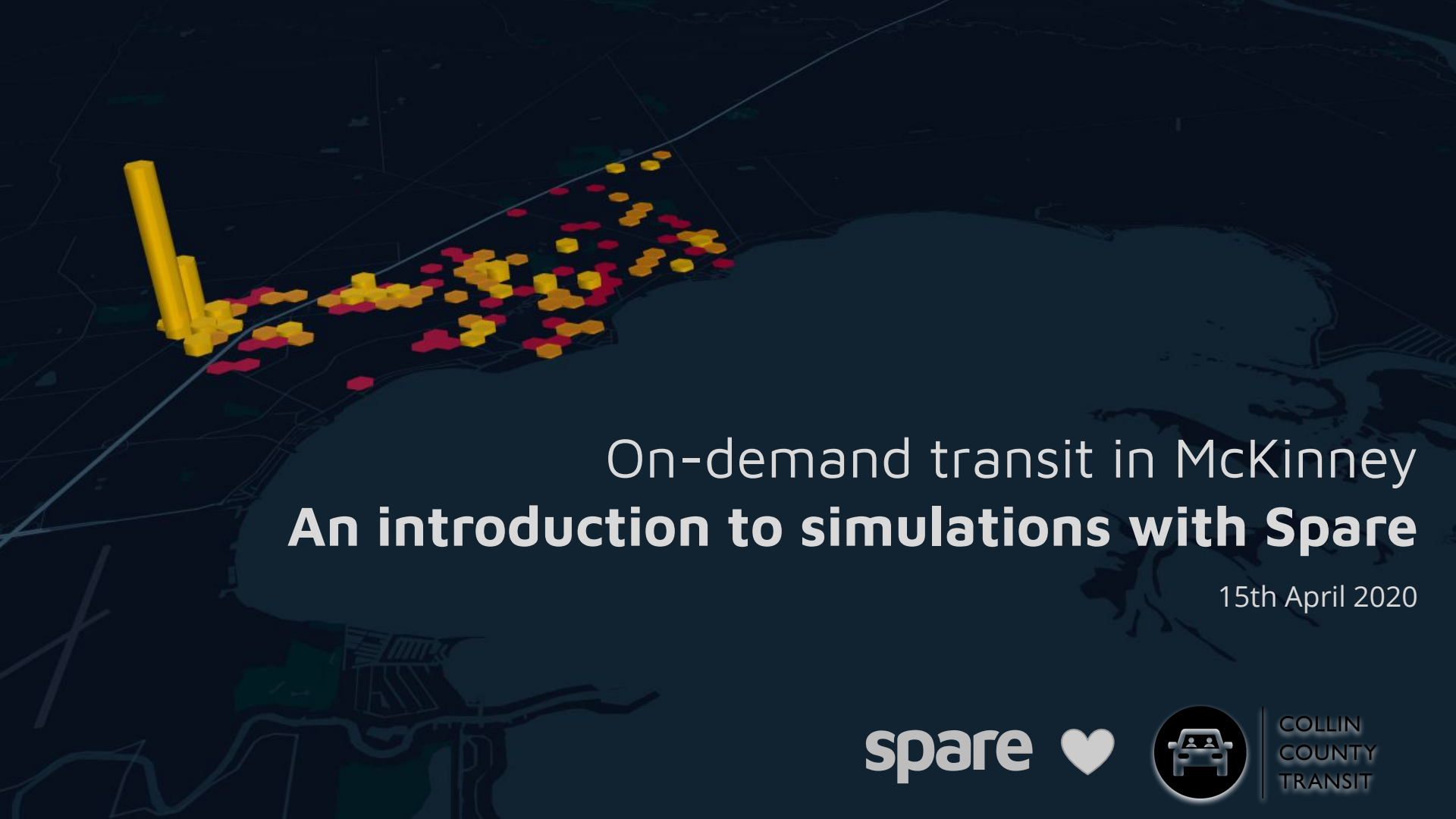
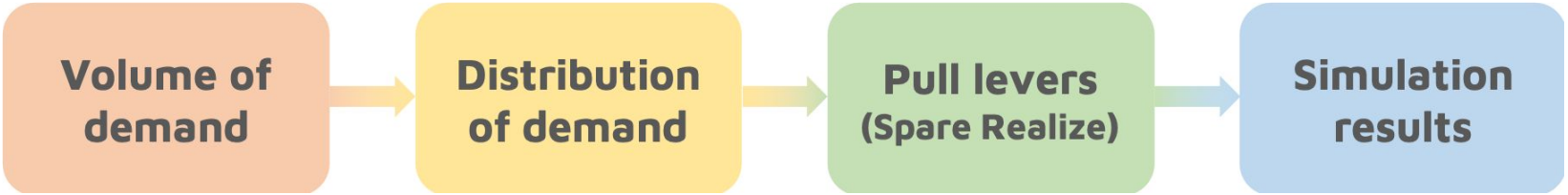


On-demand transit in McKinney

An introduction to simulations with Spare

15th April 2020

spare ♥ COLLIN COUNTY TRANSIT



Spare's framework for simulating demand

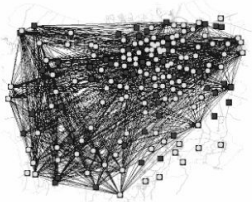
Inputs

Volume of demand → Distribution of demand → Pull levers (Spare Realize) → Simulation results

APC data

Demographics

Transit usage data



O-D trip data

Data from other Spare services

In Dallas, we know that…

APC data

+

Demographics

+

Transit usage data

=

200 microtransit trips

In Dallas, we know that…

APC data

+

Demographics

+

Transit usage data

=

200 microtransit trips

So, in McKinney…

APC data

+

Demographics

+

Transit usage data

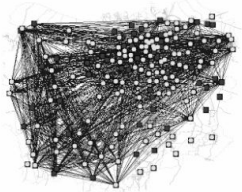
=

130 microtransit trips

Inputs

Volume of demand → **Distribution of demand** → Pull levers (Spare Realize) → Simulation results

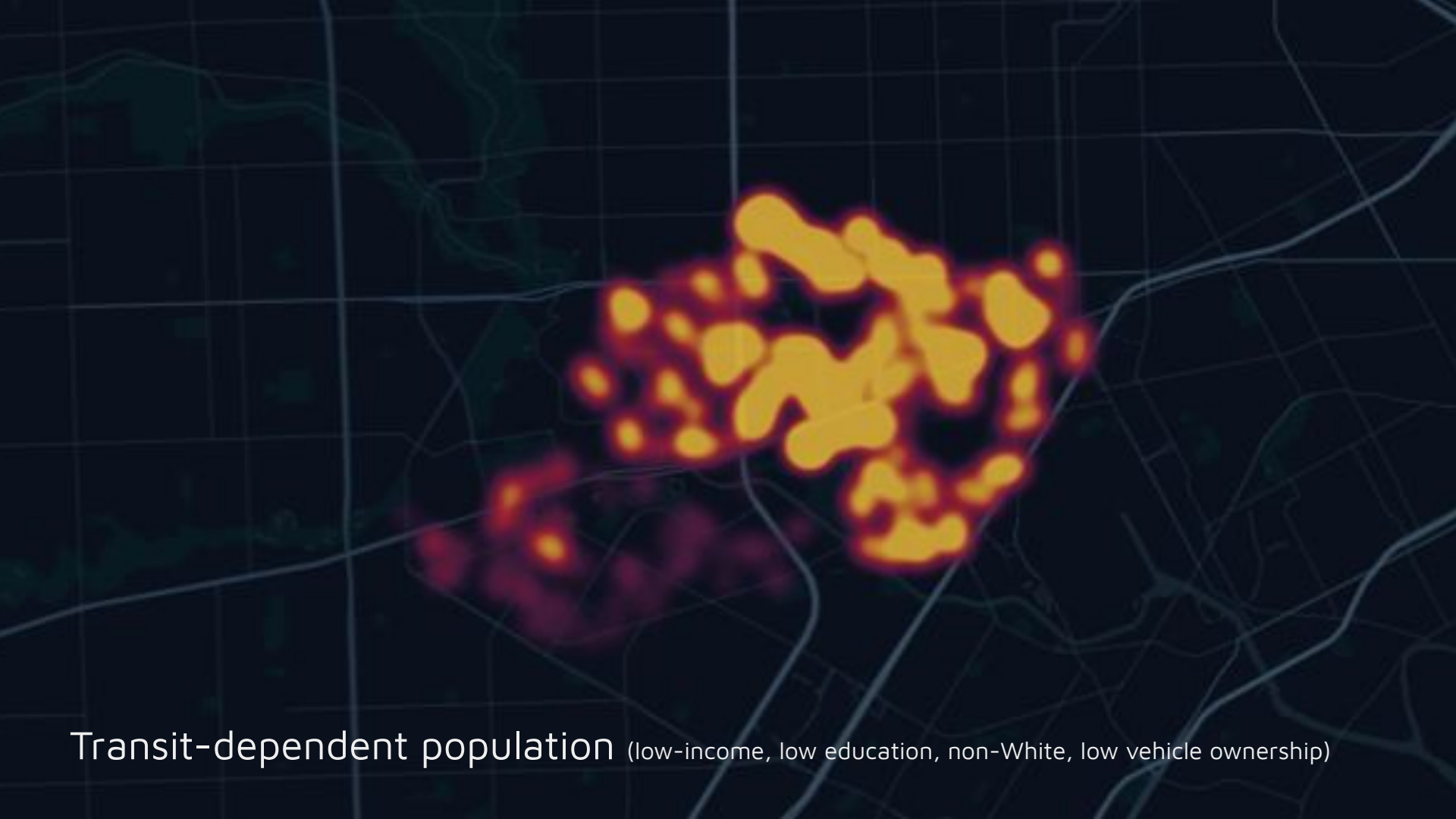
Demographics



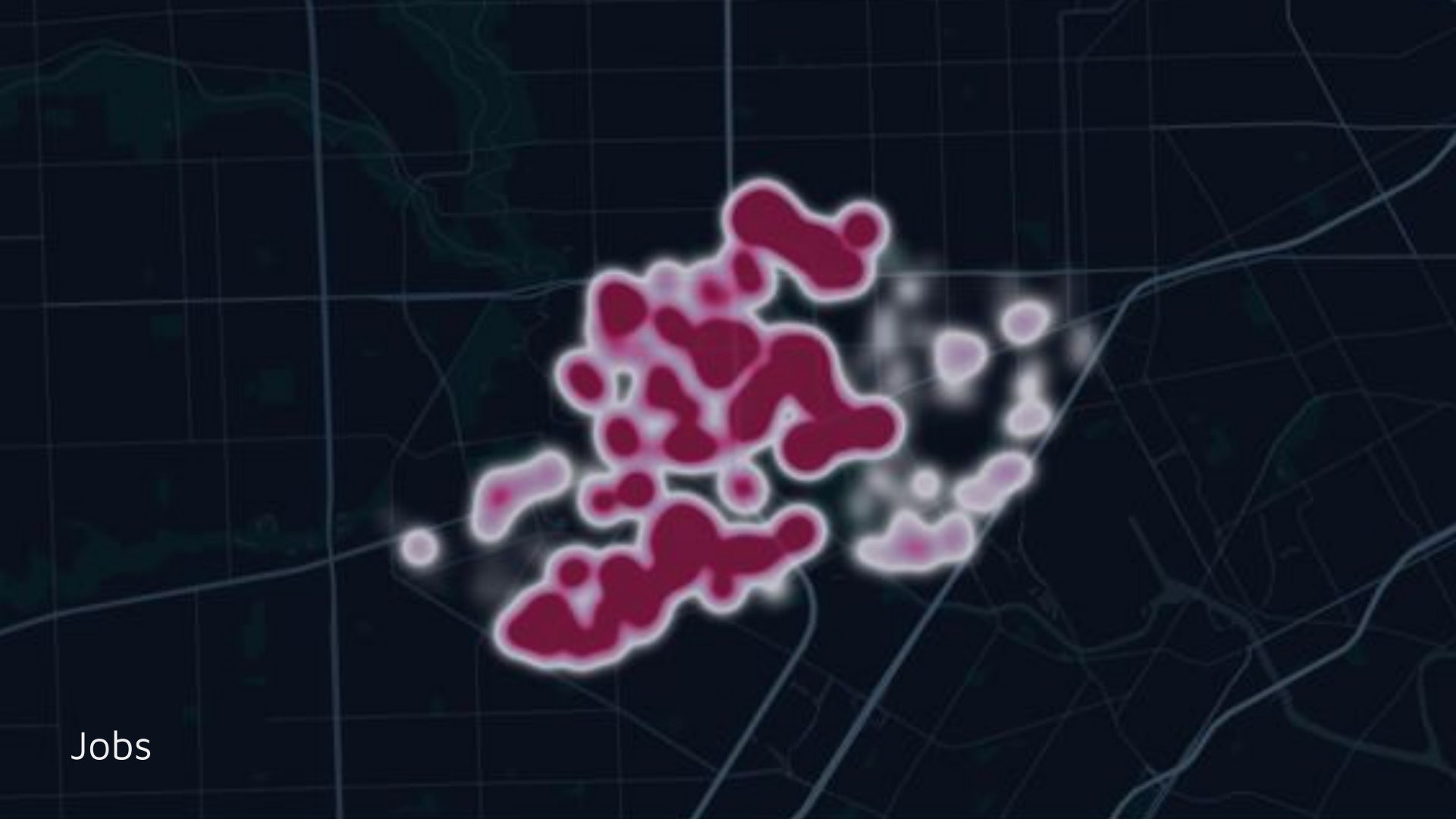
O-D trip data

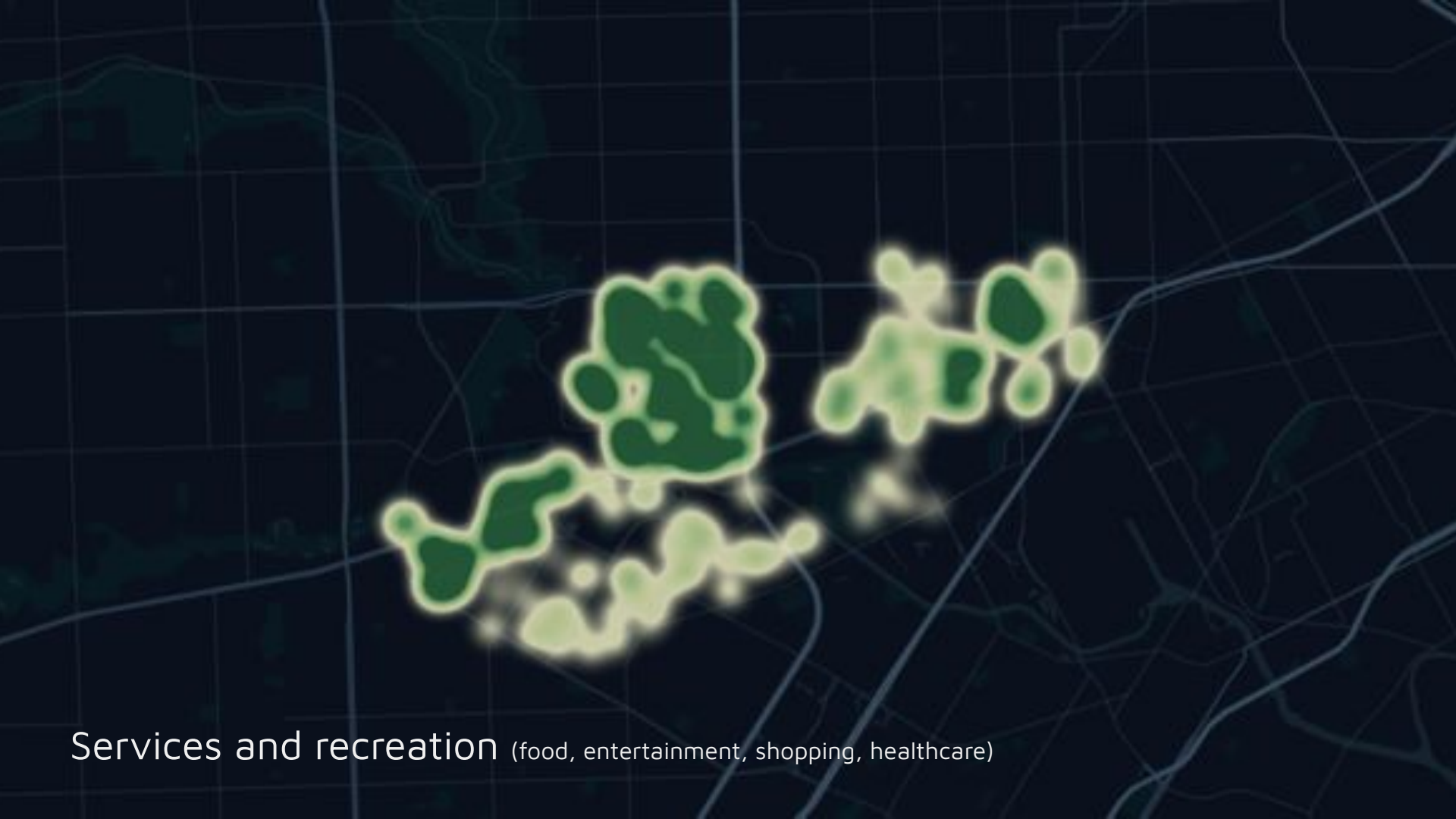
Accessibility to other transit modes

Income data



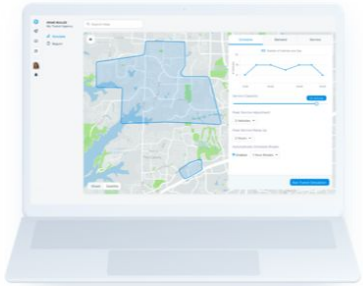
Transit-dependent population (low-income, low education, non-White, low vehicle ownership)


Jobs



Services and recreation (food, entertainment, shopping, healthcare)

Generate 10,000 random trips from weighted demand model → Randomly assign times to trips (assume uniform dist.) → Randomly pick 480 trips based on expected demand volume → Spare Realize

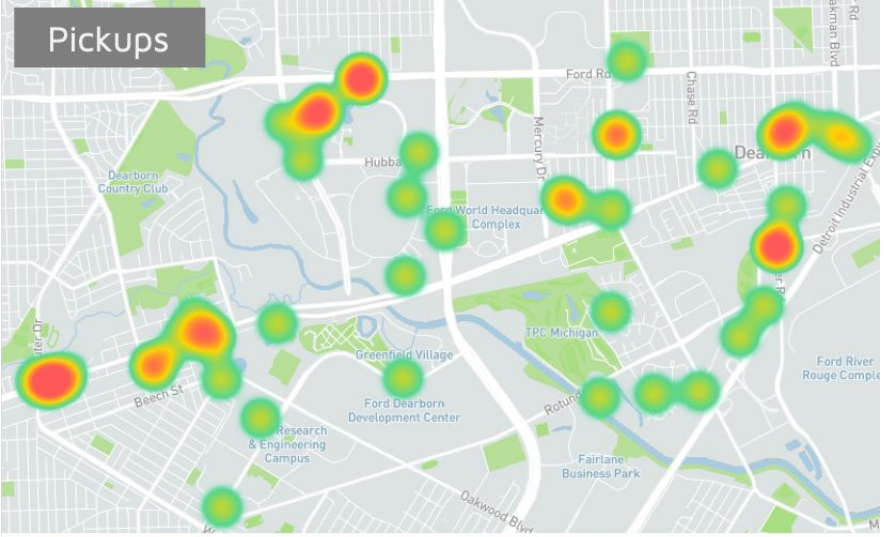


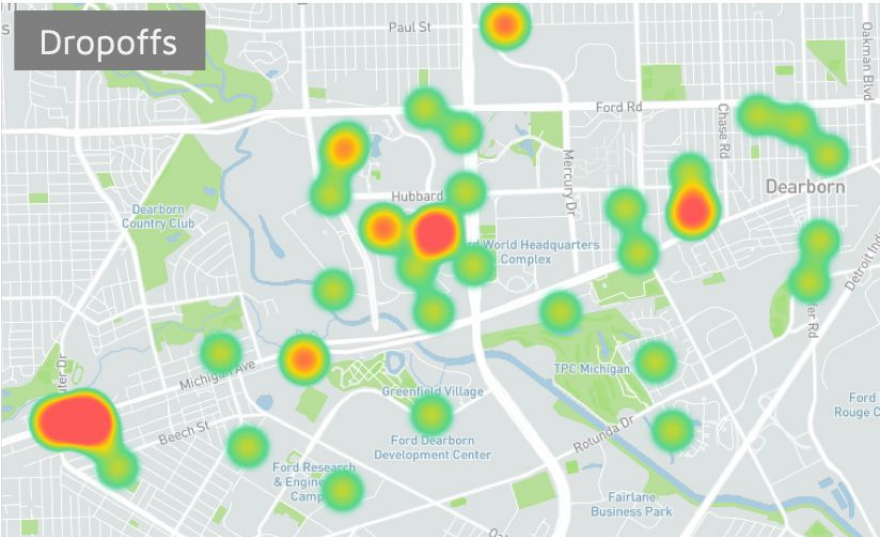
Simulation setup

Demand	Low, Medium, High
Duty level	Low, Medium, High
Duty structure	Full hours, Peak-only (6–9am, 2–9pm)
Stop type	Door-to-door, Stop-to-stop

Cost modelling

	Annual costs	Costs per trip	Gains per additional spend
Low service level Fewer vehicles, cheaper	**$xx–xx**	**$xx–xx**	**$xx–xx**
High service level More vehicles, more expensive	**$xx–xx**	**$xx–xx**	**$xx–xx**





	Low Demand	Medium Demand	High Demand
Avg. wait	...	...	
<15 min wait	...		
PPVH			
Pooling ratio			
Duties			

	Door-to-door	Stop-to-stop
Avg. wait	...	...
<15 min wait	...	
PPVH		
Pooling ratio		

Recommendations for right-sizing vehicles

Deliverable: Realize Report