

# WELCOME

HIIT SESSION: SOFTWARE TECHNOLOGY







*PLEASE WELCOME:*

MIA BRUNELI

“EFFICIENCIES WITH TECH UPGRADES”



University of Iowa | CAMBUS

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# Tech solutions for operational improvements

**On-Demand, Automatic Passenger Counters, and more**

July 17, 2025



# Projects and status

Project	Initiation	Planning	Execution	Monitoring	Close/ Maintenance
Demand-Response scheduling software					X since spring 2023
Security camera upgrade					X since fall 2024
NTD reporting software				X since spring 2025	
Automatic Passenger Counters			X since spring 2025		



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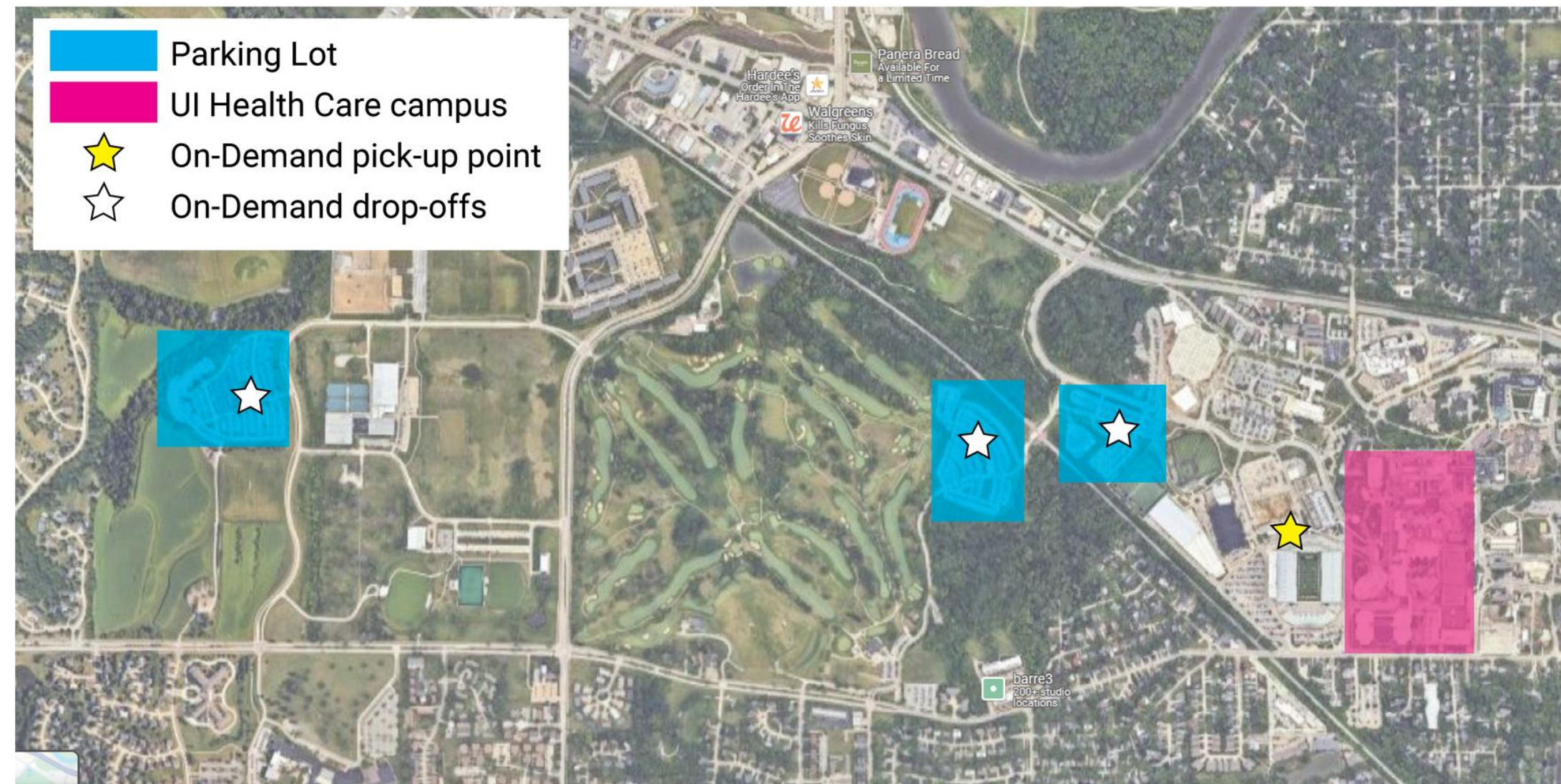
# **On-Demand and Paratransit software**

**Launched since March 2023**



# Project background

- Began operating on-demand service in spring 2020 in response to pandemic
- Weekday evening service from 8:45 p.m. – 12:30 a.m. to get UI Health Care staff to remote parking lots
- Riders could call to schedule a ride ahead of time, or just walk up to the bus to request a ride
- Driver used pen and paper to record rides



# Project goals



Future expansion of on-demand services



Accommodate on-demand and paratransit services



Rider ability to schedule and cancel rides on their own



Real-time info and alerts to riders



Schedule optimization while enforcing service policies



Reduce administrative burden on reporting

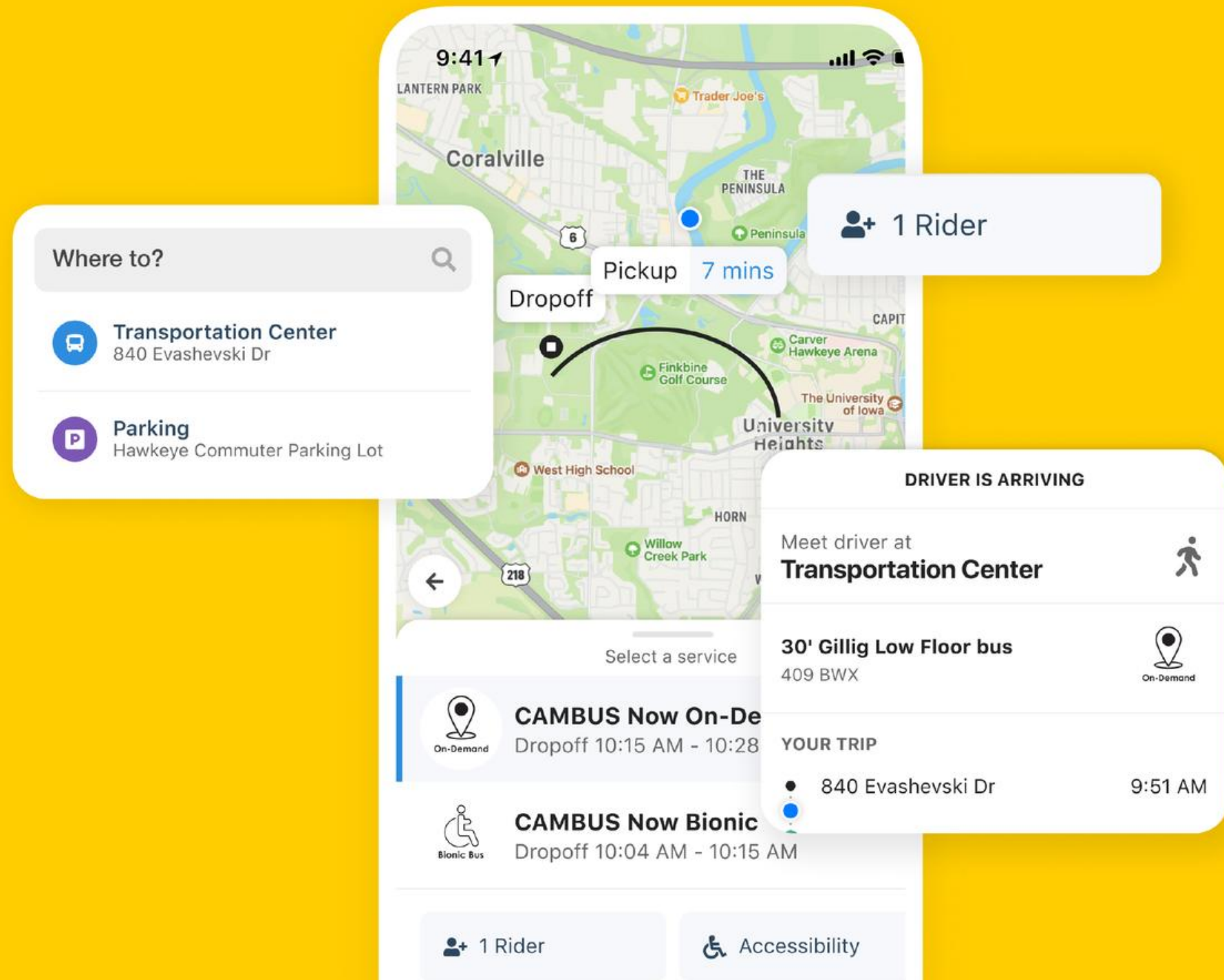


# CAMBUS Now

Schedule a ride with the tap of a button

**CAMBUS on-demand services - on your schedule**

→ [TRANSPORTATION.UIOWA.EDU/CAMBUS](https://TRANSPORTATION.UIOWA.EDU/CAMBUS)



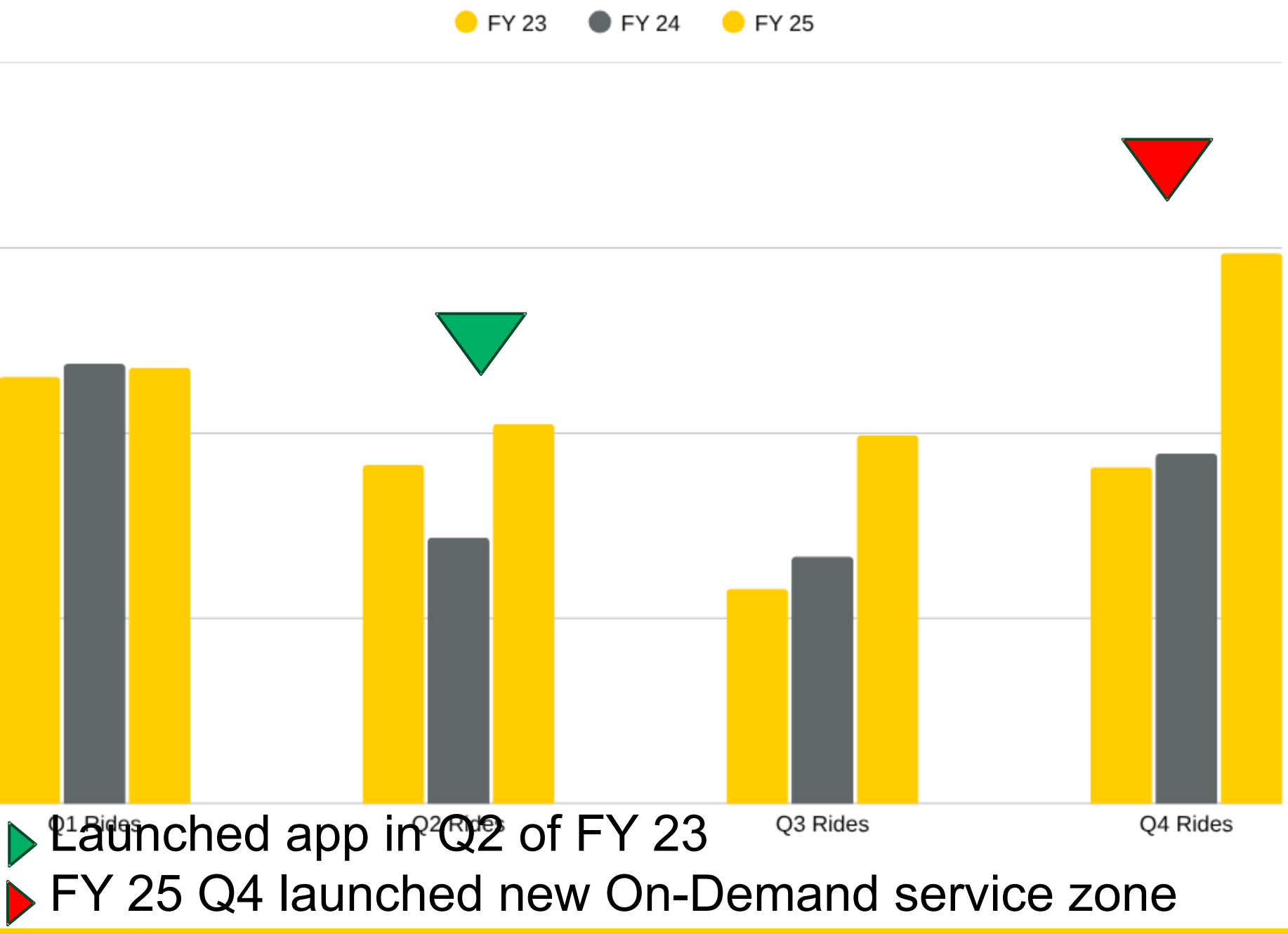
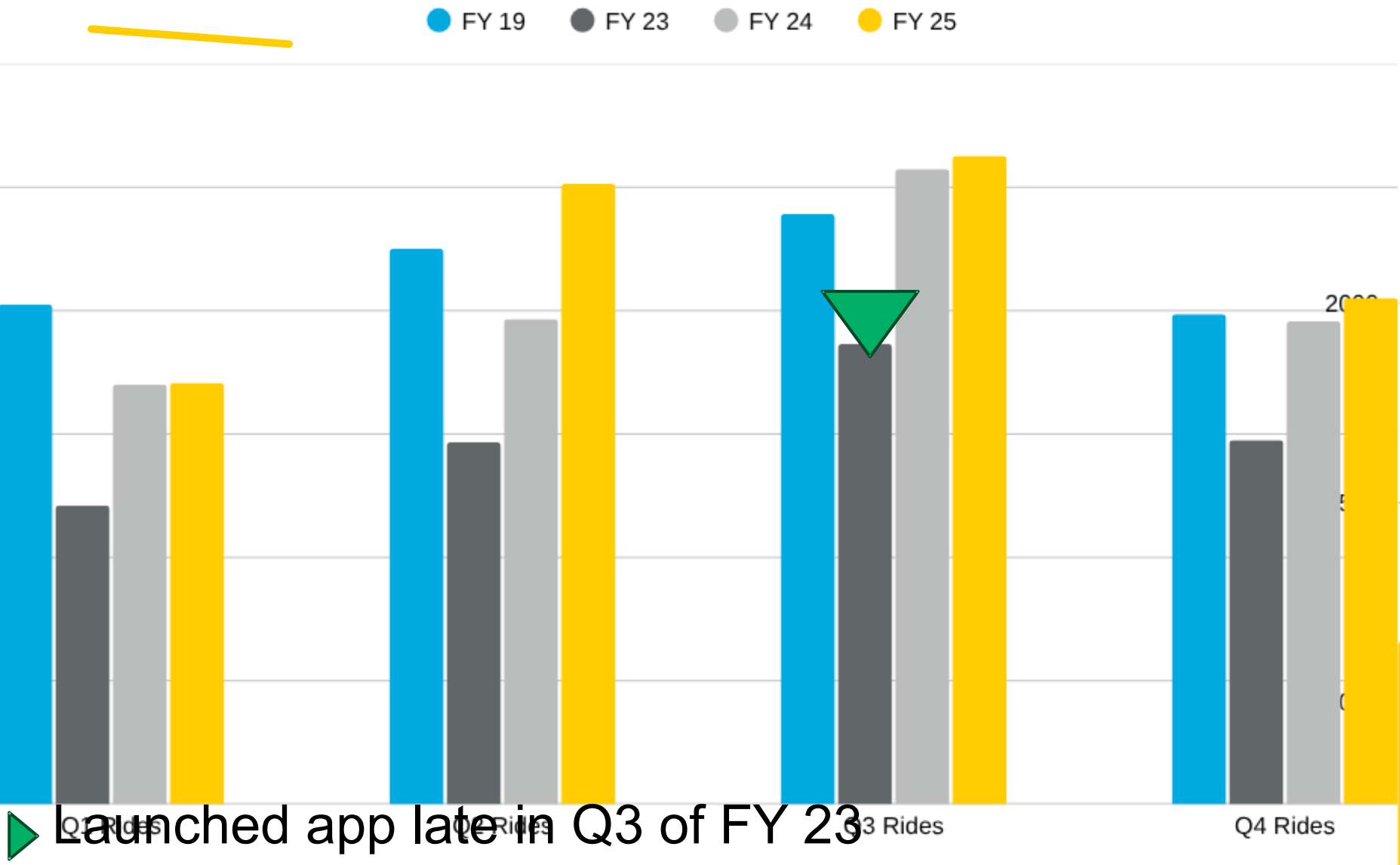
## Spare Labs, scheduling software

- Launched On-Demand services October 2022
- Launched Bionic Bus paratransit service in March 2023



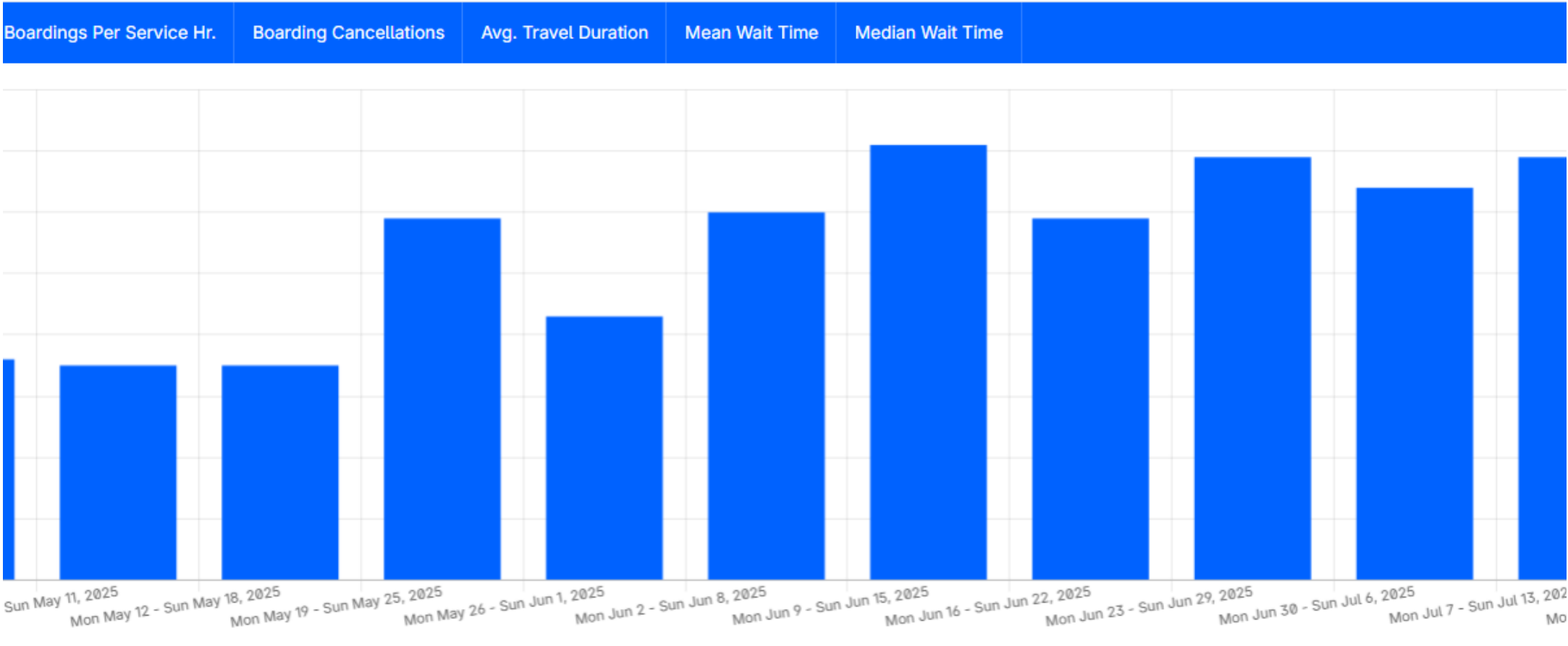
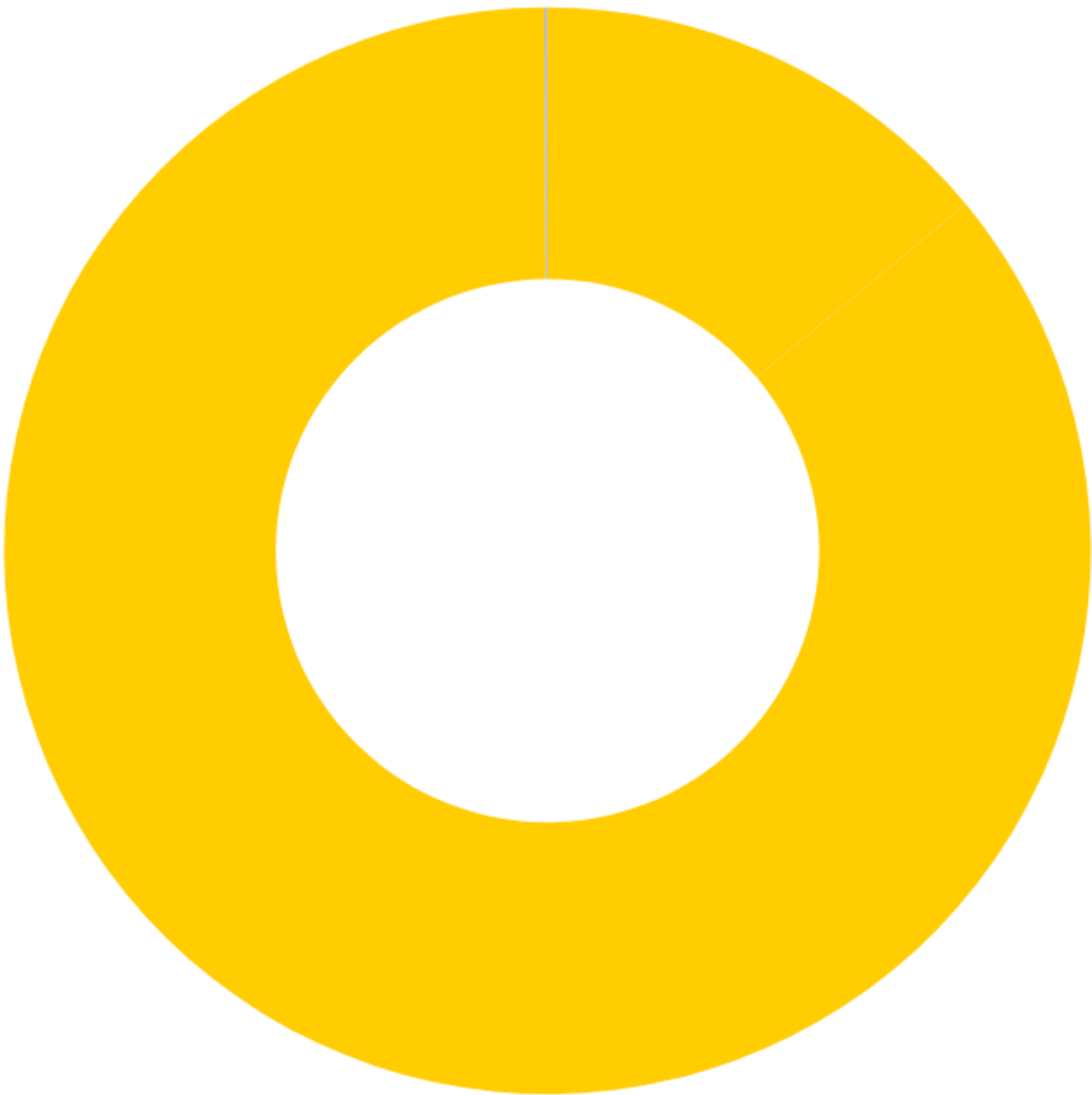


# How's it going?



# On-Demand Research Park/Medical Center North Liberty

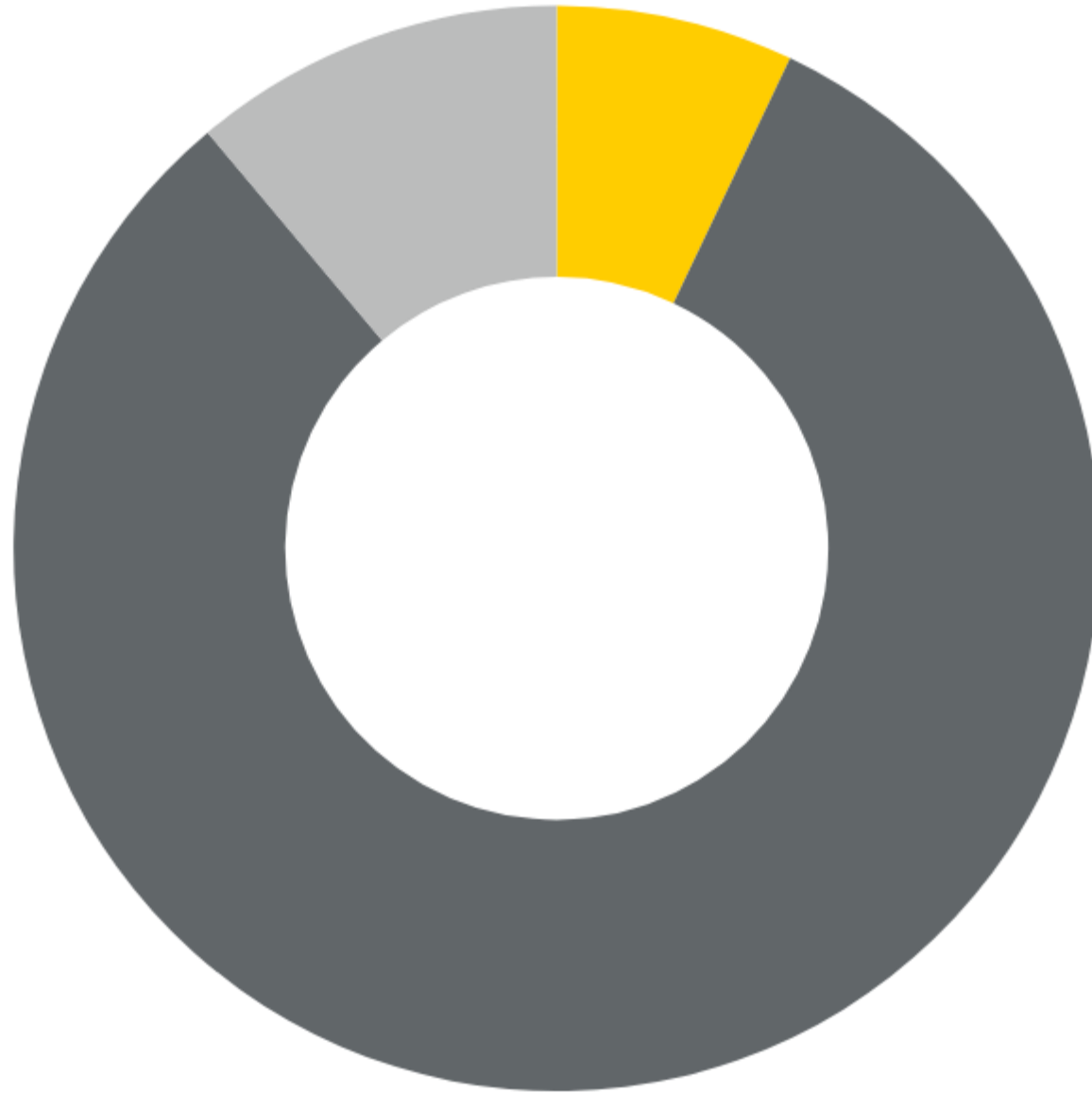
- Launched April 28, 2025
- Connect Health Care main campus with Medical Center North Liberty



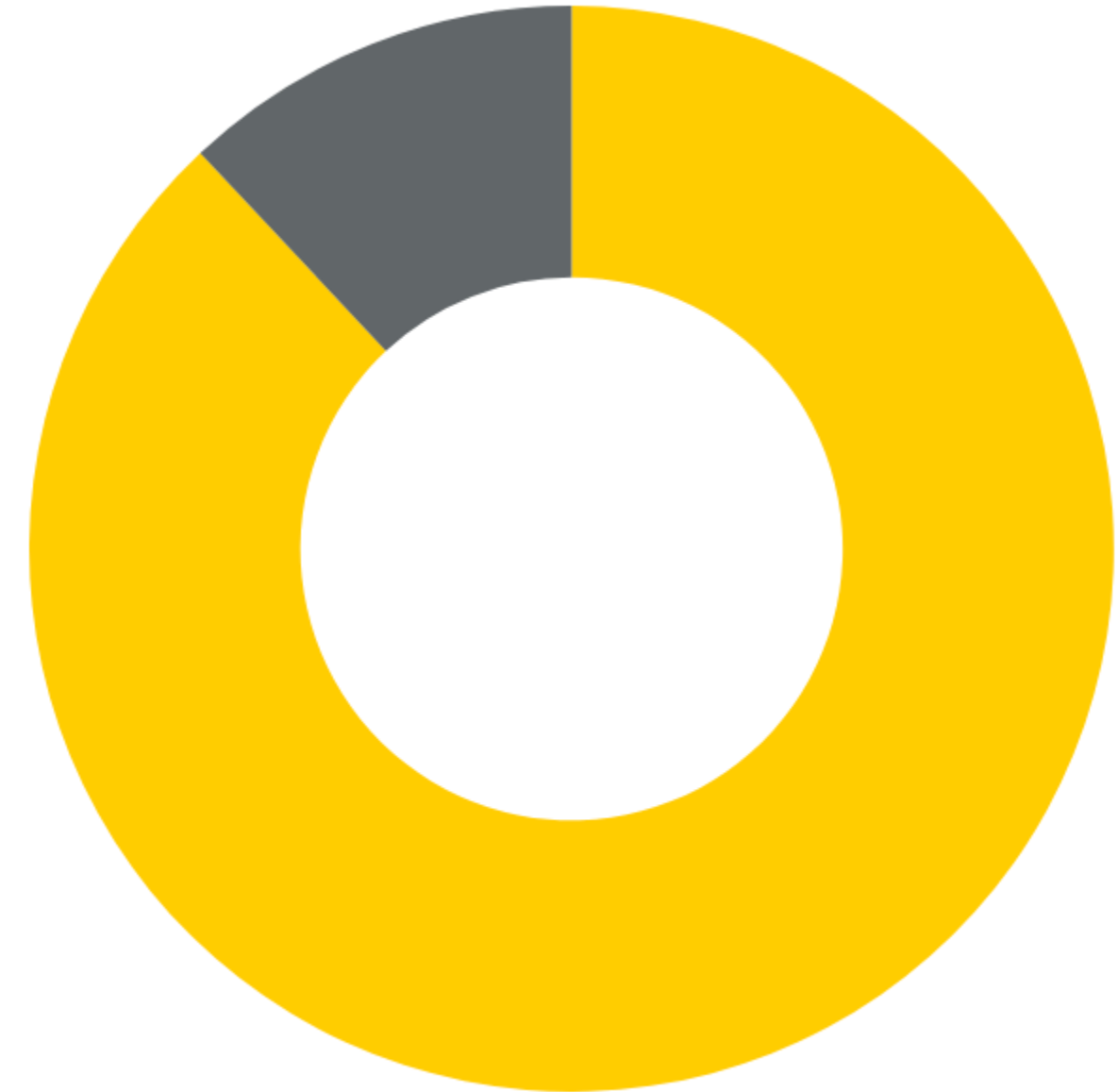


# How's it going?

● Admin/ Dispatcher   ● Mobile App   ● Walk-Up



● Admin. Dispatcher   ● Rider App



# Scheduling software

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- Positives

- Able to expand on-demand service offerings
- Created non-CDL driving position
- Increased ridership due to scheduling efficiencies
- Better access to data
- Better rider experience
- Reduced burden on dispatch team

## Challenges

- Exceptions to rules
- Fine-tuning preferences
- Manual intervention in schedules



# Scheduling software

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# Security camera upgrade

Launched since summer 2024

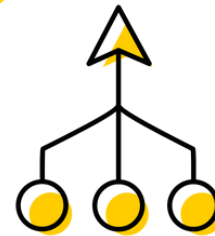


# Project background and goals

- Multiple camera systems across fleet (38 vehicles)
- Inefficient process for pulling, saving and viewing video
- Piloted Safety Vision equipment on two buses



Same camera system  
across fleet



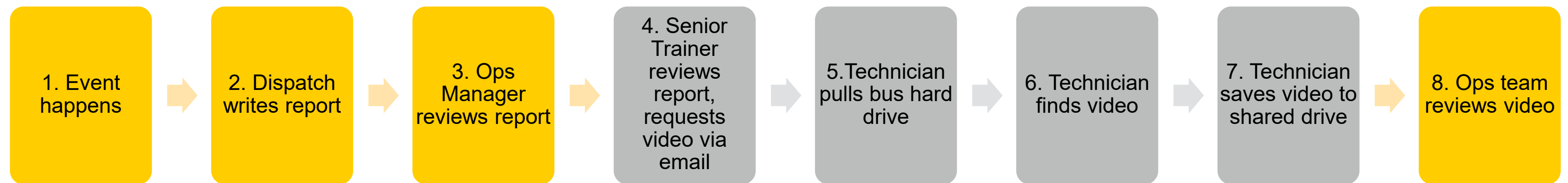
More efficient process for  
viewing video



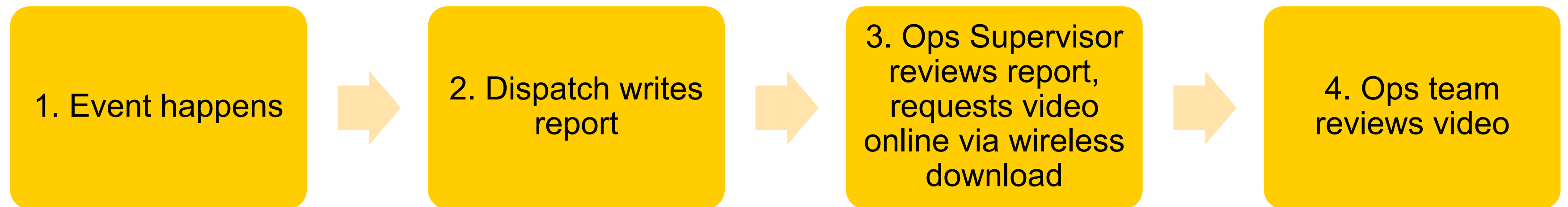
New camera  
technologies

# Safety Vision installation summer 2024

- Previous process for viewing bus video – 2-3 days



## New process for viewing bus video – within 24 hours





# Camera upgrade - results

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- Viewing video much sooner after an event
- Simplified process for providing video to external parties
- Did not enable live view-in
  - Ran into issue with onboard CradlePoint
- Video downloads when bus returns to garage
- Enabled more efficient process in verifying rider counts for Automatic Passenger Counters



# **Automatic Passenger Counters**

**Project execution phase since March 2025**



# Project background

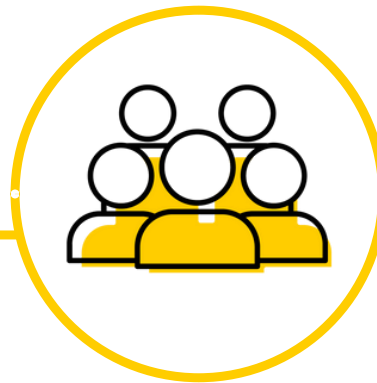
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- Currently drivers record boardings on our MDT
  - Boarding data is available in an online database and available for excel export
- Piloted APC's on two buses to:
  - Determine accuracy in APC counts versus driver counts
  - Determine overall accuracy of APC's
- Pilot results
  - APC's were >99% accurate when compared to video
  - Most drivers were undercounting passengers
    - Driver counts were 5%-15% off from APC and video counts

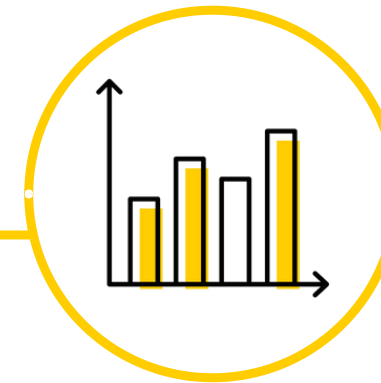
# Project goals



More accurate  
passenger counts for  
reporting



Alighting and crowding  
data



AVL integration, custom  
reporting

# Project execution

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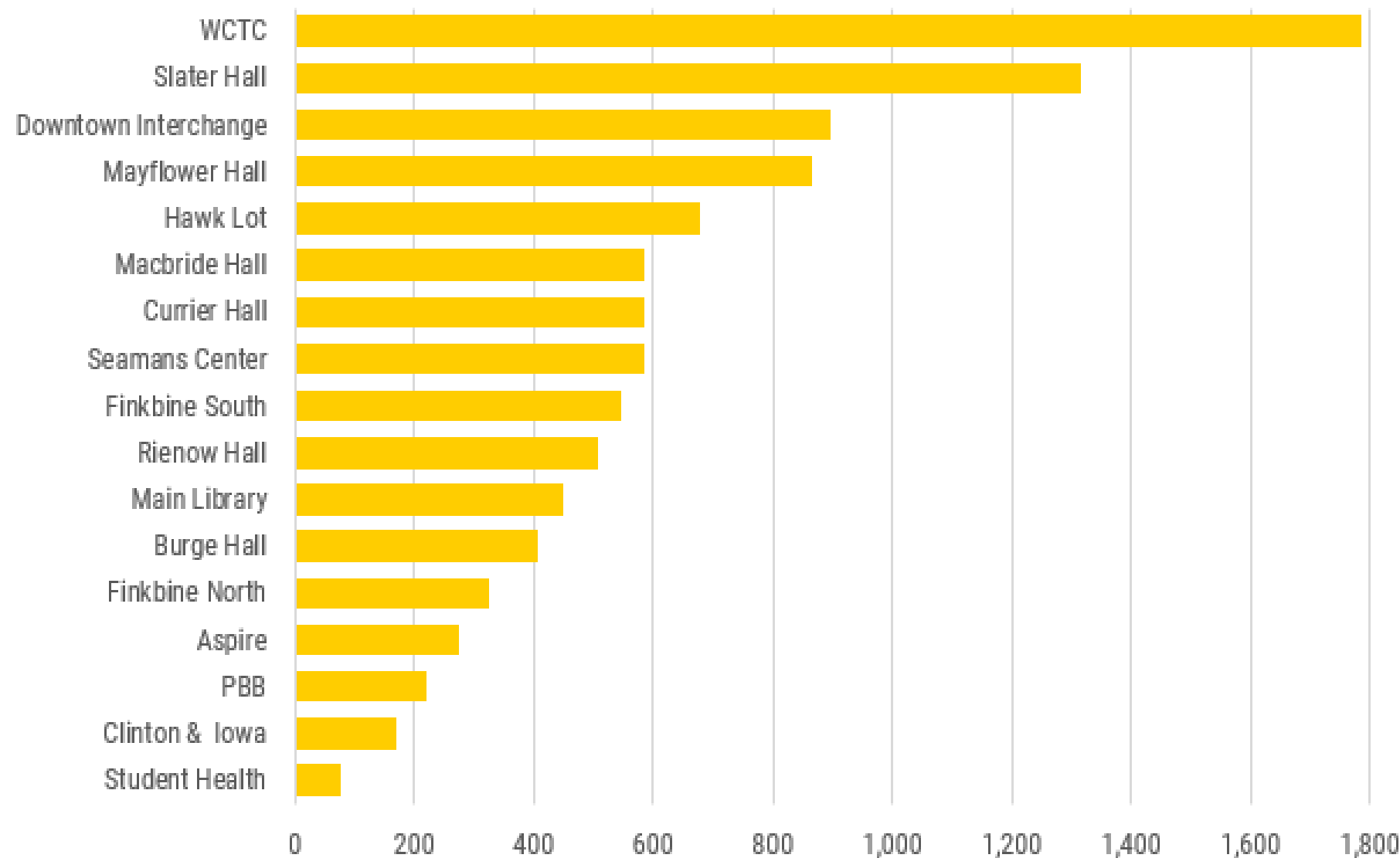
- Installation issue at back doors
- Working with UTA on APC verification and certification
- Longer than expected process
- Requirements:
  - Verify APC's across each type of bus



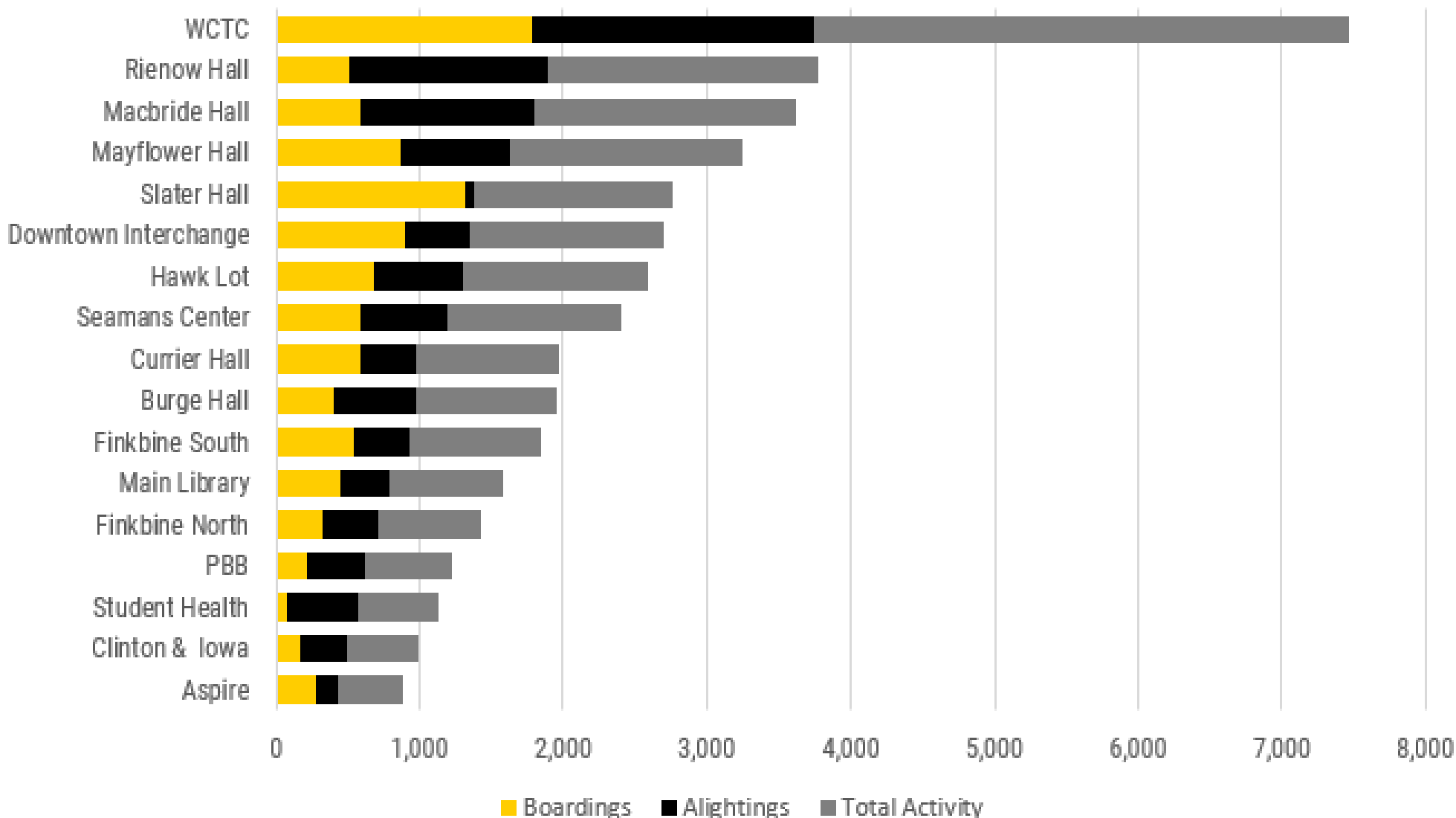


# New insights

Daily Boardings



Daily total stop activity





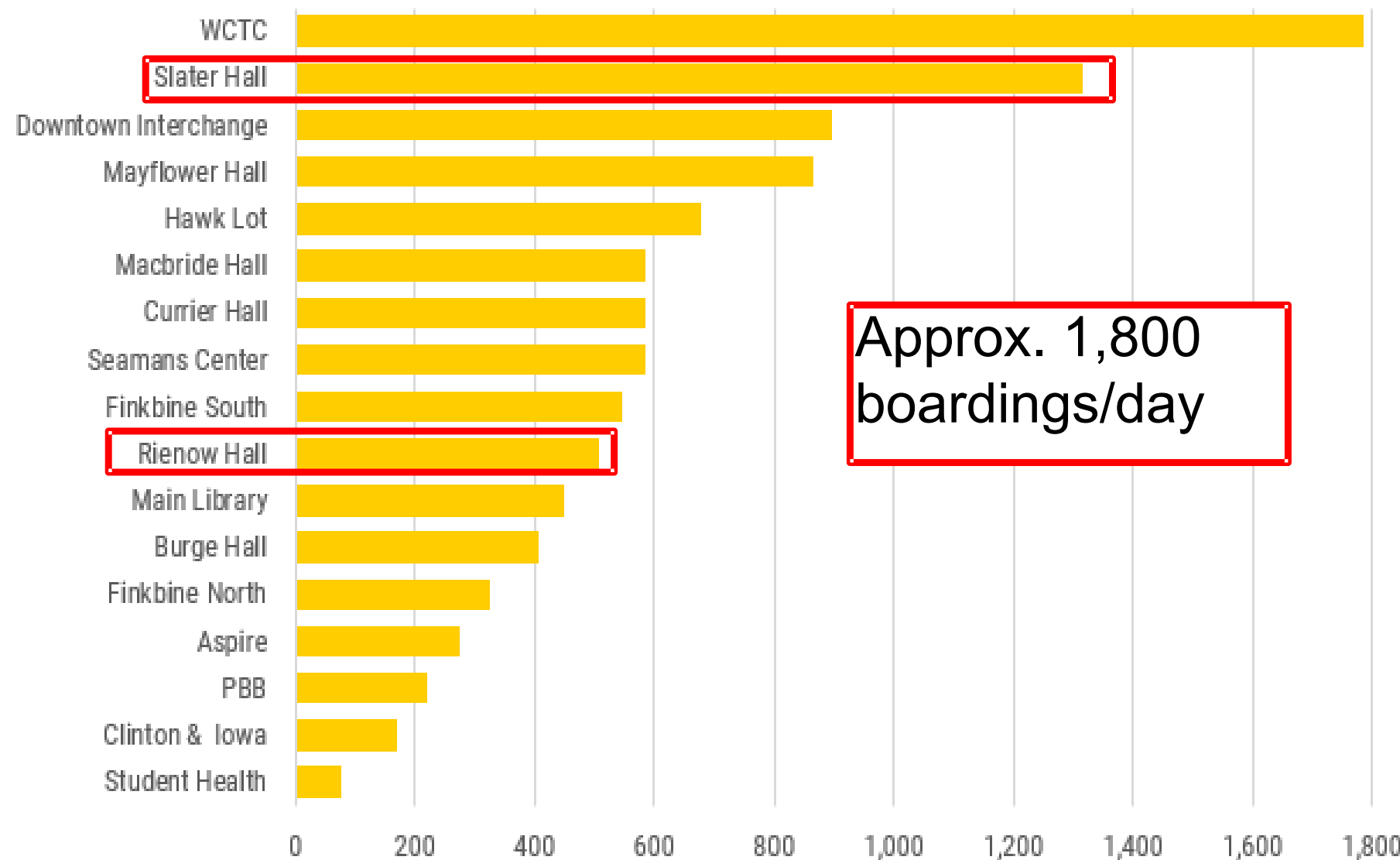
# Burlington Street Bridge replacement project - 2029



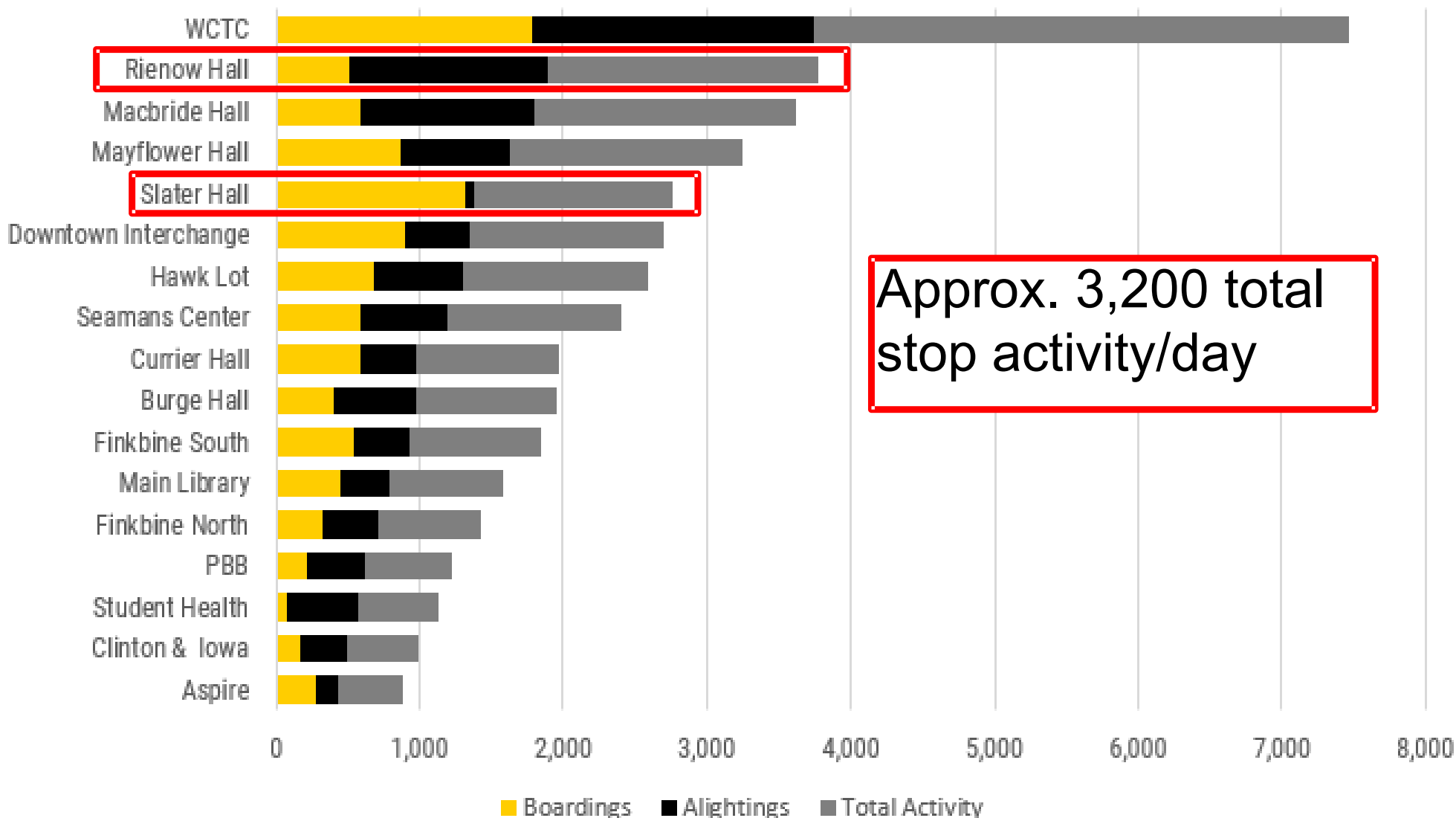


# New insights

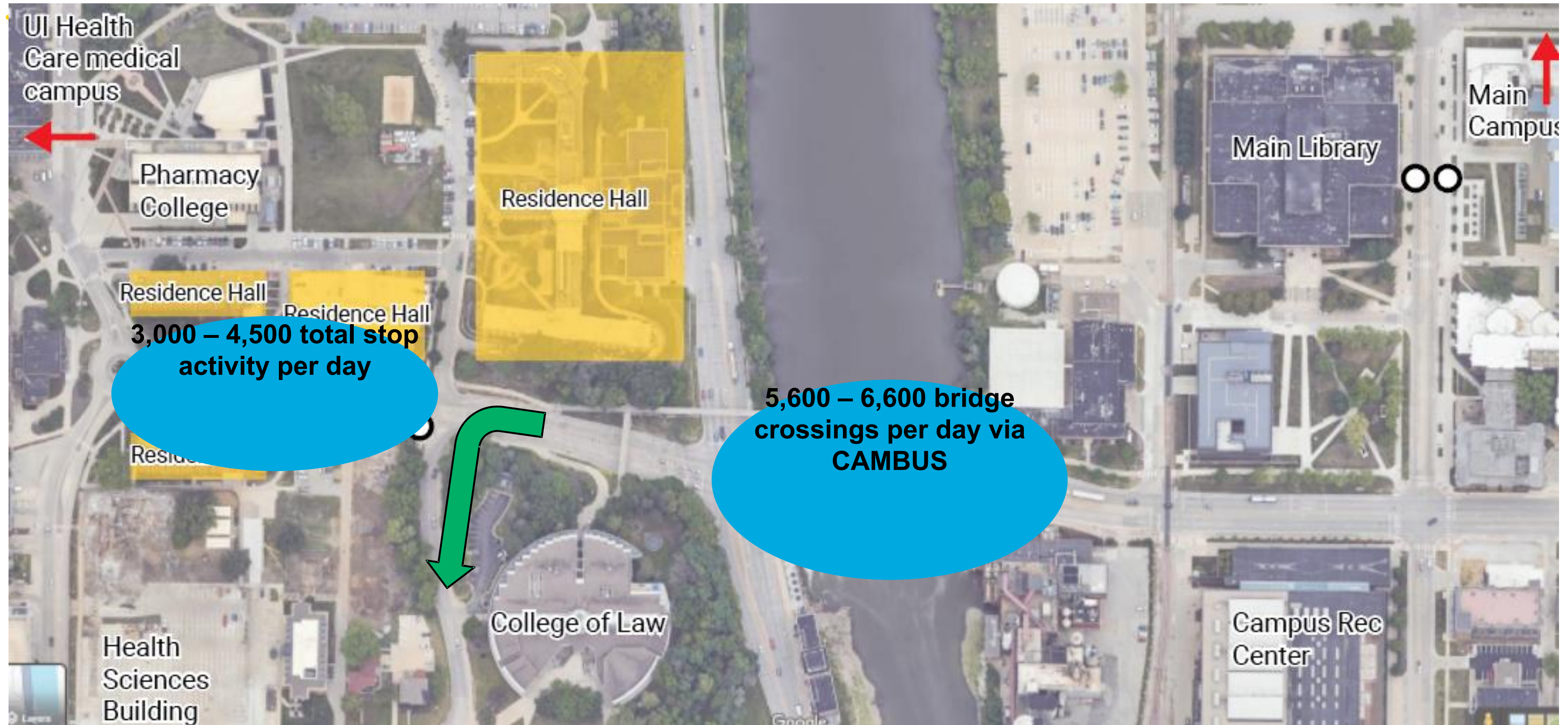
Daily Boardings



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# Burlington Street Bridge replacement project - 2029



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**IOWA**



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CARTER BALDWIN & DAWN ALAM  
“SCHEDULING SOFTWARE FOR RURAL  
AGENCIES”





Linn County LIFTS

Carter Baldwin  
Director





# Software History

- Reliability/technical support issues with previous scheduling software
- Issued an RFP
- Determined the vendor – **TripMaster by CTS Software**
- Signed a contract
- Transferred data
- Implemented off-site and on-site training
- Went live December 2023

# Transit Agencies Using TripMaster

Benton County Transportation

Jones County JETS

Iowa County Transportation

Washington County Mini Bus



# Software Features

- TripMaster by CTS Software
  - Cloud based data storage
  - Trip scheduler (automated and manual scheduling)
  - App for drivers on tablets
  - Pre and Post-Trip Inspections
    - Used for communication with mechanic
  - Trip Reminder/Where is my ride Module
  - Trip Portal Module
  - Trip Broker Integration Module
  - Vehicle Maintenance Management (service intervals)
  - Instant messaging to drivers

## Experience so far

- Very reliable
- Great customer service and technical support
- Easy to use
- Cloud based software
- Ongoing software updates and improvements
- Report format can be difficult to sort





# Lessons learned.

- Right size the software to operations and find a software that can grow with you.
- All software has limitations.
- Transferring data and making sure it is updated/correct takes a lot time and resources internally.
- On-site training is very valuable.
- Staff are skeptical and change is hard, be patient.

## Contact Information

Carter Baldwin

Linn County LIFTS


[Carter.Baldwin@linncountyiowa.gov](mailto:Carter.Baldwin@linncountyiowa.gov)

319-892-5171



# LIFTS





# Scheduling Software for Rural Agencies – Adopting Automated Scheduling



# johnson county seats stats

- 550 trips per weekday
- 10% Rural
- 80% ADA Paratransit
- 70% Subscription
- 17 - 10 hour routes, 10 - 5 to 8 hour routes, and have 3-4 dispatch/schedulers per weekday.

# the problem

- Our software was very unstable and had stalled on product development. Support was not helpful.
- We couldn't seem to staff enough schedulers to meet demand. Call volume was very high, with agencies calling in dozens of rides at once. Computer scheduling was not working, so over 150 trips per day were manually scheduled.
- We had an app for trip management, but it was unintuitive, had limited features, and didn't allow agencies to manage multiple riders' trips.



# the solution

New software with a focus on:  
Online trip management portal,  
that would interface directly  
with the software and work for  
agencies and riders.

A scheduling engine that was  
configurable to meet our needs,  
with the hope of automating  
scheduling.







## our software

about a year ago, we implemented Novus, a Trip Spark product. We picked the product because it met the reporting needs of our commingled service, allowed for online trip management for both riders and agencies, and it had a robust and flexible scheduling engine.

# how it's going.....

- It was a rough transition, but one year in we are happy with where we are. We continue to learn and tweak settings to optimize the scheduling.
- Subscriptions are permanently set on a route.
- We 'batch' schedule all of our demand trip requests in two steps: rural rides are batched onto lower capacity vehicles, then we batch everything else. This takes under 5 minutes.
- When batching, we allow the system to change scheduled times as long as it's within the window, but do not allow rides to be moved to other routes.
- The system schedules about 95% of rides.
- Schedulers then go through the schedules and fine tune them. On average, they re-schedule about 5% of trips.





# benefits

## Customer Experience

Our riders and agencies appreciate being able to manage rides online. There is heavy utilization of trip notifications that let riders know their window and bus ETA.

We have more time for those who need it most.

## Efficiency

Our cost per trip is 3% lower

Trips per hour have increased by 8%

Reduction of one scheduling staff per weekday

## Staff Morale

If you ask them, they'll tell you the computer isn't perfect...it does some wonky stuff... but if you also ask them if they want to go back to how it was before, they'll tell you absolutely not. Using their knowledge to finesse routes and to work with passengers who need extra help has had a positive effect on their overall work experience.



# lessons learned


Vendors will push you to fully automate everything. Use a software that allows you to automate in a way that works for your agency; it doesn't have to be all or nothing.

Lean on Support. If they aren't helpful, they aren't the right company for you.

Garbage in, Garbage out. Make sure your data is in a format that will work in your new system.

Make sure everything is set up and working before going live; if it isn't....postpone.

Change is hard and staff are our biggest asset, use what they know, and ask for and incorporate feedback.



Arrogance is thinking something  
is perfect after the first draft.  
Humility is knowing there is always room  
for improvement.

-Simon Sinek



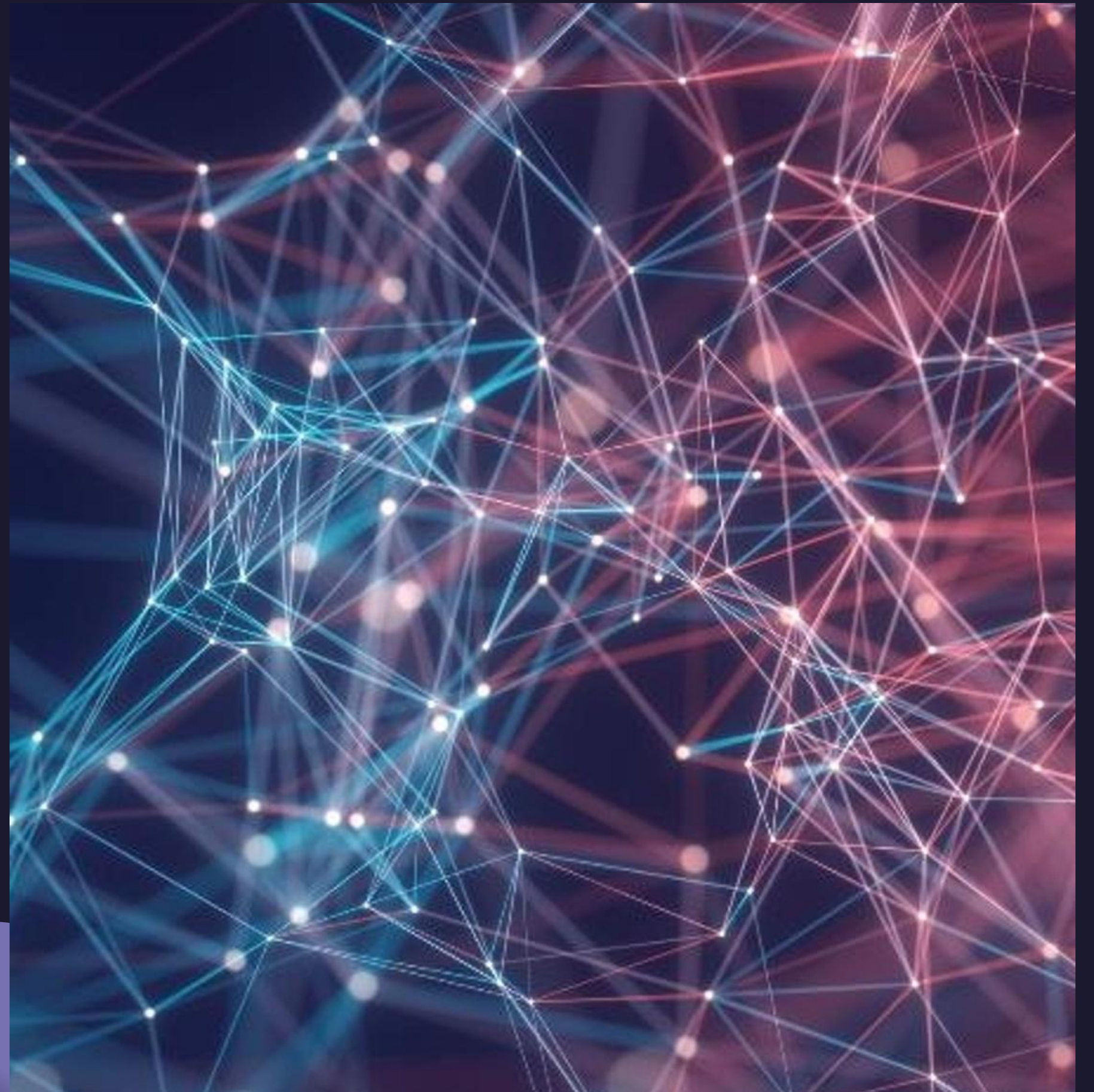
# Thank you

Dawn Alam

Director of Transportation and Fleet  
Johnson County, Iowa

319-688-5939

[dalam@johnsoncountyiowa.gov](mailto:dalam@johnsoncountyiowa.gov)







*PLEASE WELCOME:*

JASON ALLEN

“TRANSITIONING TO NEW TECHNOLOGY -  
WHAT I LEARNED”



# “Transitioning to new technology - What I learned”

Jason Allen  
Transit Operations Manager  
Sioux City Transit System





# CHALLENGES FOR INNOVATION IN PUBLIC TRANSPORTATION



FUNDING



INFRASTRUCTURE



REGULATIONS



USER  
ACCEPTANCE



INTEGRATION



DATA PRIVACY

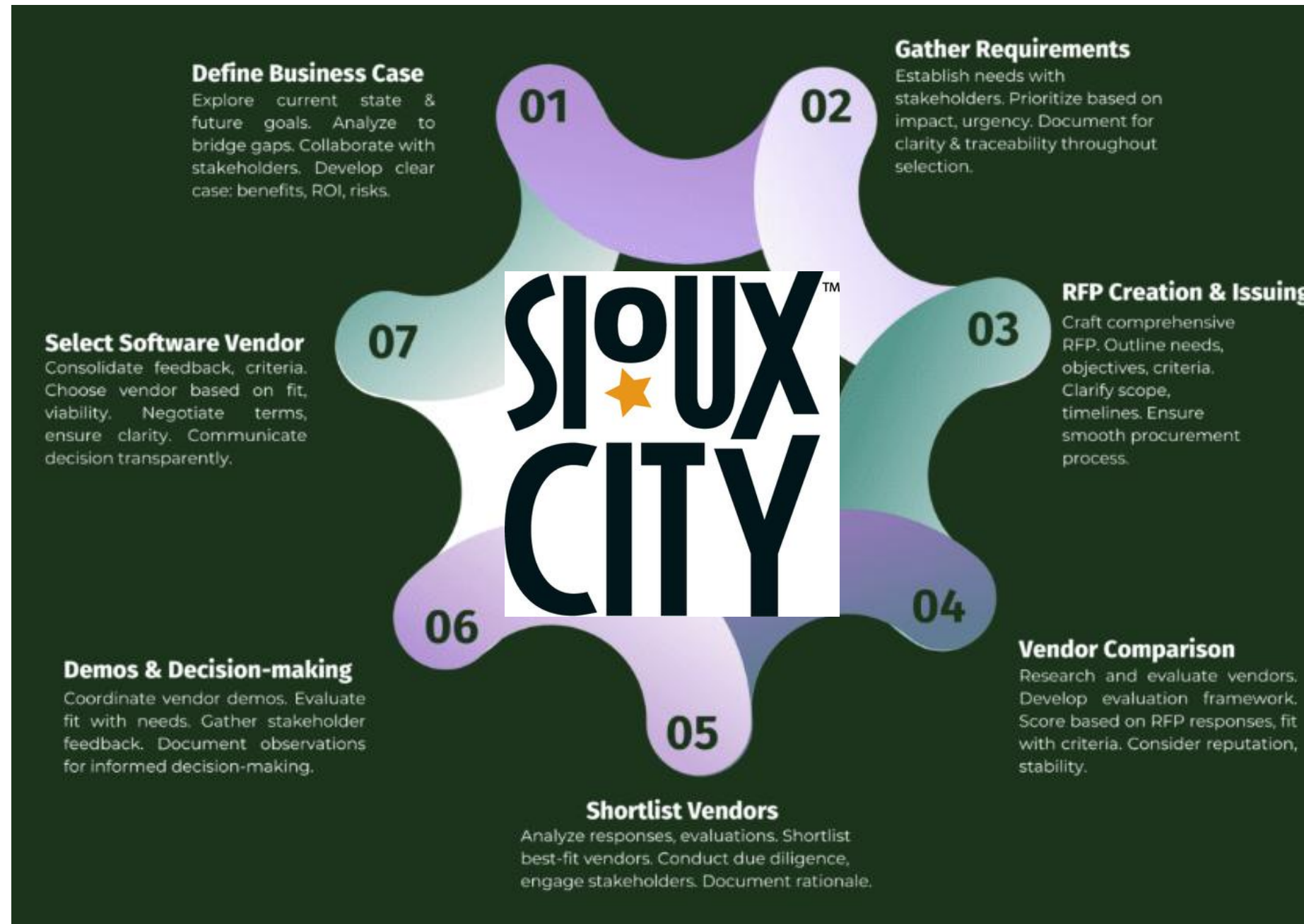


EQUITY

SOURCE-Ceder (2004)



# RFP Process



- What, if any, previous relationships (integrations) with other vendors
- Seek solutions for your same type/size agency
- Unintended consequences (new tasks, fear of change, and more time at the fare box)
- What's the most important outcome for your agency?
- Support after the sale-who is the POC?

# REAL-TIME INFORMATION

## ADVANTAGES

1. Improved passenger experience
2. Increased efficiency
3. Reduced uncertainty
4. Improved accessibility

## DISADVANTAGES

1. Technical issues
2. Implementation costs
3. Security concerns
4. Accessibility barriers







# INTEGRATED FARE SYSTEMS

## ADVANTAGES

1. Convenience
2. Cost savings
3. Increased ridership
4. Improved data collection

## DISADVANTAGES

1. Implementation costs
2. Technical challenges
3. Equity concerns
4. Privacy concerns

SOURCE- Lusikka et al.(2019)



# CONTACTLESS PAYMENT SYSTEMS

## ADVANTAGES

1. Convenience
2. Faster boarding times
3. Reduced cash handling costs
4. Improved data collection

## DISADVANTAGES

1. Limited access
2. Potential for fraud
3. Infrastructure requirements
4. Potential for technical difficulties



SOURCE- Lusikka et al.(2019)

# “Transitioning to new technology - What I learned” Summary

- It always takes twice as long, is twice as expensive, and you are not the exception
- Facts are your friend; Salesmen not so much
- Peer agencies are a great resource for information as they are probably already using the technology you are interested in
- **People, Process, Service**-People (your team and customer base), Process (the systems and procedures in place to adopt new technology), and Service (what your agency offers). The order is not arbitrary; it highlights the importance of people first, followed by establishing efficient processes, and then ensuring a more relevant and desirable service.



# References

Public transport innovation  
platform boosting Intelligent  
Transport System value chains

Lusikka et al. (2019)

The paper discusses the use of open innovation platforms in public transport to create more value through collaboration and presents a new added value description, the "Value Ramp," for testing and development of ITS in a real operating environment.

New Urban Public Transportation  
Systems: Initiatives, Effectiveness,  
and Challenges

Ceder (2004)

- Auckland, a sizable New Zealand city that is dealing with worsening traffic congestion and pollution.
- Auckland develop a combination of rail and tube systems throughout time, together with feeder and distributor bus lines.







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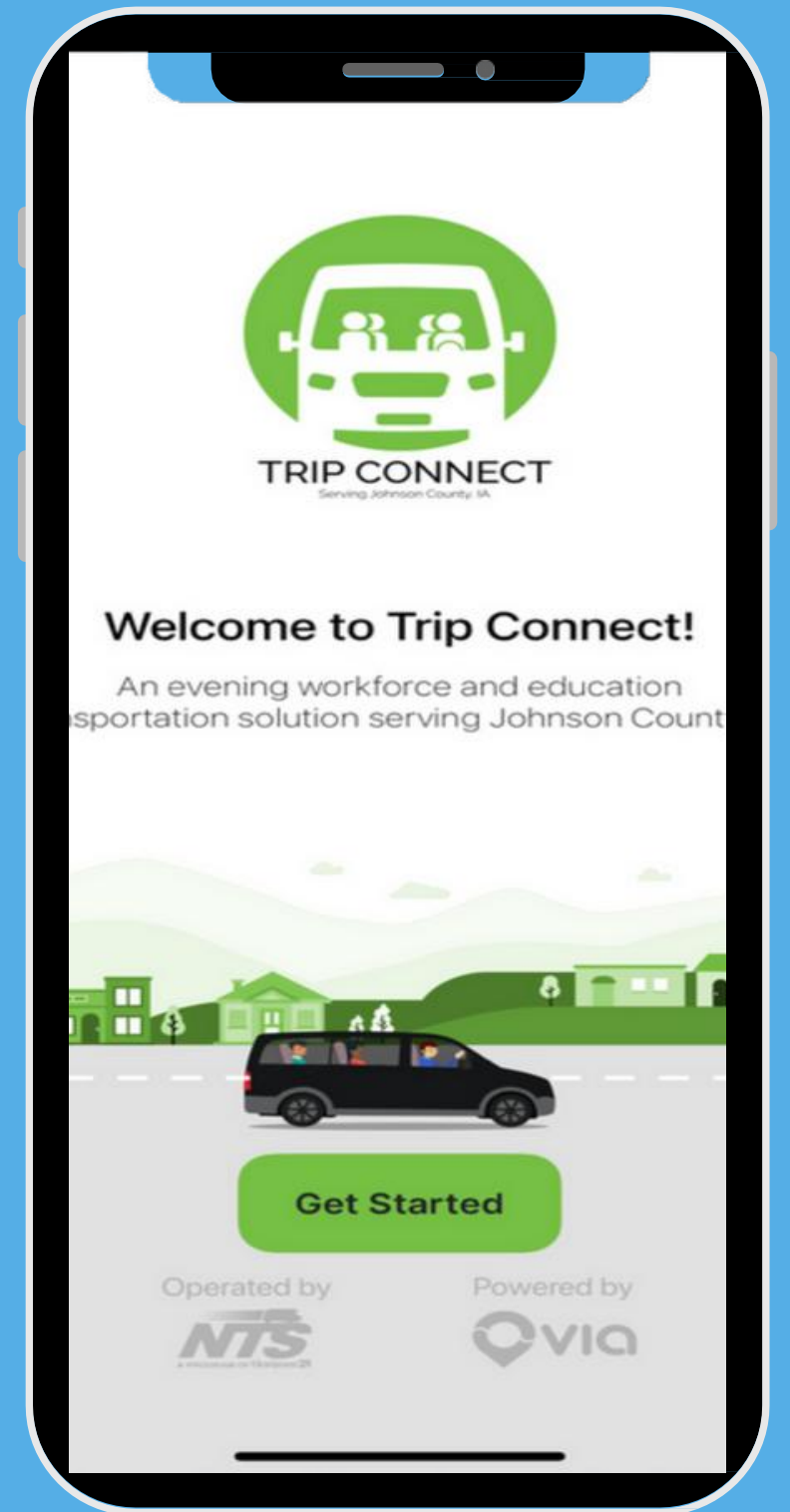
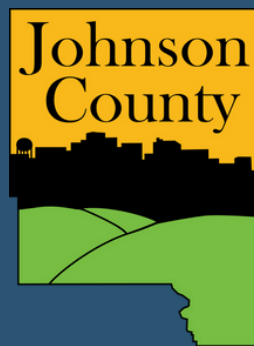
KELLY SCHNEIDER

“TRIP CONNECT”

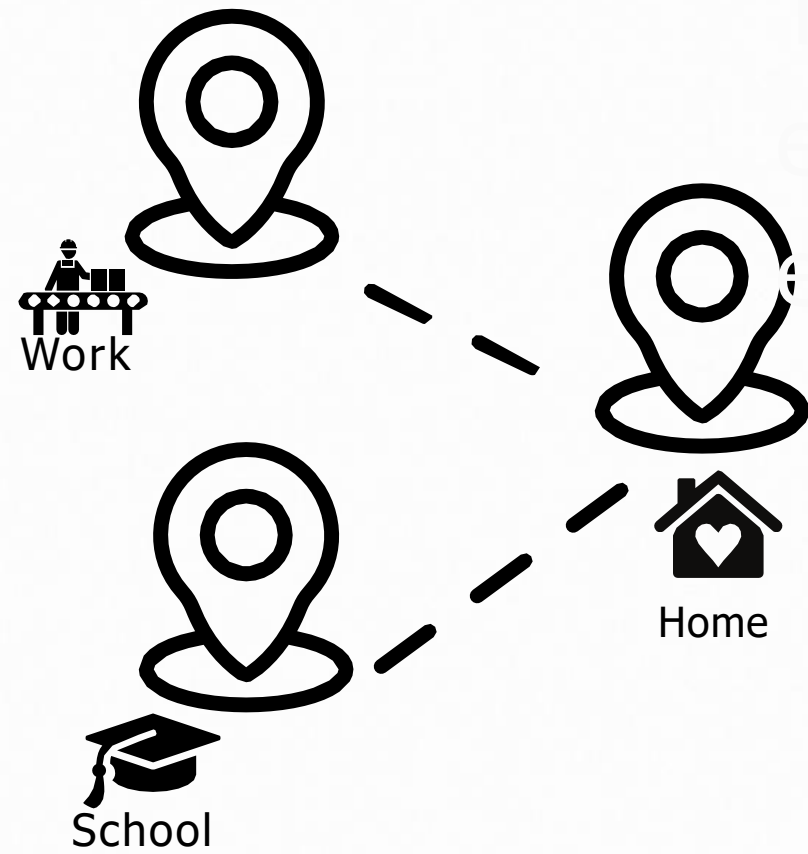


# Trip Connect

Peers Discussion on Technology in  
Transit Systems







Trip Connect provides shared curbside rides to:

- Employment
- Education
- Child care
- Home

#### Service Details:

- \$2.00 per ride

- 5pm - 12am Sunday - Monday

- Rides can be booked 1 hr to 7 days in advance

- Service area includes city limits of Coralville, Iowa City, North Liberty, Tiffin, University Heights, and all parts of Johnson County North of I-80

- Operated by NTS Horizons

- Rides are booked and paid for on Trip Connect app powered by VIA mobility or by contacting NTS Horizons

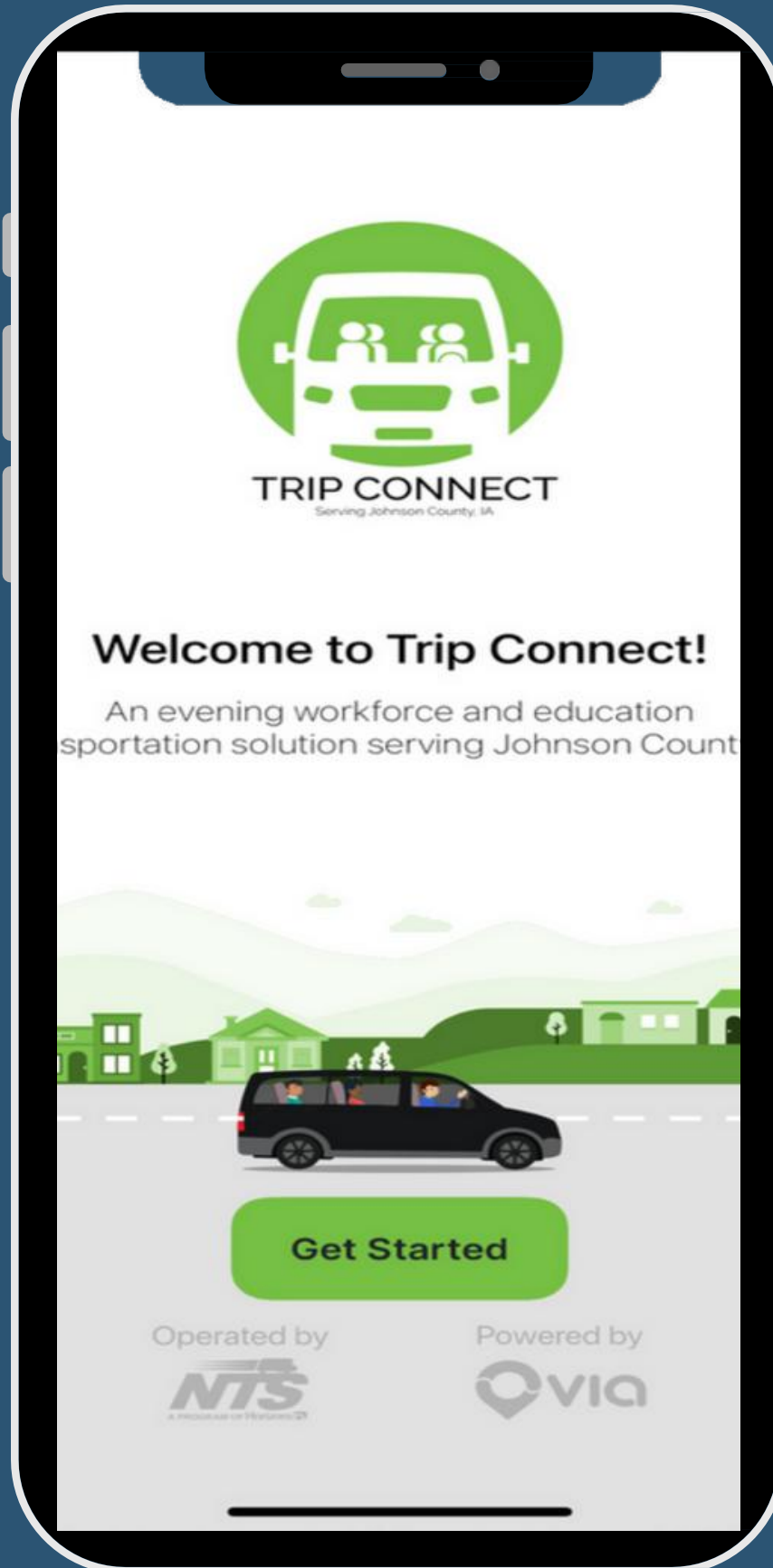




# Rider App



98.6 %  
of Trip  
Connect  
Rides are  
booked on  
app



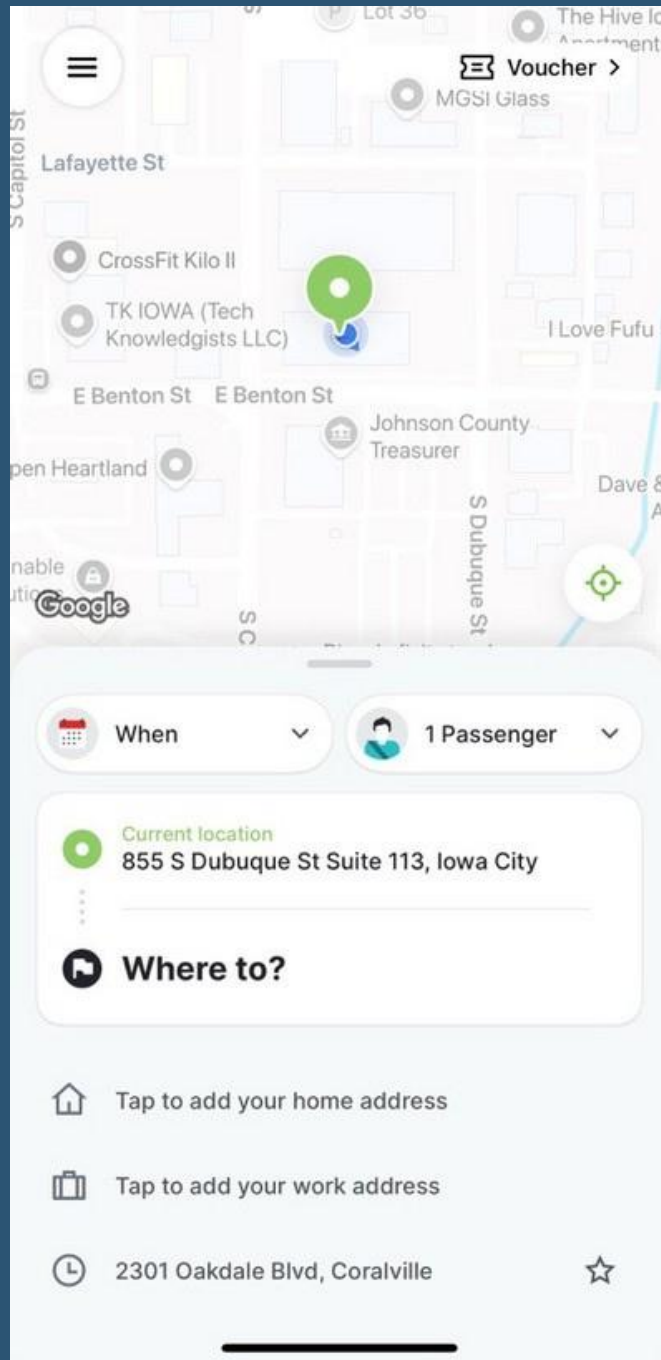
Set up  
profile:

- Phone Number
- Name
- Email

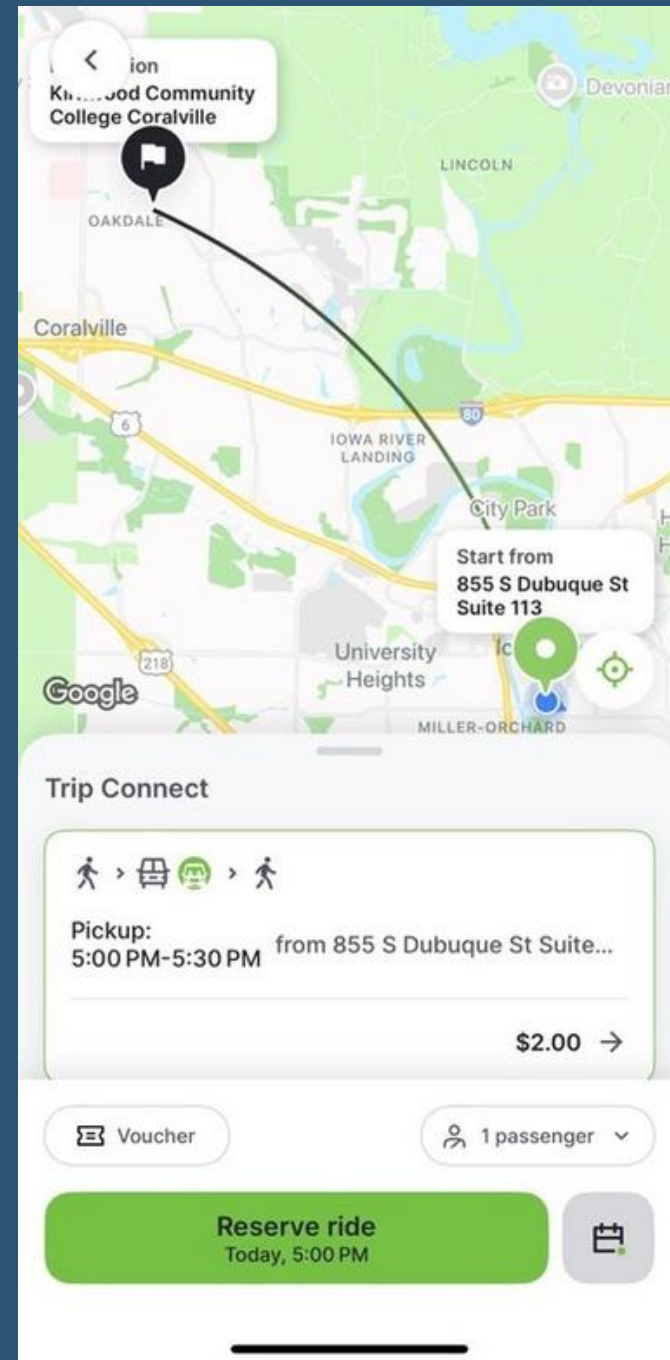
French  
Spanish

AVAILABLE

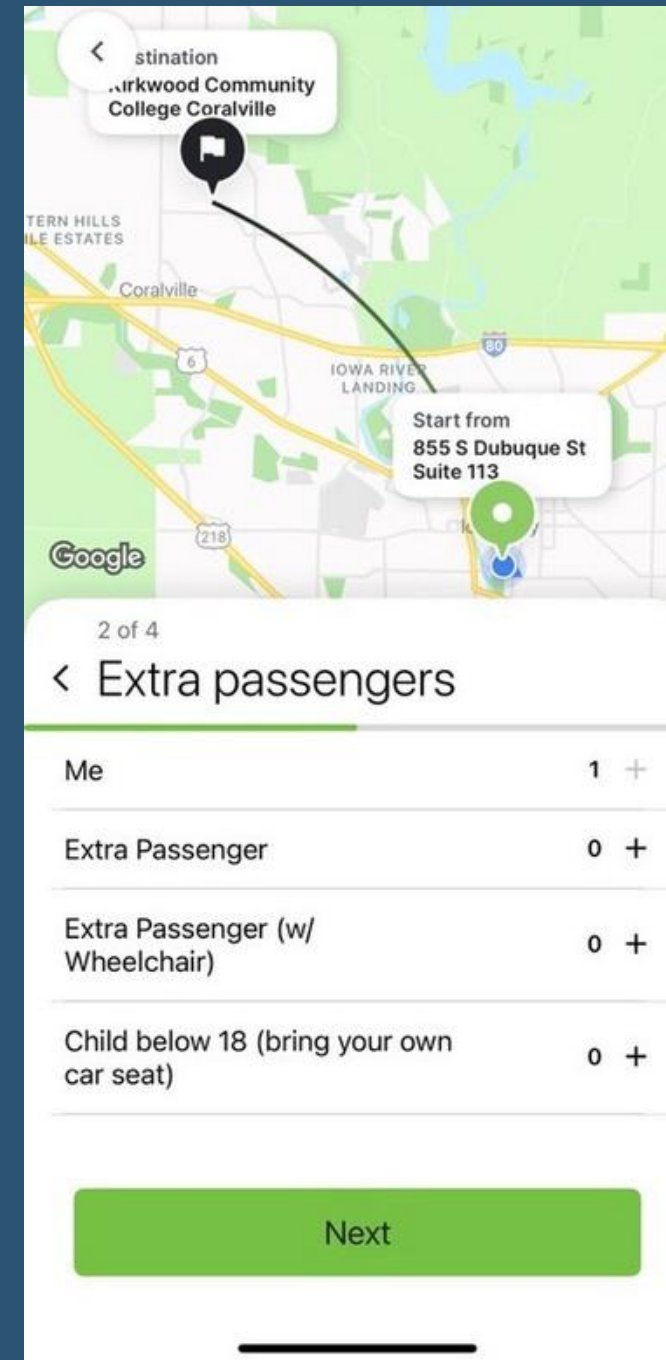
# Booking a Ride



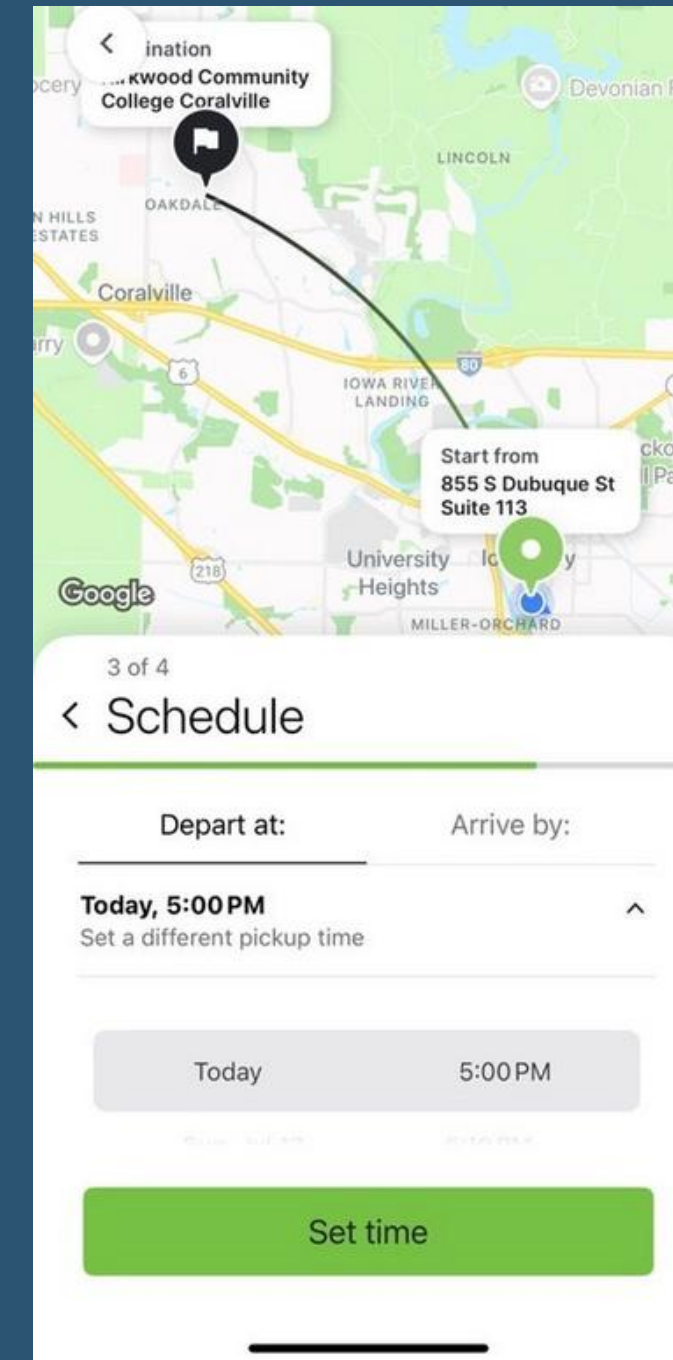
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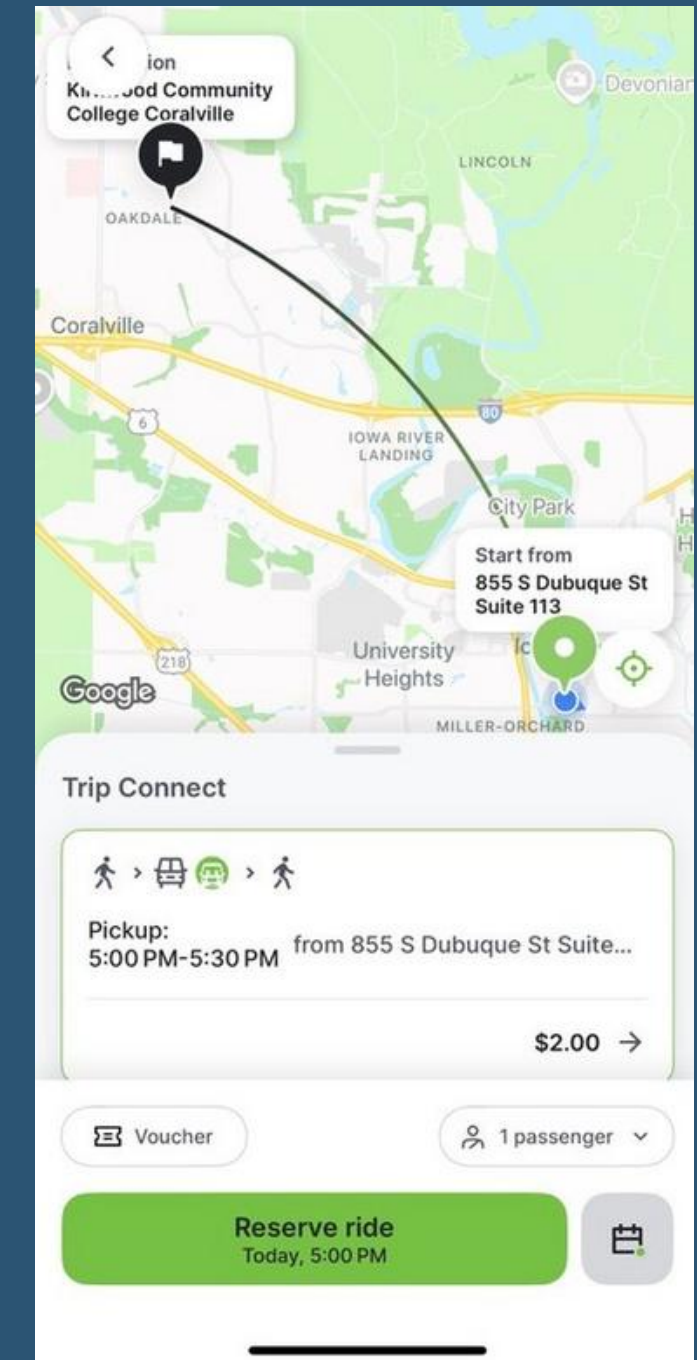
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3



4



5





# Operational Center

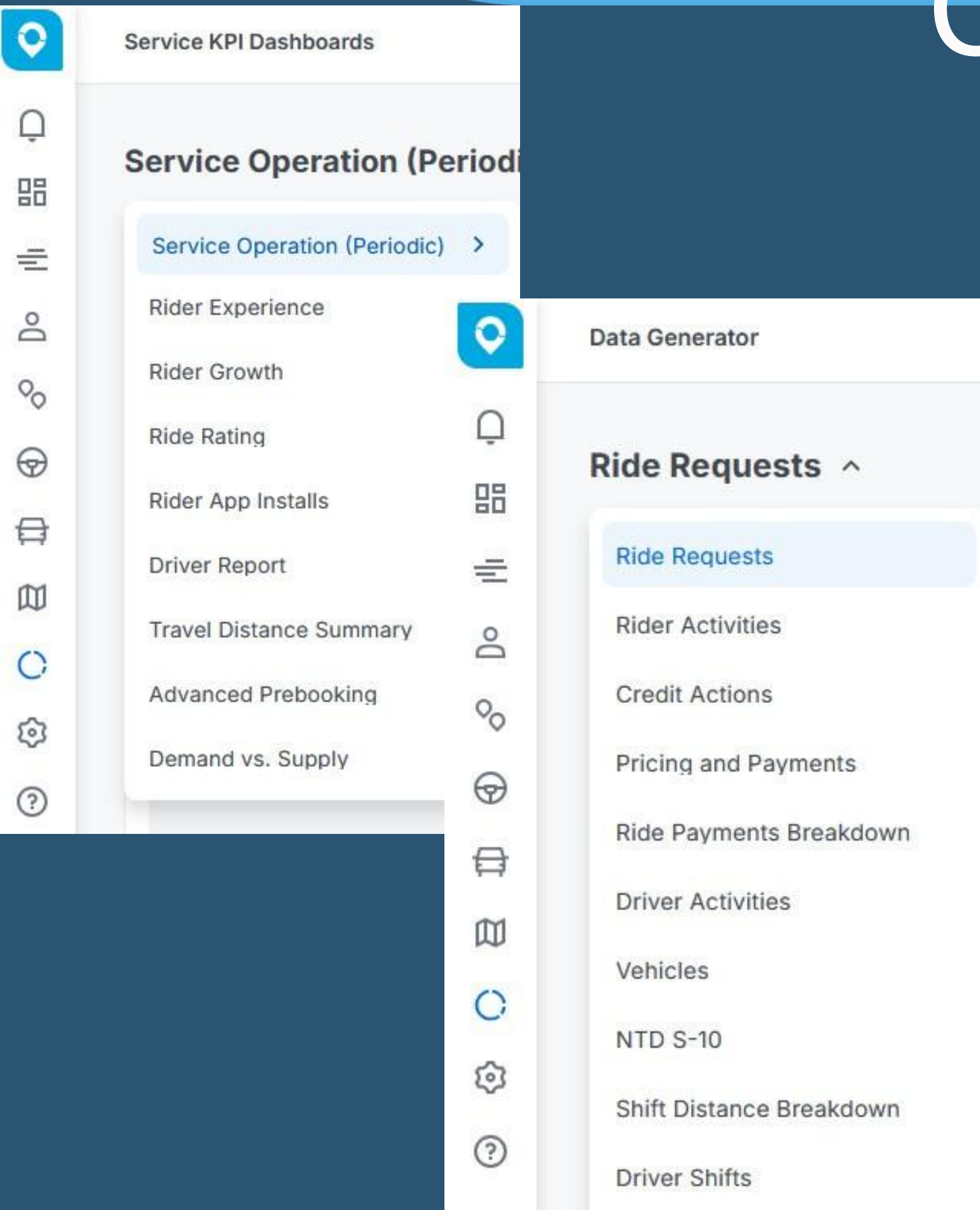
Benefits:

- easy access dashboard to view KPI's such as met demand, ride request, productivity, utilization, and geographical demand.

- easy access to ridership data, reports, rider profiles etc.

Challenges:

- varying addresses for the same location
- no direct access to Remix, planning software







319-363-1321

[www.horizonsfamily.org/tripconnect](http://www.horizonsfamily.org/tripconnect)



Kelly Schneider

319-356-6090

[kschneider@johnsoncountyiowa.gov](mailto:kschneider@johnsoncountyiowa.gov)



*NEXT UP:*

EXHIBITOR TRADE SHOW & RECEPTION

