



Transit Network Design and Service Tradeoffs Workshop

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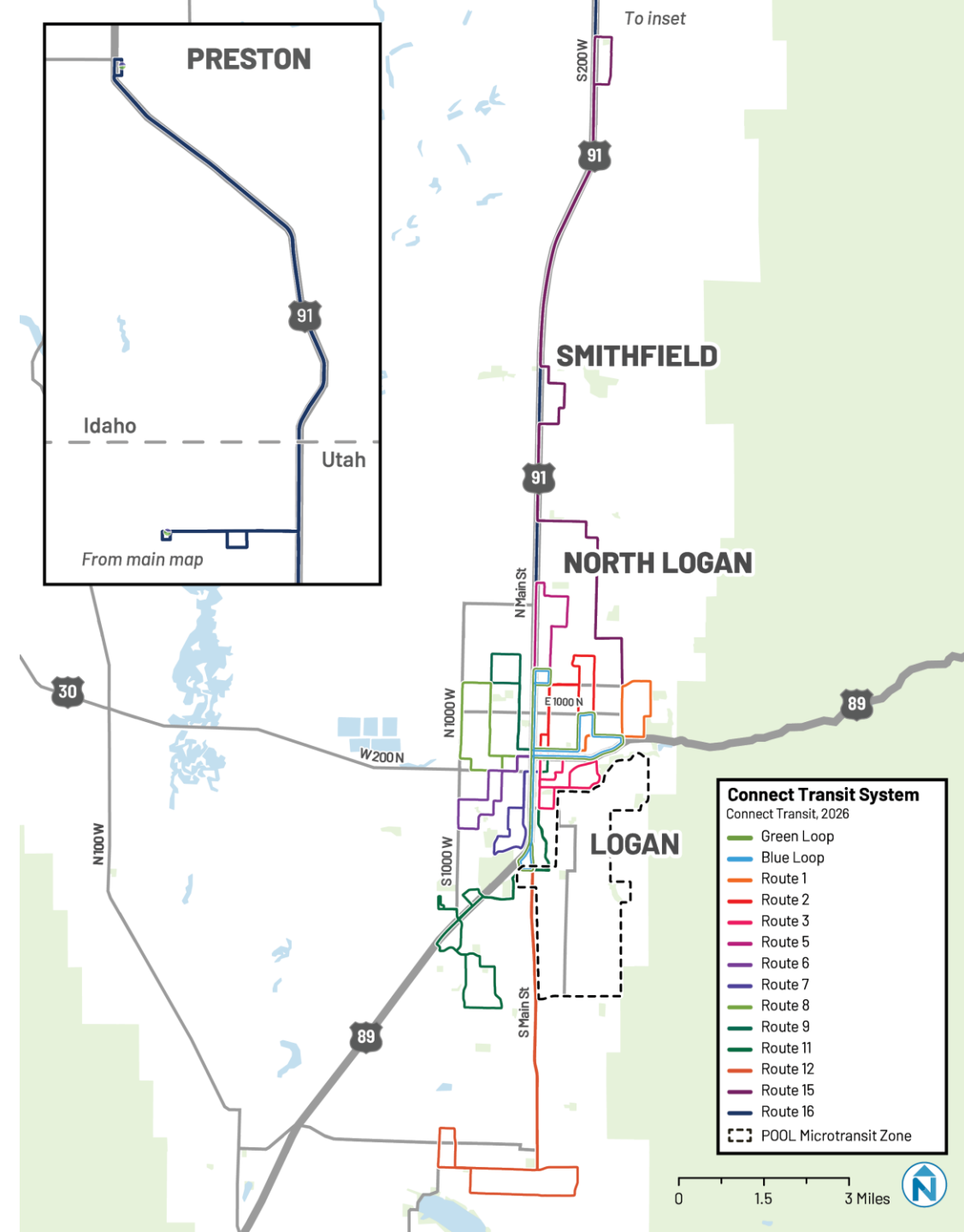
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Introduction

THOUGHTS ON CONNECT TRANSIT'S NETWORK

- Pulse-based, hub-and-spoke model
 - High frequency Loop routes
 - 30-minute core pulse route
 - Lower frequency commuter routes
- Ridership is driven by Loop Routes and Utah State University campus
- Bus route design
 - Several large one-way loops
 - Geographic coverage across service area
 - Frequent service along Main Street



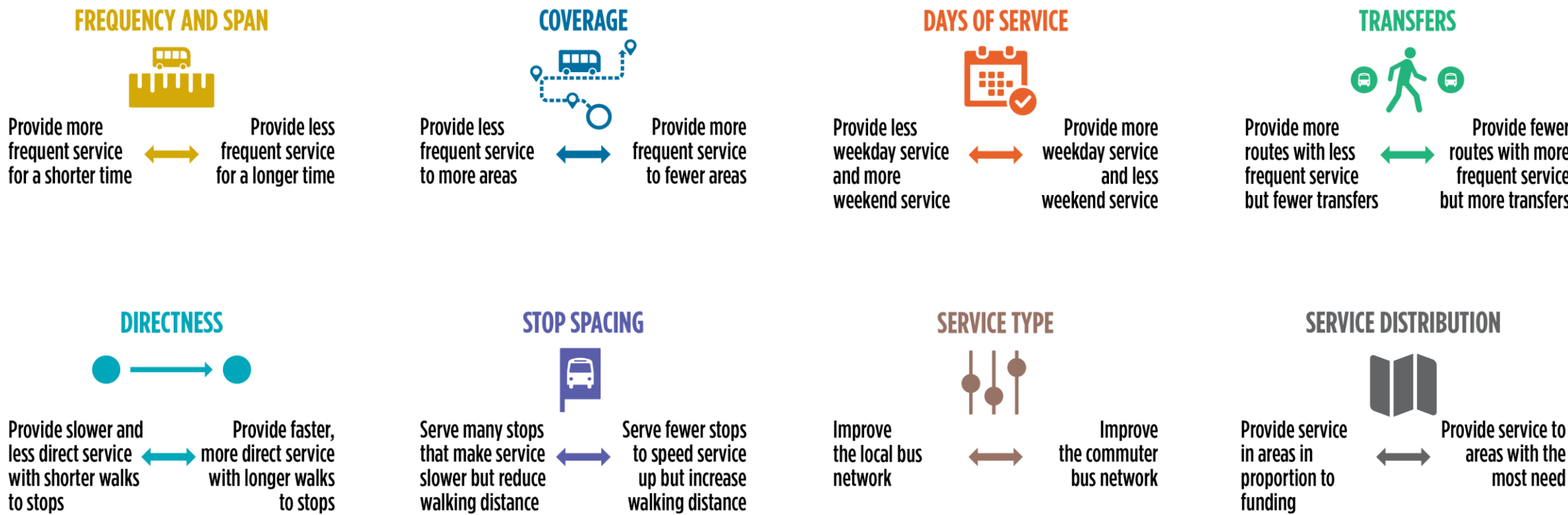
IMPORTANCE OF PRIORITIZATION FRAMEWORK

- Service planning is about tradeoffs
- If service is expanded, what are the priorities for investing those resources?
- Where are the right places to invest, what are the right markets to serve, and what does equitable investment look like?
- Prioritization Framework provides direction on everyday network design decisions
 - Planning for the long-term outcome to inform short-term decisions
 - Consistency in how decisions are applied to each route or community



Tradeoffs in Transit Planning

WHAT ARE THE REGION'S VALUES?



IMPORTANCE OF FREQUENCY

FREQUENCY AND SPAN



Provide more
frequent service
for a shorter time



Provide less
frequent service
for a longer time

- Wait less, travel conveniently
- Make connections **easily**
 - When the network is frequent, benefits are multiplied
- Trip security
 - Another bus is coming soon

Imagine if ...



You showed up for work, but the elevator
only came every 60 minutes

IMPORTANCE OF SPAN OF SERVICE

FREQUENCY AND SPAN



Provide more
frequent service
for a shorter time



Provide less
frequent service
for a longer time

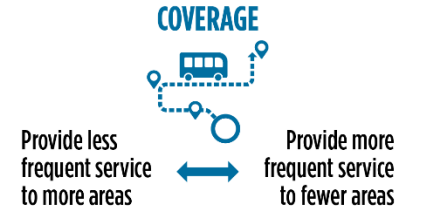
- Job market has expanded beyond standard 9 to 5 times
- Discretionary / non-work related trips are most often during non-peak times
- Longer span of service allows for more trip types to be served

Imagine if ...

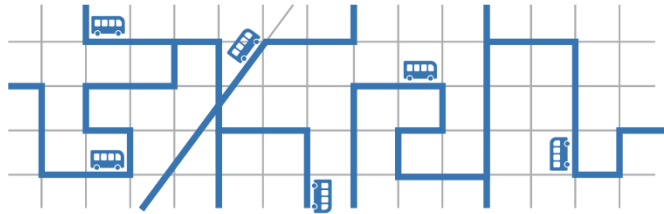


You showed up for work, but the elevator
only operated between 6 to 9 a.m.
and 3 to 6 p.m.

PRODUCTIVITY VS. COVERAGE TRADEOFF



COVERAGE

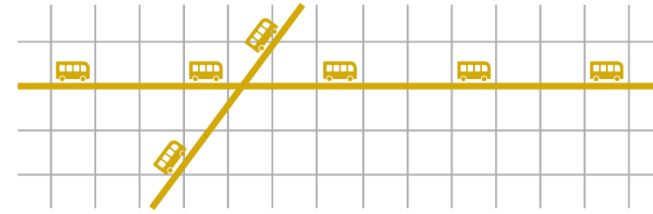


More people have **some** transit access

Ridership is **lower**...

... but really **important** for those who use it

FREQUENCY



More **trips** on transit!

Ridership is **higher**...

... but **no service** in many places

IMPORTANCE OF OPERATING MORE DAYS OF THE WEEK



Seven Day Focus

■ Positives

- Growing service industry job types are served
- Ability to live without a car is enhanced
- Mobility for people who rely on transit improves

■ Drawbacks

- Weekend service carries fewer people

Weekday Focus

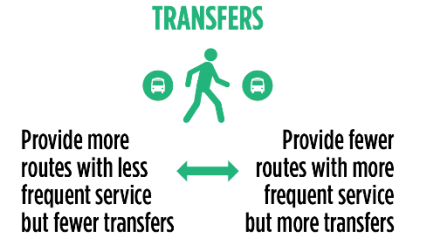
■ Positives

- Resources put where it carries the most passengers

■ Drawbacks

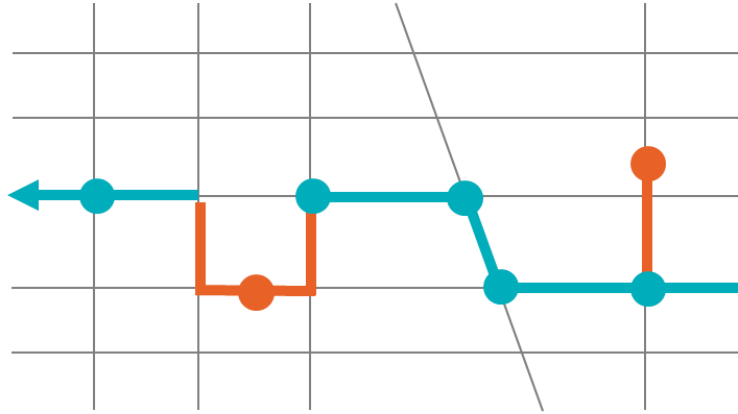
- Job access and overall mobility for unserved areas is diminished

IMPORTANCE OF TRANSFERS

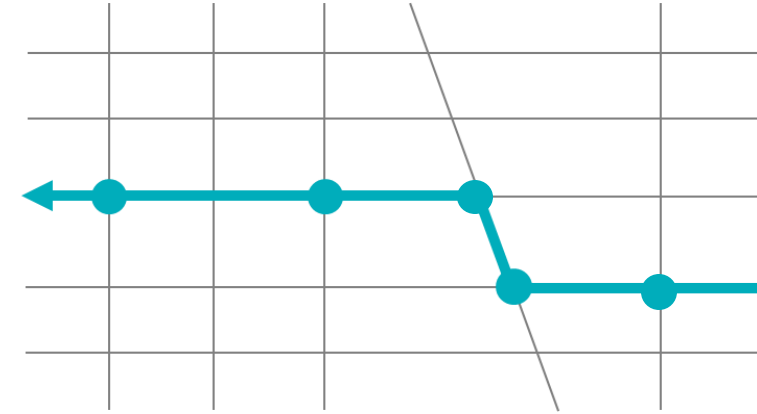


- Most trips within a metropolitan area cannot be served with a one seat ride
- Is it more important to try to serve trip patterns without transfers?
- **Considerations**
 - Customers tend to dislike transfers
 - Frequent service and good connections can reduce these perceptions
 - Greater emphasis on one-seat rides can lead to less frequent and lower utilized routes
 - Where is the balance?

IMPORTANCE OF ROUTE DIRECTNESS



OR



DIRECTNESS



Provide slower and less direct service with shorter walks to stops

**Provide faster,
more direct service
with longer walks
to stops**

- **Positives**
 - Shorter walks for percentage of riders
- **Drawbacks**
 - Slower travel times for most riders
 - Higher operating costs

- **Positives**
 - Faster travel times for most riders
 - Lower cost
- **Drawbacks**
 - Some people have to walk farther

IMPACT OF STOP SPACING ON SPEED

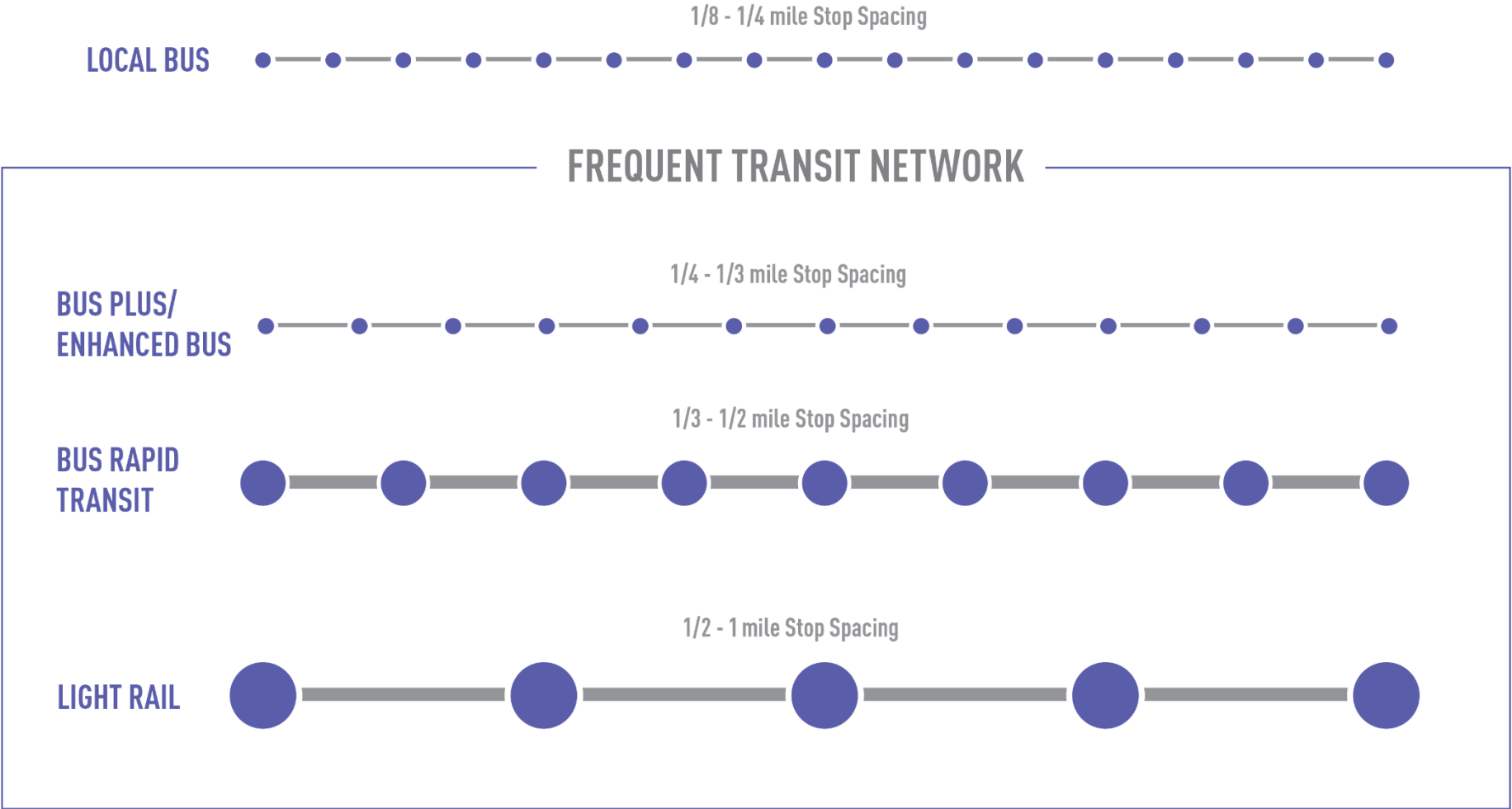
STOP SPACING



Serve many stops
that make service
slower but reduce
walking distance



Serve fewer stops
to speed service
up but increase
walking distance



IMPORTANCE OF SERVICE TYPES



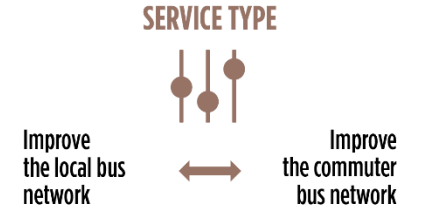
Local Services

- Serves all-day market with many trip purposes
- Higher ridership
- Lower operating and capital costs

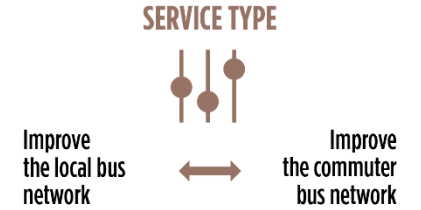


Commuter Services

- Takes people off the road at most congested times
- Attracts downtown employee market
- High operating cost
- High capital cost due to need for park-and-rides



IMPORTANCE OF SERVICE TYPES



Microtransit Services

- Serves all-day market with lower demand than fixed-route
- Lower ridership and operating costs
- Suited for low-density areas or testing new markets for transit



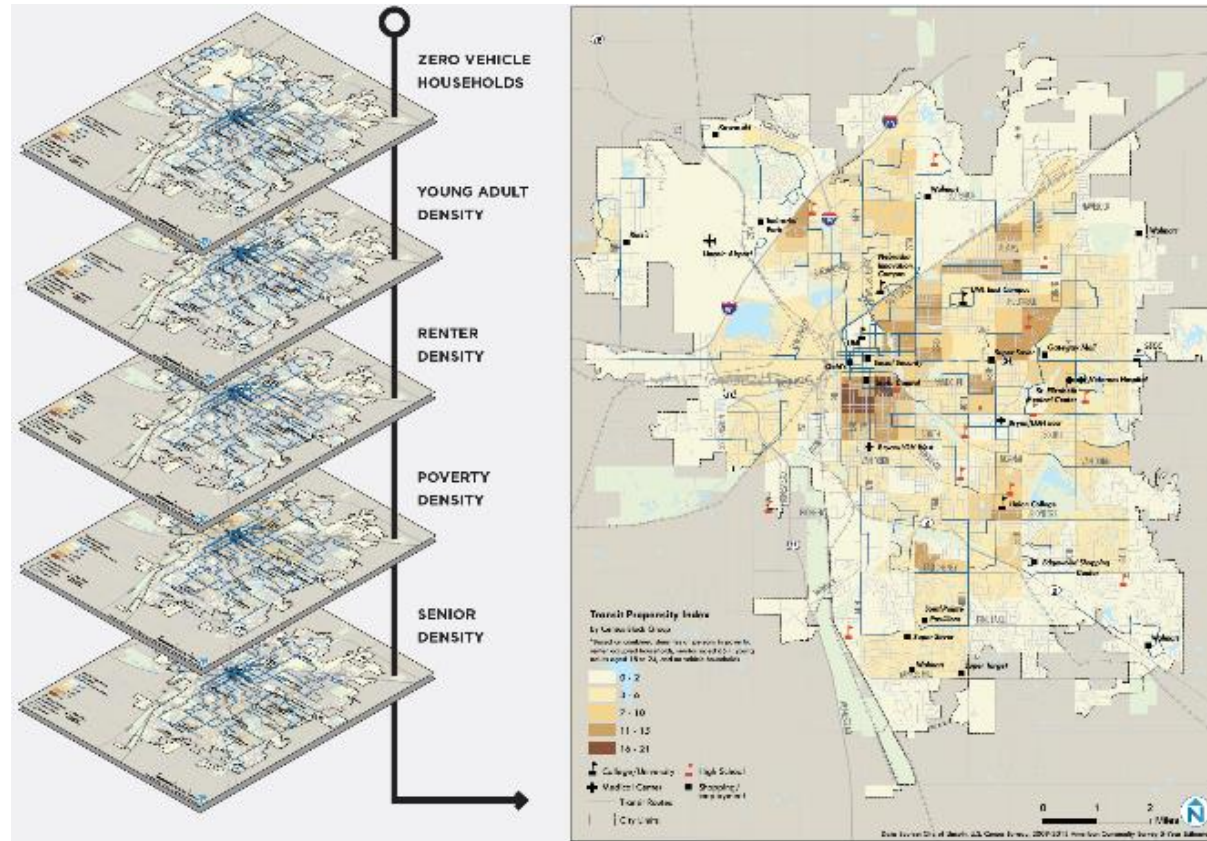
Considerations in Transit Planning

SOME POPULATIONS ARE MORE LIKELY TO USE TRANSIT

Groups More Likely to Rely on Public Transportation

■ Examples

- Zero/Low Vehicle
- Poverty
- Renters
- Young adults
- Seniors

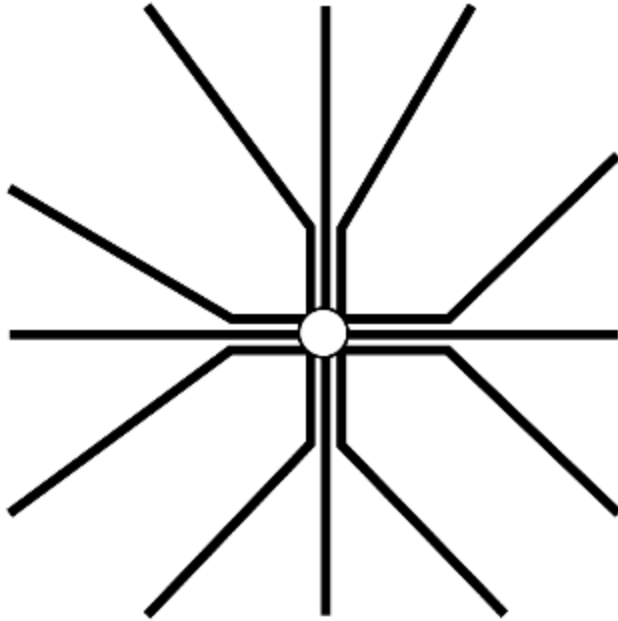


GUIDELINES FOR SERVICE



ARRANGING THE PIECES: NETWORKS

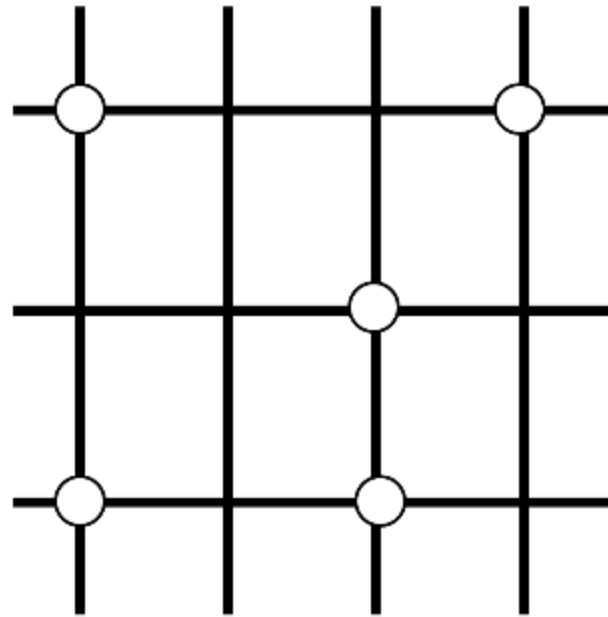
Radial (Hub and Spoke)



Commuter Oriented

Cost Effective

Grid

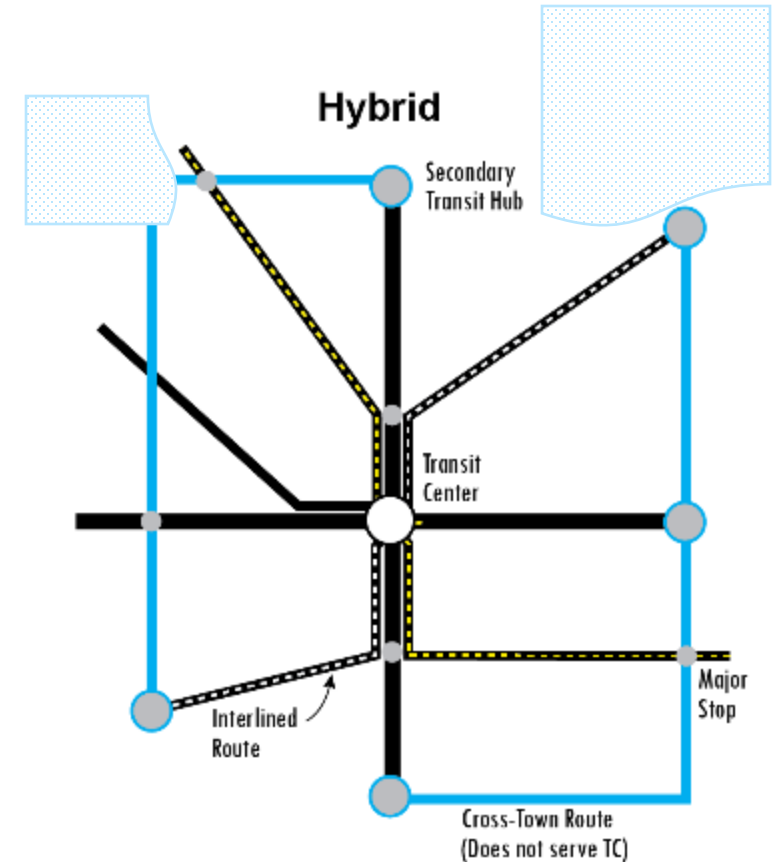


All Trip Types Served

Most Ridership

Highest Cost

Hybrid



Service Types Fitted to Market

Balance Cost and Productivity



Interactive Planning Game

INTERACTIVE PLANNING GAME

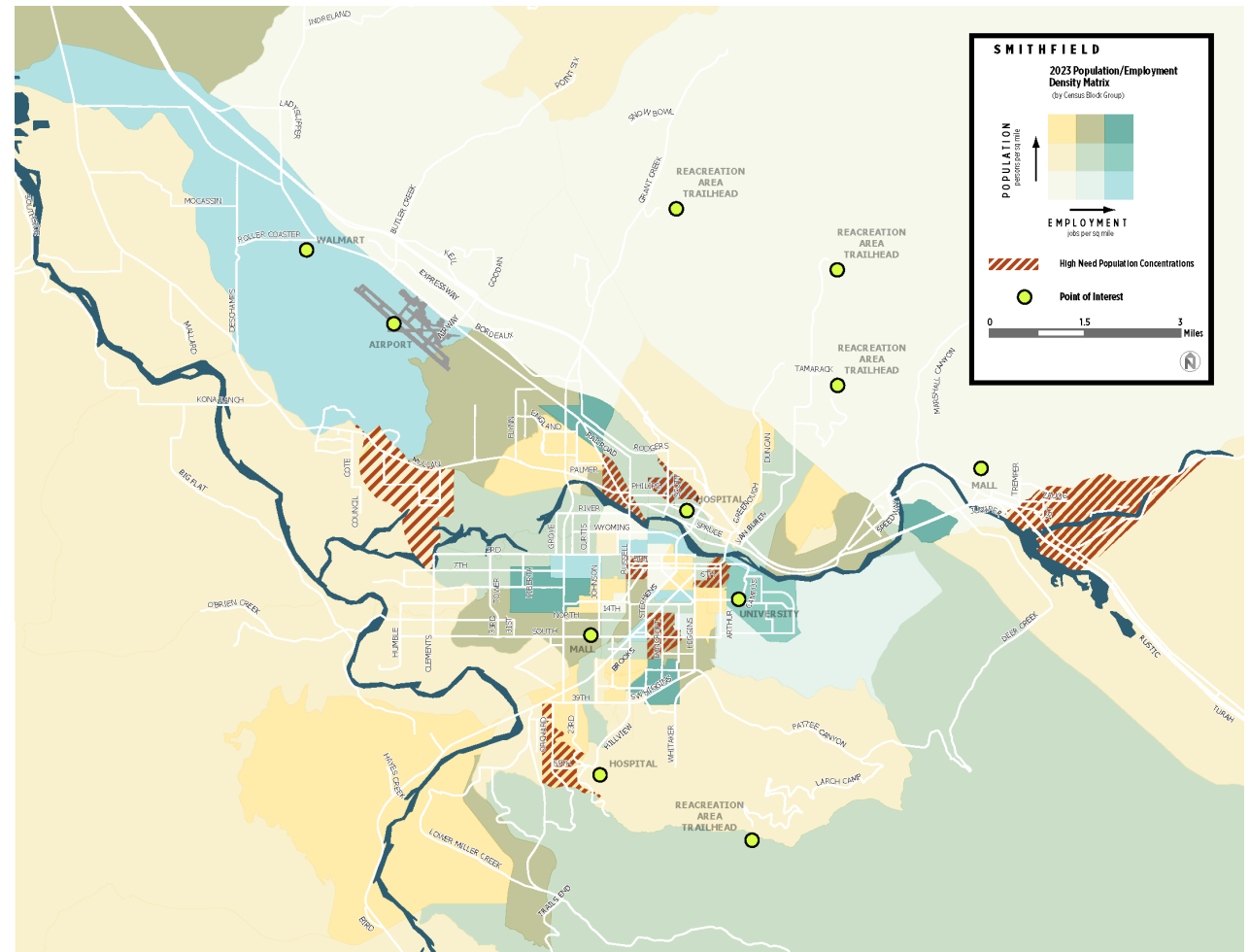
INTERACTIVE PLANNING GAME

- Simulated transit service planning exercise
- **Your challenge:** Design the bus network in Smithfield, USA
- **The process:** Discuss priorities as a group, draw routes on a map, check to see if routes meet priorities, and go back to drawing board as necessary
- **Your tools:** a map, colored strings, a facilitator, and a recorder
- **Your budget:** fixed



PLANNING GAME: MAP

- Major roads
- Population and employment densities
- Activity centers
- High need population concentrations



PLANNING GAME: PROCESS

- Start by selecting an alignment
- Then select a frequency:
 - 15 minutes = red
 - 30 minutes = blue
 - 60 minutes = green
 - Microtransit = green
 - Commuter = yellow
- ... and start placing strings on the map
- Your budget is fixed
- You can trade strings based on value
 - 1 red = 2 blue
 - 1 blue = 2 green
 - 1 green = 1 yellow



PLANNING GAME: CONSIDERATIONS

- Your options: routes that are ...
 - **Local**, running all day both ways, every 15, 30, or 60 minutes
 - **Commuter**, running every 30 minutes during rush hours only, in the peak direction
 - **Microtransit**, running all day on-demand service



PLANNING GAME: CONSIDERATIONS

- You have limited resources, and will have to make difficult decisions: Who gets service? What kind, and how much? Who gets a “one-seat ride,” and who must transfer?



PLANNING GAME: CONSIDERATIONS

- Simplified exercise (weekdays only, no space constraints at terminals, etc.)
- But – you must deal with “trade-offs.” Given limited resources, do you ...

Focus on serving “all-purpose” riders
(students, seniors, low-income who ride
transit for all trip purposes)



Try to attract occasional riders who
could otherwise drive (“get people out of
their cars”)



Maximize geographic coverage with
infrequent service



Maximize ridership and cost-effectiveness
by providing more frequent service on the
busiest routes



Try to provide as many direct trips as
possible



Provide fewer but more frequent routes
(requiring more transfers, but reducing
wait times for all trips)



PLANNING GAME: CONSIDERATIONS

Frequency and span impact system perception/usability

Frequency, Span	Buses/Hour	Perception of service
15 min, all day	4	Desirable; "Transit is always coming"
30 min, all day	2	Less desirable; "Unlikely to use if I have other options"
60 min, all day	1	Least desirable; "Must plan my life around the schedule"
30 min, AM/PM peak only	2	Works for very specific users (9-5 downtown workers)

PLANNING GAME: ASSESSING OUTCOMES

- At end of game, we will compare maps – and choices



PLANNING GAME

Color	Service Type
Red	All day, 15-minute service
Blue	All day, 30-minute service
Green	All day, 60-minute service
Yellow	Peak only, 30-minute service

Trade-in value:

- 1 red = 2 blue
- 1 blue = 2 green
- 1 blue = 2 yellow
- 1 green = 1 yellow

Recorder should note:

- How your group made decisions
- What your group prioritized/what you had to give up
- Who/what types of trips are well-served

 **Choose someone to report out!**

PLANNING GAME: REPORT OUT

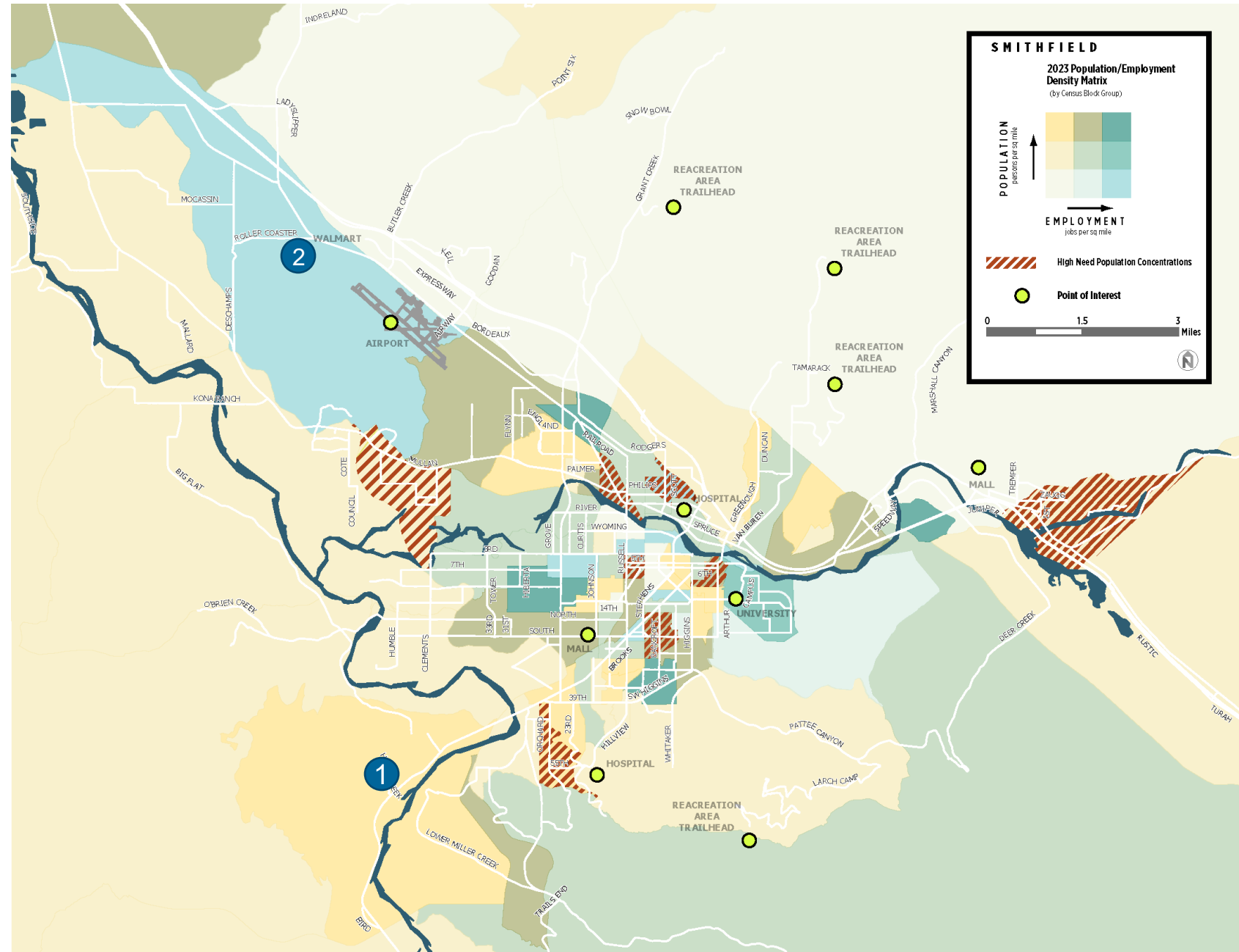
- Group discussion
- Each group reports out (5 minutes):
 - Your transit system
 - Your decision-making process
 - Tradeoffs you made
 - Who/what types of trips are best served
- Facilitator evaluation
- Rider “test”





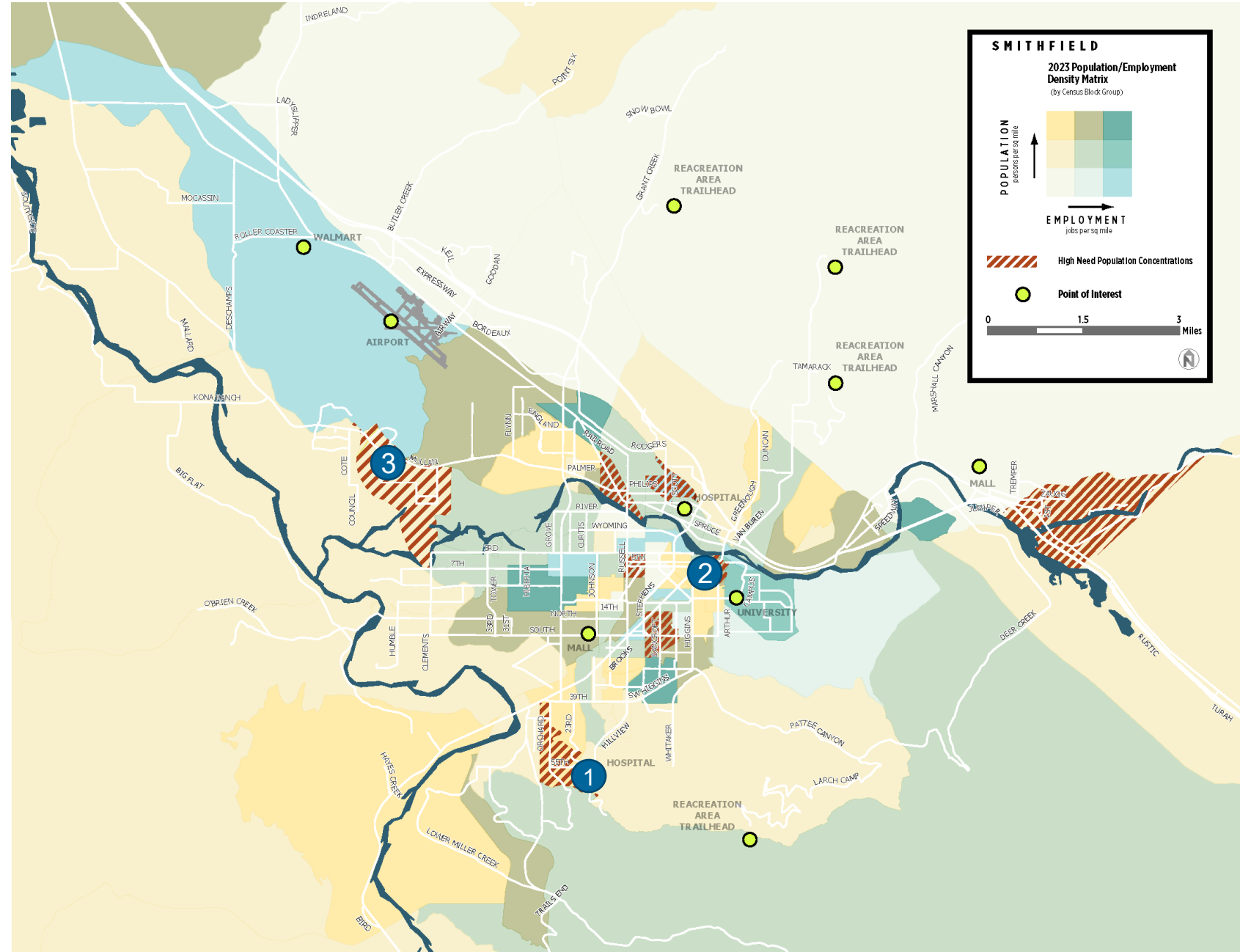
Alicia

- 60-year old researcher
- 1 Lives in south Smithfield
 - 2 Works at Walmart





- 45-year old administrator
- 1 Works at south Smithfield Hospital
 - 2 Needs to pick up his daughter at daycare before heading home at 4pm
 - 3 Lives in west Smithfield



WRAP- UP AND NEXT STEPS



THANK YOU!



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