Spare Labs Transit Study: Review of Results

Considerations for propelling CCT into the future

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Summary of Recommendations

- The Spare team provided a few considerations for the board to grow CCT:
  - Considerations for using a routing software for trip planning and long-term transit planning,
  - Considerations for pooling rides in higher density areas with populations more receptive to public transit,
  - considerations for extending hours of service,
  - and considerations for right-sizing CCT's vehicle fleet.
- To reach these considerations, Spare simulated low, medium, and high demand with a low, medium, and high number of vehicles under multiple parameters. Spare also created a four-phase path for CCT success where the service could take on pooling, move to multiple operators on a mixed supply model, and eventually commingle service with NEMT, para-transit, and potentially even school operators.

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Summary of Recommendations

- A routing software that allows for in-app trip planning for the rider and administrative scheduling and data collection for the service provider is critical to the long-term health and success of CCT.
  - 97% of transit riders rate their experience with the length-of-wait performance metric and the on-time performance metric. Providing the rider with a real-time pickup window works to increase customer trust in the system while ensuring staff has the proper data for realistic decision-making.
  - The routing software can assist CCT in tracking and analyzing high-frequency route data, improving reliability by giving staff the tools to make changes only where needed.
- Routing software algorithms quickly calculate which routes to give drivers to pick up the greatest number of passengers per vehicle hour, reducing the number of required vehicles on the road– this reduces cost per passenger and optimizes productivity.

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Summary of Recommendations

- A pooled micro-transit system will deliver modest cost savings for CCT.
  - The pooling rate, or the proportion of trips that are shared between multiple riders, is expected to be 48–64% under a door-to-door model.
    - Pooling reduces the number of vehicle hours required to service the given demand, as fewer vehicles will be needed to complete the same amount of work. The cost benefit in pooling on a software platform comes from the reduced number of vehicle hours and deadhead vehicle hours.
    - It is understood that the COVID19 pandemic poses difficulties to implementation of pooling transit riders.
- Spare simulated low, medium, and high demand with low, medium, and high number of vehicles under the current service window, 6a-6p, and an extended service window, from 6a-12p.
  - They found that low average waiting times and high efficiency are achievable with relatively few vehicles under the current service window, at a low-cost option that varies from $520,000 to $870,000 per year depending on actual demand.
  - They found that these same metrics are achieved under an extended service window with a variable cost of $780,000 to $1,300,000 per year based on actual demand.

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Summary of Recommendations

- Considerations for rightsizing the fleet vehicles & expanding the fleet
  - CCT could save on operating costs in the long-term by investing in **two additional dedicated vehicles** to serve most of the expected demand. Smaller vehicles cost less to purchase, run, and maintain than the shuttle vans owned by CCT. If CCT purchased two additional 5-passenger vehicles, Irving Holdings or another contractor could be used for overflow only.
  - Using a dedicated fleet could result in savings of $7 per trip and annual savings of $140,000, assuming a medium-demand, low-cost scenario.

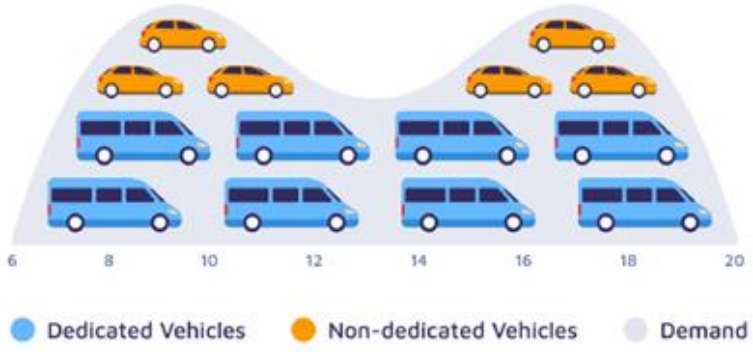

Figure 19. How a mixed-supply model enables transit agencies to slightly under-supply for any given demand, by brokering trips to other non-dedicated operators when needed.

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Summary of Recommendations

- Spare simulated low, medium, and high demand with low, medium, and high number of vehicles on a “door to door” vs. a “stop to stop” model of service. (pg23 table vs pg25 table)
  - Stop to stop model provides a shorter anticipated wait time and increased ability to pool riders but may not be feasible due to area density and average outdoor temperatures in TX.
  - A door-to-door service would offer the best increase in performance per additional dollar spent. A stop-to-stop service offers the best value for money but would be difficult for CCT’s target population.
- Finally, Spare simulated low, medium, and high demand with low, medium, and high number of vehicles and focused the evaluation on a low-cost approach vs a great service approach. (pg23 table)
  - The difference between low cost and great service is the number of vehicles in rotation. If CCT pursued a ‘low-cost’ approach to this service, meaning a service relying on 3–4 vehicles as a mix of dedicated and non-dedicated vehicles, we could expect to see average waiting times would be around 27 mins and maximum waiting times around 60 minutes.
    - Annual costs would range from $520,000 to $870,000, depending on the number of dedicated vehicles on duty.
  - A ‘great service’ option, a service relying on 5–8 vehicles, would reduce average waiting times by 8–12 minutes, and maximum waiting times would decrease by up to 15 minutes.
    - Annual costs estimated between $920,000 and $1.6 million.

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Spare's Four Phased Model to Success

Phase 0
Business as usual

Inefficient and expensive
One trip per vehicle
Single non-dedicated operator
Lots of dead-heading

Phase 1
Pooling

Optimizing with one operator
Multiple trips per vehicle
Single non-dedicated operator
Digital and data-driven

Phase 2
Multiple operators

Mixed supply drastically cuts costs
Multiple trips per vehicle
Multiple (non-)dedicated operators
Improved rider experience

Phase 3
Dynamic pricing

Define the rules for cost recovery
Multiple trips per vehicle
Multiple (non-)dedicated operators
Introduce dynamic pricing

Phase 4
Commingling

Full flexibility for service excellence
Multiple trips per vehicle
Multiple (non-)dedicated operators
Pool all services (paratransit, schools, NEMT)

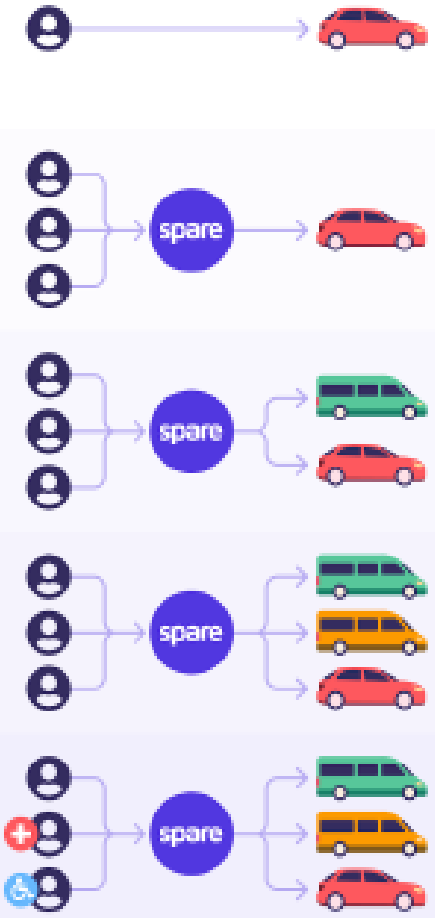

Figure 18. Spare's framework for propelling CCT into the future.

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Key Take-Aways:

- The system as presently designed is inefficient but can be optimized starting with a few reasonable changes.
  - Implementing a software that allows for in-app trip planning for the rider and administrative scheduling and data collection for the service provider is critical to the long-term health and success of CCT. Using this software to pool trips could increase efficiency of rides and save CCT money in the long term.
  - Purchasing additional “right-size” fleet vehicles and reducing the level of reliance on third party contractors (like Irving Holdings) is key to saving money while maintaining a high level of service in the region.
  - Extending hours of service could benefit riders and increase accessibility of service, though there is additional cost for that expansion of service.
  - Implementing a stop-to-stop service in this region would result in significant average time savings of up to nine minutes, and would significantly improve pooling ratios, at no extra cost to CCT. Considerations regarding feasibility in the region is discussed above, so it is unlikely that CCT diverges from the door-to-door model that is currently employed.
- It is imperative that we make decisions that prioritize and impact the long-term health and success of the CCT program.
  - In the future, CCT can move past its “phase zero” and move towards pooled rides, multiple operators, dynamic pricing models, and commingled services– but it will take innovation to get there.

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