RIDER READY?

AN INTROSPECTIVE LOOK AT

— RIDERSHIP FORECASTING —

Matthew Brown

- BRATS Driver 656

OLD SCHOOL?

NEW SCHOOL?

Jahan Nanji

Lindsey Morrow

Olivia Blahut

THE DEEPER QUESTIONS OF ~~LIFE~~ TRANSIT

WHY DOES YOUR TRANSIT ORGANIZATION EXIST?

1. Because we are a perpetually existing a government agency?
2. To provide transportation for those who have no other option?
3. To provide a desirable transportation option in your community?

RIDERSHIP FORECASTING FOCUSES ON THE QUESTION:

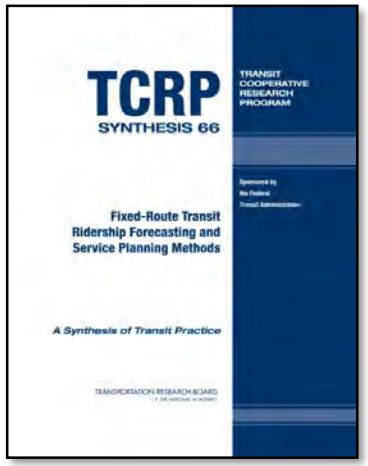
WHO NEEDS OUR SERVICE?

MOBILITY GAP:

THE DIFFERENCE BETWEEN THE NUMBER OF TRIPS PER DAY MADE BY PERSONS LIVING IN HOUSEHOLDS HAVING ONE PERSONAL VEHICLE AVAILABLE AND THOSE LIVING IN HOUSEHOLDS THAT OWN NO PERSONAL VEHICLE.

RIDERSHIP FORECASTING SHOULD ASK THE QUESTION:

DO WE HAVE A SERVICE THAT PEOPLE WANT TO USE?



TCRP SYNTHESIS 66

Fixed-Route Transit Ridership Forecasting and Service Planning Methods

TCRP REPORT 161

Methods for Forecasting Demand and Quantifying Need for Rural Passenger Transportation: Final Workbook

CHAPTER 3

Demand

General Public Rural

Two methods are available to estimate the demand expected for passenger transportation in rural areas not related to social-service programs. A third method for estimation of demand for **general public** transportation (i.e., service used as reported to the rural NTD) also included in this section addresses demand based on need and the supply of service. This third method provides a figure for demand that is not tied to a specific market, but provides an estimate for demand for transportation in general.

The methods for general public (non-program) demand are listed below in order of suggested application:

1. Peer data from your system, other nearby systems or systems in same state or
2. Non-program Demand = (2.20 × Population age 60+) + (5.21 × Mobility Limited Population age 18 to 64) + (1.52 × Residents of Households having No Vehicle)

PG. 18

PG. 20 - GENERAL PUBLIC DEMAND

Demand (trips per year) =

(2.20 x **Population Age 60+**)

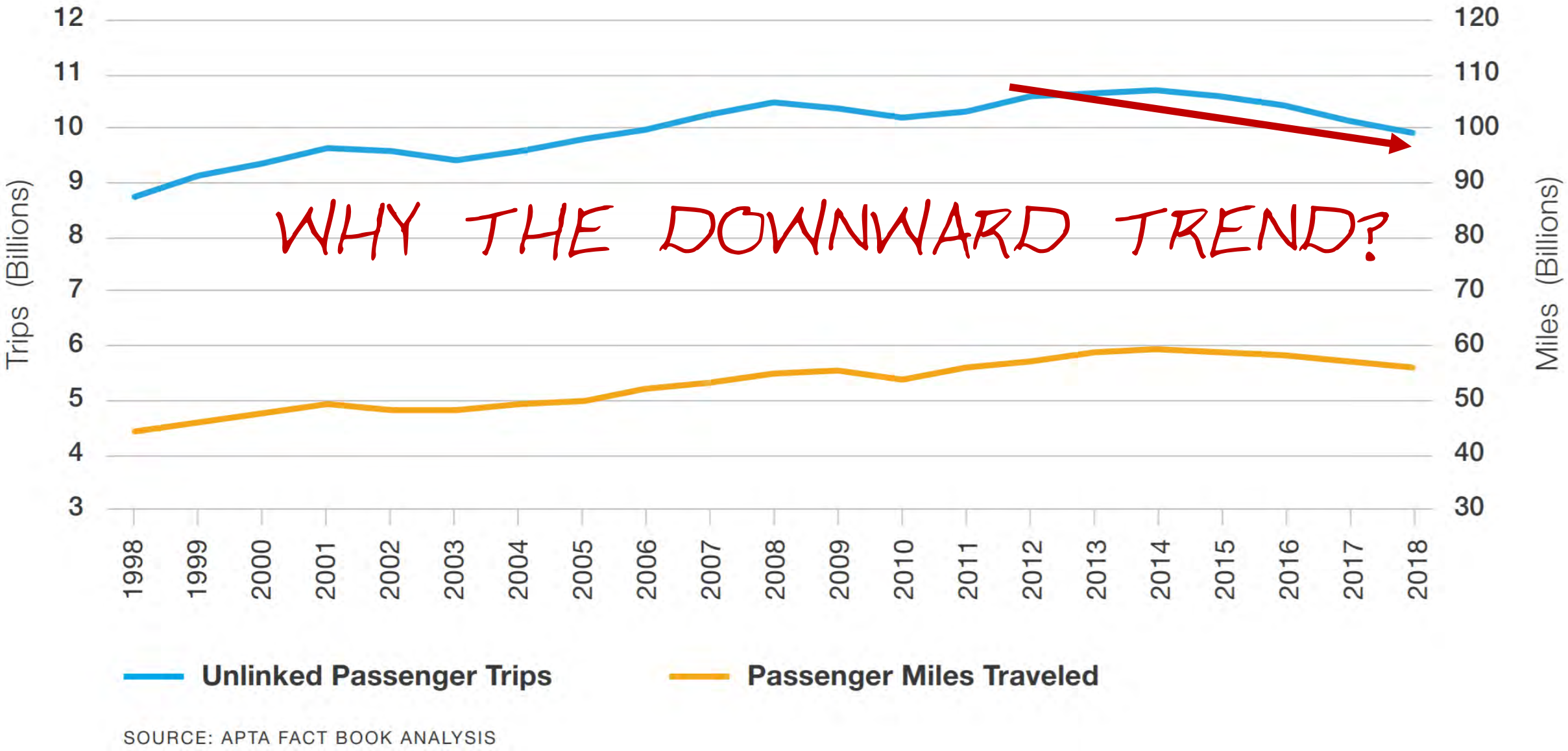
(5.21 x **Individuals with Disabilities Age 18-64**) +

(1.52 x **Residents with No Vehicle**)

MONOPOLY-BY-NECESSITY

Figure 7: Ridership and Distance Traveled on Public Transit

1998-2018



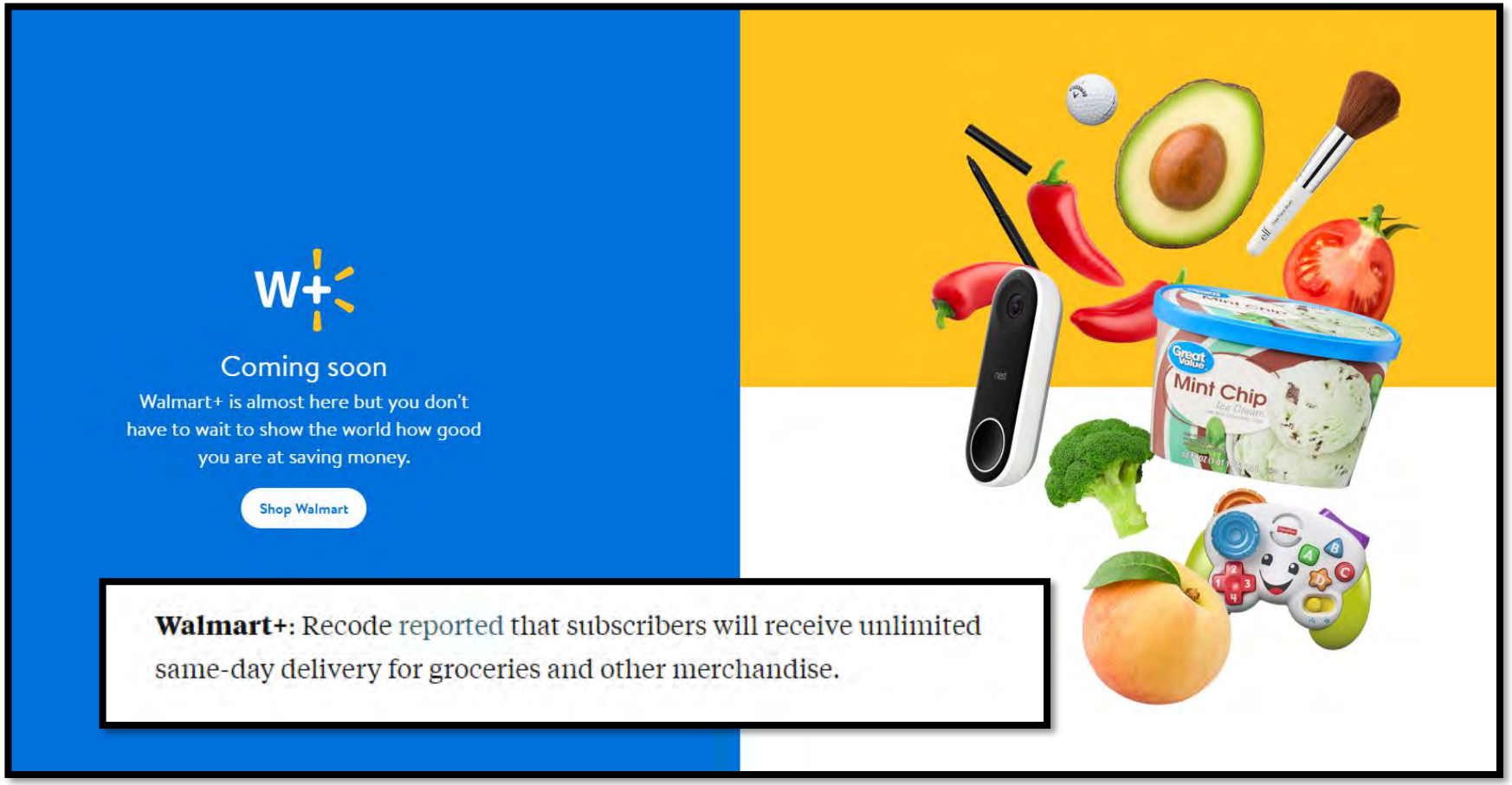
SOURCE: APTA FACT BOOK ANALYSIS

COLLATERAL COMPETITION:

GRUBHUB

prime

DOORDASH



VIA

SHIPT

Uber

zTrip

lyft

RIDERSHIP FORECASTING SHOULD ASK THE QUESTION:

DO WE HAVE A SERVICE THAT PEOPLE WANT TO USE?

AS CULTURAL EXPECTATIONS CHANGE, SO MUST OUR SERVICE.

PG. 20 - GENERAL PUBLIC DEMAND

Demand (trips per year) =

(2.20 x **Population Age 60+**)

(5.21 x **Individuals with Disabilities Age 18-64**) +

(1.52 x **Residents with No Vehicle**)

STILL A GREAT EXERCISE

https://data.census.gov/cedsci/ | https://data.census.gov/cedsci/ta | American Community Survey (AC

data.census.gov/cedsci/

United States Census Bureau

DATA.CENSUS.GOV

Explore Census Data

The Census Bureau is the leading source of quality data about the nation's people and economy.

Baldwin County

SEARCH

Baldwin County, Alabama
Covering 1,589.4 square miles, Baldwin County, Alabama is the largest county in Alabama by area.

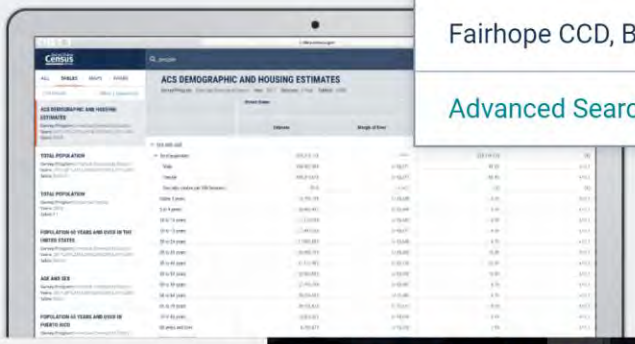
Baldwin County, Georgia

Foley CCD, Baldwin County, Alabama

Daphne CCD, Baldwin County, Alabama

Fairhope CCD, Baldwin County, Alabama

Advanced Search



Check out our new table display which allows you to dynamically add geographies, topics, or any applicable filters. You can reorder, pin, and hide columns all with simple drag and drop functionality. Tab through different tables to make sure you found the right one, customize it, and then download multiple vintages of it quickly. If you don't see a functionality you need, find a bug, or have a comment, drop us a line at cedsci.feedback@census.gov.

Send Feedback
cedsci.feedback@census.gov

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Baldwin County, Alabama

County, or equivalent in Alabama

Covering 1,589.4 square miles, Baldwin County, Alabama is the largest county in Alabama by area. Baldwin County, Alabama is bordered by Mobile County, Monroe County, Clarke County, Washington County, Escambia County, and Escambia County.

POPULATION	MEDIAN HOUSEHOLD INCOME	POVERTY RATE	EMPLOYMENT RATE
208,107	$55,962	10.6%	55.7%

People and Population

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United States Census Bureau

Baldwin County, Alabama

SEARCH

People and Population

Age and Sex

42.8 +/- 0.3

Median age in Baldwin County, Alabama

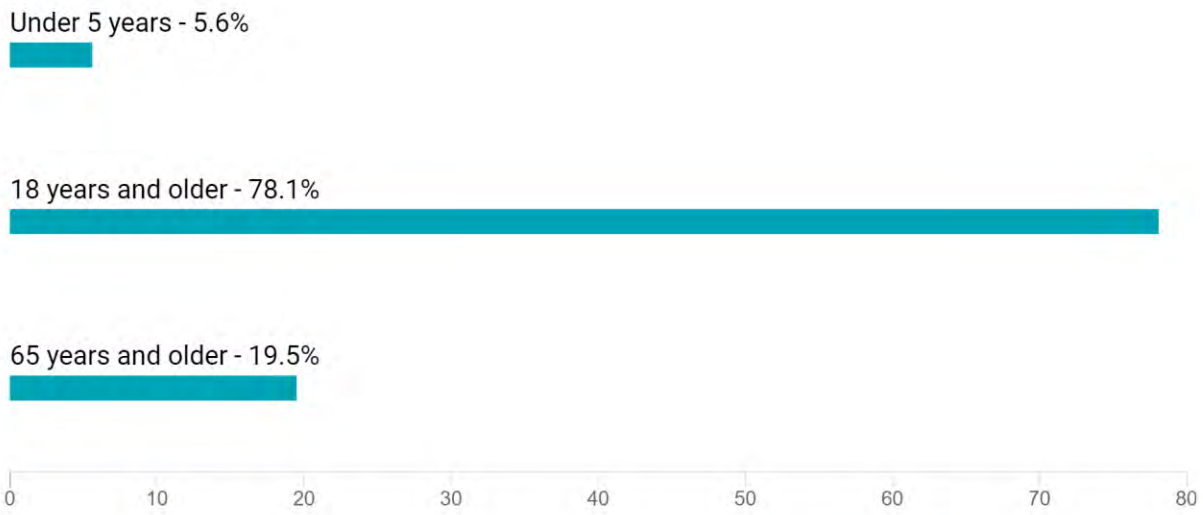
37.9 +/- 0.1

Median age in the United States

Table: DP05
Table Survey/Program: 2018 American Community Survey 5-Year Estimates

Table: DP05
Table Survey/Program: 2018 American Community Survey 5-Year Estimates

Population by Age Range in Baldwin County, Alabama



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Share / Export

Customize Chart

Veterans

Veterans by Sex in Baldwin County, Alabama

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data.census.gov/cedsci/table?q=ACSDP5Y2018.DP05%20Baldwin%20County,%20Alabama&g=0500000US01003&tid=ACSDP5Y2018.DP05&hidePreview=true

United States Census Bureau

ACSDP5Y2018.DP05 Baldwin County, Alabama

SEARCH

// Search / Tables / DP05

ACS DEMOGRAPHIC AND HOUSING ESTIMATES

Survey/Program: American Community Survey **TableID:** DP05 **Product:** 2018: ACS 5-Year Estimates Data Profiles

Data Notes | Selections | 1 Geography | Years | Topic | Survey | Code | Hide | Filter | Transpose Table | Margin of Error | Restore Layout | Download | Print | More Data | Map

	Baldwin County, Alabama			
Label	Estimate	Margin of Error	Percent	Percent Margin of Error
SEX AND AGE				
Total population	208,107	*****	208,107	(X)
Male	101,188	±242	48.6%	±0.1
Female	106,919	±242	51.4%	±0.1
Sex ratio (males per 100 females)	94.6	±0.4	(X)	(X)
Under 5 years	11,609	±114	5.6%	±0.1
5 to 9 years	11,689	±741	5.6%	±0.4
10 to 14 years	14,323	±812	6.9%	±0.4
15 to 19 years	12,707	±399	6.1%	±0.2
20 to 24 years	10,790	±294	5.2%	±0.1
25 to 34 years	23,326	±324	11.2%	±0.2
35 to 44 years	25,377	±380	12.2%	±0.2
45 to 54 years	28,330	±346	13.6%	±0.2
55 to 59 years	14,440	±733	6.9%	±0.4
60 to 64 years	14,851	±731	7.1%	±0.4
65 to 74 years	24,551		11.8%	±0.1
75 to 84 years	12,165		5.8%	±0.2
85 years and over	3,949	±477	1.9%	±0.2
Median age (years)	42.8	±0.3	(X)	(X)
Under 18 years	45,677	*****	21.9%	*****
16 years and over	167,712	±321	80.6%	±0.2
18 years and over	162,430	*****	78.1%	*****
21 years and over	155,502	±559	74.7%	±0.3
62 years and over	49,811	±645	23.9%	±0.3

55,516

Columns | Cell/Column Notes

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data.census.gov/cedsci/table?q=ACSDT1Y2018.B08201&g=0500000US01003&tid=ACSDT1Y2018.B08201&hidePreview=true

United States Census Bureau

ACSDT1Y2018.B08201 | SEARCH

// Search / Tables / B08201

HOUSEHOLD SIZE BY VEHICLES AVAILABLE

Survey/Program: American Community Survey **Universe:** Households **TableID:** B08201 **Product:** 2018: ACS 1-Year Estimates Detailed Tables

Data Notes | Selections | 1 Geography | Years | Topic | Survey | Code | Hide | Filter | Transpose Table | Margin of Error | Restore Layout | Download | Print | More Data | Map

Label	Baldwin County, Alabama Estimate	Margin of Error
3 vehicles available	13,914	±1,541
4 or more vehicles available	5,939	±1,038
1-person household:	23,304	±2,395
No vehicle available	1,527	±594
1 vehicle available	16,728	±2,233
2 vehicles available	3,896	±1,028
3 vehicles available	945	±572
4 or more vehicles available	208	±254
2-person household:	32,344	±2,399
No vehicle available	543	±352
1 vehicle available	6,431	±1,332
2 vehicles available	18,863	±1,966
3 vehicles available	5,285	±1,[illegible]
4 or more vehicles available	1,222	±[illegible]
3-person household:	11,020	±1,915
No vehicle available	244	±264
1 vehicle available	1,342	±655
2 vehicles available	4,908	±1,504
3 vehicles available	3,122	±806
4 or more vehicles available	1,404	±590
4-or-more-person household:	16,833	±2,337
No vehicle available	241	±209
1 vehicle available	1,189	±584
2 vehicles available	7,736	±1,769
3 vehicles available	4,562	±1,[illegible]

4,309

Columns | Cell/Column Notes

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American Community Survey (AC
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United States Census Bureau

ACSDP5Y2018.DP02 Baldwin County, Alabama

SEARCH

// Search / Tables / DP02

SELECTED SOCIAL CHARACTERISTICS IN THE UNITED STATES

Survey/Program: American Community Survey **TableID:** DP02 **Product:** 2018: ACS 5-Year Estimates Data Profiles

Data Notes | Selections | 1 Geography | Years | Topic | Survey | Code | Hide | Filter | Transpose Table | Margin of Error | Restore Layout | Download | Print | More Data | Map

Label	Baldwin County, Alabama			
	Estimate	Margin of Error	Percent	Percent Margin of Error
Civilian population 18 years and over	162,122	±149	162,122	(X)
Civilian veterans	19,354	±912	11.9%	±0.6
DISABILITY STATUS OF THE CIVILIAN NONINSTITUTIONALI...				
Total Civilian Noninstitutionalized Population	205,452	±471	205,452	(X)
With a disability	28,863	±1,217	14.0%	±0.6
Under 18 years	45,591	±46	45,591	(X)
With a disability	1,667	±374	3.7%	±0.8
18 to 64 years	119,865	±408	119,865	(X)
With a disability	13,431	±893	11.2%	±0.7
65 years and over	39,996		39,996	(X)
With a disability	13,765	±707	34.4%	±1.8
RESIDENCE 1 YEAR AGO				
Population 1 year and over	206,023	±424	206,023	(X)
Same house	182,516	±2,117	88.6%	±1
Different house in the U.S.	22,899	±2,047	11.1%	±1
Same county	12,262	±1,615	6.0%	±0.8
Different county	10,637	±1,328	5.2%	±0.6
Same state	4,661	±860	2.3%	±0.4
Different state	5,976	±903	2.9%	±0.4
Abroad	608	±277	0.3%	±0.1
PLACE OF BIRTH				
Total population	208,107	*****	208,107	(X)
	200,937	±833	96.6%	±0.4
States	198,875	±885	95.6%	±0.4

27,195

Columns | Cell/Column Notes

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PG. 20 - GENERAL PUBLIC DEMAND

Demand (trips per year) =

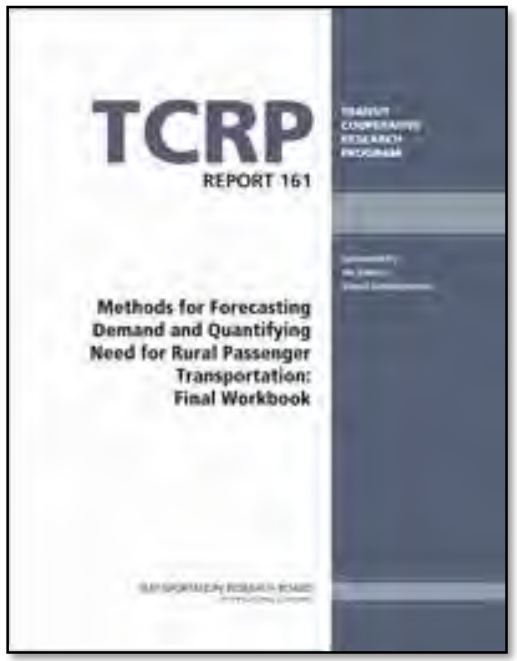
(2.20 x 55,516) +

(5.21 x 4,309) +

(1.52 x 27,195) =

185,921

NOTE: SHOULD PROBABLY SUBTRACT MPO AREA.



Matthew Brown

- BRATS Driver 656

OLD SCHOOL?

NEW SCHOOL?

Jahan Nanji

Lindsey Morrow

Olivia Blahut

Ridership Forecasting from a Transit Agency Perspective

FY2020 ALTRANS & Alabama Transit Association Conference

Agenda.

1. **Introductions and Via background.**
2. Dynamic transit overview.
3. Service design and demand forecasting in dynamic services.
4. Wrap-up.

Introductions

Olivia Blahut
Southeast Partnerships Lead

Lindsey Morrow
Launch Advisor

Jahan Nanji
Launch Manager

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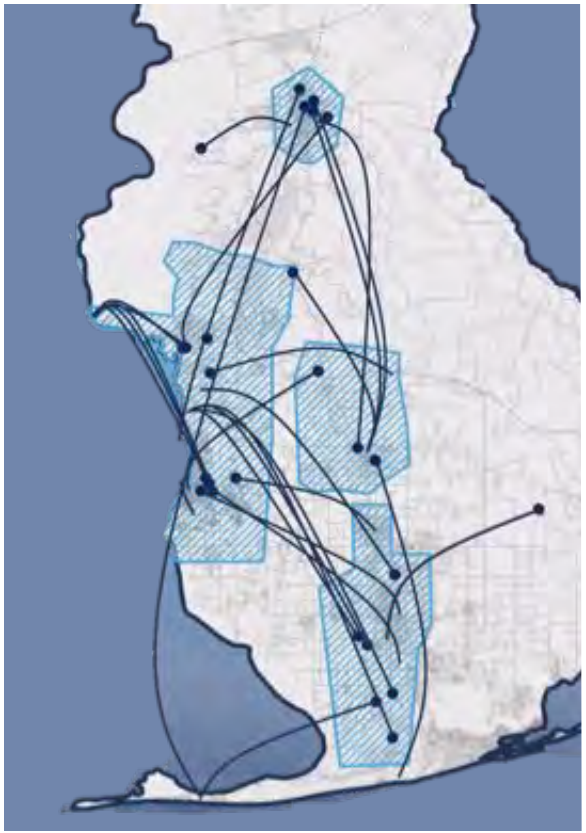
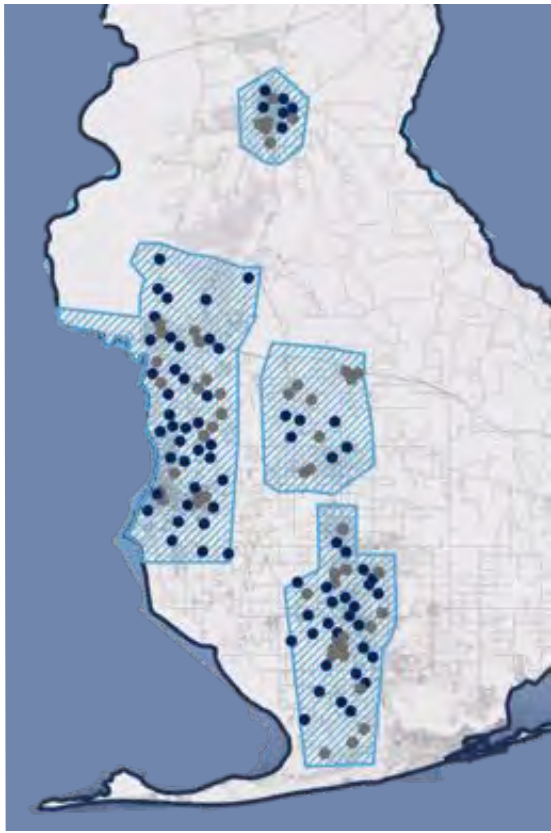
The future of public transit in Baldwin County

The world's largest rural mobility on demand (MOD) deployment

Fully replacing current fixed routes and pre-scheduled zone service with more flexible options for riders

- Trips within primary zones can be on-demand
- Trips between primary zones can be pre-scheduled in as little as 3 hours in advance
- Trips between outer zones can be pre-scheduled in as little as 12 hours in advance





Transportation challenges around the world

Public transport ridership is decreasing

Many areas are underserved by transit

New mobility providers are cannibalizing public transport

Building infrastructure is expensive and challenging

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Our mission

To build the world's most efficient, convenient, and accessible shared mobility solutions.

We strive to be the digital infrastructure powering public transit for cities, transit agencies, and private operators.

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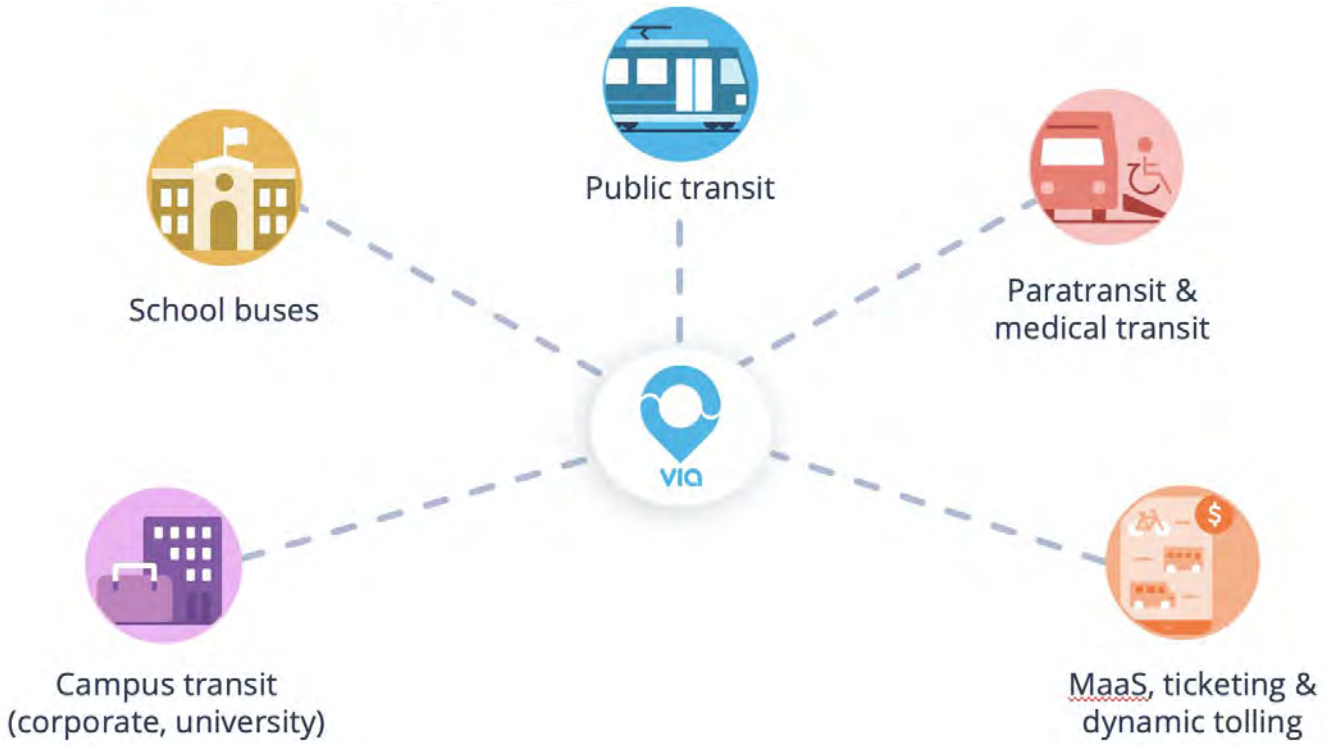
Via is leveraging technology to improve all forms of public mobility.



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Implementing transit technology in variety of communities.

100+
partnerships

20+
countries

2m+
rides/month

350+
engineers

*Launching soon

Via or ViaVan cities

Via in Alabama.

BRATS

- Powering first of its kind integrated rural transportation system
- On-demand and pre-scheduled trips in zones throughout Baldwin County
- Software-as-a-service

City of Birmingham

- Community shuttle program in 8 sqm zone
- Connects residents to employment, healthcare, education, grocery stores, etc.
- Transportation-as-a-service

Southern AL Regional Planning Commission

- Transit feasibility study aimed at providing local agencies and governments with guidance on obtaining non-fixed route transit systems

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Agenda.

1. Introductions and Via background.
2. **Dynamic transit overview.**
3. Service design and demand forecasting in dynamic services.
4. Wrap-up.

On-demand routing: smarter rides with virtual stops

Pairs riders traveling along the same path

Matches riders with the best vehicle for that shared journey

Directs riders and drivers dynamically to the best virtual stop

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On-demand services address fixed route challenges

Challenges
of a 100% fixed route model

- Limited coverage
- Less frequent
- Higher costs
- Rigid

Strengths
of hybrid fixed route & on-demand model

- Maximizes coverage
- Tech-enabled and accessible
- Cost effective
- Flexible to current needs

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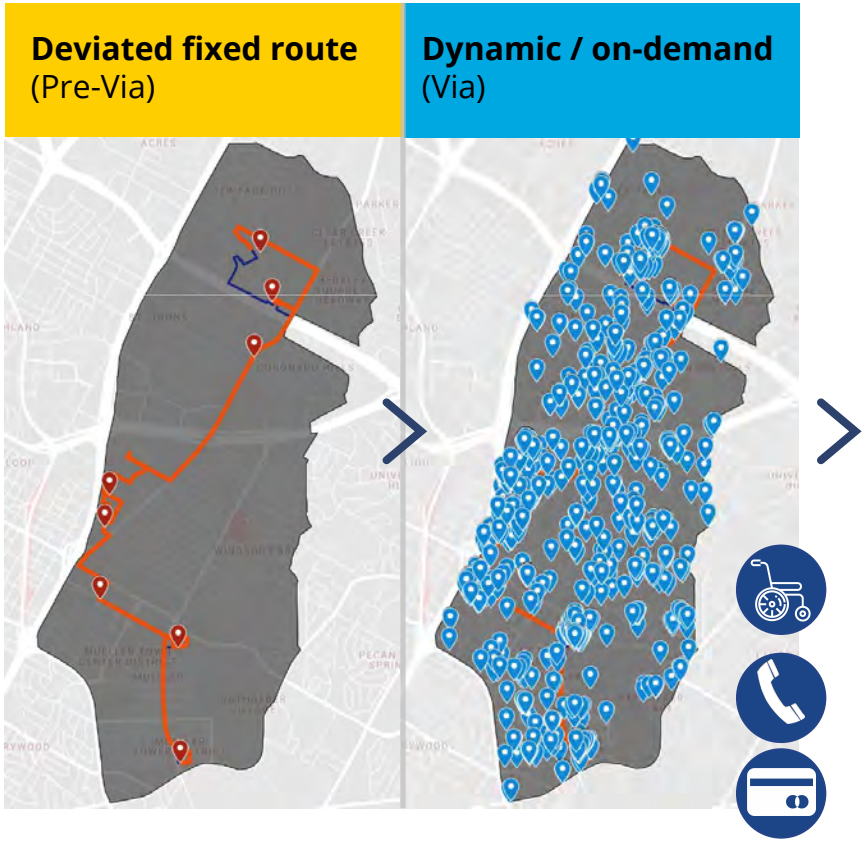
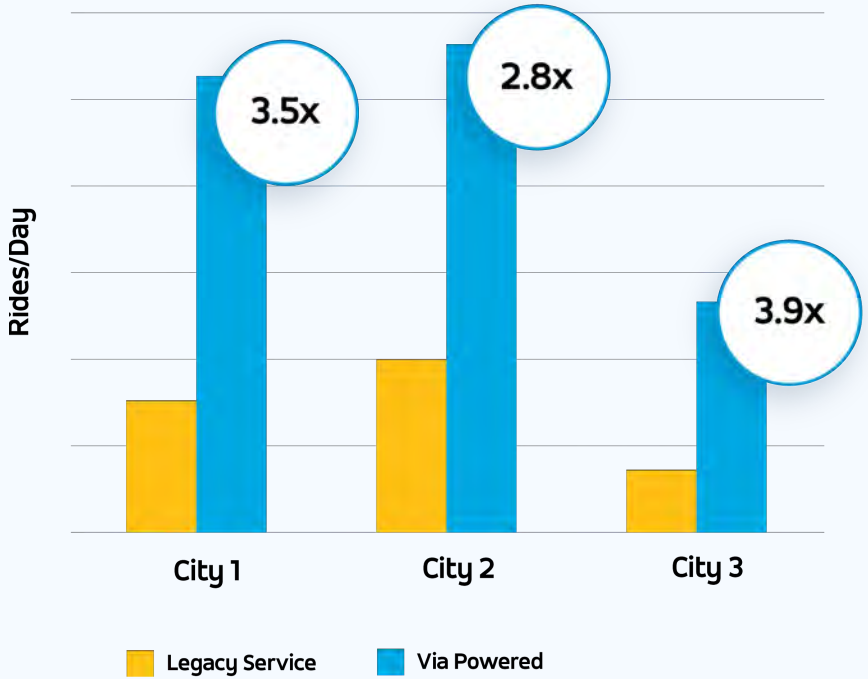
Convenience & accessibility drive demand





Agenda.

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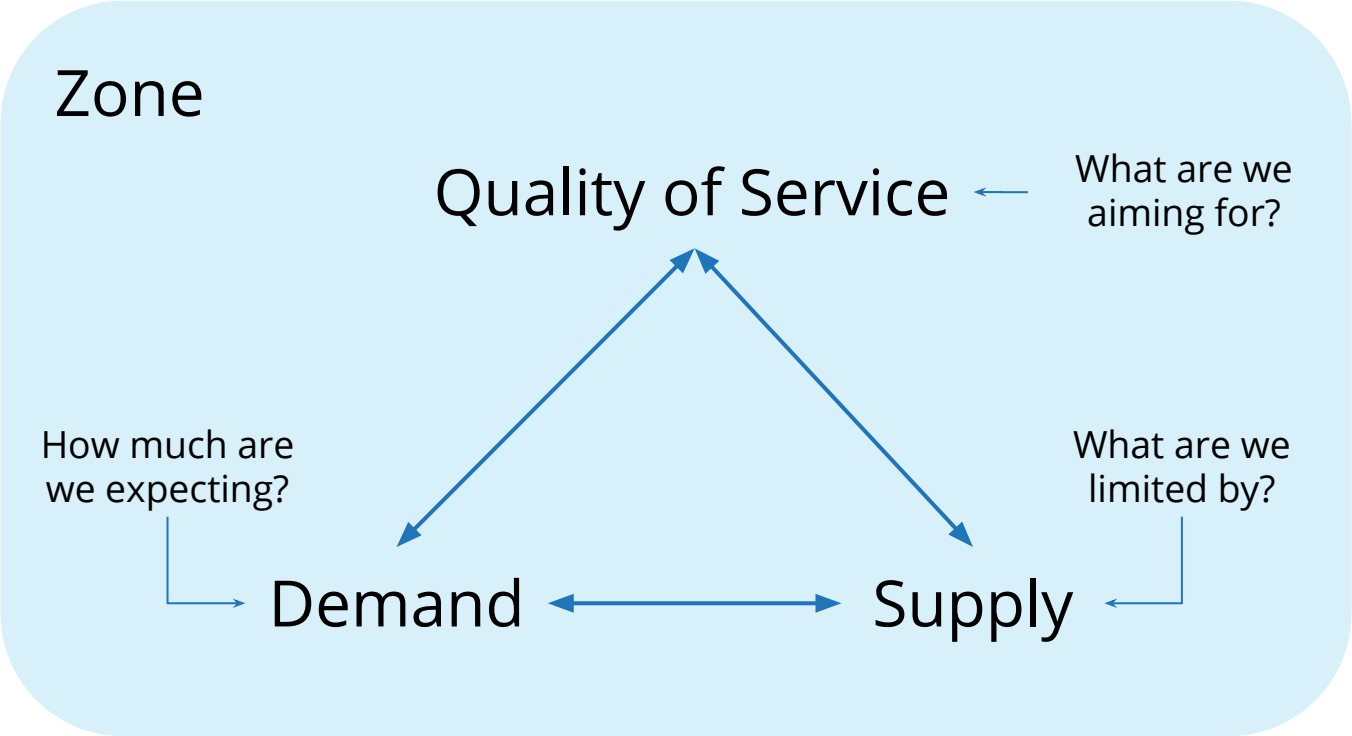
Understand the dynamics behind service design



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Evaluate trade-offs between rider experience and system efficiency

Dynamics of Service Design | Quality of Service

Taxi / Private Car

On-demand & dynamically-routed systems:
Ability to adjust algorithm parameters

System with limitations:
Prescheduled or limited routing
(i.e., on-demand or not dynamic)

Fixed-route Systems

Better Rider Experience
System conforms to rider

Rider preferences affect the service quality:

- Greater tolerance for low Quality of Service (willingness to wait) increases average wait time
- The reverse is also true

Greater System Efficiency
Rider conforms to system

System settings affect service quality:

- Waiting time
- Time on board
- Walking distance

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We leverage Via's advanced algorithms, simulation capabilities and proprietary statistical models to design services

travel patterns

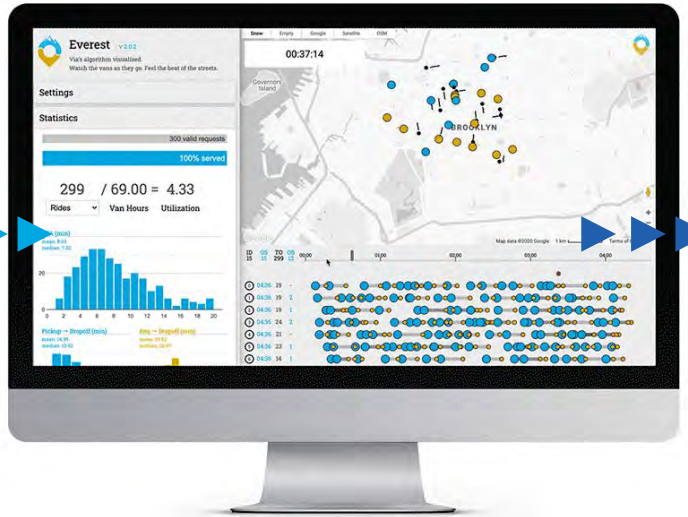
capacity

demand

area

supply

fleet size



Iterative Simulations using ViaViewer™

walking distance

service quality

wait time

utilization

ride duration

Demand forecasting begins with three principles

Dynamics of Service Design | Demand

Service Characteristics

- Service zone size and shape
- Service hours of operation
- Restrictions on types of trips

Service Zone Characteristics

- Existing transportation infrastructure and alternatives
- Parking availability
- Walkability
- Potential use cases / zoning

Rider Characteristics

- Rider preferences
- # that live and work in the zone
- Age demographics, income levels, car ownership
- Anticipated demand patterns

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Via's rider growth approach positions our partners for sustained success

01

Goals based planning

Defining success and aligning on priorities is critical to a successful launch

02

Customer segmentation

Segmentation by use case allows for the tailoring of channels and messaging

03

Multi-channel approach

Best channel mix is determined through goal setting, testing, and performance iteration

Marketing philosophy: Be data-driven, be flexible, and build on best practices

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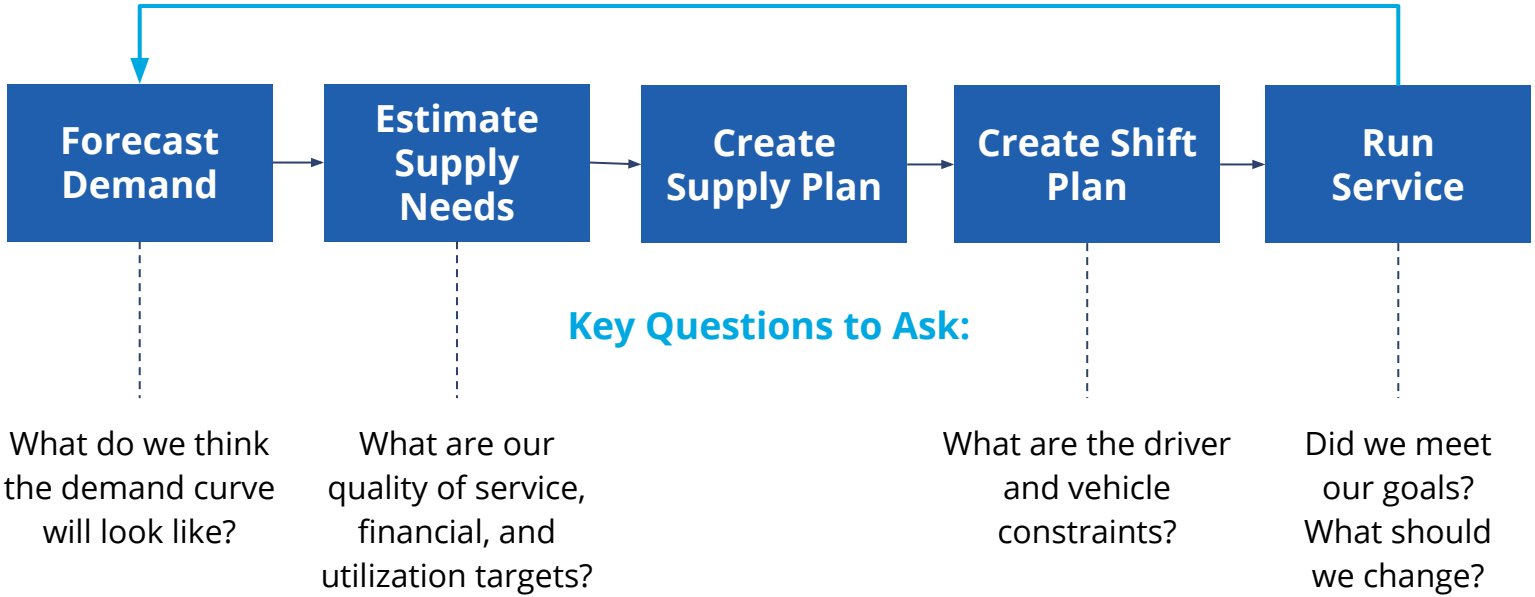
Supply can be a flexible, growth driver for demand

Dynamics of Service Design | Supply



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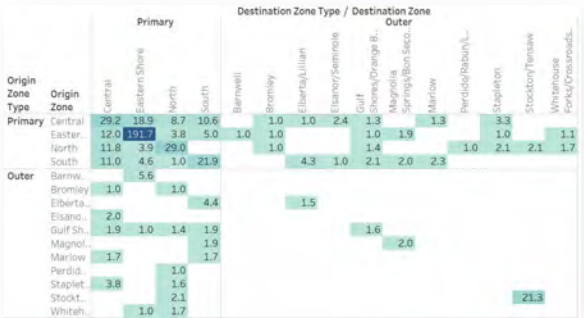
In Baldwin County, supply optimization powered by our dynamic technology will give riders even greater flexibility

- Analyzed historical demand patterns in Baldwin County
- Determined target supply by service area
- Created daily shift plan based on FT/PT drivers



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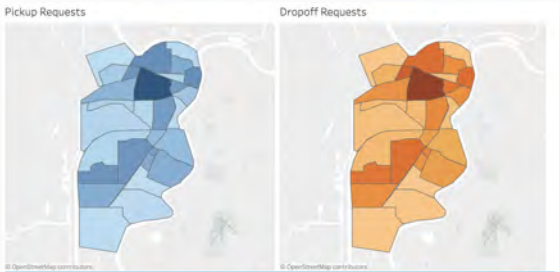
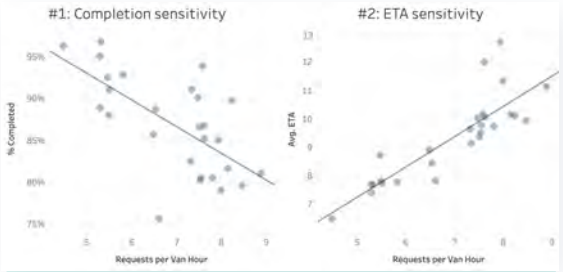
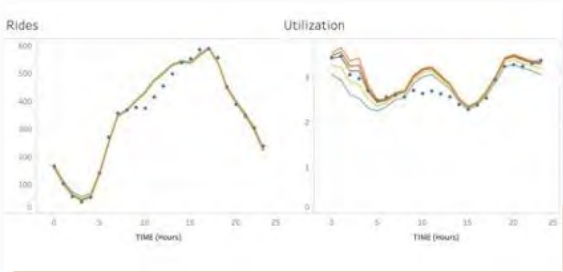
We will continue to use data-driven performance optimization to translate service design into post-launch success



Geographic Demand Heatmap



Supply-Demand Sensitivity Models



Regression Analysis for Quality of Service KPIs

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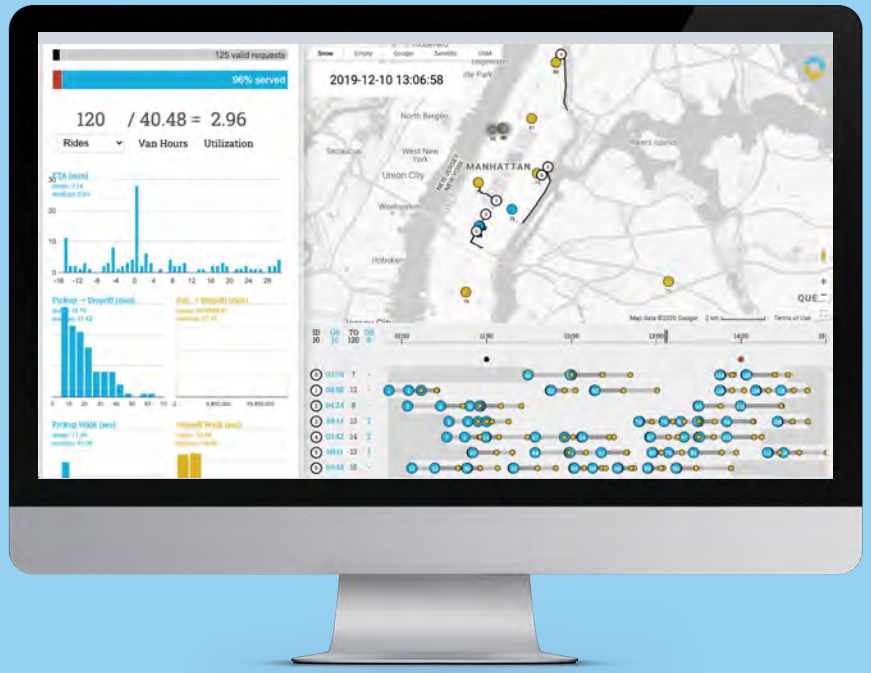
Agenda.

1. Introductions and Via background.
2. Dynamic transit overview.
3. Service design and demand forecasting in dynamic services.
4. **Wrap-up.**

Envisioning future service models.

Curious where and how dynamic transit might help to…

- Improve efficiency?
- Expand coverage?
- Increase accessibility?
- Drive ridership?



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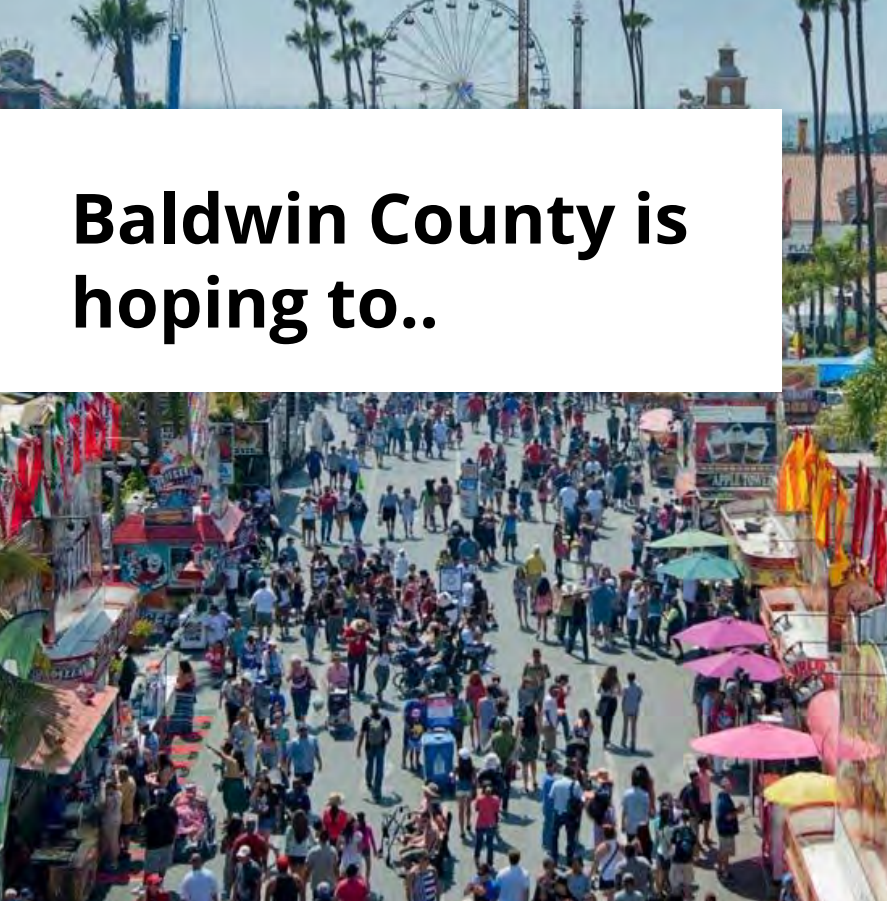
Thank you.

Olivia Blahut | Southeast Partnerships Lead
olivia.blahut@ridewithvia.com

Appendix

Baldwin County is hoping to..



- **Increase service efficiency** and operational cost savings
- **Increase mobility access** for seniors and underserved riders
- **Become an innovator in the region** and build a playbook for successful implementation to be adopted by other agencies

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