merge” in the Bay Area was highly successful at reducing SOV congestion on the Bay Bridge
- Not a new or innovative system, but the humble carpool fits into existing car culture and, if nurtured, can remove an abundance SOV trips from the road at a fraction of the cost



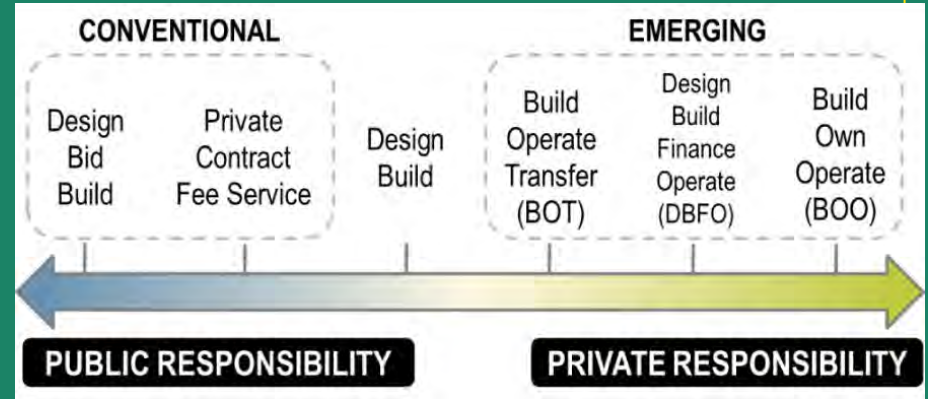
Option 3: MicroTransit/Paratransit/Vanpool

- Provide a shuttle connection to transit
- Cutting edge technology could enable front-door pickup, demand-responsive scaling, and day-of ride hail
- Basically paratransit with extra technology for efficient routing
 - Service format would be customized for Edina's use case
- May be expensive to implement, not yet a widely accepted system
 - There are examples of success like Dart GoLink (TX), Ride-on-Flex (MA), VIA Bubble (Israel)



Public-Private Partnerships

- A **stakeholder** whose goal is a successful transportation system
- New systems with new technology require infrastructure
- Car-share itself requires an entity take care of it
- Public-private partnerships are a good way to reduce the cost of the system by enabling a private operator to run the system
- Some form of government support is essential for any of these services to succeed





Questions?



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