USING BIG DATA TO FORECAST FIRST/LAST MILE TRANSIT RIDERSHIP

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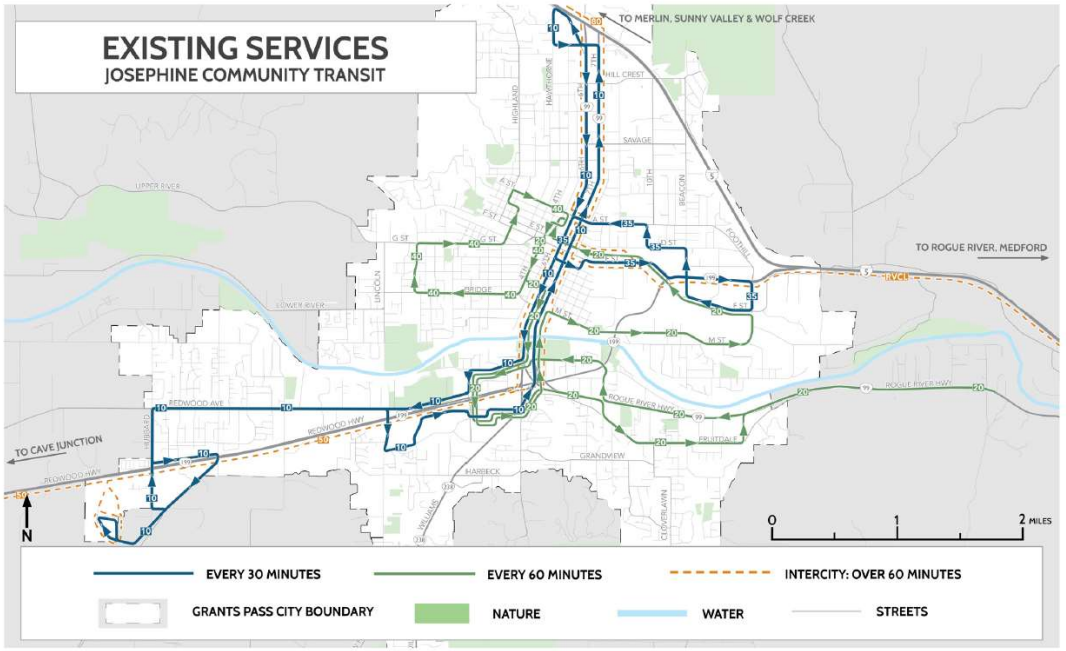
JOSEPHINE COUNTY ON DEMAND
TRANSPORTATION SERVICE SOLUTIONS

JOSEPHINE COUNTY AND JCT

- Josephine County:
  - Population 86,000
  - Grants Pass is the county seat

- Josephine Community Transit:
  - 162,000 boardings annually, 650 boardings daily for local routes
  - Service Monday – Friday, 6:30 am to 6:30 pm



Source: Josephine County Transit Master Plan, 2018

ON DEMAND SERVICE

WHAT IS ON DEMAND SERVICE?

An efficient solution to complement the existing services in the region and expand affordable mobility options.

Shared rides

Small to medium size vehicles

Door to door service

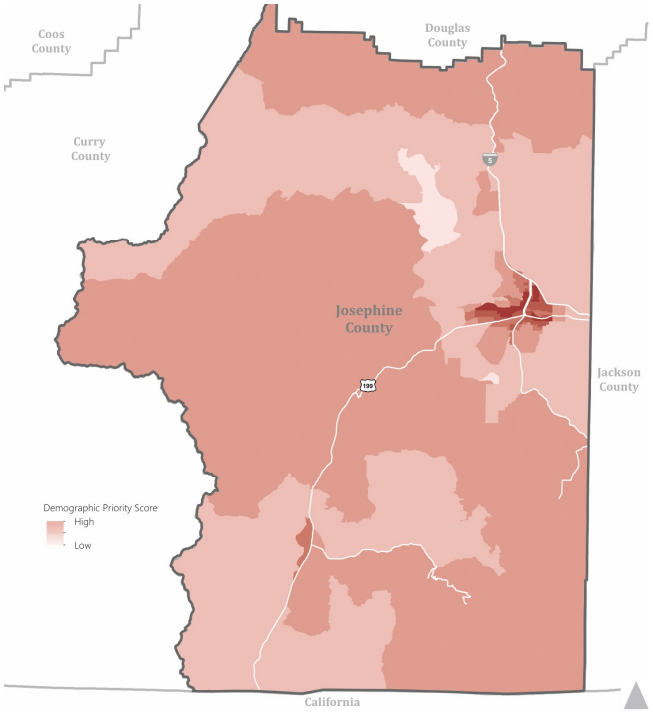
Flexible routing

Flexible scheduling

EXISTING CONDITIONS – DEMOGRAPHICS, AND THE BUILT ENVIRONMENT

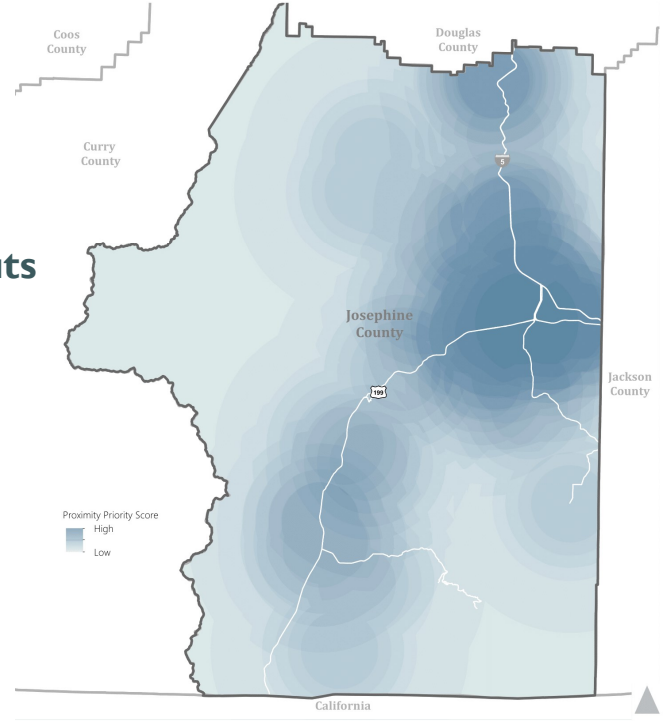
Demographic Priority Score Inputs

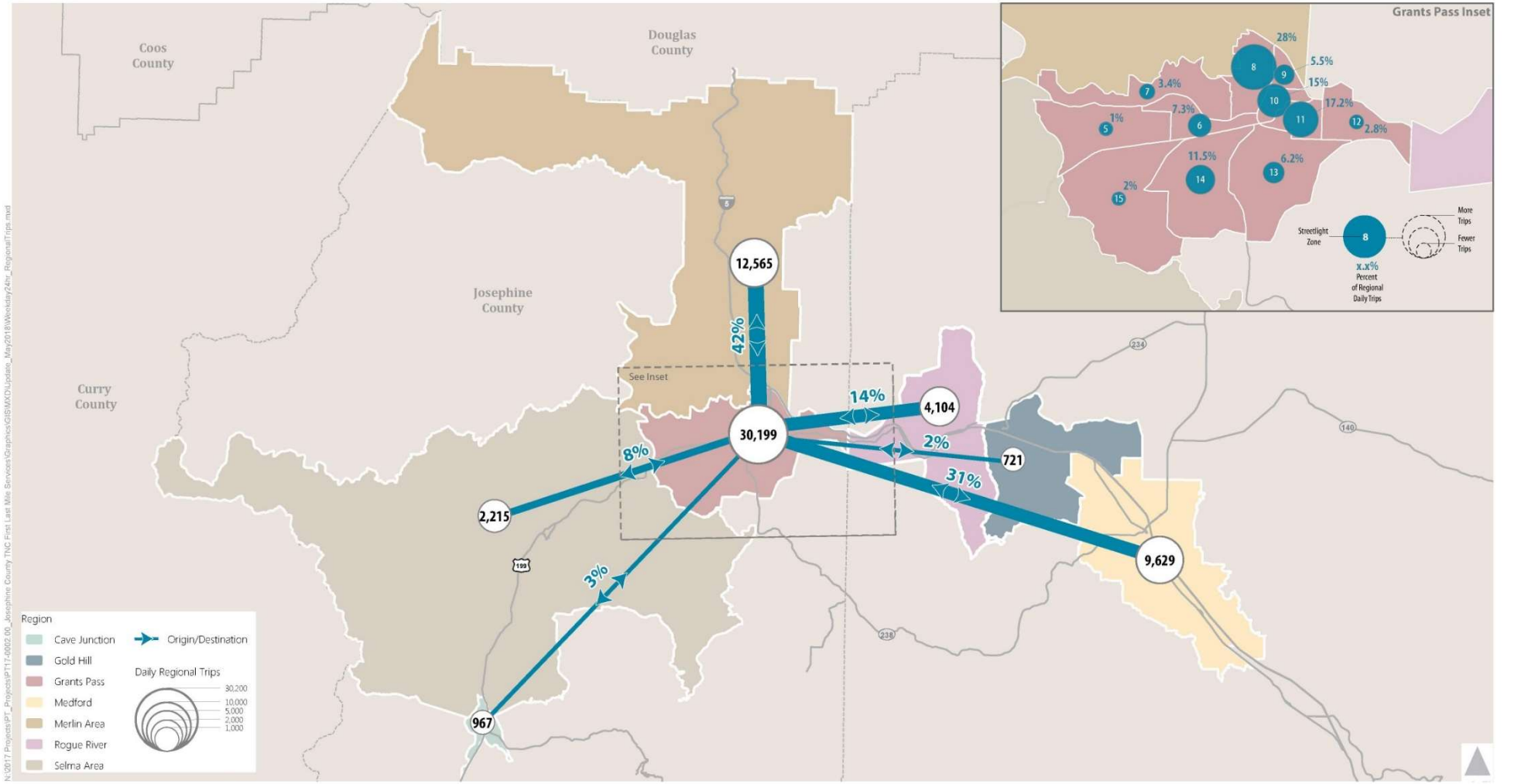
- Population density
- Employment density
- Age (<18, >62)
- Income
- Vehicle ownership
- Non-ambulatory



Proximity Priority Score Inputs

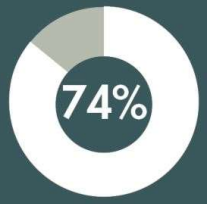
- Schools
- Parks
- Hospitals
- Transit proximity
- Other key destinations



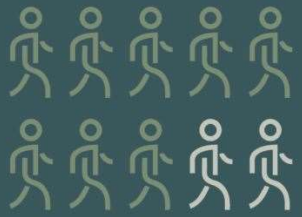

Coos County
Douglas County
Josephine County
Curry County
See Inset
12,565
42%
30,199
14%
4,104
2%
721
31%
9,629
8%
2,215
3%
967
Grants Pass Inset
28%
5.5%
15%
17.2%
2.8%
6.2%
11.5%
2%
7.3%
3.4%
1%
Streetlight Zone
More Trips
Fewer Trips
x.x% Percent of Regional Daily Trips
Region
Cave Junction
Gold Hill
Grants Pass
Medford
Merlin Area
Rogue River
Selma Area
Origin/Destination
Daily Regional Trips
30,200
10,000
5,000
2,000
1,000

JCT RIDER SURVEY

of all trips are to or from work or school, with many people traveling to Rogue Community College



- of transit riders walk to the bus stop
- 20% walk 12 minutes or more

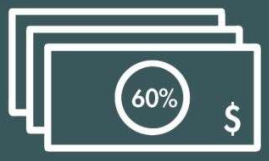


use JCT at least twice per week

If transit were not available...

respondents would have gotten a ride from someone else or driven alone

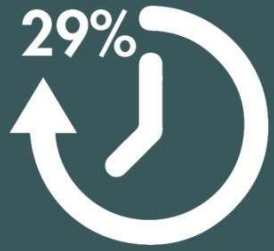
NO CAR AVAILABLE FOR THEIR TRANSIT TRIP



vs.

How riders get transit information

About half of respondents (49%) have incomes below the federal poverty level; 85% of respondents have incomes below the Grants Pass average



of riders would use JCT more often if later evening service were offered

SERVICE TYPES

First Last Mile

- Trips between bus stops and expanded service area
- Operates at same time as JCT bus service (6:30am-6:30pm)
- Extends the range of existing transit service

Point to Point
Daytime

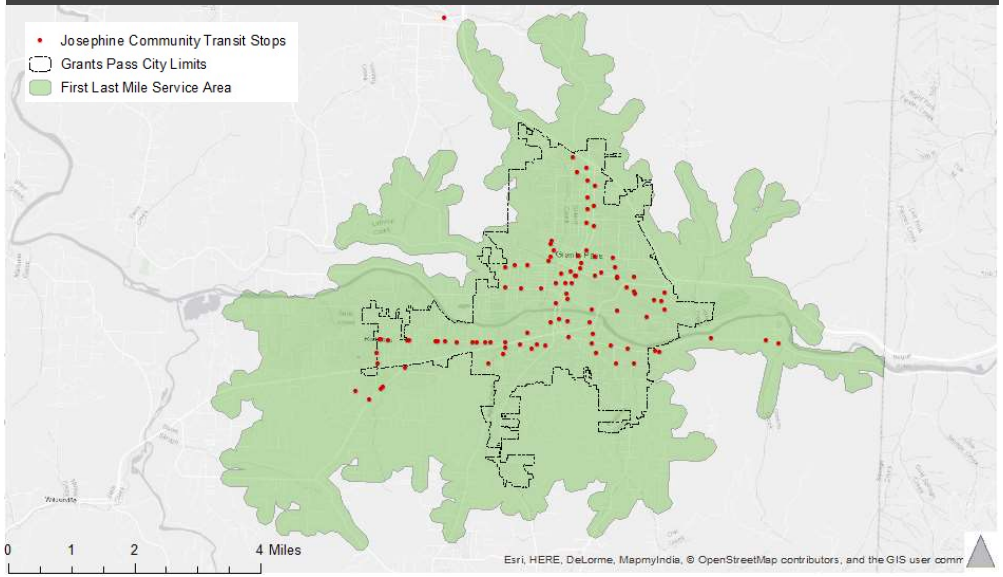
- Connects any two points within JCT's existing service area
- Operates at same time as JCT bus service (6:30am-6:30pm)
- Connects points that are not currently well-connected

Point to Point
Evening

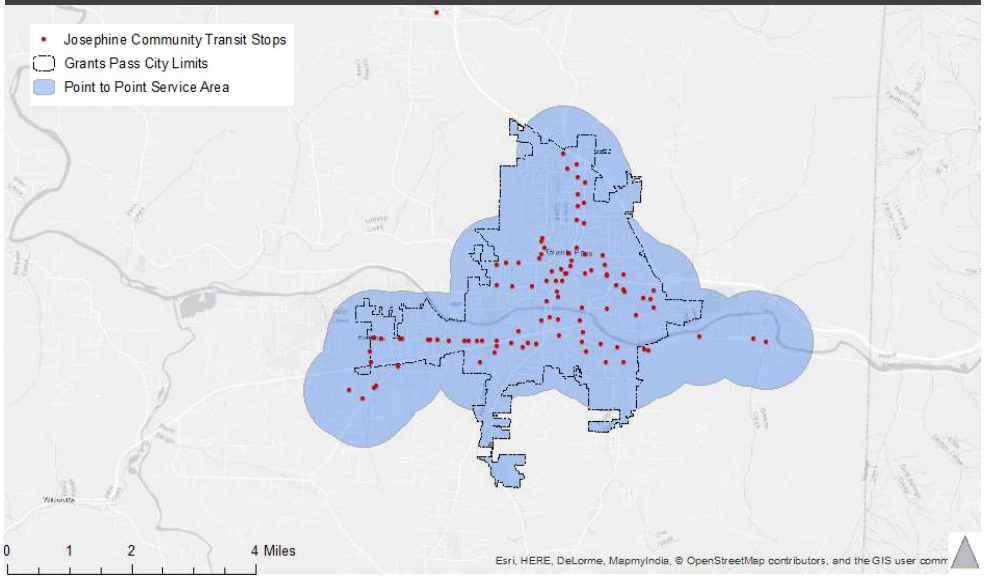
- Connects any two points within JCT's existing service area
- Operates after JCT service ends (6:30pm-9:30pm)
- Extends the operating hours of existing transit service

SERVICE AREA

First Last Mile



Point to Point



RIDERSHIP DATA AND ASSUMPTIONS

- Extrapolated transit ridership propensity from the existing fixed route system and service area to the proposed service areas by using:
  - Origin-Destination data from StreetLight Data, Inc.
  - American Community Survey (ACS) Data
  - JCT Rider Survey
  - Technical Resources

EXPECTED FIRST/LAST MILE RIDERSHIP

Low Ridership	High Ridership
• Ratio of the boardings by those who walk more than ½ mile to transit to population within ½ mile of transit; • Applied to population in the 3 mile service area	• Ratio of boardings within ½ mile of transit and walking less than 10 minutes • Applied to population in the 3 mile service area

Calculated for total population as well as by income level and vehicle ownership

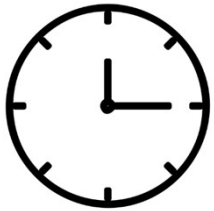
ASSUMPTIONS

- Factored for:
  - Smartphone access or riders who would use the call-in line to book a ride
  - Decrease in demand with implementation of $1 fare
  - High ridership also included elasticity of wait and increased travel time

$1 First-last mile

$2 Point to point

Fare



Average of 15 mins, maximum 30 mins

Wait time

EXPECTED POINT TO POINT RIDERSHIP

Point to Point

- Compared Streetlight trips to transit boardings in order to approximate transit mode share
- Applied to population in the 3 mile service area

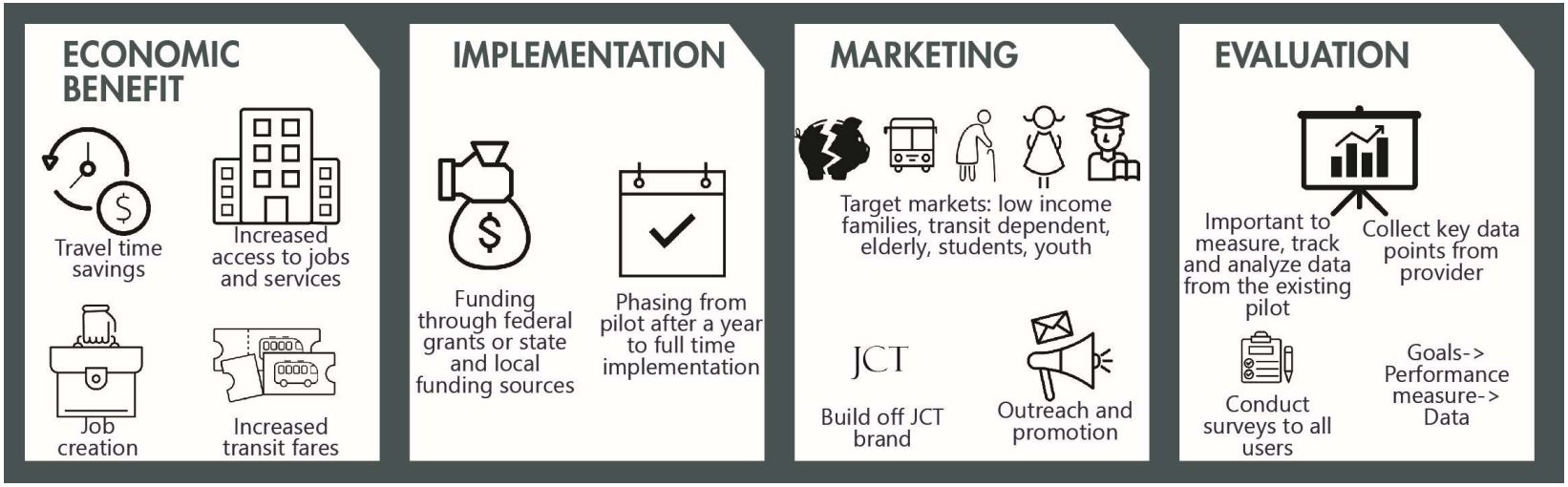
- Factored for:
  - Smartphone access or riders who would use the call-in line to book a ride
  - Decrease in demand with implementation of $2 fare
  - Elasticity of wait and increased travel time
  - High ridership also included induced demand

RIDERSHIP ESTIMATES

	First-Last Mile		Point to Point (Daytime)		Point to Point (Evening)	
	Low	**High**	**Low**	**High**	**Low**	**High**
Annual riders *(JCT fixed route boarding increase)*	15,000 *(+9%)*	51,000 *(+32%)*	30,000 *(+18%)*	47,000 *(+29%)*	20,000 *(+12%)*	23,000 *(+14%)*
Daily riders	58	205	119	188	79	91
Peak hour riders	5	16	9	15	35	40

IMPLEMENTATION

- Costs:
  - Looked at the number of vehicles needed to meet demand and the costs to run the service
  - Compared costs for a service run by JCT or a service run by a transportation network company



Thank you

for your time.

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FEHR PEERS