Transit Optimization Study

March 2022

March 1, 2022

Dear DART Riders and Stakeholders:

As the current and past chairs of the DART Commission, we've had the privilege of seeing and experiencing the many ways DART service positively impacts the lives of central Iowans.

Twelve central Iowa communities invest in public transit because it contributes to a strong regional economy. As a result of our investment, DART connects people to jobs and educational opportunities as well as healthcare and other essential services.

To further our mission of enriching lives, connecting communities and expanding opportunities, the DART Commission directed DART staff and a consulting team to evaluate DART's performance and the needs of the region. During this extensive effort, we listened to riders and our member communities through an extensive public feedback process. We focused on our commitment to providing efficient and effective service that provides opportunities for our residents and helps maintain the quality of life for which Greater Des Moines is known.

We closely examined the needs of the region and worked together to develop a vision for the future that builds on what's working well and how we can address inefficiencies or gaps in service. We considered new approaches to delivering mobility services, including leveraging technology and pursuing private partnerships where those arrangements can meet riders' needs.

We did all of this in the midst of pandemic. This extended our timeline, but also brought a renewed appreciation from our riders, stakeholders and our own team for the critical role that transit plays in getting essential workers to jobs.

Following this extensive and inclusive process, the Transit Optimization Study represents the Commission's vision for how DART can adapt to meet the evolving needs of the region and sustain the critical transit services we offer to central Iowans.

Respectfully,

Doug Elrod
Mayor, Bondurant
Chair of the DART Commission

Russ Trimble
Mayor, West Des Moines
Past Chair of the DART Commission

Des Moines Area Regional Transit Authority

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50309-4530

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Board of Commissioners

The Des Moines Area Regional Transit Authority (DART) is represented by a board of 12 Commissioners, one from each member community it serves.

As a tax-supported transit system, DART is accountable to its region's voters. Each member of DART's Board of Commissioners is an elected official from each individual member government. The DART Commission is a volunteer group that sets policy and oversees DART's budget. DART's staff manages and carries out system planning and day-to-day operations. Terms for DART Commission positions are four years.

Commissioner Vernon Willey II – Altoona Council Member

Commissioner Kelly Whiting – Ankeny Council Member

Commissioner Doug Elrod – Bondurant Mayor – Board Chair

Commissioner Michael McCoy – Clive Council Member – Executive Committee Member At-Large

Commissioner Josh Mandlebaum – Des Moines Council Member – Vice Chair

Commissioner Andrew Borcherding – Grimes Council Member

Commissioner Paula Dierenfeld – Johnston Mayor

Commissioner Ross Grooters – Pleasant Hill Council Member – Secretary/Treasurer

Commissioner Steve Van Oort – Polk County Supervisor

Commissioner Bridget Montgomery – Urbandale Council Member – Executive Committee Member At-Large

Commissioner Russ Trimble – West Des Moines Mayor

Commissioner Joseph Jones – Windsor Heights Council Member

Project Team

HNTB

TMD
TRANSPORTATION MANAGEMENT & DESIGN, INC.

SHARED-USE MOBILITY CENTER

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Introduction

OUR MISSION

Enriching Lives, Connecting Communities, Expanding Opportunities.

DART carries out this mission through its system of public transportation services that connect thousands of people every day to jobs, school, medical appointments, entertainment and more.

OUR VISION

Facilitate affordable, seamless mobility options that support economic prosperity for all by:

- **Connecting people to jobs, education, and essential services**
- **Leveraging data, technology and collaborative partnerships**
- **Ensuring innovative and regional mobility solutions are in the right place at the right time**

In order to achieve this vision, DART embarked on the Transit Optimization Study to determine the best way for DART to serve the Greater Des Moines region and ensure that a system of coordinated mobility options meet the region's needs in a rapidly evolving transportation landscape. Through this process, DART has shown a willingness and eagerness to take a proactive approach to positioning public transportation in a changing landscape of technology, travel options and transportation policy.

Goals of the Transit Optimization Study

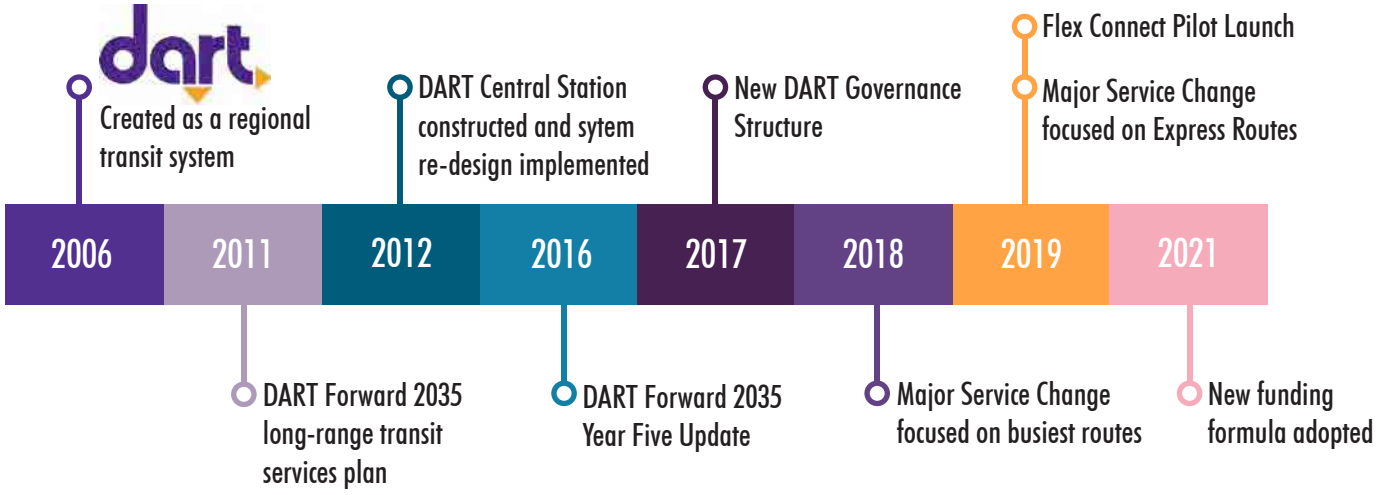
1 **Optimize** existing service to ensure that public mobility services are efficient and effective

2 Incorporate **innovative service and business models** to DART's regional mobility offerings

3 Develop a **long-term vision** for DART service and identify recommendations for how best to achieve stated goals and evolving needs of **member communities**

Timeline of DART Milestones

DART was founded as a regional transit authority in 2006. Since that time, DART's services and governance have evolved to reflect a more regional mindset and match service levels with regional needs and resources. This Transit Optimization Study builds on prior planning efforts that led to the construction of DART Central Station, the redesign of the bus route network, as well as earlier, later and more frequent midday service.



Advancing Equity in the Region

Access to safe, affordable public transportation is critical to giving people of all backgrounds, ages and abilities the opportunity to fully participate in their community. In order to advance diversity, equity and inclusion in our region, DART has used the **4 Equity Tool**[1] developed by the Capital Crossroads initiative as a framework for designing public outreach and decision-making for this study. This has resulted in diverse public input on mobility needs in our region and careful consideration of how benefits and trade offs are balanced so that transit can expand opportunities for all.

1 4 Equity Tool. Capital Crossroads. Available at: https://www.capitalcrossroadsvision.com/wp-content/uploads/2019/01/Social-Capital_4-Equity_June.pdf

The Existing DART System

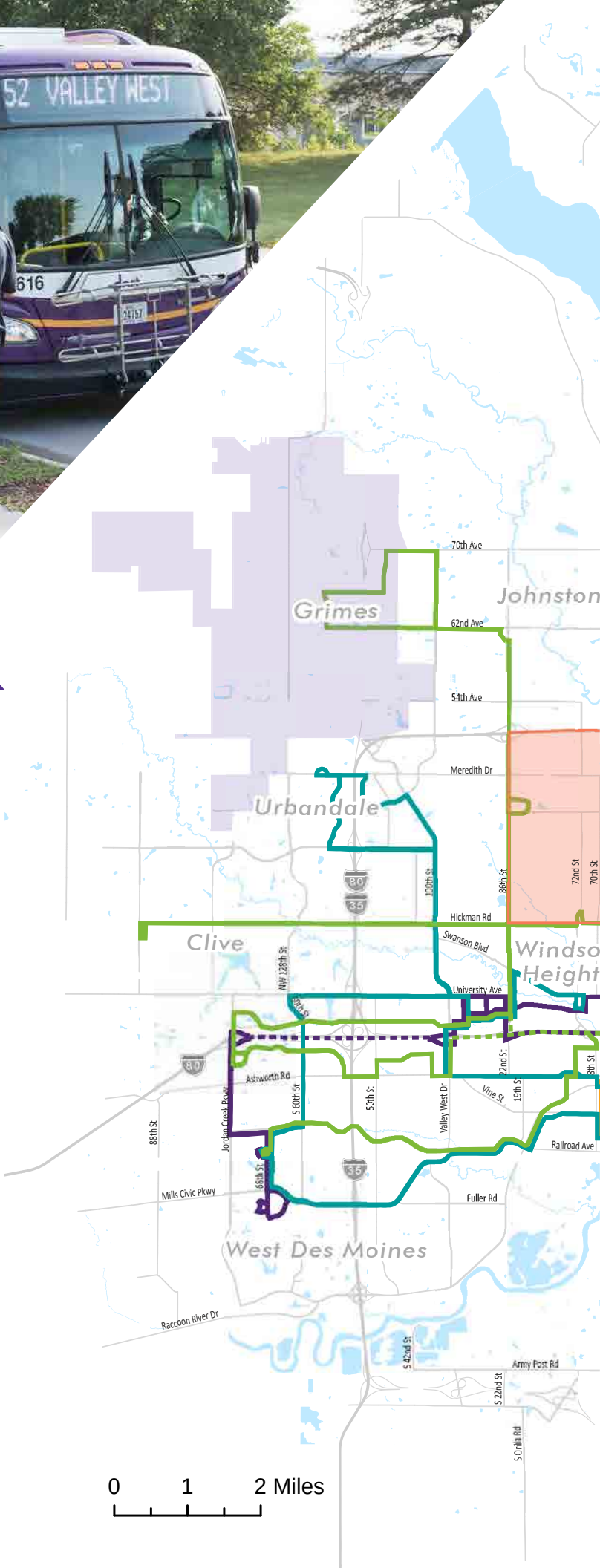
DART provides fixed route and/or On Call transit service to all of its member communities. Some DART services have different service areas. For example, ADA paratransit service is provided mostly within ¾ miles of the fixed route and On Call bus network, while RideShare vanpool service is offered throughout an 18-county region.

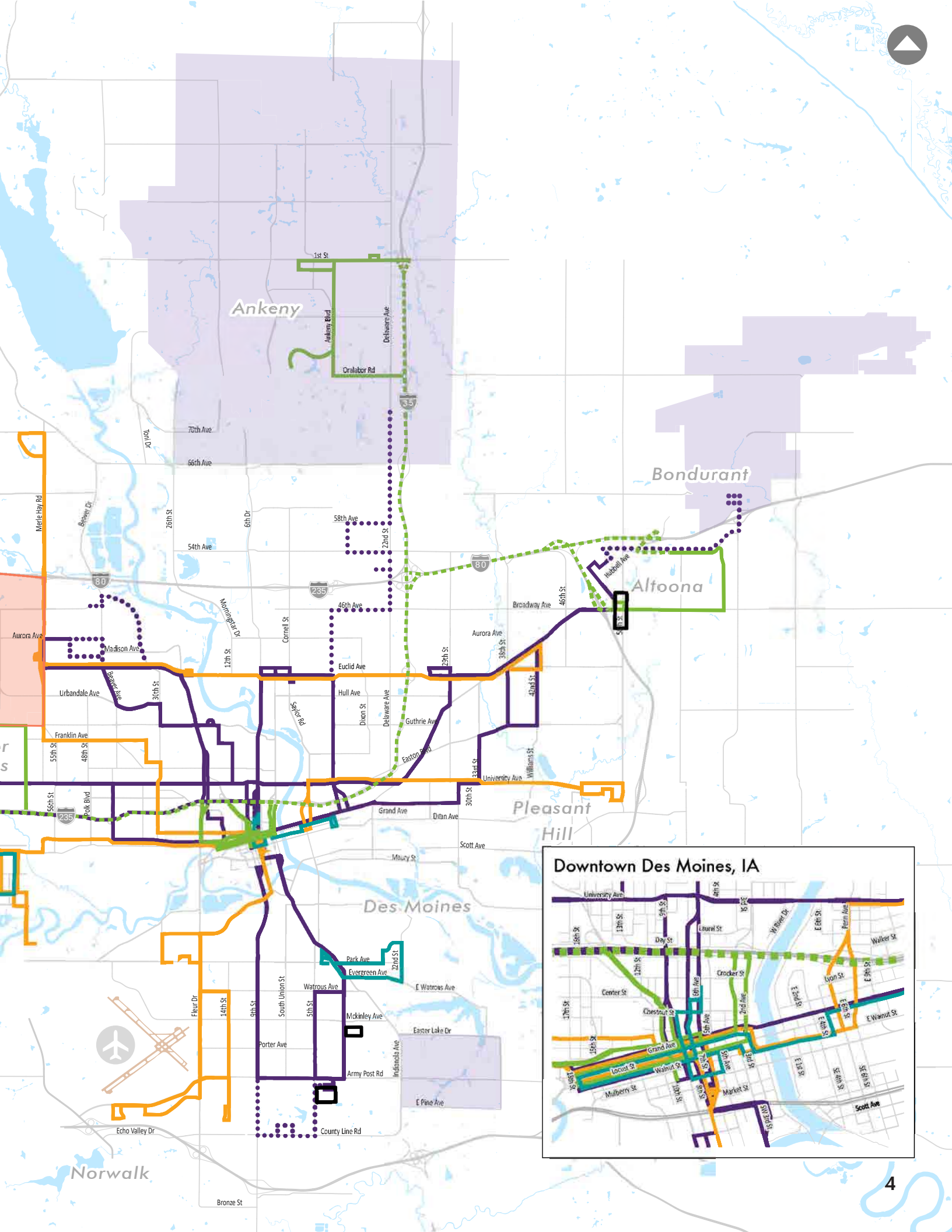
Legend

Routes by Type

- Frequent Local Fixed Routes
- Local Fixed Routes
- Express Routes
- Express Routes No Stops
- Shuttle Routes
- On Call Zone
- Flex Connect Zone

Note: *DART On Demand microtransit pilot was launched in 2021, replacing the On Call zone in Ankeny.*




Ankeny
Bondurant
Altoona
Pleasant Hill
Des Moines
Norwalk
1st St
Ankeny Blvd
Delaware Ave
Oralabor Rd
35
70th Ave
66th Ave
Tonl Dr
Merle Hay Rd
Beaver Dr
26th St
6th Dr
58th Ave
22nd St
54th Ave
80
235
46th Ave
Hubbell Ave
Broadway Ave
46th St
Aurora Ave
Madison Ave
Morningstar Dr
Cornell St
12th St
Euclid Ave
29th St
38th St
42nd St
Urbandale Ave
Beaver Ave
30th St
Hull Ave
Dixon St
Delaware Ave
Guthrie Ave
Franklin Ave
55th St
48th St
Saylor Rd
Easton Blvd
33rd St
University Ave
Williams St
56th St
Polk Blvd
Grand Ave
Dilan Ave
30th St
Scott Ave
Maury St
Park Ave
Evergreen Ave
22nd St
Watrous Ave
E Watrous Ave
Fleur Dr
14th St
9th St
South Union St
5th St
Mckinley Ave
Easter Lake Dr
Porter Ave
Indianola Ave
Army Post Rd
E Pine Ave
Echo Valley Dr
County Line Rd
Bronze St
Downtown Des Moines, IA
University Ave
4th St
13th St
9th St
16th St
Laurel St
Day St
W. River Dr.
E 6th St
Penn Ave
Walker St
18th St
12th St
Crocker St
Lyon St
Center St
6th Ave
E 2nd St
E 6th St
17th St
Chestnut St
5th Ave
2nd Ave
E Walnut St
15th St
Grand Ave
Locust St
Walnut St
Mulberry St
Market St
Scott Ave

DART's Services

DART operates a family of transportation services that make getting around Greater Des Moines easier and more convenient. In 2019, DART adopted its current Service Standards for the following performance metrics: Productivity (passengers per hour), Cost per Customer, and Target Frequency.

Productivity (passengers per hour)

Cost per Customer

Target Frequency

Frequent Local Fixed Routes

Operates 7 days per week until 9 pm or later (5 pm on Sundays), and are dense corridors with key regional destinations. These routes form the backbone of DART's transit network.

20 $6.00 15-30 minutes

Supporting Local Fixed Routes

Serves lower-density areas with fewer regional destinations, helping to provide regular all-day weekday service to parts of the region where more frequent service may not be warranted yet. These routes operate Monday-Friday only, and some may operate only during peak commuting hours. Supporting local fixed routes also provide dedicated trips to many Des Moines schools.

15 $10.00 30-60 minutes

Express Routes

Operates Monday through Friday, mostly during the morning and evening rush hours, picking up passengers at limited stops and providing direct, nonstop service to and from Downtown Des Moines. Some provide local connections before proceeding nonstop to Downtown Des Moines.

10 $15.00 20-30 minutes

Shuttles

Facilitates first-last mile connections to other DART fixed routes and circulation in and around Downtown Des Moines. Downtown shuttles provide a fare-free connection between parking, employment centers, and other downtown destinations. Weekend service varies on Shuttle routes.

5 $25.00 varies

On Call Zones

Pick up passengers at their door and take them to destinations within specific zones. Customers book trips by calling DART customer service at least one day in advance. Most services operate 1-2 days per week, except Ankeny and Grimes which operate Monday-Friday. Service hours are limited.

5 $25.00 subject to demand

Flex Connect

A new mobility-on-demand (MOD) service that connects passengers in areas where the fixed route network does not reach. Like On Call, riders can book trips within a defined zone to or from a bus stop that connects them to DART's fixed route network. Flex Connect allows same day booking using Uber, Yellow Cab taxi or a DART-operated accessible vehicle, and can be booked by phone or through the Uber app. DART introduced Flex Connect as part of a pilot program in 2019.

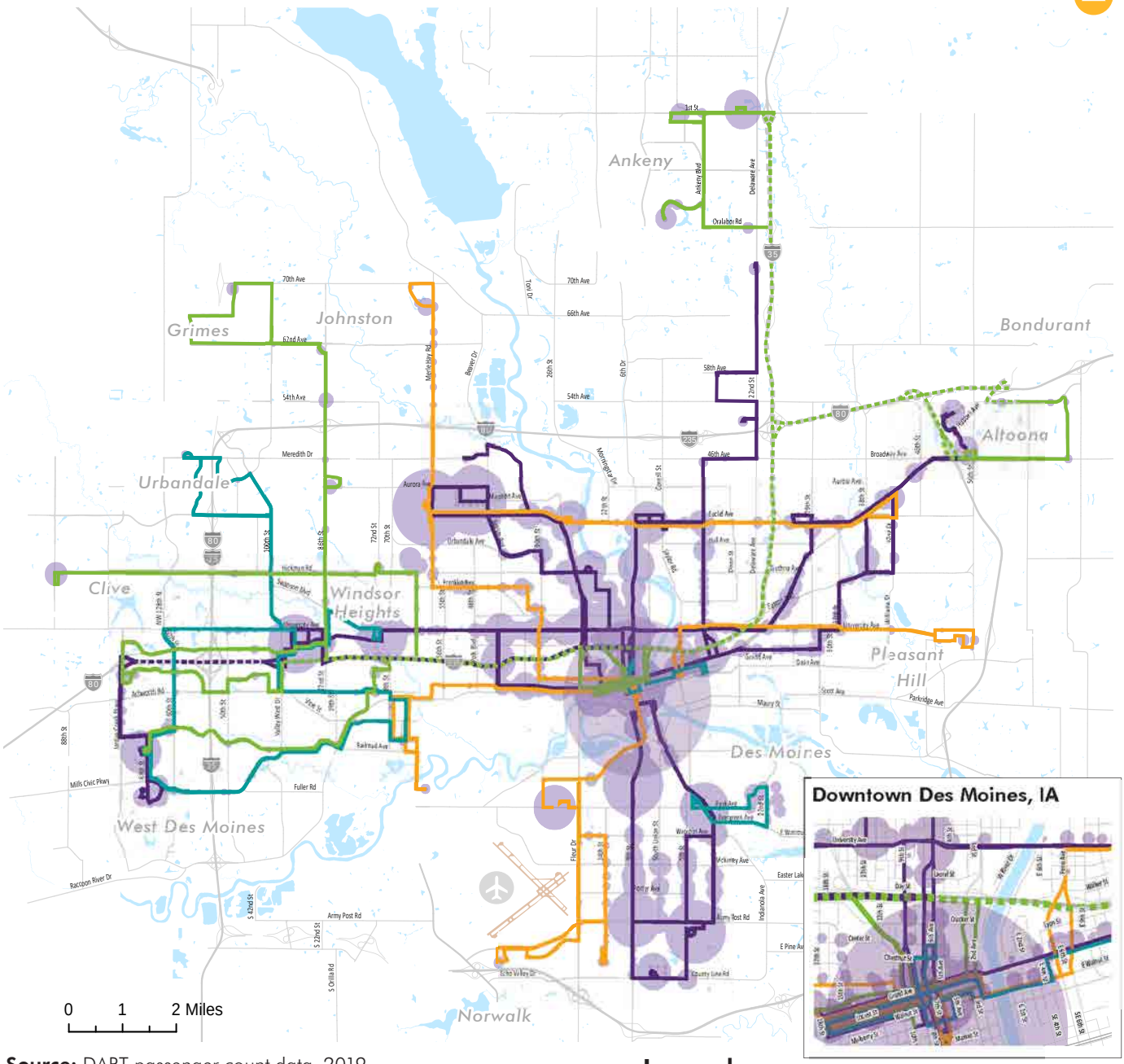
Paratransit

Available for senior citizens and persons with disabilities who are unable to use DART fixed route service. Paratransit is a "door-to-door" and wheelchair accessible service, and includes federally mandated ADA complementary service, as well as contracted trips to senior meal sites and medical appointments.

RideShare

Vanpool program administered by DART in which a group of commuters share a DART-provided van. Covering 18 counties in Central Iowa, RideShare is available beyond DART's normal service Area. Historically, DART has limited RideShare formation to areas beyond the reach of the Express Route network.

Where are DART's Current Riders?



Source: DART passenger count data, 2019

DART served approximately **15,000 riders on an average weekday and 4.4 million annually in 2019.**

Two-thirds of DART's boardings occur on nine of its frequent local routes (3, 4, 5, 6, 14, 15, 16, 17, 60). These high-ridership routes form the spine of DART's transit network, **operating highly productive service in transit-supportive built environments.**

DART's strongest ridership occurs along high-density corridors, at park and ride locations, at schools, and at major transit hubs (DART Central Station, Merle Hay Mall, Valley West Mall, and Southridge Mall).

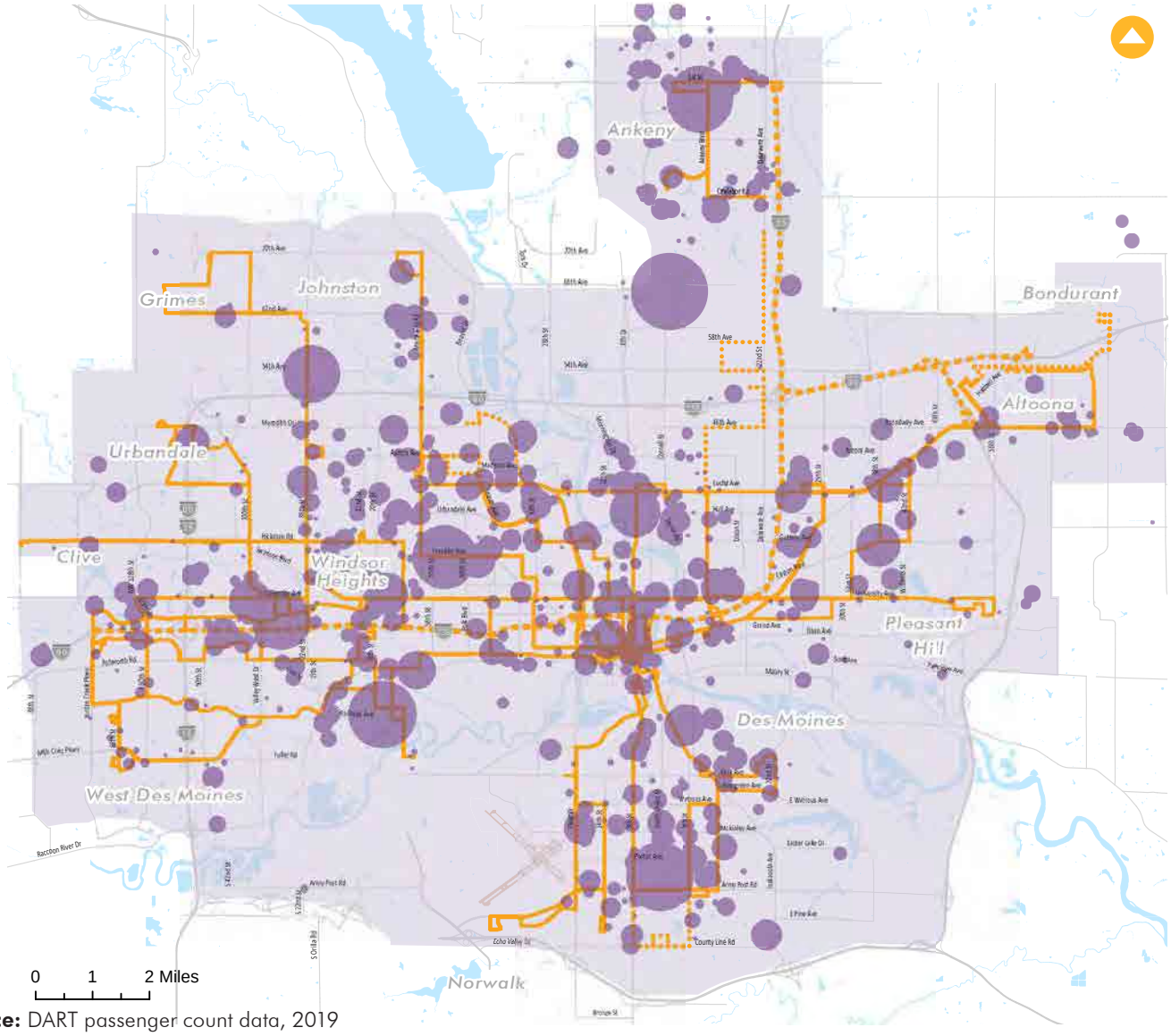
Legend

Average Weekday Ridership

- 1
- 10
- 50
- 100

Routes by Type

- Frequent Local Fixed Routes
- Local Fixed Routes
- Express Routes
- Express Routes No Stops
- Shuttle Routes



Source: DART passenger count data, 2019

Paratransit

DART is required to offer ADA paratransit service within ¾ mile of the fixed route network, and DART's paratransit service area extends beyond that in some places. DART also provides contracted paratransit service for Medicaid trips, congregate meal sites, and other services for seniors and people with disabilities.

Paratransit service averaged approximately 400 trips each weekday in 2019.

Eighty seven percent of paratransit trips begin within ½ mile of the fixed route network, and 72% within ¼ mile. This shows that **DART's fixed route network provides good coverage, reaching most origins and destinations that are important to DART's customers.**

While the fixed route network is focused on connecting passengers to and through Downtown Des Moines, 62% of paratransit trips start and end in the same city, emphasizing the demand for intra-community mobility options.

Legend

Paratransit Boardings

- 1
- 10
- 50
- 100

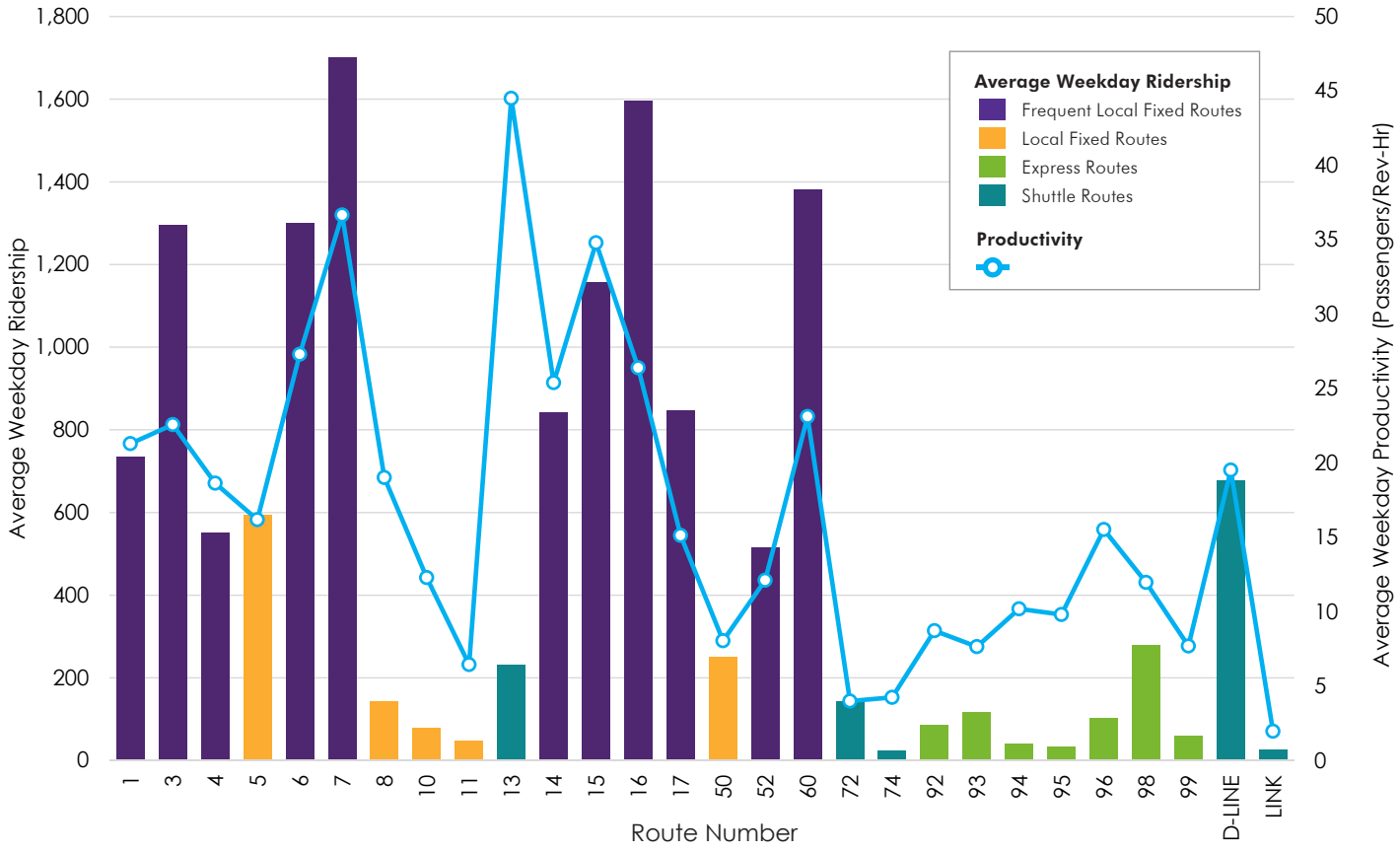
DART Fixed Route Network

DART ADA Zone

Due to changes in how the State of Iowa administers Medicaid, there has been a significant decrease in the number of contracted Medicaid trips on paratransit, an increase in ADA complementary trips, and a decrease in revenue for DART.

System Productivity

Weekday Ridership and Productivity by Route



Source: DART passenger count data, 2019

DART's frequent local network is highly productive, carrying an average of 24 passengers per revenue-hour of service.

Productivity correlates with ridership, but low ridership routes can also have strong performance when service levels are appropriately tailored.

Twenty four of DART's 28 fixed routes meet at least 75% of their productivity target. Recommendations of this study aim to build on DART's most productive services while addressing underperforming and less productive services.

DART regularly benchmarks its performance across similarly sized transit agencies, and DART's productivity is in line with its peers.

Most fixed routes carry more passengers than can be cost-effectively transported using alternative mobility-on-demand (MOD) services, which perform at less than 5 passengers per hour.

Weekday Productivity by Hour

	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	Daily
Frequent Local Routes																					
Frequent Local Productivity Target																					20
1		12	28	50	16	9	13	19	15	19	24	44	35	18	18	6	13	8	10	2	20
3	10	17	17	23	20	18	20	22	23	24	27	30	33	21	23	38	30	25	14	3	23
4	2	6	16	20	8	23	21	21	15	15	12	29	20	13	30	17	15	13	16	0	19
6	6	18	11	35	17	21	19	26	26	25	30	31	39	26	21	15	16	10	10		22
7	19	36	24	53	34	28	28	31	35	35	36	61	39	26	62	33	29	28	10	4	35
14		4	15	32	20	18	25	17	19	23	24	46	25	24	11	15	14	12	9	2	21
15	7	11	19	66	34	28	27	27	29	31	29	50	45	36	17	21	15	13	9	2	31
16		19	14	45	22	27	27	24	25	23	26	28	28	18	17	19	18	18	10		24
17		5	9	11	19	20	18	17	18	22	23	17	15	12	12	20	23	10	10	1	15
52		4	15	14	10	8	7	7	10	10	12	13	23	21	16	6	7	7			12
60		19	13	33	25	19	24	26	23	25	31	40	26	23	16	11	11	10	12		23
Supporting Local Routes																					
Supporting Local Productivity Target																					15
5		11	12	20	12	15	11	8	11	10	14	20	15	11	15	5	4				12
8		0	12	56								48	8	6	0						19
10		5	12	15	7							20	13	7							12
11		8	6	17	8							0	2	4	1						6
50		2	10	7	8	5	11	4	9	8	12	9	16	5	8	4	7				8
Shuttle Routes																					
Shuttle Productivity Target																					5
13			6	14								15	32	12							14
42 D-Line			10	19	17	21	22	23	30	21	18	21	20	8							20
72			6	5	3	7	5	4	4	7	6	6	5	3	2	1	1	0			4
74			6	6	3								5	4	0						4
Express Routes																					
Express Productivity Target																					10
92		3	6	13								9	5	7							9
93		7	6	8							3	15	14	9	2						8
94/95			13	7									15	4							10
96			12	16								11	15	8							16
98		16	20	14	8				8	5	6	14	22	10	1						12
99		3	7	15								7	9	2							8
40 LINK		0	0	5	3	0	0	0	0	2	4	3	6	2	1						2

Source: DART passenger count data and service levels, 2019

Productivity remains relatively strong throughout the day, demonstrating that service frequencies are tailored to demand at different times of day.

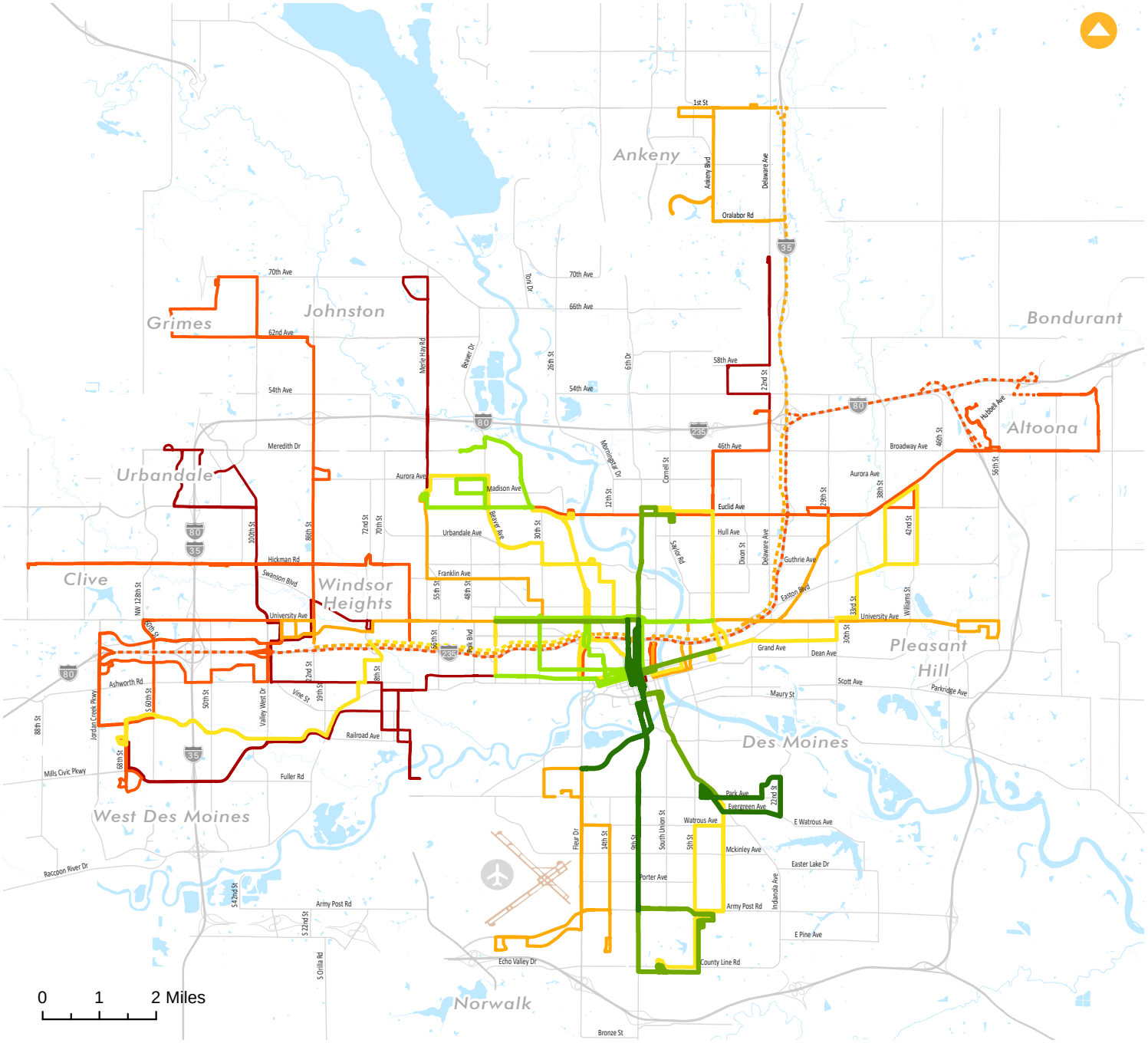
While early morning and later evening services are lower-performing, a full span of service is critical to attract and retain ridership. For example, if service ends at 9:00 PM, a person traveling home at 9:00 PM may choose not to use transit for their 2:00 PM trip from home if they can't be guaranteed a return trip.

Early morning and late evening service also serve shift workers who depend on reliable transit to get to work.

On Call Zones

On Call service provides access and mobility in areas where low density development and low demand make fixed route transit less cost-effective.

Even though DART delivers most On Call trips using existing paratransit capacity to deliver them more efficiently, DART operators often have to travel long distances to provide a single trip. Ridehail or taxi service could potentially serve some of these trips more cost-effectively.



Weekday Productivity by Segment

Productivity varies geographically: stronger performance tends to occur in denser areas with a broader mix of destinations; lower performance in areas that are more auto-centric with dispersed or single-use destinations.

The lower-productivity outlying segments of the fixed route network still mostly equal or exceed the practical productivity limit of an MOD service – fixed route is the most efficient service type in most of DART's network at most times of day.

The southeastern portion of Route 72 is the lowest-productivity segment in the DART fixed route network.

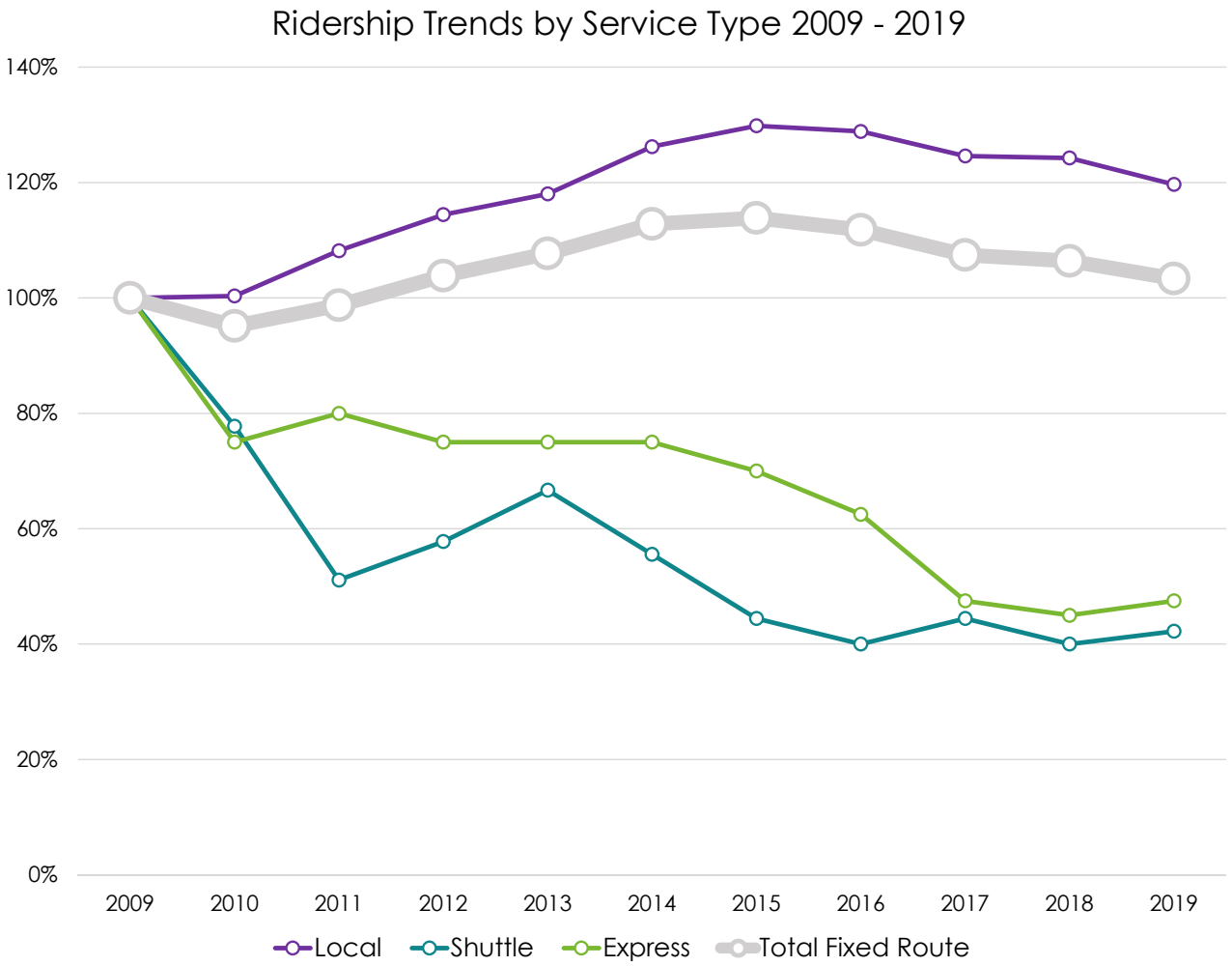
Source: DART passenger count data and service levels, 2019

Legend

Weekday Route Productivity
by Segment *(passengers per rev-hour)*

- More than 30
- 26 - 30
- 21 - 25
- 16 - 20
- 11 - 15
- 6 - 10
- Under 5
- Express Routes No Stops

Historical Ridership Trends

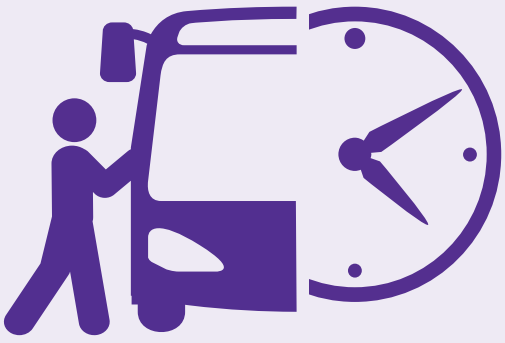


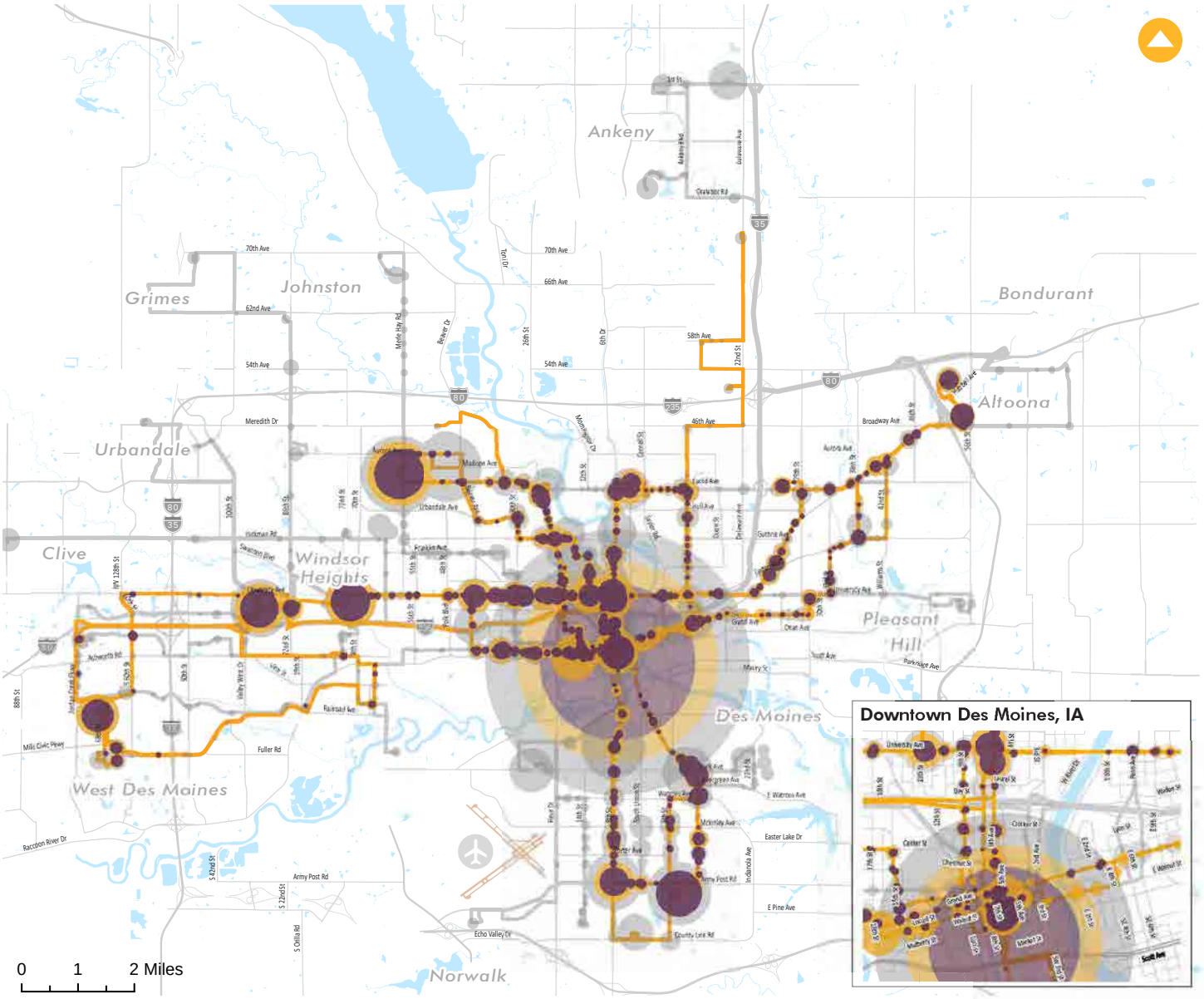
Source: DART passenger count data, 2009-2019

DART ridership grew rapidly after implementation of the DART Forward recommendations in 2010 and 2011. Ridership plateaued in 2015 and has since declined somewhat, as has ridership on many transit systems nationwide.

On Call and Express service have lost market share as they've experienced the most significant relative drops in ridership. Drops in express ridership reflect office workers commuting fewer days per week and workforce turnover. Looking ahead, the Des Moines area is changing with the fastest-growing employment centers located outside of Downtown Des Moines and in areas with less transit service.

We don't know the full effect of the COVID-19 pandemic yet, but it appears to have accelerated these same overall trends.





Source: DART passenger count data, 2019

Weekend Ridership

DART provides around 40% less service on Saturdays, and 65% less service on Sundays, even though transportation data shows people typically make nearly as many trips on weekends as they do on weekdays across all modes (not just on public transportation).

Only 13 of DART's 28 fixed routes run on weekends. Routes that run every 20 to 30 minutes on weekdays run every 30 to 60 minutes on weekends, with fewer hours, especially on Sundays.

Lower ridership on weekends mirrors the lower levels of service provided by DART – 57% lower on Saturdays and 75% lower on Sundays.

Legend

Average Daily Boardings

- 1
- 10
- 50
- 100
- 1,000

- Weekday DART Fixed Route Network
- Weekend DART Fixed Route Network

Day Type

- Weekday
- Saturday
- Sunday

Saturday Productivity by Hour

Frequent Local Routes	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	Daily
Frequent Local Productivity Target																					20
1			11	11	18	14	22	23	18	22	25	21	17	25	14	13	9	8	0		16
3			7	21	18	29	31	39	44	34	38	45	32	42	26	19	14	17	8		29
4			12	12	12	25	19	7	32	22	26	14	28	26	15	9	19	16			17
6			15	21	28	36	40	39	38	36	39	51	41	37	34	24	16	12			32
7			18	30	34	40	47	45	48	53	49	41	46	48	34	29	35	17			39
14			12	14	11	21	24	12	15	12	14	13	16	15	23	16	19	12	9		15
15			9	14	18	18	19	17	24	18	16	17	19	19	18	10	15	13			17
16			9	10	26	13	32	19	33	26	30	23	26	19	26	13	19	17			21
17			7	25	15	18	54	18	27	24	48	21	24	46	19	20	30	11	4		21
52			8	18	10	23	10	18	11	29	13	35	14	17	10	10	8	4			14
60			12	11	21	18	35	16	36	19	29	19	28	16	18	10	17	7			20

Shuttle Routes	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	Daily
Shuttle Productivity Target																					5
42 D-Line							17	21	15	19	16	10	14								16
72				4	5	4	3	3	4	3	3	7	5	4	2	1	1	1			3

Sunday Productivity by Hour

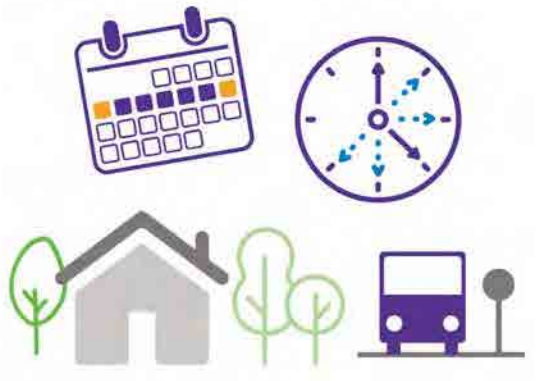
Frequent Local Routes	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	Daily
Frequent Local Productivity Target																					20
1				13	15	11	17	17	12	20	15	17	19	14	2						14
3				16	22	14	17	19	21	16	22	20	23	14	15						19
4				12	15	16	18	12	19	19	17	17	23	16	0						13
6				52	30	32	41	28	36	46	29	45	34	26							36
7				24	35	25	29	25	36	31	28	33	35	27							30
14			10	12	16	10	8	14	8	12	28	29	32	18							14
15				19	10	11	9	10	16	10	12	11	29	23	2						13
16				32	24	50	37	56	31	57	45	57	37	37	11						41
17			8	17	14	20	41	16	16	16	26	16	22	27	12						18
52				11	9	8	16	6	15	10	13	8	29	4	2						11
60				10	22	12	27	10	30	18	28	17	24	8							20

Shuttle Routes	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	Daily
Shuttle Productivity Target																					5
72						4	3	3	4	2	3	3	5	3	3						4

Source: DART passenger count data and service levels, 2019

Weekend Productivity by Hour

DART's system is nearly as productive on weekends as it is on weekdays, despite significantly lower overall ridership.



DART could attract more weekend riders if the service ran more frequently and for longer hours, but overall system productivity would likely drop.

Investing in more weekend service often has the benefit of also increasing weekday ridership by making transit a viable transportation choice seven days a week.

Many of DART's customers work in industries such as manufacturing, services, and retail, with work hours that may not be served by the current limited hours and route availability on weekends. Limited weekend service makes it hard for these workers to depend on transit.

Impact of Covid-19 Pandemic

The first case of COVID-19 was detected in Iowa in March 2020 and began to quickly spread. DART moved quickly to modify services to meet the needs of the community during the initial period of community spread, responding to rapidly changing commuter patterns, reduced employee availability, and evolving public health guidance.

DART, like other transit services around the United States, experienced a large decrease in ridership during the pandemic. Amid the immense disruption to public life and services, certain trends in DART ridership patterns became abundantly clear: routes with high use by essential workers; changing travel patterns with more people working from home; and populations with the strongest reliance on public transit access. Immediately upon closures of workplaces in March 2020, ridership on local routes declined by half, while Express and downtown shuttle ridership dropped by 90%. Ridership began to gradually recover throughout 2020 and 2021, with local and shuttle routes gaining back ridership more quickly than express routes.

Lessons Learned

Routes 3, 7, 16, and 60 maintained particularly high ridership during the pandemic, and DART deployed extra buses as needed to prevent crowding. These routes generated consistent all-day ridership before the pandemic and serve a high proportion of non-downtown/non-work commute trips.

The non-downtown oriented crosstown Route 50 also maintained more than 50% of its ridership, among the most resilient routes during the pandemic. Like the routes listed above, it generates some of its highest ridership demand in the middle of the day.

While weekend ridership is much lower than weekdays overall, **weekend ridership during the pandemic dropped much less than weekdays.**

Looking Ahead

The pandemic has provided a clearer view of the equity case for where and when to invest in transit service:

> **The customers who depend on DART the most are looking for consistent all day service, including weekend service.**

As ridership recovers, DART expects ridership patterns to continue to shift to more all-day travel patterns with less emphasis on traditional rush hour commute times. However, there will always be demand for additional peak-hour demand for downtown commuters and public school students.


rea Regional Transit Authority
1807
WELCOME TO DART

Market Analysis

DART is consistently evaluating the existing and future markets for mobility services in the Greater Des Moines region. The Transit Optimization Study took a deeper dive to evaluate existing "transit propensity" – the overall likelihood of an area to generate transit ridership – in addition to existing overall travel in the region (not just transit) and potential growth markets.

Transit Propensity Analysis

The built environment and socioeconomic factors drive transit propensity, including population density; job density; proportion of low-income, zero-car, and non-white households; specific age groups of the population; and persons with disabilities.

Areas served by DART's frequent local network have the highest transit propensity. DART's operating resources are deployed to maximize ridership and productivity.

Ankeny is the largest exception, having relatively high transit propensity and limited service and ridership.

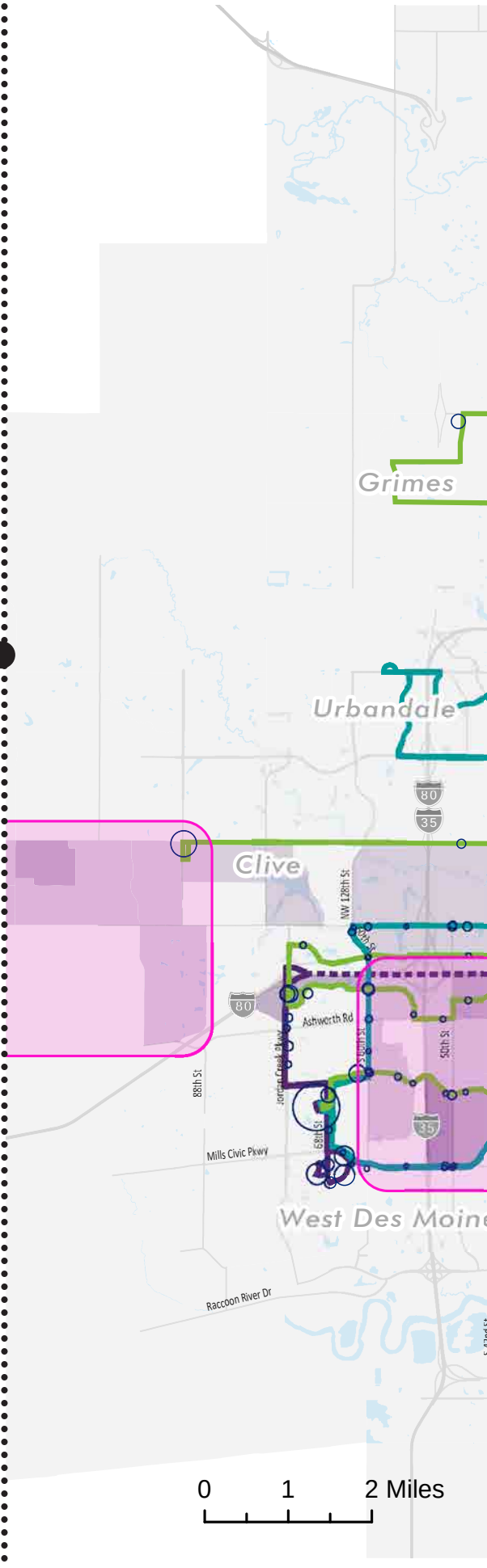
Waukee, not currently a DART member city, shows propensity levels that are comparable to many areas where DART currently operates fixed route service.

Transit Propensity

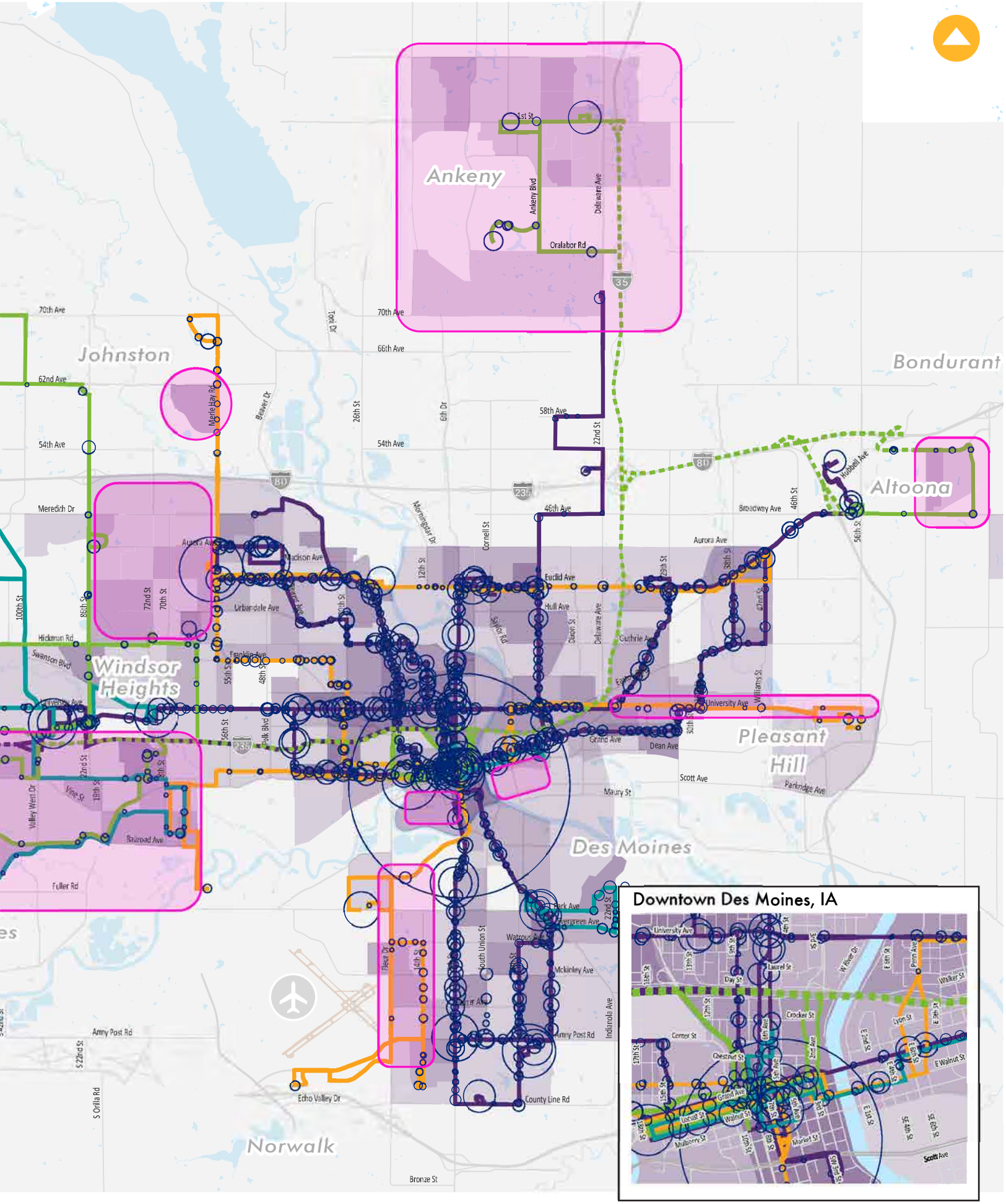
Opportunity Areas

This map highlights "opportunity areas" with high transit propensity and low ridership, including Fleur Drive, Ankeny, parts of West Des Moines and Urbandale, Gray's Station, Market District, and Altoona.

DART service in these areas focuses on downtown-oriented commuter trips; but many trips originating in these areas are not headed downtown and are not well served by transit. MOD and expanded all-day fixed route service may better facilitate circulation within communities and to mobility hubs where other routes and services connect.



Sources: DART passenger count data, 2019. | American Community Survey 5 Year Estimates for total population, minority population, low-income population, zero-vehicle households, seniors (65+), youth (under 18), college-aged residents (18-24), and persons with disabilities. | Des Moines Area Metropolitan Planning Organization estimates of employment.


Ankeny
Johnston
Bondurant
Altoona
Windsor Heights
Pleasant Hill
Des Moines
Norwalk
Downtown Des Moines, IA

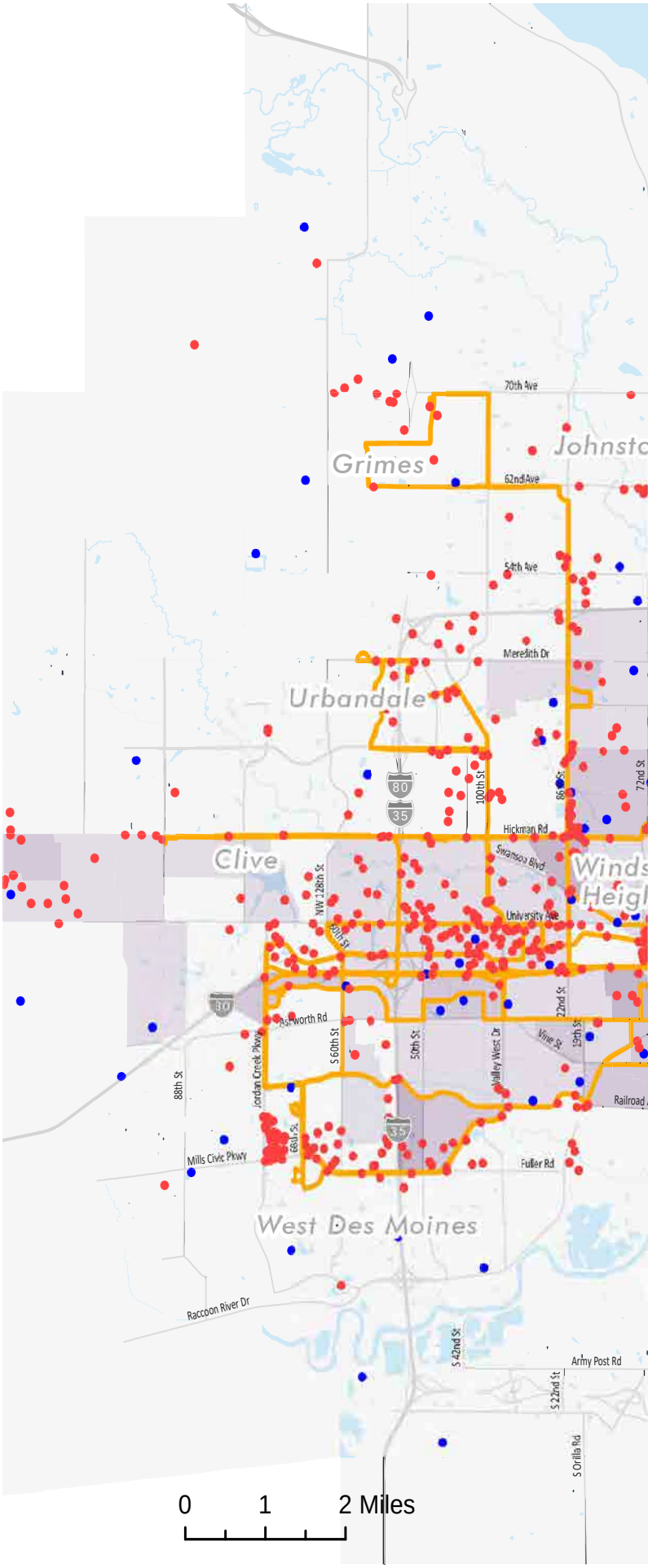
Jobs/Housing Mismatch

There is geographic mismatch between low income households and low-wage jobs. Low-income households are more concentrated within approximately five miles of Downtown Des Moines, while low-wage jobs are more dispersed, creating a jobs-to-housing mismatch. Today, many transit trips linking workers to jobs require transfers downtown and reverse commute travel patterns.

A large and growing concentration of jobs exists near the edge of DART's service area where scheduled transit service is limited or nonexistent.

DART's Express and On Call services are not well suited to serving reverse commute trips made by low-wage workers because of limited hours and lack of service on nights and weekends.

In 2020, DART began a pilot program expanding availability of reduced fares to individuals receiving food assistance, housing assistance, unemployment benefits, or workforce training programs. More than ¾ of customers using the half-fare benefit commute out of downtown to suburban employment locations, rather than the traditional inbound commute.



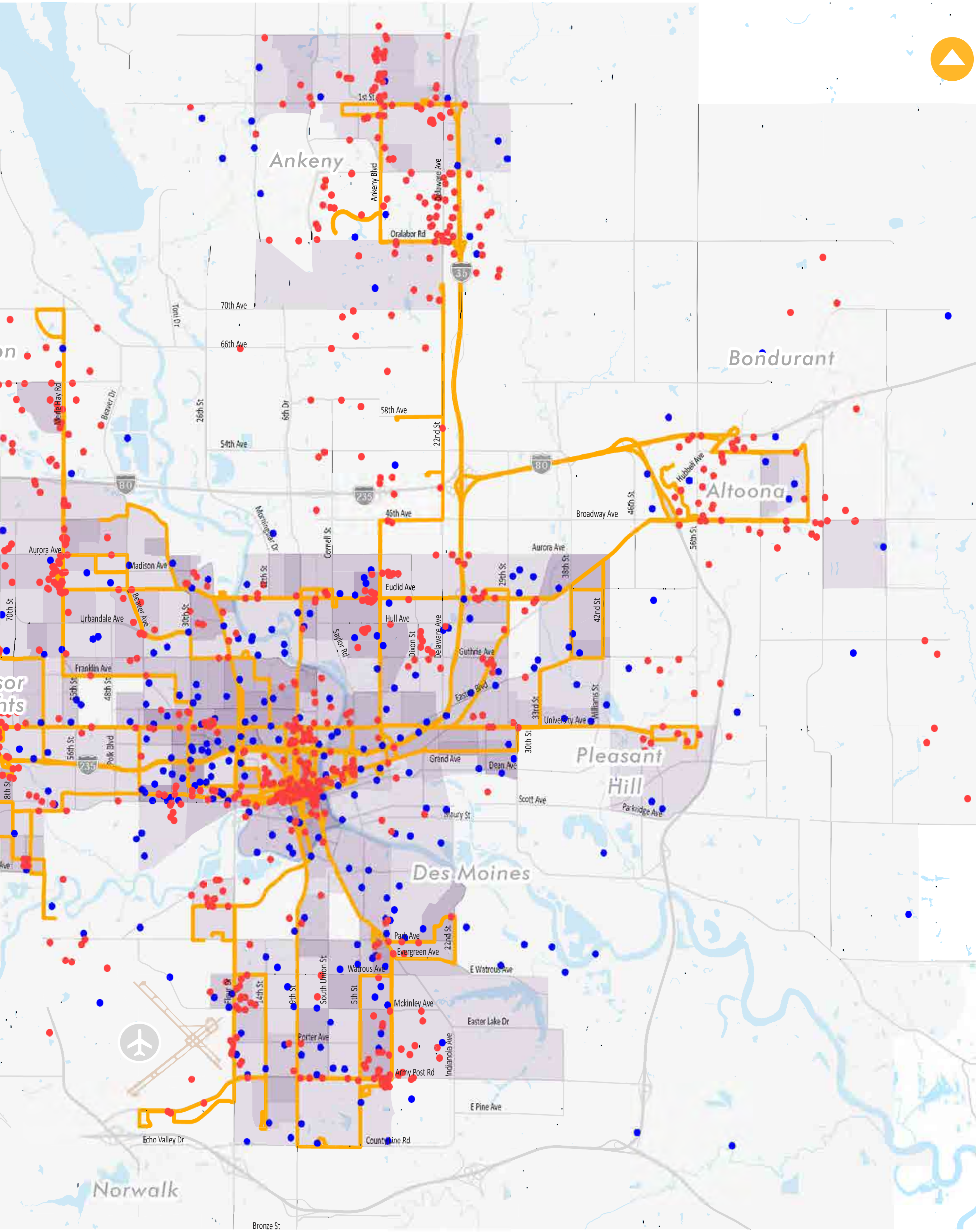
Legend

Transit Demand Potential
- Very High
- High
- Moderate
- Low
- Very Low
- DART Fixed Route Network

Jobs paying less than $1,250/mo
- 1 Dot = 50 jobs

Households earning less than $1,250/mo
- 1 Dot = 50 households

Source: Census and Polk County Data



Ankeny
1st St
Ankeny Blvd
Delaware Ave
Oralabor Rd
35
70th Ave
66th Ave
58th Ave
54th Ave
45th Ave
22nd St
26th St
6th Dr
Beaver Dr
Merle Hay Rd
80
235
Bondurant
Altoona
Hubbell Ave
Broadway Ave
46th St
56th St
Aurora Ave
Madison Ave
Euclid Ave
Hull Ave
Urbandale Ave
Franklin Ave
Guthrie Ave
Saylor Rd
Dixon St
Cornell St
Morningstar Dr
29th St
38th St
42nd St
30th St
33rd St
Williams St
University Ave
Grand Ave
Dean Ave
Scott Ave
Maury St
Pleasant Hill
Parkridge Ave
Des Moines
Park Ave
Evergreen Ave
Watrous Ave
E Watrous Ave
Mckinley Ave
Easter Lake Dr
Porter Ave
Army Post Rd
Indianola Ave
E Pine Ave
South Union St
5th St
9th St
14th St
Echo Valley Dr
County Line Rd
Norwalk
Bronze St

Market Analysis (StreetLight)

DART leveraged big-data transportation analytics provided through StreetLight Data to gain a fuller understanding of trip patterns throughout the region, and to better understand not only existing transit users, but also the larger universe of potential transit users.

DART Ridership vs. Regional Travel

The highest ridership times on the DART network are weekdays during the morning and peak "commute" periods. Saturday ridership is 57% lower than weekday ridership and Sunday ridership is 75% lower (see top figure below).

Overall regional travel activity looks different than DART's peak ridership times (see bottom figure below). Across the region lots of trips occur on the weekends – almost as many as during weekdays. On weekdays, travel demand remains high throughout the midday, growing gradually from the AM rush to the PM rush.

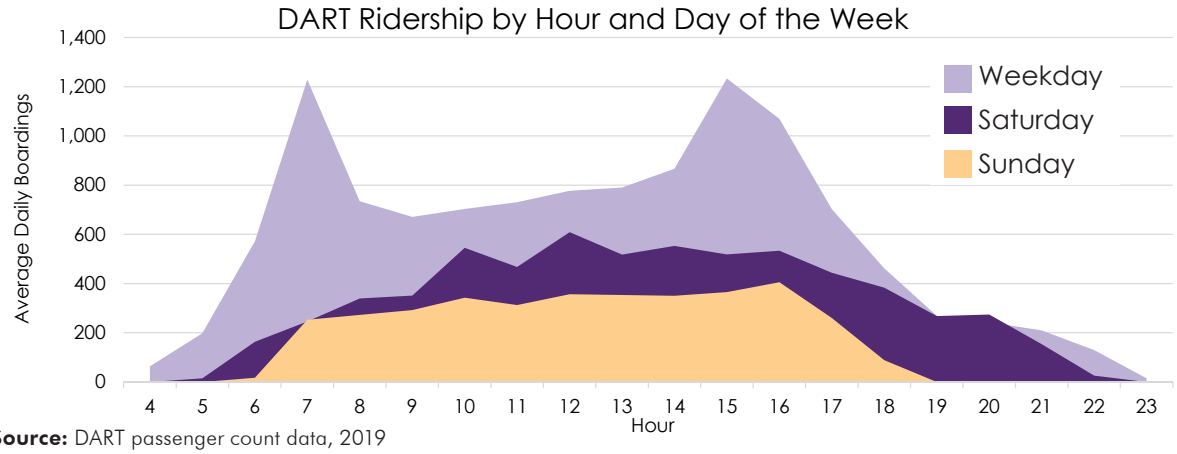
Weekend trips go to different destinations at different times of day than weekday trips. They are concentrated in the middle of the day and tend to include more non-work trips such as shopping and recreation. DART could consider emphasizing service improvements on non-downtown oriented routes on weekends.

There is a significant drop in commute trips to and from Downtown Des Moines on weekends. DART's Saturday and Sunday fixed route networks generally mirror the weekday network designed to facilitate and emphasize access to and from downtown.

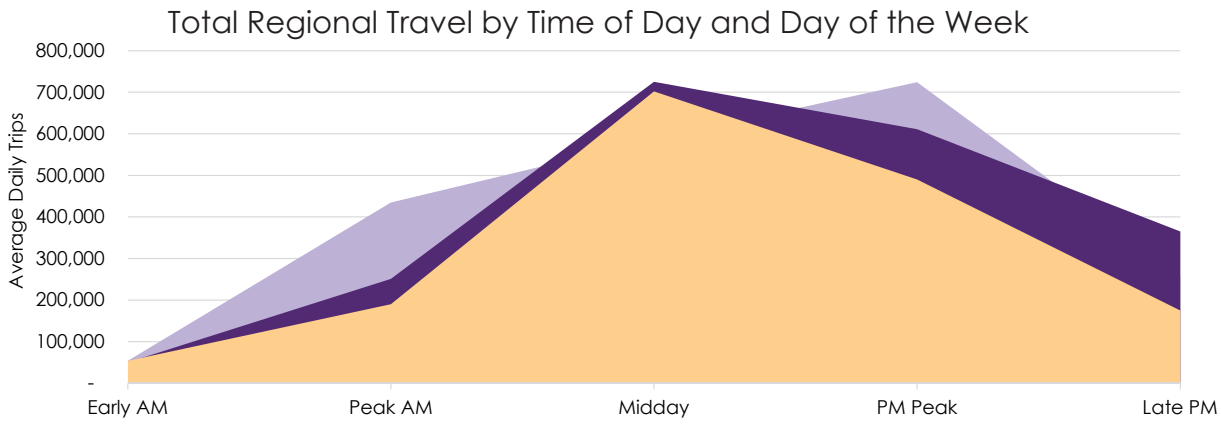
The StreetLight Data analysis also showed that certain parts of the region, including West Des Moines, Altoona, and southeast Des Moines, see more trips on weekends than on weekdays, and these trips mostly do not go downtown.

StreetLight Data

StreetLight Data transportation analytics, derived from GPS and smartphone-based app data, provides detailed information for trips to, from, or within different parts of the region for people using all forms of transportation. The data allows DART to better understand overall travel patterns and potential travel markets it might serve in the future.



Source: DART passenger count data, 2019



Source: StreetLight Data, 2019 travel patterns

Density of AM Trips to Downtown Des Moines

Generally, areas closer to Downtown Des Moines have a higher proportion of overall travel that goes to and from downtown. These are the trips that are best served by the existing fixed route transit network, which is optimized for traditional commute patterns within the region (to and from downtown).

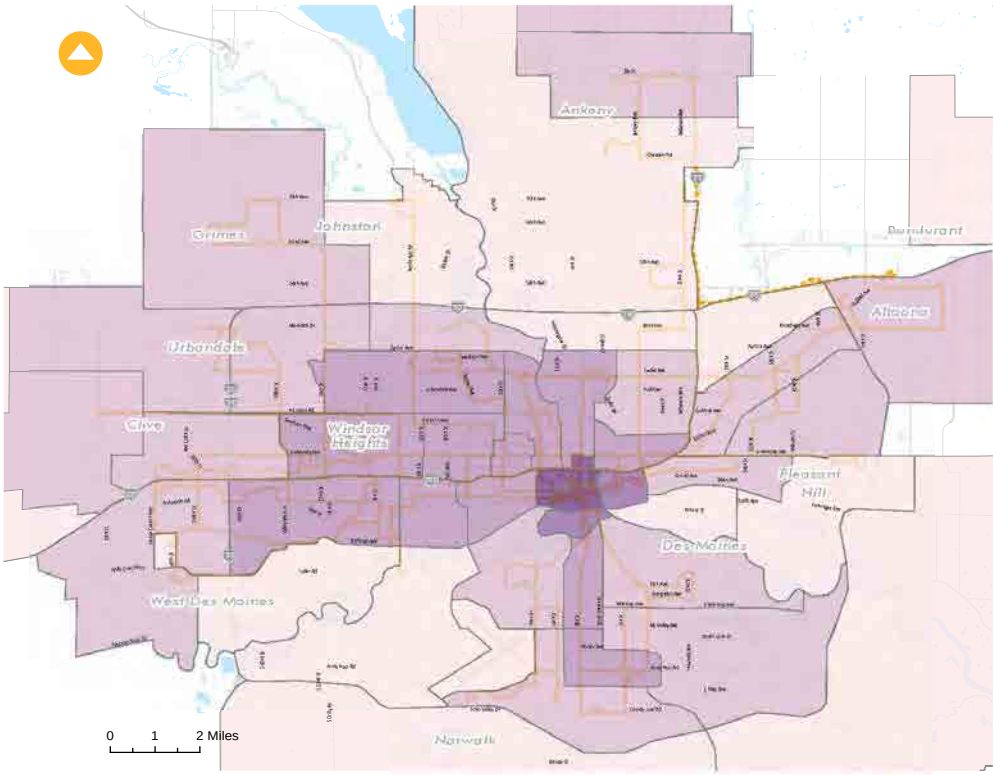
The data also showed that there are a lot of longer trips that do not go to (or through) downtown, making them difficult to serve by fixed route transit. For example, there are relatively high numbers of trips between Altoona and the Pleasant Hill/ eastern Des Moines area, between Grimes and western West Des Moines, and between West Des Moines and Ankeny.

Legend

- DART Fixed Route Network

Density of Trips per square mile

- 0 – 75
- 75.1 – 200
- 200.1 – 500
- 500.1 – 1000
- 1000.1 – 2000



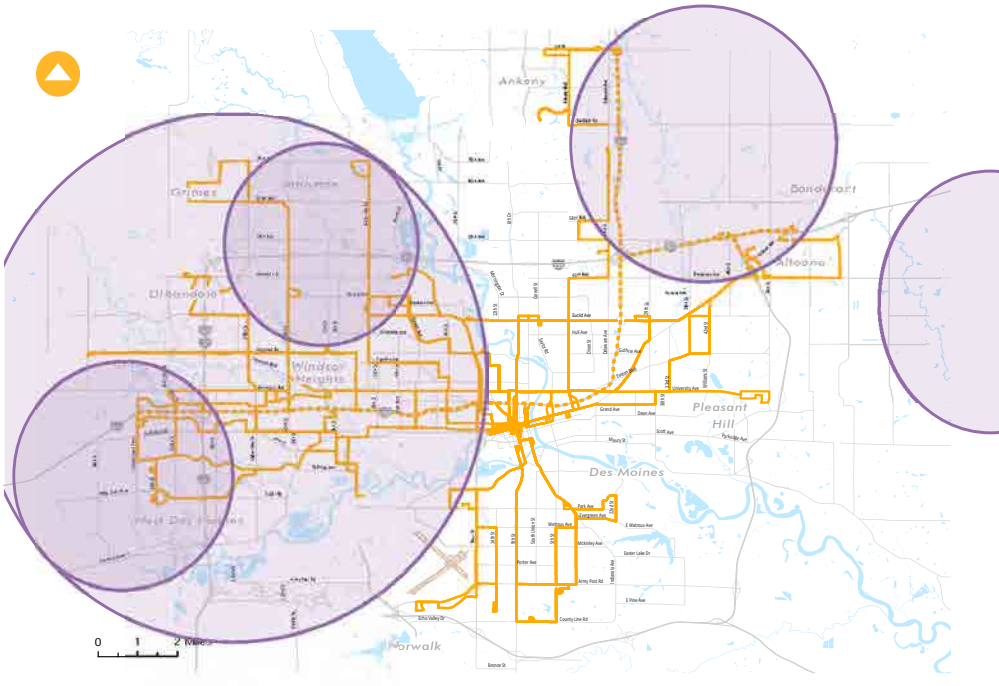
Map: Density of Trips (per square mile) to downtown during the morning peak period.
Source: StreetLight Data, 2019 travel patterns

Sub-regional Travel

While the DART system well-serves commuters to and from downtown, large proportions of trips stay within suburban parts of the region, particularly those areas further from Downtown Des Moines including Ankeny, Altoona, and western West Des Moines. These trip patterns are more challenging to serve with fixed route transit because of dispersed origins and destinations and lower overall density of activities and trips. MOD service, oriented for both point to point trips and to feed the DART fixed route network, may better serve these local travel markets.

Legend

- Areas of high sub-regional/local travel
- DART Fixed Route Network



Map: Areas of sub-regional travel.
Source: StreetLight Data, 2019 travel patterns


dart ELECTRIC BUS

How is the Region Changing?

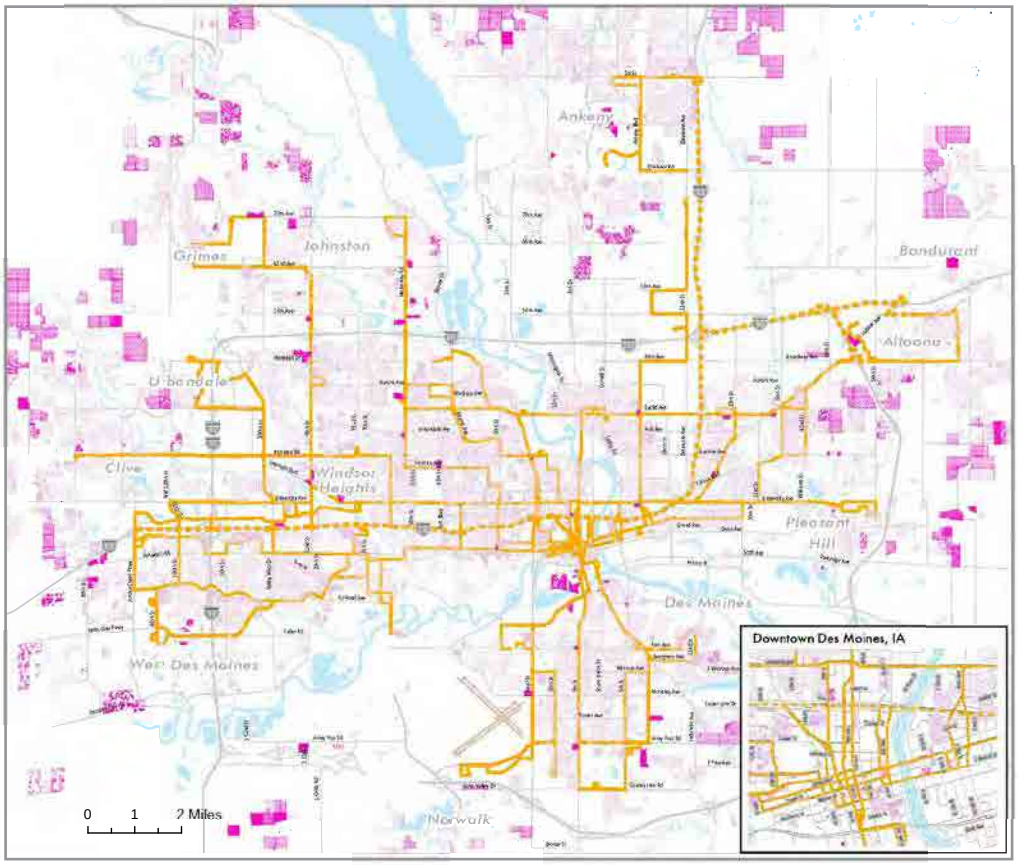
As DART plans for the future, it is clear that service models will need to adapt to best serve a changing region. Greater Des Moines' population is anticipated to continue to change dramatically over the next 35 years – including a growing and aging population, and geographic expansion of population and employment further from the core of the region.

The region benefits from a vibrant downtown, growing employment centers and significant infrastructure investments. However, a majority of the DART service area contains development patterns and population or employment densities that are challenging to provide with cost-effective transit service. Regional demographic forecasts predict that the majority of future growth will continue to follow this trend.

Demographic and Employment Growth

Projected Housing Growth

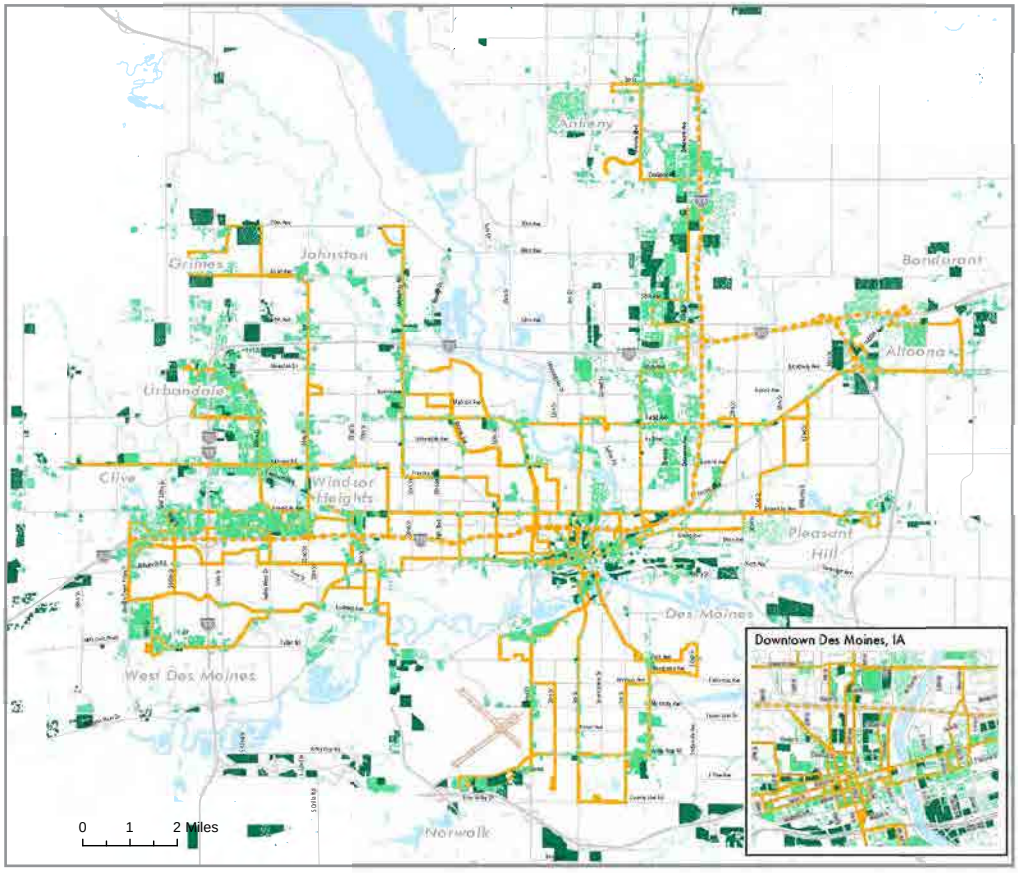
- Nearly all of the forecasted housing growth (93%) is anticipated outside of DART's existing fixed route service area and population density in the region is projected to continue to decline.
- Today, about half of the region's population (52%) is within a ½-mile of a transit stop. In 2050, it is projected that less than 40% percent will be within ½-mile of the current DART fixed route network.



Source: Des Moines Area Metropolitan Planning Organization

Projected Employment Growth

- Significant employment growth is also projected. It is anticipated that 21,000 jobs will be added to downtown by 2050. There will also be substantial growth in emerging job centers, decreasing the regional share of jobs in Downtown Des Moines.
- Extending service to projected growth areas would likely reduce DART's system productivity, increasing DART's operating cost per passenger



Source: Des Moines Area Metropolitan Planning Organization

How Land Use and Development Patterns Impact DART

Land use patterns directly impact transit operating costs: Lower development densities drive up the per-capita cost of providing transit service. Additionally, it is common for new employers to locate beyond the reach of DART's current fixed route network, placing additional cost pressure on DART to provide service to these locations. The existing pattern of low-density, auto-centric development along non-linear corridors that is projected to continue at the regional level presents a long-term challenge to DART's ability to provide cost-effective fixed route transit service.

The metropolitan transportation plan of the Des Moines Area Metropolitan Planning Organization, Mobilizing Tomorrow 2050, and the DART Forward 2035 plan both recognized that transit planning must be woven into land use planning and community development. Transit-supportive planning can take the form of broad-based policy objectives, such as encouraging denser development and complete streets. It can also focus on specific developments and ensuring the provision of space for bus shelters, sidewalks, and for larger developments, transit layover and transfer facilities.

Photo: New Lillis Lofts in Urbandale, adjacent to Merle Hay Mall, with access to transit, essential services and jobs.

A number of DART member communities have adopted policies that can promote transit-supportive infrastructure and development. Some examples include:

Des Moines and West Des Moines emphasize transit access in supporting medium- and high-density residential areas. The City of Des Moines further envisions a network of community nodes and corridors to support community shopping, services and public amenities with good proximity to transit. **DART can work closely with its member cities to jointly pursue infrastructure projects aimed at incorporating high-quality transit into these corridors and nodes.**

The City of Altoona focuses on providing housing opportunities near commercial areas both to attract and provide workforce housing near places of business. **The Greater Des Moines Housing Study identified transit as a tactic to improve affordable housing opportunities by promoting development on infill sites in close proximity to existing transit service.**

The cities of Ankeny, Des Moines, Grimes, Johnston, and Windsor Heights all identified transit as a strategy to reduce transportation demand and mitigate the need for expensive roadway expansion projects. This capitalizes on **public transit's ability to maximize roadway throughput compared to single-occupant vehicles.**

The cities of Des Moines, West Des Moines, Johnston, Pleasant Hill, Urbandale, and Windsor Heights have adopted Complete Street policies or resolutions. Complete Streets policies ensure safe access to and from transit: **all transit passengers begin or end their trips as pedestrians.**

The One Economy Polk County Report highlights the importance of public transit access to populations in Central Iowa with higher unemployment rates. The report emphasizes that **lack of access to a private car can be a barrier to employment opportunities, and public transportation can play a critical role in bridging this gap.**

Public Input

DART has always taken public feedback on its services very seriously. Through the course of this project DART led several rounds of public engagement, reaching thousands of riders, non-riders, and business leaders in the process.

Spring 2021 Customer Survey

In the spring of 2021, DART conducted surveys of riders, non-riders, and business leaders to gather feedback on DART service in general, changes in travel during and after the pandemic, and priorities for consideration as part of the Transit Optimization Study. DART received over 1,000 responses to the online survey, including similar numbers of riders and non-riders.

Key Findings:

- Service closer to home was the top requested improvement among both riders and non-riders.
- Among lower-income riders, the top requested improvement was more weekend service, and almost 70% of low-income riders said they would ride more frequently if there were more routes operating on weekends. Low-income riders also requested longer service hours and more frequent service among the top improvements that would lead them to ride more.
- Of possible new types of service, on-demand shuttles were the most popular among both riders and non-riders. Ridehail, carshare, and vanpool were the least popular.

75%

Almost 75% of current riders are satisfied with DART service.

80%

More than 80% of both riders and non-riders say that transit funding should be greater than it is today.

55%

55% of riders report that their most common DART trips are to work.

48%

48% of low-income riders report that their most common DART trips are to work.

30%

30% of low-income riders cite shopping and medical appointments as their most common reason for riding DART

Fall 2021 Public Feedback on Draft Proposals

In the late summer and fall of 2021 DART conducted a second round of public outreach to share and collect feedback on draft recommendations for service modifications that are responsive to the needs identified in the first phase of the study. DART worked with its Transit Riders Advisory Committee (TRAC) to design its outreach strategy to ensure that information sharing and feedback methods were inclusive and would provide meaningful opportunities for public input. The recommendations were shared via in-person and virtual public meetings, an interactive project website, and pop-up outreach at DART Central Station and community events in many DART member communities. DART staff were able to reach more than 1,000 people in-person at these meetings and community events, and the project website had more than 4,000 views. More than 400 people also shared their thoughts on the study recommendations through an online and paper survey that was made available.

Key Findings:

- Most people agreed with the project goals and findings, and there was general support for the study recommendations.
- Most people are supportive of DART trying out innovative service delivery models.
- Some concerns were raised about several proposals, including:
  - Eliminating some bus routes as proposed would negatively impact some people's mobility and access to jobs
  - Skepticism about whether innovative delivery models would work for their travel needs
  - Uncertainty as to whether mobility on-demand services would have longer wait times and be less reliable than fixed route buses
  - Some proposals don't go far enough to meet the needs identified
- Of the near-term proposals shared, the microtransit pilot in Ankeny was by far the most well-received, likely because it would be enhancing rather than replacing a service that customers rely on.
- The modest enhancements that respondents would like to see implemented first would be additional service on Fleur Drive and increased weekend frequency on Routes 7, 16 and 60.
- The long-term enhancements that respondents believe would eventually provide the most value would be increased weekday frequency on the busiest routes, and a new crosstown route on E 14th Street

This public input was shared with the DART Commission and several near-term proposals were updated based on the feedback. For example, the public input led to additional context to be added about how proposals would function and evolve, some proposed route alignments were modified, and some route elimination recommendations were scaled back.


1023
Wi-Fi ONBOARD

Mobility on Demand

How is Technology Changing the Way we Deliver Transit Service?

DART, like many transit agencies, has begun to explore the ways in which emerging technology and new mobility providers can help to better serve our customers and improve the efficiency and productivity of the system. This section presents an overview of different Mobility on Demand (MOD) modes and how transit agencies are leveraging these tools as part of their overall service offerings.

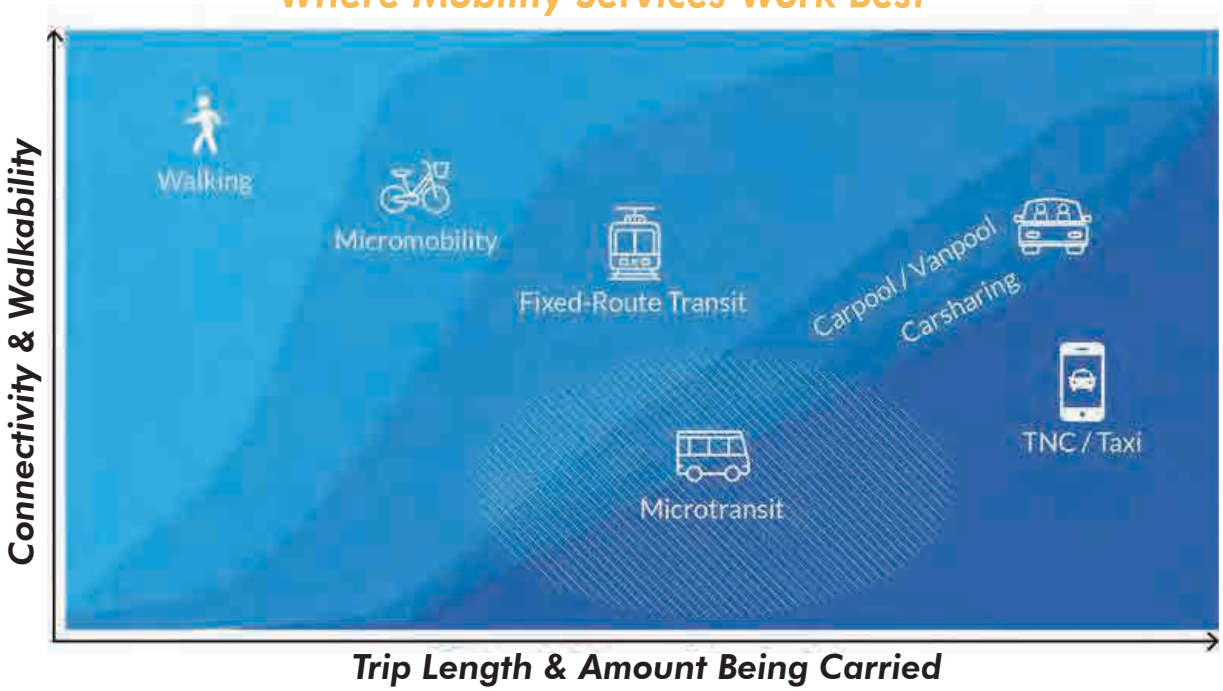
What is MOD?

MOD refers to a **multimodal system of transportation services where the user can take advantage of transportation when and where they need it, without depending on their own private vehicle.**

It may include micromobility, such as bike-share and scooter-share; microtransit and demand-responsive transit; taxis and transportation network companies (TNCs); and car sharing. For-hire taxicabs have been a form of MOD for more than a century. New technology has vastly increased the variety of MOD options and the convenience of finding, using and paying for them. While many MOD services are run by the private sector, a number of transit agencies have begun to experiment with emerging technology to introduce new MOD offerings of their own, as well as modernizing traditional transit MOD such as paratransit and dial-a-ride services.

MOD fits within and depends on a broader transportation landscape, which includes walking, biking, and scheduled transit services. Different forms of mobility are suited to different trips, with variables including trip length, number of travelers, children or heavy items, and the comfort or walkability of the built environment. The chart below suggests how transit and shared mobility services work together to satisfy a wide variety of trips, and the following section provides an overview of key mobility on demand services.

Where Mobility Services Work Best




Locust
ONE WAY
60 UNIVERSITY
dart
2006
dart

Microtransit

Flexible Demand-Response Service Providing Shared Rides within a Determined Zone

Microtransit is a technological evolution of dial-a-ride and paratransit, with flexible pick up and drop off areas and on-demand availability, typically using small transit buses or cutaway vans with capacities of 6-20 passengers.

Unlike other MOD modes, these services require trained commercial drivers, typically employed through a vendor or directly by a transit agency. Microtransit works best in environments where fixed route transit cannot operate productively, either due to low density, dispersed trip patterns, or lack of pedestrian infrastructure. It is best suited for short-to-medium range trips (3 to 15 miles) and **typically serves 3-5 passengers per vehicle revenue hour.** Microtransit can serve the "whole trip" or as a first/last-mile connection to fixed route transit.

Microtransit can be agency-operated using a dedicated fleet, or outsourced to a private operator. SWPrime uses agency-owned and -driven vehicles; Denver uses vendor-owned and operated vehicles with agency branding; others co-brand with a turnkey operator.

KCATA: Freedom On-Demand program serves paratransit customers at lower operating cost

How have transit agencies deployed microtransit?

As a potential substitute for low-productivity fixed route service

SWPrime microtransit in Twin Cities – expands mobility to low density suburban areas that couldn't support fixed route service.

KCATA's RideKC Micro Transit provides connectivity within Kansas City, Kansas and in suburban Johnson County. Passengers can take short trips within a defined service area or transfer to fixed routes at select transfer facilities.

As a first-mile/last-mile link from low-density employment hubs to the fixed route network.

The Village of Bedford Park, IL, created a microtransit service to serve shift workers across a large warehousing/intermodal district, connecting them to frequent transit service too distant to walk to. Discounted Uber rides are available as another option.

Modernizing existing On Call or deviated fixed-route services

Denver RTD modernized its network of suburban call-and-ride routes with a zone-based on-demand system that users can book online via a dedicated app, or by phone, boosting the service's availability and usefulness.

DART launched its first microtransit pilot, called DART On Demand, to enhance the Ankeny On-Call service in late 2021.

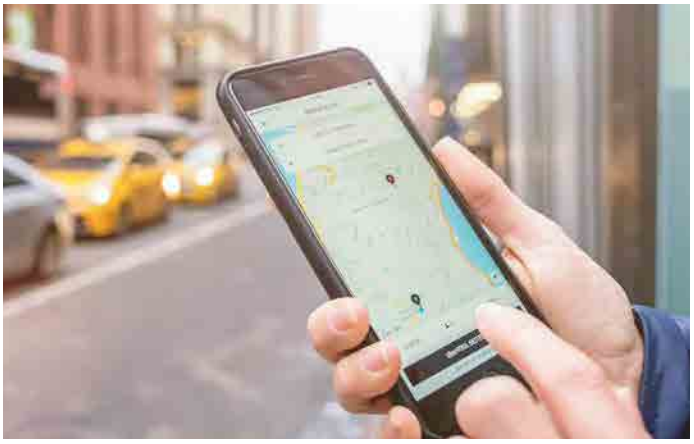
Ridehailing/TNCs

Rides On-Demand Using TNCs or Taxis

Ridehailing services are tech-enabled versions of taxicabs that have existed for over a century. Best exemplified by transportation network companies (TNCs) like Uber and Lyft, ridehailing typically uses passenger vehicles with capacities up to about six passengers.

Trips can service individual trips or may pool multiple trips in the same vehicle. Pooled services are mostly available in larger cities with sufficient density of riders and vehicles. Pooled services can work in smaller markets for specific users, destinations, or programs, though this may require subsidy or support through a public-private partnership. Ridehailing is an effective choice for low to moderate density contexts (including suburbs and semi-rural areas), especially in car-dependent landscapes with poor pedestrian connectivity and infrequent transit.

DART: Flex Connect connects low-density areas to the fixed route network



How have transit agencies deployed ridehailing?

Ridehailing can connect outlying areas of housing and/or job growth centers to high-capacity fixed route transit using TNC or shared taxi programs.

DART's existing Flex Connect zone connects to three transfer points on the fixed route network, providing a more flexible and cost-effective last-mile solution for workers to reach their jobs. The service replaced a low-frequency bus route.

Ridehailing can augment traditional paratransit by providing improved customer experience while also controlling costs for transit agencies.

KCATA's Freedom On-Demand program began as an initiative to encourage eligible ADA customers to use on-demand taxis and TNCs using an app, instead of the traditional paratransit service that required advanced booking, increasing convenience and reducing operating costs. KCATA built on this success to expand the service to the general public with a premium distance-based fare.

Since TNCs often have trouble guaranteeing wheelchair-accessible vehicle (WAV) availability, agencies often contract with a separate WAV provider for accessible rides. Example: PSTA Direct Connect.

TNCs can also be utilized as a "backstop" for dedicated microtransit service, offering customers a backup option when the microtransit service is at capacity and wait times exceed a predetermined service standard, or during hours when the microtransit service is not operating.

Micromobility

Flexible short trips to provide better first-and-last mile connectivity to transit, or for circulation within districts

Micromobility includes shared fleets of small, low-speed vehicles (bikes and scooters), either human-powered or electric.

Micromobility is best for short trips in areas with good connectivity and a density of destinations. It serves as a first/last-mile option that is faster than a taxi, walking, or transferring to low-frequency transit. Typical trips are 1-3 miles, but some can be as long as 10 miles, especially with an electric assist. Micromobility includes docked bikeshare, dockless bikeshare, and scooter sharing. Bikeshare systems rapidly grew in the U.S. in the early 2010s. By 2018, scooter trips had surpassed station-based bikeshare trips in the U.S.[1] The key to success of micromobility is a supportive network of safe and comfortable routes for cycling and scootering. This requires extensive protected bicycle lanes, slow streets, and/or off-street paths and trails.

Capital Metro: Metrorail Station with MetroBike share station in Austin.

1 NACTO 2019. https://nacto.org/shared-micromobility-2018/

How have transit agencies integrated their services with micromobility?

Micromobility helps solve the "first and last mile" gap to transit and provides enhanced community connectivity and access to other modes.

MetroBike share in Austin – The transit agency and city partnered to enhance the existing B-Cycle network and will be expanding services in conjunction with planned investment in high-capacity transit, as well as implementing in underserved areas. The transit agency also offers combined bike + bus passes.

Dayton RTA in Ohio – Scooter pilot and docked bikeshare operated directly by the transit agency (using vehicles provided by a private vendor). The transit agency's role as a "mobility manager" is supported by the City's policy framework and data sharing/API requirements.

Carsharing

A car when you need one

Carsharing features a network of cars available for short-term use.

Carsharing is ideal for mid- to long-range trips (5 to 20+ miles), especially when shopping, transporting passengers, or carrying cargo. Rentals are self-service, relying on apps and transponders to access the vehicles. Carsharing requires moderate to high density around the vehicles, as users still must walk to the vehicle. It thrives in walkable residential and employment centers. **Round-trip or station-based carsharing** was the earliest service configuration, with vehicles picked up and returned to set parking spots. **One-way carsharing,** allowing users to pick up and leave cars anywhere within a service area, is more flexible, but requires higher-density land use.

How have transit agencies integrated their services with carsharing?

Carsharing can provide additional support to a transportation ecosystem in which people can make most trips using transit, but still have access to a car when they need one.

Supporting carsharing as part of a mobility ecosystem with transit as its backbone requires that carshare vehicles be conveniently accessible using transit or on foot. Some agencies set aside space at major transit centers, park-and-ride lots, or on other agency-controlled real-estate for carshare vehicles. As DART considers expansion and upgrades to its transit facilities and mobility hubs throughout the region, carshare space could be reserved if and when an operator launches service in the region.

Transit fare media can also be integrated with carshare operations, boosting the utility of both services. These were among the earliest fare-integration implementations with transit and MOD. Should a carshare operator launch service in Des Moines, DART could work with them to incorporate DART fare media and/or transfer policies with the carshare payment platform.

Chicago's CTA first accomplished fare integration with local carshare operator I-GO in 2009. Other farecard integrations include the Twin Cities' Hourcar and Los Angeles' BlueLA.

Valley Metro in Phoenix is pursuing full fare integration between transit and carshare.

A limited number of transit agencies have directly contracted with private carshare operators to bring carshare service to their communities where it might not otherwise be available. These partnerships are often funded through grants with electric utilities and involve the deployment of electric carshare vehicles.

DART has already partnered with MidAmerican Energy to implement several battery-electric buses. A similar partnership could be pursued to launch an electric vehicle carshare program. This was recently piloted in Chattanooga, TN.

Mobility on Demand Vision

Transit agencies incorporate MOD into their family of services, primarily through **microtransit** and **ridehail,** to provide a more tailored, flexible, and accessible approach to mobility. DART can leverage MOD to:

1. **Replace some fixed routes**, providing shorter wait times and better first/last-mile connections **at a similar cost**
2. Respond to customer needs by offering **short trips between origins and destinations** that are **not directly linked by DART's existing fixed route network**
3. Provide a more convenient, **customer-friendly upgrade to current On Call service** that no longer requires advance reservations
4. Extend the reach of the network by offering **night and weekend service** on corridors where fixed routes don't operate during these times

Best Uses for Microtransit and Ridehailing

Microtransit

- First/last-mile connection to fixed route transit
- Point-to-point community circulation

Ridehailing

- First/last-mile connection to fixed route transit
- Night/weekend substitute for fixed route transit
- "Backstop" to guarantee availability and reasonable wait times for microtransit service
- Supplement/alternative to traditional paratransit

In the DART spring 2021 public outreach survey, both riders and non-riders cited transit access closer to their home as the #1 factor that would lead them to make greater use of DART service. Frequency was the #3 factor for both groups. In low-density areas currently served by low-frequency circulator bus routes, MOD can potentially address both concerns.

What does MOD success look like?

When substituting MOD for current service offerings or upgrading existing On Call service, the new service should consider the following pillars of success:

Reliability
Customers find MOD services to be reliable and meet their needs at least as well as the services they replaced.

Transfers to DART fixed route
MOD services enhance the mobility ecosystem in the Des Moines region and support DART's fixed route network by facilitating seamless transfers to fixed route services and continuing to increase ridership.

Average wait time
DART users have access to a flexible, on-demand service that equals or reduces the time spent waiting for replaced fixed route transit services.

Potential cost savings
DART and member communities can realize cost savings and efficiencies over low-productivity fixed routes while maintaining or improving the overall quality of service.

User satisfaction
Customers are satisfied with DART services and their ability to access transportation options.

Market share
New customers are attracted to DART services who currently choose not to or are unable to use it.

MOD Operating Model

There are many details to consider when implementing MOD and integrating it with the larger transit network. All of these considerations revolve around the need to **fully integrate MOD into DART's family of services, allowing customers to complete a full trip supported by comprehensive trip planning, fare payment, and transfers.** Some key topics include:

Operator

MOD may be operated with DART-owned vehicles and DART employees supported by a vendor-provided dispatch and customer-facing software solution; may be entirely privately operated; or may be a mix of both. Using agency staff to operate the service allows DART direct control over the service, superior quality control, and better cost control. Private operations, especially through the TNC model of independent contractors, may be more quickly scalable. Due in part to TNC driver availability issues during the COVID-19 pandemic, **DART's customers have expressed a preference for a direct agency-operated service to guarantee service availability.**

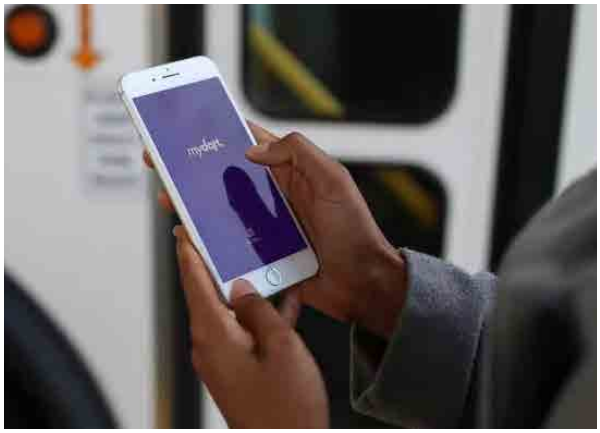
Network Integration

Though MOD may offer the opportunity to eliminate some very low-productivity fixed routes, **successful deployment of MOD as a cost-effective public transit service depends on a robust complementary fixed route network.** For longer trips and trips to and from higher-density areas, **MOD will interchange with the fixed route network at designated mobility hubs** to cost-effectively carry passengers where they need to go. This integration requires a thoughtfully designed route network, to include the following elements:

1. Investments in physical infrastructure to create hubs where transfers are planned to happen.
2. High-capacity premium fixed route transit corridors that are time-competitive with driving for MOD customers to transfer to and from.
3. Service standards that ensure reasonable wait times at MOD-to-fixed-route transfer points.

Booking and Payment

During DART's Flex Connect pilot, many customers continued to book their trips by calling DART Customer Service, rather than booking through Uber's mobile app. This may not be sustainable as service expands. DART should expand its mobile app and/or work with third-party mobile apps to **integrate trip planning, MOD booking, and fare payment** in a way that is customer-friendly and demonstrates MOD's role as part of the overall DART network. DART also needs to consider how to integrate MOD fares with its conventional fare collection system, something not yet addressed in the Flex Connect pilots. App-based payment solutions can better integrate fixed and MOD service, including free or discounted transfers, reduced fares, etc. Including subscription-based booking in a booking app may induce more customers to use it. Alternative approaches for serving unbanked customers will need to be provided—services to accomplish this through account reloading at retail locations or online are becoming more widely available. If the service is operated using DART-owned vehicles, onboard fareboxes can be used as well. **By integrating booking, trip planning, and fare payment across all of its services, DART can market new services with an emphasis on their ease of use.**

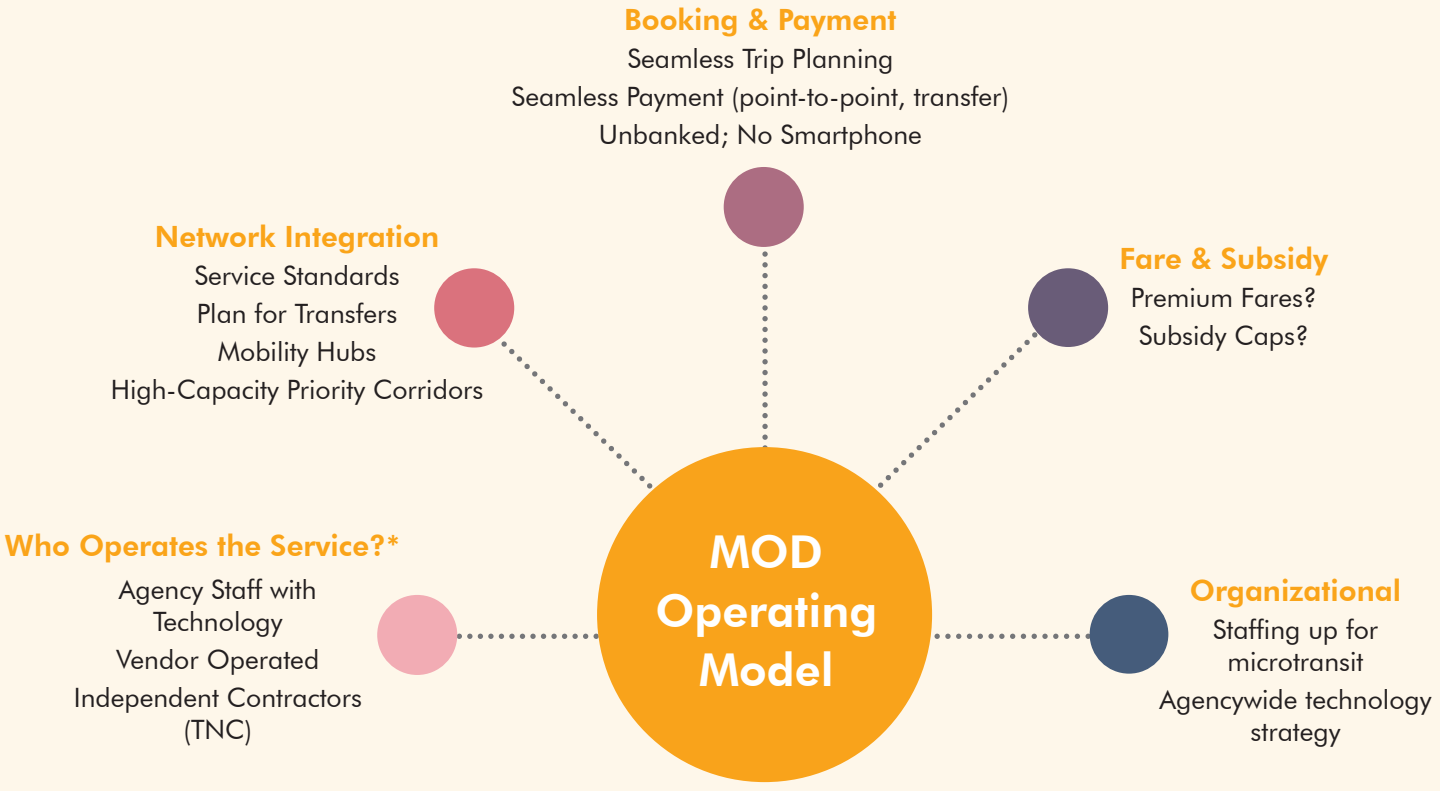


Fare Structure and Subsidies

Because of the real-time pricing model utilized by TNCs, where prices vary by trip length and time of day, DART must consider operating cost uncertainty and how to manage this risk. When utilizing TNCs to deliver mobility, many transit agencies set a subsidy ceiling for TNC rides, above which the customer is responsible for additional charges. A typical fare approach may start with a rider-paid base fare around the level of a bus fare, agency coverage of a set amount (often based on existing levels of subsidy per ride), and rider responsibility for charges beyond the subsidy cap. If offering both TNC and agency-operated operations in the same service area, DART may also consider premium fare structures that incentivize the use of the more cost-effective option.

Organization and Staffing Considerations

Many of the above considerations will affect broader agency strategies including technology procurement, fare structures, and customer service and administrative staffing. While the use of private vendors and an emphasis on app-based trip planning can reduce startup costs and staff resource needs, there will still be an increased customer service call volume, contract and vendor management needs, and operational support. Expanding DART's MOD offerings could result in the need for 2 additional administrative staffing positions to oversee operations, manage technology platforms, and support the new services. Additionally, for microtransit service, bus operators, mechanics, and road supervisors will be needed in proportion to the size of the service, similar to existing fixed route and on-demand services, and are reflected in its operating cost.



DART riders express a preference for DART-operated service, and have observed reliability issues with TNC substitute service and Flex Connect during the COVID-19 pandemic.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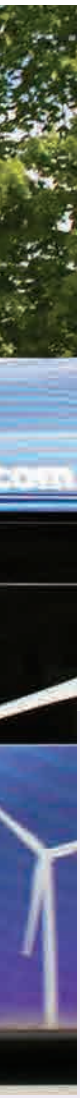


Recommendations for Transit Optimization

Guiding Principles

In developing the recommendations for this Transit Optimization Study, the project team began from a set of Guiding Principles. These principles represent a summation of all of the analysis, public outreach, and coordination with staff and the DART Commission that occurred prior to and throughout the course of this project.

1. The **fixed route network is largely productive**, with the largest service investments deployed in areas of greatest transit propensity

2. DART's **highest ridership routes** will be the **"backbone" of the system**

3. In low density areas, **MOD** can provide **flexible mobility** and **connect workers to jobs**

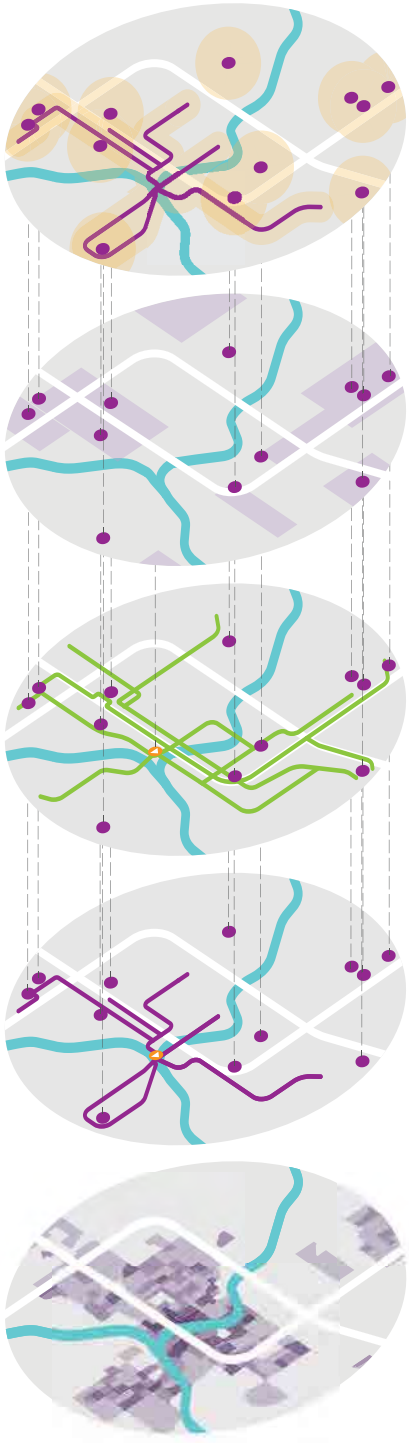
4. To integrate new forms of mobility, DART must offer passengers a **seamless travel experience**

5. DART must be a **good steward of limited resources,** but **the public strongly supports greater investment**

6. **Customers are satisfied** with DART but want **longer hours, non-downtown connections, and frequent all day service**

Design Principles

The Recommendations of the Transit Optimization Study each represent a component of a comprehensive transit network intended to enhance mobility and access throughout the region, and to respond to the priorities articulated by both riders and non-riders through DART's extensive outreach efforts. To be most effective, each component of the system must be viewed as a part of a larger whole, in which **complementary fixed route and on-demand services; supporting infrastructure; seamless trip planning tools**; and **supportive land uses** are integrated. The graphic below visually depicts the design principles that frame the way that these different components fit together and reinforce one another.



Deploy **MOD** to extend the reach of the DART system and provide **flexible travel options**, especially for those **seeking jobs beyond the frequent local fixed route network**

Provide **non-downtown connections** through expanded **feeder corridors** and **crosstown service**

Expand service hours where possible to run an **all-day, everyday network**

Enhance DART's **priority corridors** with **frequent service** and **on-street infrastructure investments** to provide **more reliable and faster service**

Work with member communities to drive **transit-supportive land use and development patterns** to maximize the benefits of transit for residents, workers, and businesses

Develop **mobility hubs** where DART services interconnect, providing a comfortable and **seamless travel experience**

Transit-supportive development increases transit propensity over time

Updated DART Service Categories and Performance Targets

The DART system is built around a framework for categorizing and evaluating different types of service. The following updated service categories may be applied to DART's existing service as well as future services as they are developed. Some existing routes may be transitioned to different categories in the future.

Service Description	Passengers per Revenue-Hour	Operating Cost per Customer	Headways	Span of Service
Priority Corridors Highest-frequency, 7-day corridor service intended to serve areas with the most supportive land uses, and carry large numbers of transfers from other routes. Enhance with supporting infrastructure investments	25	$5.00	• 15 minute weekdays (aspirational goal) • 30 minute nights and Saturday/Sunday	• 5:00 am to 11:00 pm weekdays • 6:00 am to 11:00 pm Saturdays • 6:00 am to 8:00 pm Sundays
Key Corridors 7-day, frequent corridor service intended to serve dense areas; lower priority for supporting infrastructure	20	$7.00	• 15 minute weekdays • 30-60 minute nights and Saturday/Sunday	• 5:00 am to 11:00 pm weekdays • 6:00 am to 11:00 pm Saturdays • 6:00 am to 8:00 pm Sundays
Supporting Corridors Corridor service in lower-density travel markets, 5-day service with weekend service only where appropriate. Where practical, may be operated as an extension of a higher-frequency Corridor route.	15	$10.00	• 30-60 minute weekday all day, less where appropriate • Weekend service where appropriate	• 5:00 am to 10:00 pm weekdays • Weekend hours where appropriate
Commuter Express Nonstop travel between specific higher-density locations and mobility hubs; limited service hours tailored to ridership demand	10	$15.00	Span and headway should be determined based on markets served. Particularly if reverse commute trips are intended to be served, service should be designed in coordination with employers based on shift times	
Feeder Local travel in lower-density travel markets to serve short trips and transfers to Corridor and Commuter Express routes. Where practical, may be operated as an extension of a higher-frequency Corridor or Commuter Express route.	10	$20.00	• 30-60 minute weekday all day • Weekend service where warranted	• 6:00 am to 9:00 pm weekdays • Where appropriate, similar hours on weekends • Some routes may operate during peak hours only
Shuttle Specific high-density local markets with an emphasis on circulation in dense, walkable areas. These routes tend to facilitate very short trips and rely less on connectivity to the full transit network.	15	$6.00	• 15 minutes	• Varies

Service Description	Passengers per Revenue-Hour	Operating Cost per Customer	Headways	Span of Service
Microtransit/On Call In low-density areas, agency-operated on-demand shared ride service for short trips and transfers to the fixed route network. Can also serve some current paratransit trips to boost productivity.	3.5	$25.00	20-minute maximum wait for 90% of microtransit trips	• 5:00 am to 10:00 pm weekdays • Weekend service as appropriate
Flex Connect In small markets with specific mobility needs, TNC-operated on-demand service for short trips and transfers to the fixed route network; may operate at all times or as a fixed route substitute during low-demand hours to expand access to the DART network	Up to 2.5. Above this threshold DART should consider transitioning to Microtransit or fixed route.	Varies by service area size	20-minute maximum wait for 90% of trips	Hours tailored to the market being served

Performance Monitoring and Service Modifications

DART's Service Standards and Performance Monitoring Guidelines provide more detail on how DART monitors service performance in a routine, consistent, and equitable manner and how services are modified accordingly. Routes that consistently underperform relative to Service Standards may require corrective action to improve performance or reallocation of resources to more effective service options.

Universal service design principles

DART lays out its transit system around certain universal design principles based around reasonable walking distances, as most DART customers begin and end their trips as pedestrians.

- ½ mile spacing between parallel bus routes
- ¼ mile typical spacing between local bus stops. Express routes will operate closed-door segments with no stops, while shuttles may have stops spaced more closely. If DART pursues Bus Rapid Transit (BRT) in the future, typical stop spacing on a BRT route may be ½ mile or more, especially if local service with more frequent stops operates on the same corridor.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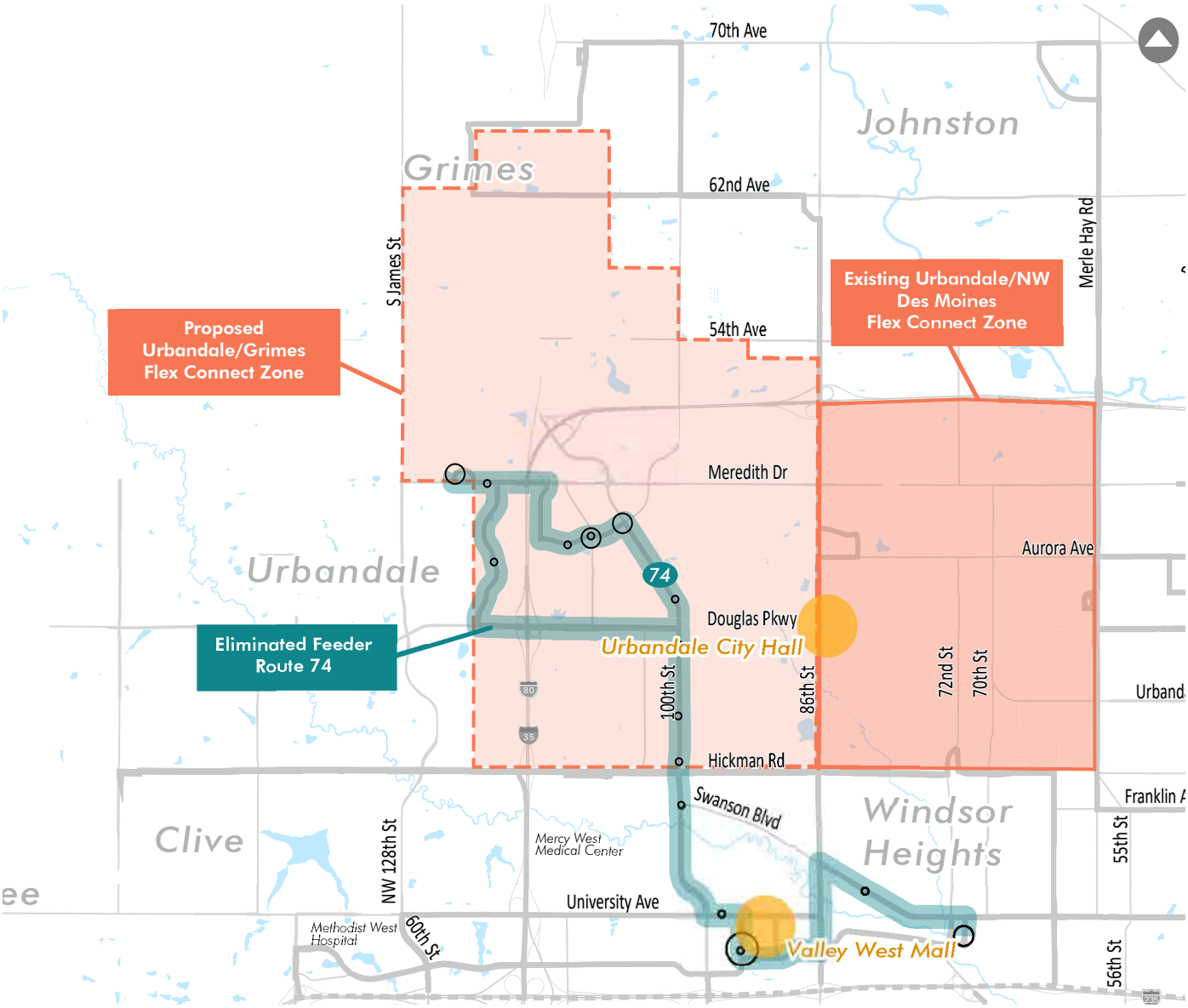
Near-Term Service Proposals

DART has identified a number of changes that can be made with existing resources in the next 1-3 years. By reducing service on lower-performing bus routes, resources can be shifted to serve customer needs identified in the study.

Flex Connect Urbandale / Grimes



In DART's spring survey, respondents expressed concern about the reliability of service provided through Uber and taxis. DART must monitor the reliability of its existing Flex Connect service against its Service Standards before proceeding with expansion.

The Goal

- Provide cost-effective first/last mile connection to employment areas in NW Urbandale and Grimes

Proposed Change

- Replace Route 74 with a new Flex Connect Zone that will provide Uber or taxi service to select bus stops from anywhere in the zone
- Mobility hubs and designated fixed-route transfer points at Valley West, Urbandale City Hall
- Expansion to Grimes
- Service hours 6 a.m. to 6:30 p.m. Monday - Friday

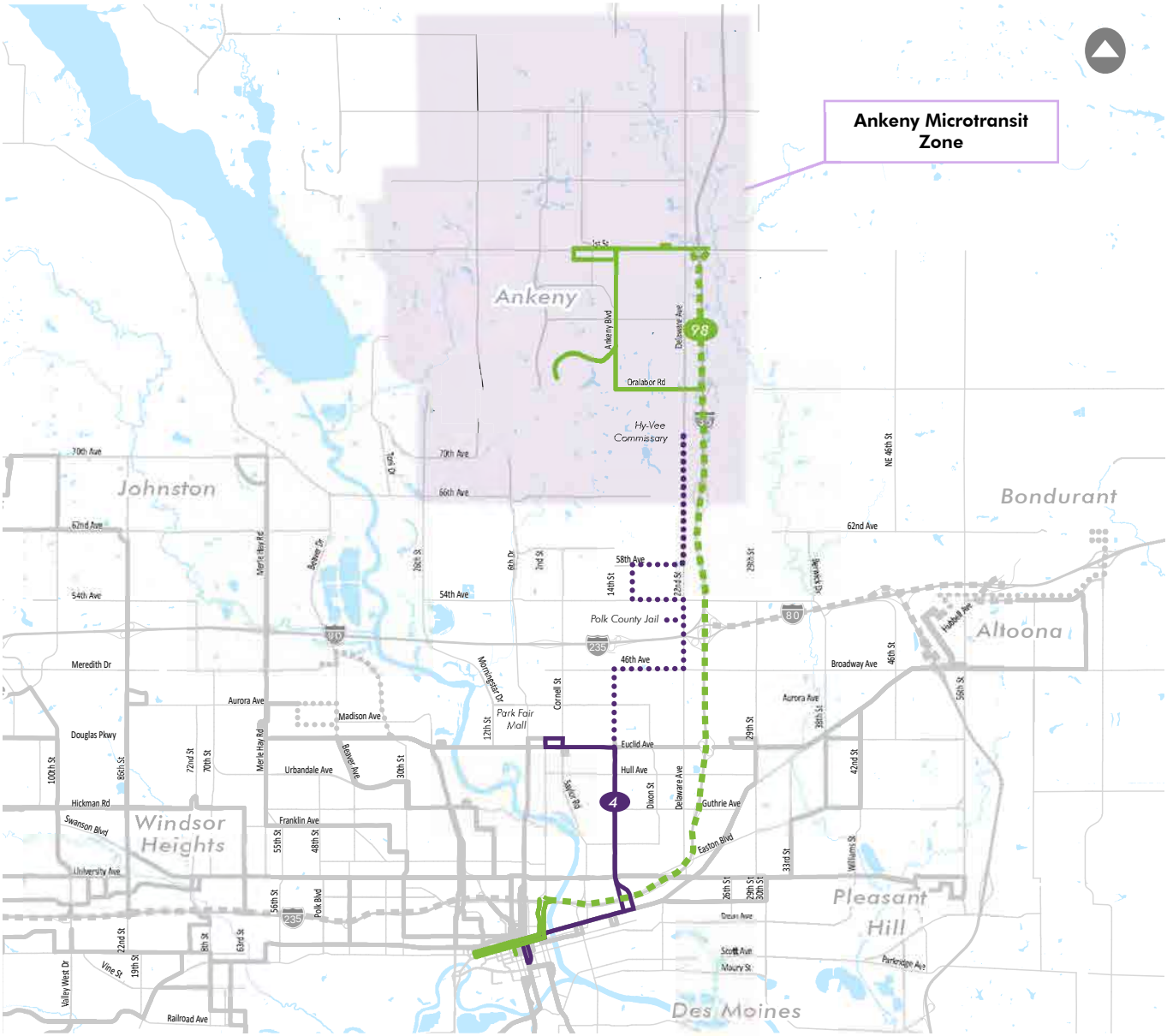
Rider Impact

- Minimal disruption: only 25 daily boardings, most are transferring already
- Expanded hours of service compared to existing Route 74
- On demand service reduces wait times compared to the current hourly bus service.

Cost Impact

- Cost-neutral to serve existing Route 74 demand + up to 50% increase in demand
- As resources allow, consider **longer hours and weekends**

Ankeny Microtransit Pilot



In DART's spring and fall outreach efforts, there was strong support for implementing microtransit in Ankeny and elsewhere in the region. As with other on demand models, short wait times and reliability will be key to customer satisfaction. In late 2021, DART launched the DART On Demand microtransit pilot in Ankeny.

The Goal

- Provide more flexible, customer-friendly local circulation in Ankeny

Proposed Change

- Upgrade Ankeny On Call to Microtransit, expand hours to 6 a.m. - 6:30 p.m. Monday - Friday

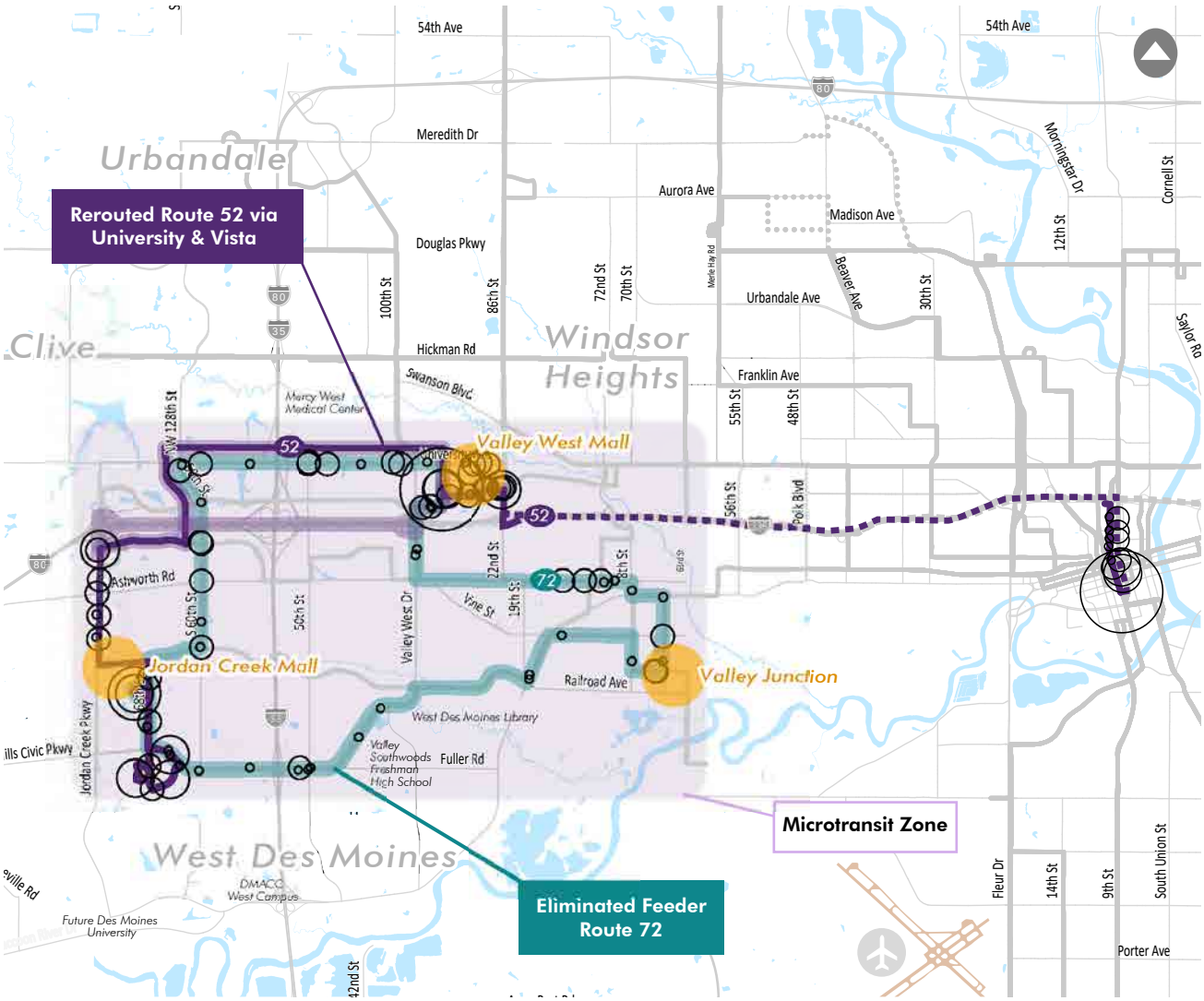
Rider Impact

- Few riders use the On Call today: opportunity for growth
- May be able to accommodate some local paratransit trips
- Could be a "stepping stone" to local fixed route service if demand exceeds practical limitations of Microtransit

Cost Impact

- **One vehicle funded for FY22**
- Resource needs are driven by service standard (i.e. maximum wait times): if demand is strong, additional vehicles may be needed, increasing the cost

Microtransit West



In DART's Fall 2021 outreach, over 40% of West Des Moines residents said this proposal would lead them to ride transit more, and only 17% said they would ride less. Feedback from Route 72 riders was mixed, and additional outreach should be conducted to explain the specific proposals and better understand how the service can be tailored to meet customer needs.

The Goal

- **First/last mile connections and local circulation** in West Des Moines, expanded service hours

Proposed Change

- Discontinue Route 72
- Reroute Route 52 to cover portions of the discontinued Route 72 along University Ave and 60th Street
- Implement microtransit throughout West Des Moines, substituting Route 72 and expanding local travel options. Microtransit would operate from early morning to late evening, with service offered 7 days a week.
- Mobility hubs at Valley West, Jordan Creek, and Valley Junction

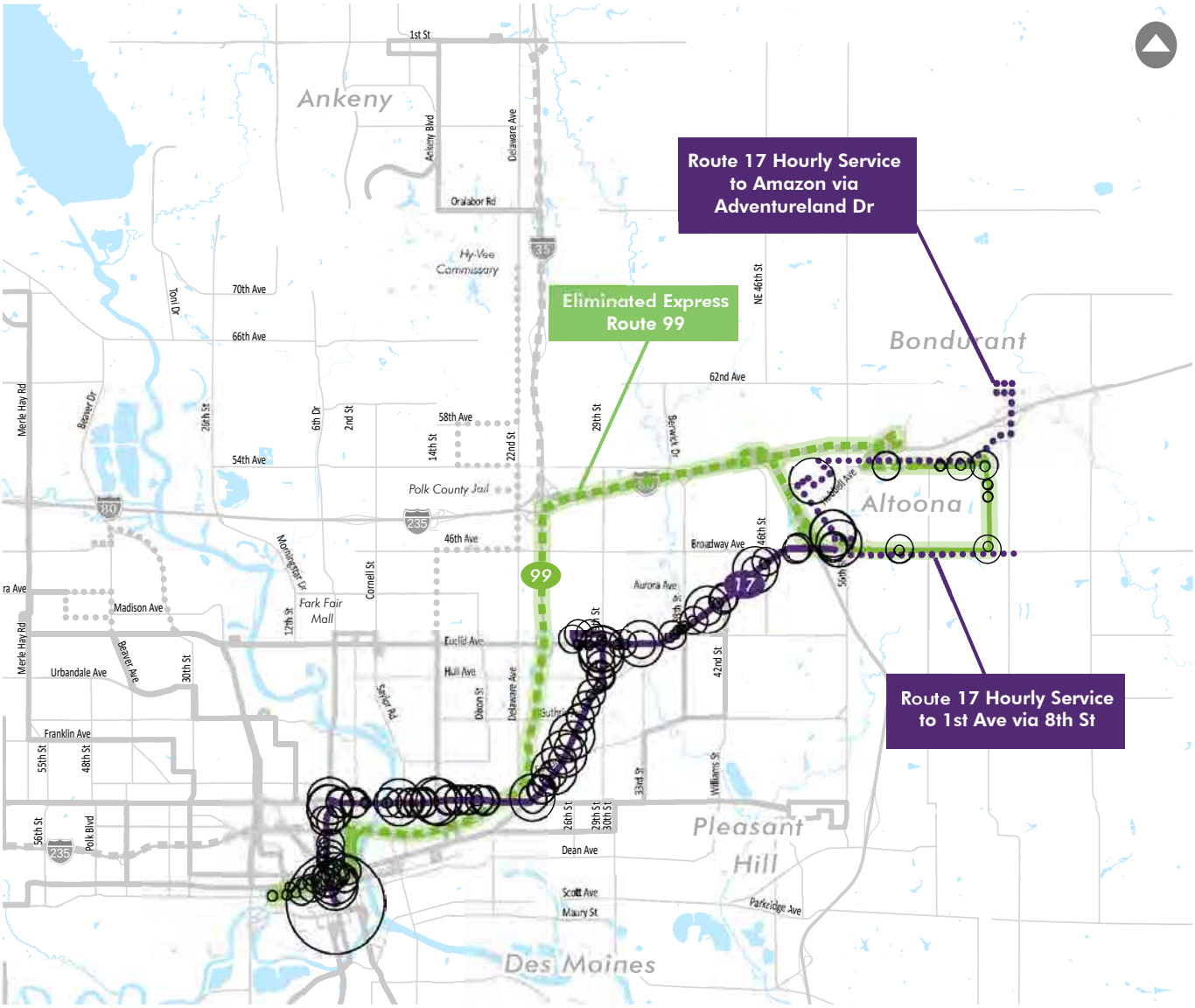
Rider Impact

- 75 riders (Route 52+72) riders lose fixed route service
- 100 Route 72 riders receive one-seat ride to more destinations, higher frequency service, and longer hours via the rerouted Route 52
- Route 52 frequency is reduced from 30 to 40 minutes to facilitate timed transfers with Route 3 at Valley West Mall.
- Microtransit increases access and schedule flexibility over discontinued Route 72

Cost Impact

- Potential cost savings depending on number of microtransit vehicles deployed
- Flexibility to expand microtransit

Discontinue Route 99, Reinvest in Route 17



This proposal was adjusted in response to public feedback from DART's fall 2021 outreach, where some expressed concern over the loss of service resulting from elimination of Route 99.

The Goal

- Improve mobility for reverse commuters seeking jobs in Altoona and Bondurant

Proposed Change

- Discontinue Route 99
- Reinvest resources into Route 17: operate 30-minute service to WalMart, with hourly service to Adventureland Drive, Amazon, and 8th Street corridor

Rider Impact

- Longer hours, better service for reverse commuters
- Significant increase in service along Adventureland Drive and along 8th Street
- Travel time impact depends on destination
- Route 99 riders switch to Route 17 or stop riding
- Fewer than 2 daily Route 99 riders would lose fixed route service

Cost Impact

- Cost-neutral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Des Moines Area Regional Transit Author
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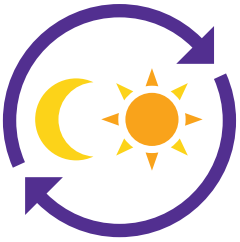
Potential Future Improvements

As one of the fastest growing Midwest metro areas, we know transportation needs will continue to evolve as the region grows. DART's vision for the future of its transit network includes recommendations for additional investment of operating resources in the DART system that can be rolled out over time as resources become available. Many of the recommendations in this section build and expand upon the near term service proposals presented in the previous section. These recommendations are intended to respond to the following community needs, which are priorities that have been articulated in multiple rounds of public outreach:

Providing access to new places
New fixed-routes, Microtransit zones, and Flex Connect zones greatly expand the geographic reach of DART's network, providing more residents and jobs with access to transit service.



Extending service for longer hours
Longer service hours make transit available at more times of day, so it is useful to riders for a wider variety of trip purposes. Select routes with service earlier in the morning and later at night on weekdays and weekends will increase transit's usability for many riders.

Reducing travel and wait times
Increased frequencies reduce the amount of time riders have to wait for the bus, shortening overall travel times, especially when trips involve a transfer.

Facilitating travel outside of downtown
Acknowledging that not all trips are destined for Downtown Des Moines, new Microtransit and Flex Connect zones focus on facilitating intra-community travel, allowing riders to use transit for short-distance, local trips such as grocery shopping and running errands.

Modest Enhancements

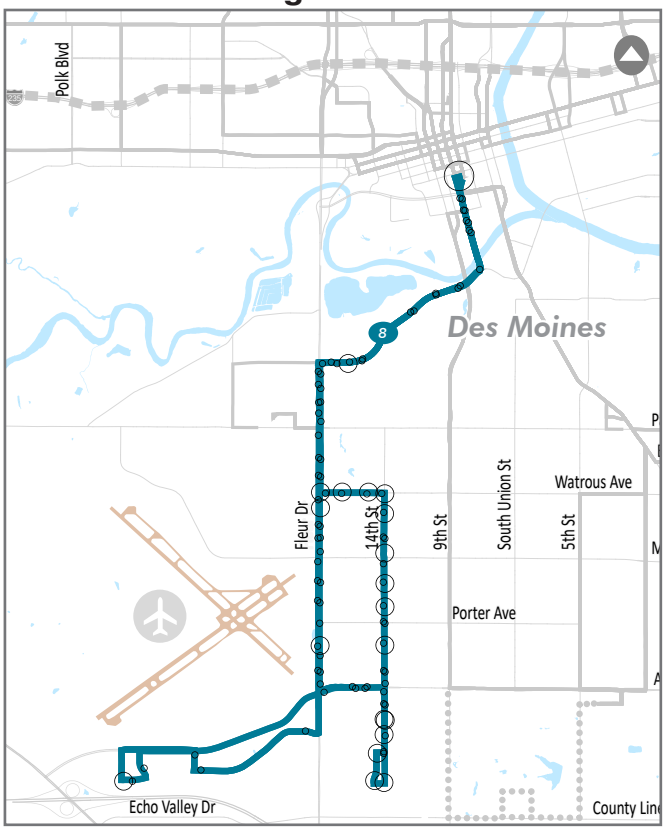
DART has identified a number of recommendations that are responsive to regional needs and customer requests, but are beyond DART's existing budget. These recommendations could only be implemented if additional funding were identified for DART.

Long-Term Enhancements

As the region continues to grow and conditions evolve, additional investments in transit could be needed to accommodate expected growth in jobs and housing. The following recommendations would be appropriate to pursue with additional funding partnerships or in response to significant future growth.

All Day Service on Fleur Drive

Existing Service



Proposed Service

More service on Fleur Drive and to the airport has been a common customer request and was identified as a top priority in DART's Fall 2021 public outreach.

With a major expansion of service to the South Business Park, DART would expect ridership growth along this segment which sees few riders today. If ridership does not respond, the service would be reevaluated in the future for potential elimination or substitution with MOD.

The Goal

- Simplify routing to make it more customer-friendly
- Address customer and business requests for more service

Proposed Change

- Break Route 8 into two simpler alignments
- Hourly all-day service along SW 14th Street
- Hourly peak service on Fleur Drive to Airport South Business Park
- Start with weekday only service

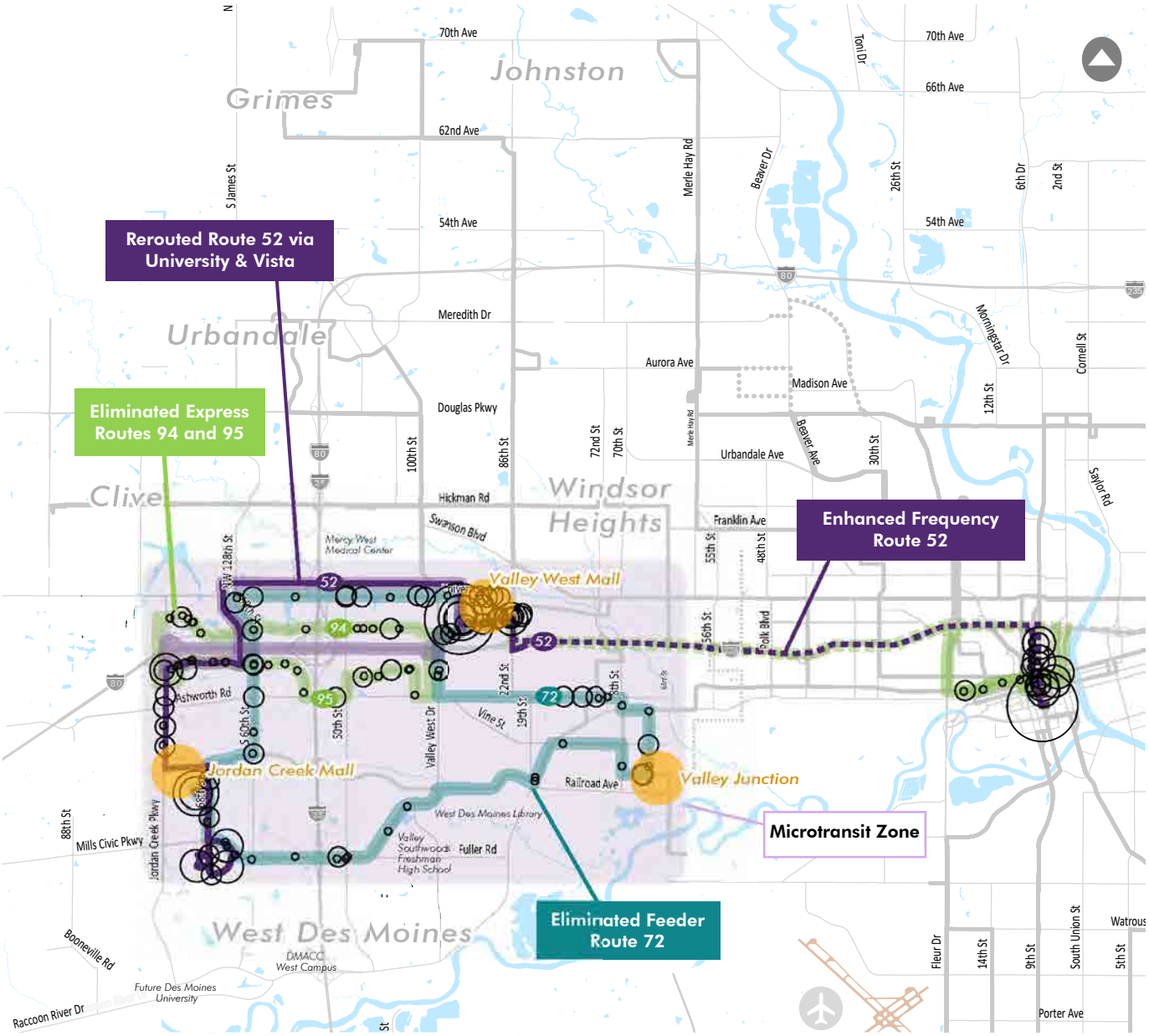
Rider Impact

- Significant increase in service compared with peak-only service that operates today
- Simpler routing
- SW 14th St would lose service between McKinley Ave and Army Post Road, but would remain within 1/2 mile of both Route 7 and Route 8

Cost Impact

- $300k/year additional operating cost

Microtransit West, Phase II



The Goal

- Improved local circulation
- All-day reverse commute service

Proposed Change

- Discontinue express routes 94 and 95
- Increase frequency on Route 52 to 20 minutes during peak hours
- Expand microtransit resources to accommodate increased demand - anticipate up to three vehicles deployed during peak hours
- Mobility hubs at Valley West, Jordan Creek, and Valley Junction

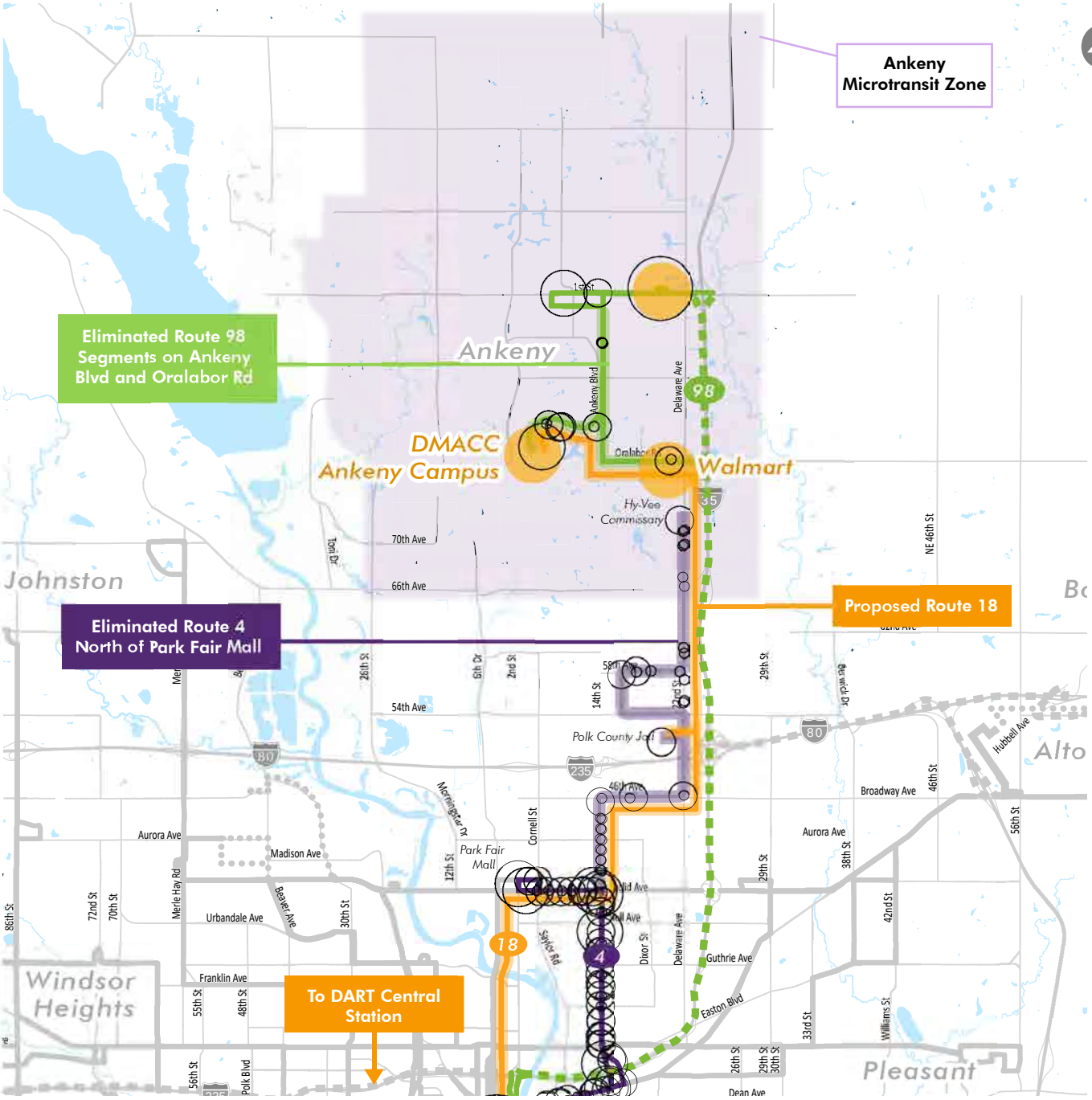
Rider Impact

- More convenient reverse commute option with longer hours
- 35 inbound express passengers shift to Route 52, 92, 96, or stop riding
- 40 reverse commute express route passengers switch to microtransit

Cost Impact

- Around $300k/year

Expanded Ankeny Microtransit with Supporting Fixed Route



The Goal

- Expand local circulation in Ankeny
- Better connect points throughout Ankeny to the rest of the DART service area

Proposed Change

- Expand Ankeny Microtransit hours to 10:00 pm and add weekends
- All day local service via new Route 18, replacing the low-frequency Route 4 extension
- Reduce Route 98 circulation and eliminate some off-peak trips
- Mobility hubs at DMACC, WalMart, Mercy North

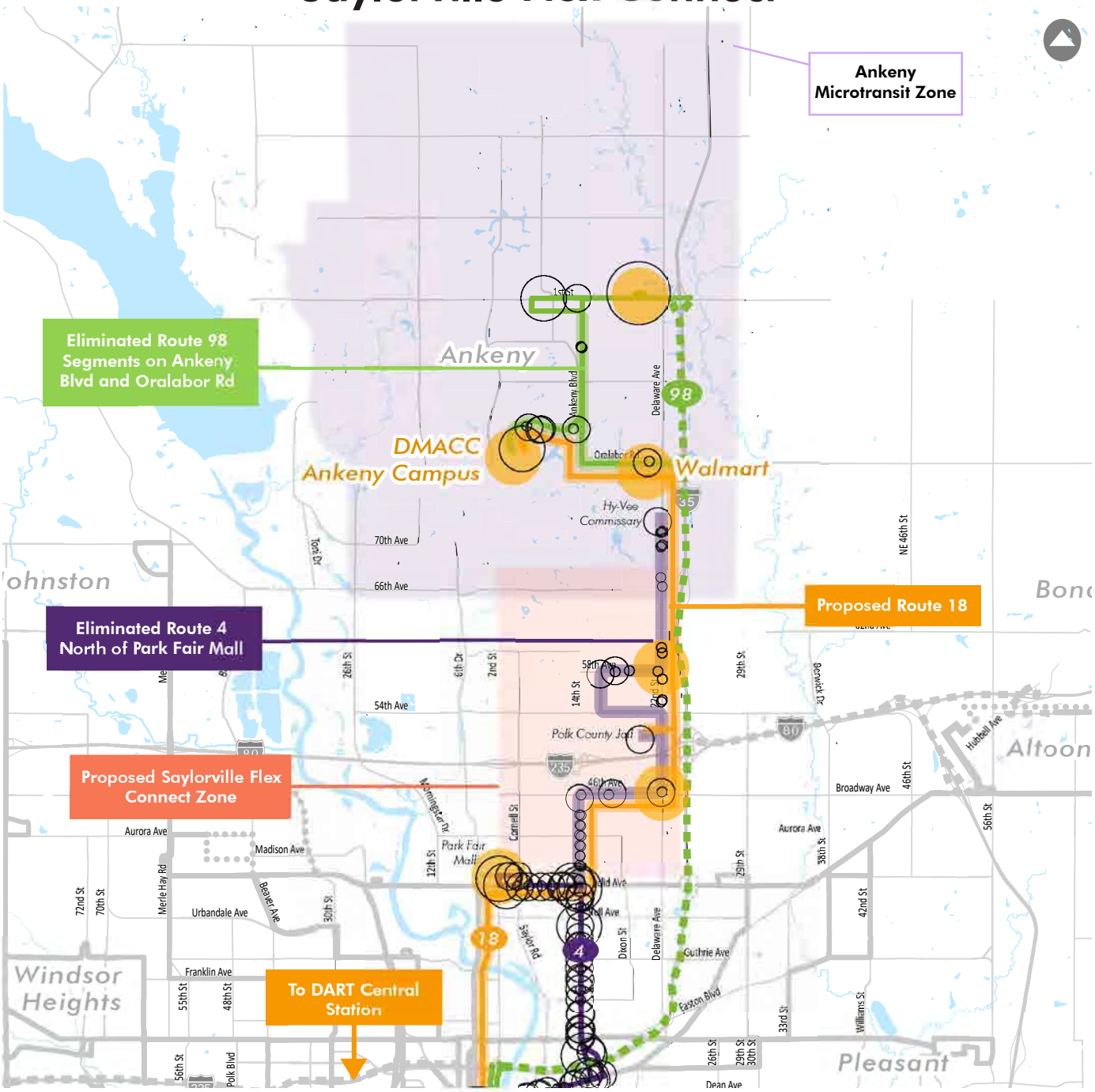
Rider Impact

- Loss of one-seat express at DMACC
- Significant expansion in local and inter-city mobility for Ankeny

Cost Impact

- $750k/year for fixed route expansion
- $125k/year to extend Microtransit to 10pm and weekends

Saylorville Flex Connect



The Goal

- Improved first/last mile service to jobs between Euclid Avenue and Ankeny

Proposed Change

- Implement Flex Connect service to link to the expanded Route 18
- Mobility hubs along Delaware Ave and Park Fair Mall

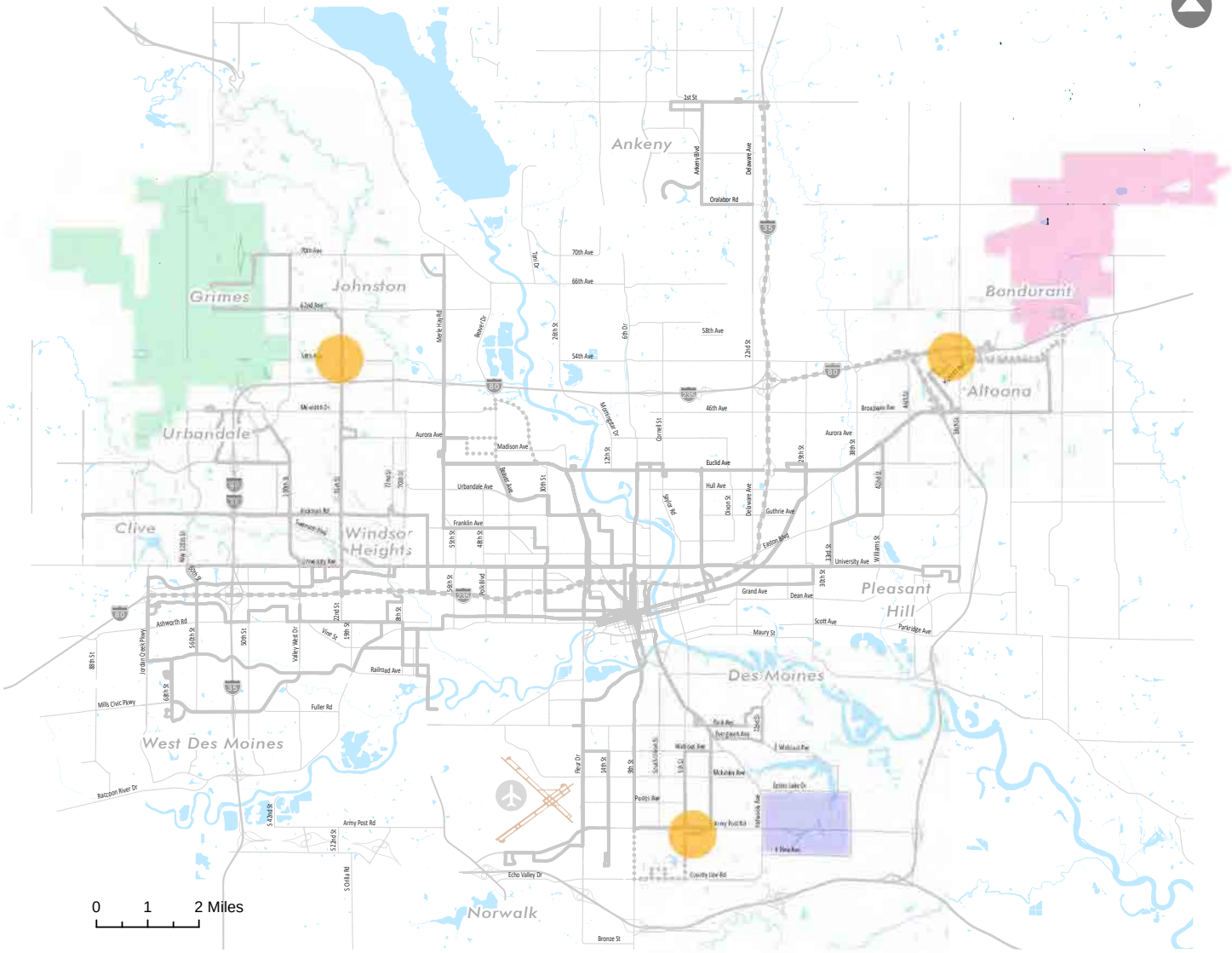
Rider Impact

- Enhanced jobs access from both Ankeny and Des Moines

Cost Impact

- $9-10/trip for additional Flex Connect service, demand TBD
- Seek employer support for this service

Roll out MOD to DART's other On Call Zones



The Goal

- Improved customer experience with flexible, same-day booking

Proposed Change

- Roll out Flex Connect platform to existing On Call zones
- Would require adding the ability to collect fares
- Eventually transition Grimes On Call to Microtransit following evaluation of the Ankeny pilot
- Complement with mobility hubs to facilitate transfers to fixed routes

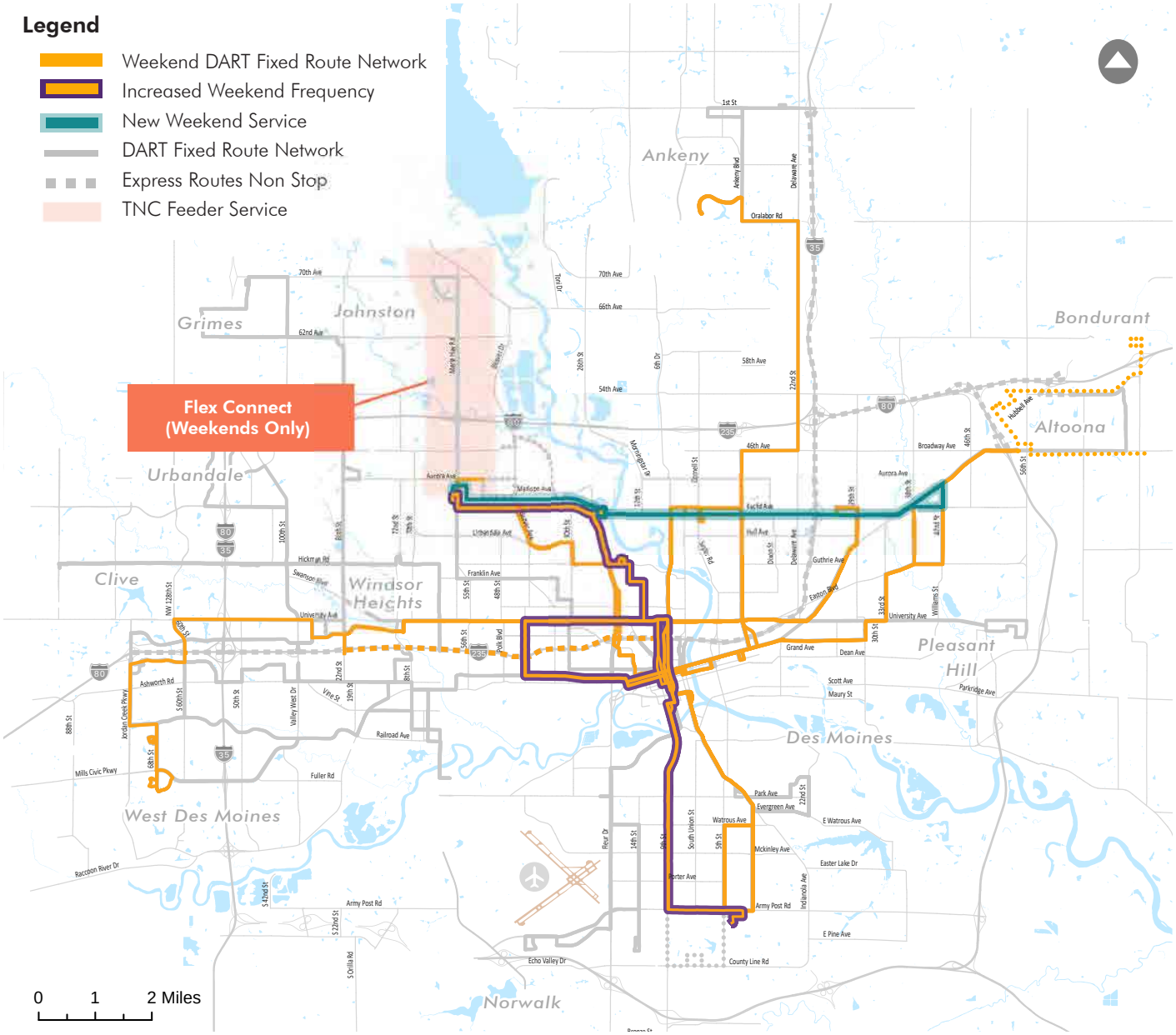
Rider Impact

- Service availability remains the same, increased convenience of on-demand option
- Some customers may still prefer DART-operated service

Cost Impact

- Cost-neutral or potential cost savings for addition of Flex Connect option. Transition to microtransit and expansion of Grimes service would result in additional costs

Provide More Weekend Service, Especially on Sundays



Increased frequency, longer hours, and more routes on weekends are consistently the top-requested improvement among DART's existing customers, especially those with low incomes who depend on transit.

The Goal

- Better meet customers' mobility needs throughout the week

Proposed Change

- Expand Sunday hours to 7:00 am - 8:00 pm systemwide
- Extend Saturday hours to 11:00 pm systemwide
- Introduce weekend Flex Connect feeder service on Merle Hay Rd from Merle Hay Mall to Johnston, linking this corridor to the rest of the DART network on weekends
- Add weekend service on Route 50
- 30 minutes frequency all weekend on Routes 7, 16, and 60

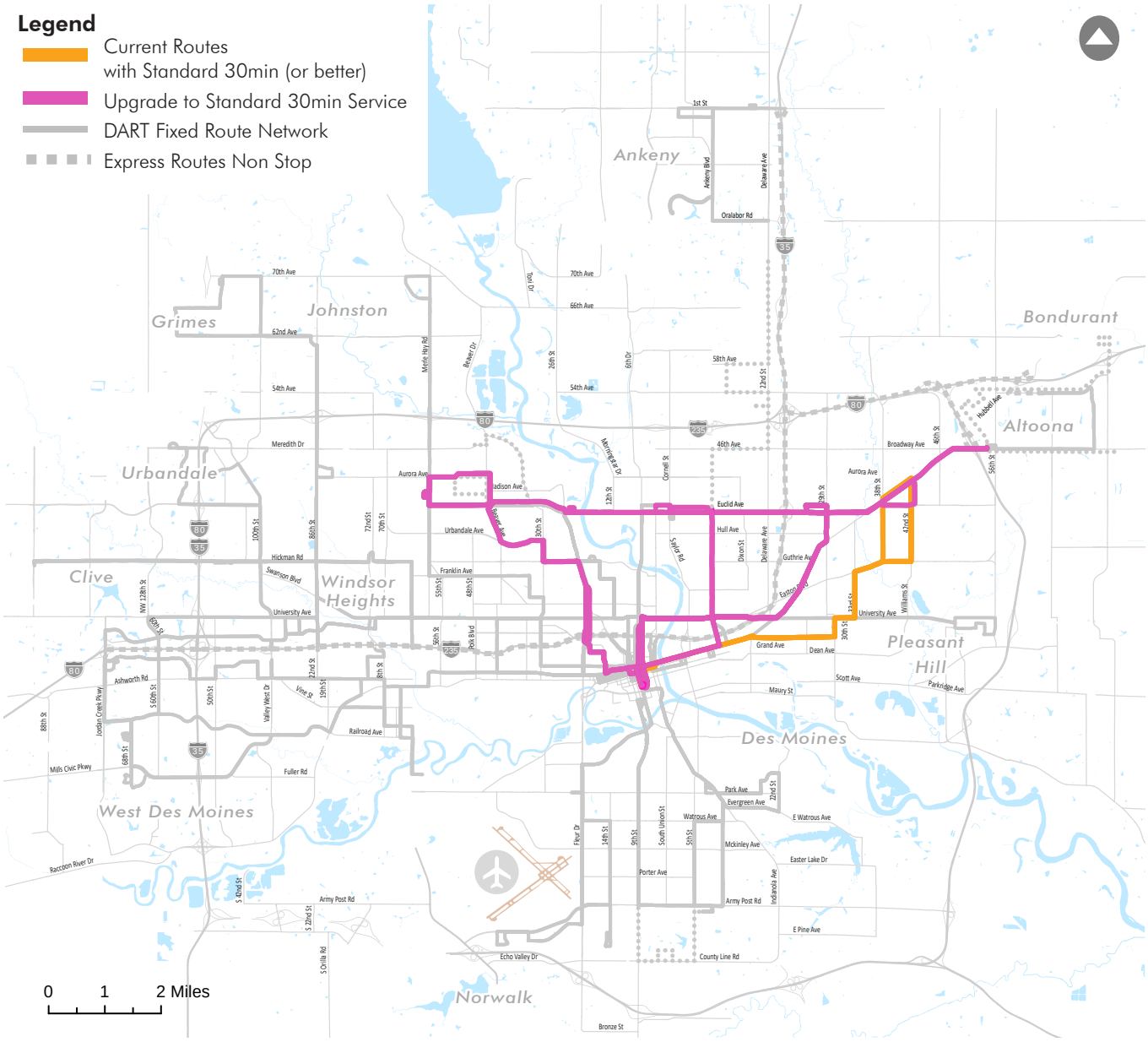
Rider Impact

- Improved weekend service

Cost Impact

- $250k for extended weekend hours
- $400k for frequency improvements
- $115k for new Route 50 service
- $67,000 for Merle Hay Rd weekend Flex Connect

Increased Frequency on DART's Most Productive Routes



The Goal

- Reinforce DART's Priority Corridor network with increased frequency
- Facilitate timed transfers to supporting routes and MOD
- Respond to a top customer request
- Grow ridership where demand is highest

Proposed Change

- Standardize 30-minute service on routes 4, 14, 17, and 50

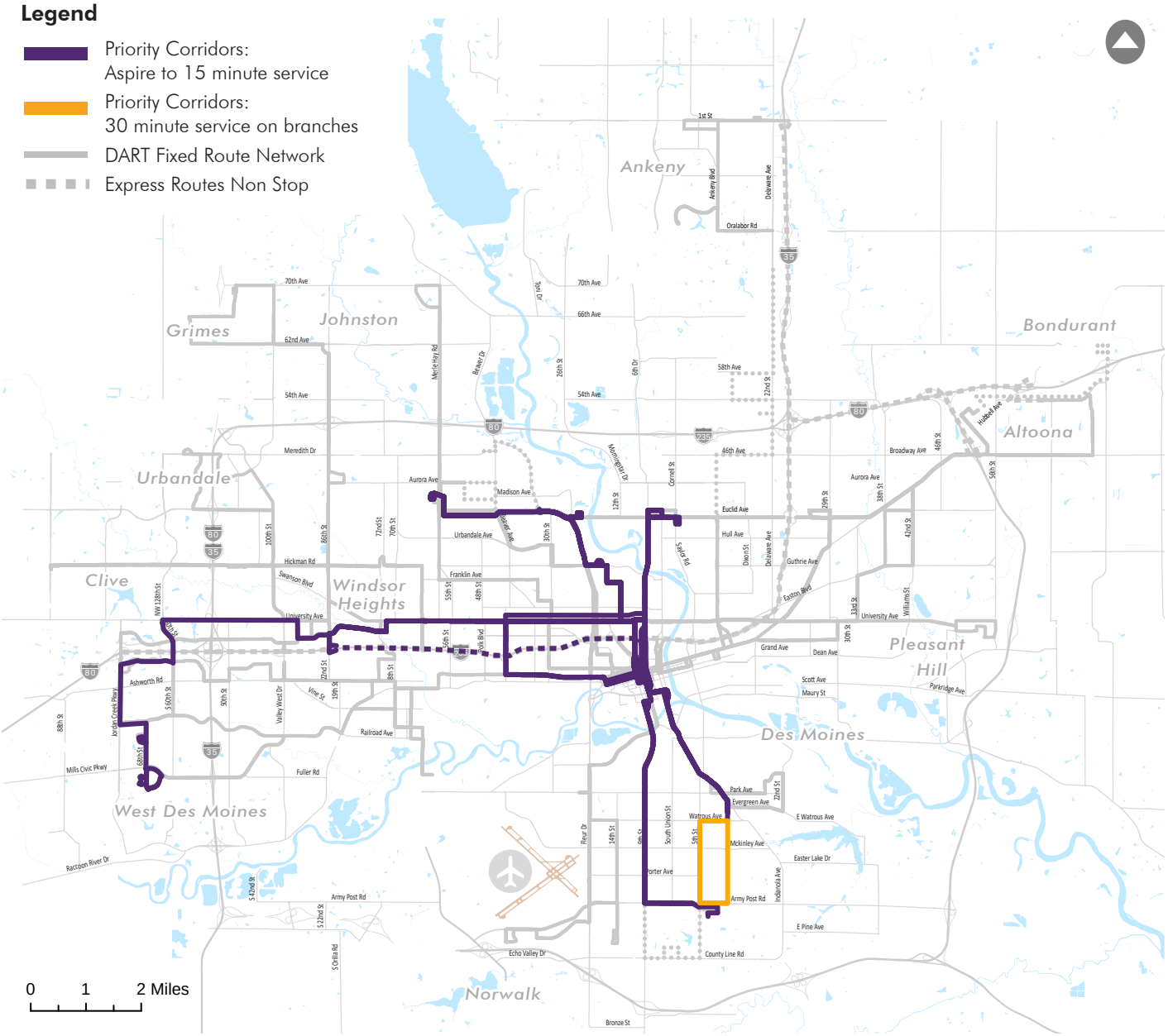
Rider Impact

- Improved convenience & access

Cost Impact

- $500k/year
- Can be phased in over time

Increased Weekday Frequency on DART's Most Productive Routes



The Goal

- Reinforce DART's Priority Corridor network with increased frequency
- Facilitate timed transfers to supporting routes and MOD
- Respond to a top customer request
- Grow ridership where demand is highest

Proposed Change

- 15-minute all-day service on routes 3, 6, 7, 15, 16, 52, and 60

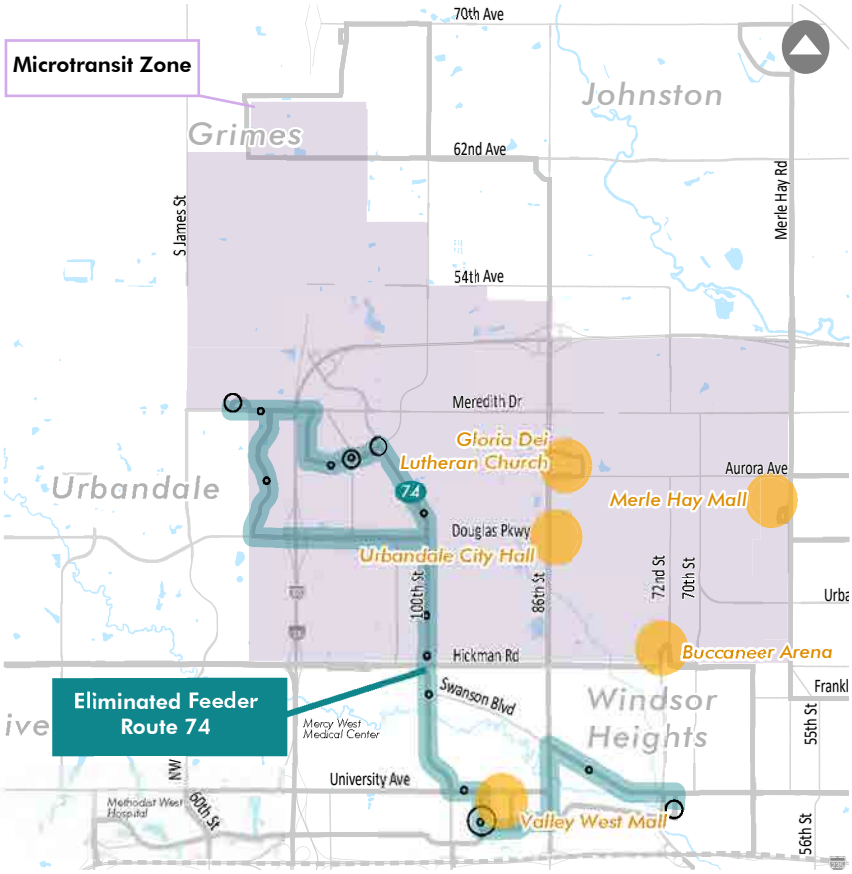
Rider Impact

- Improved convenience & access

Cost Impact

- $2.5M/year
- Can be phased in over time

Urbandale Microtransit



The Goal

- Increase local circulation opportunities
- Improve customer experience with a DART-operated service

Proposed Change

- Merge the two Urbandale Flex Connect Zones into a single DART-operated microtransit zone
- Allow local travel (current service primarily serves transfers to fixed routes)
- Expand hours to nights/weekends

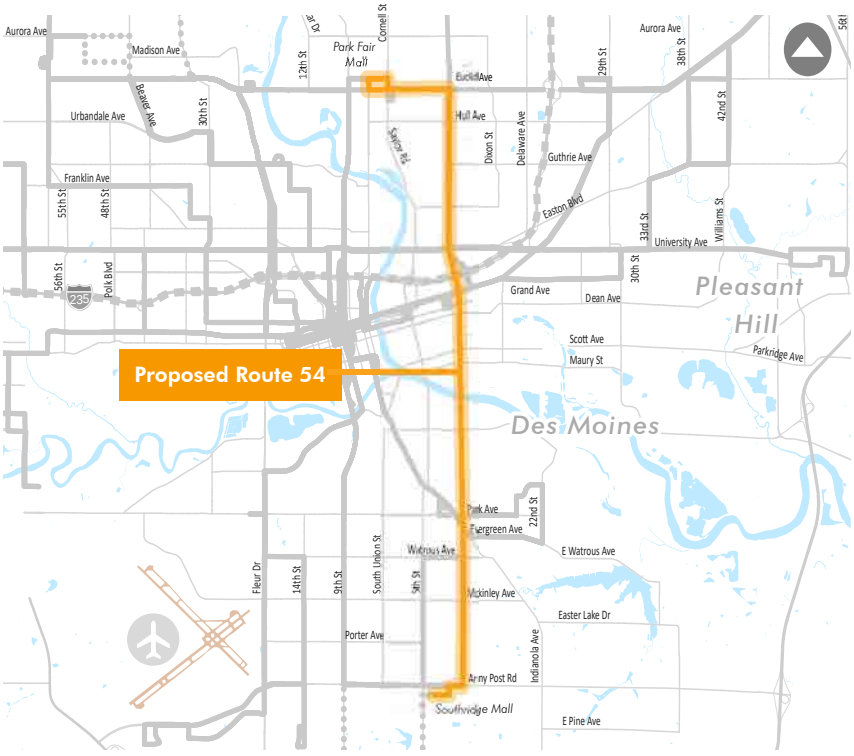
Rider Impact

- Enhanced flexibility to more fixed route connecting points
- Ability to make short trips within the zone
- No need to transfer to get between adjacent Flex Connect zones

Cost Impact

- $275k/year (plus additional cost for nights and weekends)

New Service: Route 54



The Goal

- Increase non-downtown connections among highest transit-propensity areas
- Fill SE 14th Street service gap

Proposed Change

- Implement a new crosstown feeder route
- 30-minute weekdays, 60-minute nights and weekends

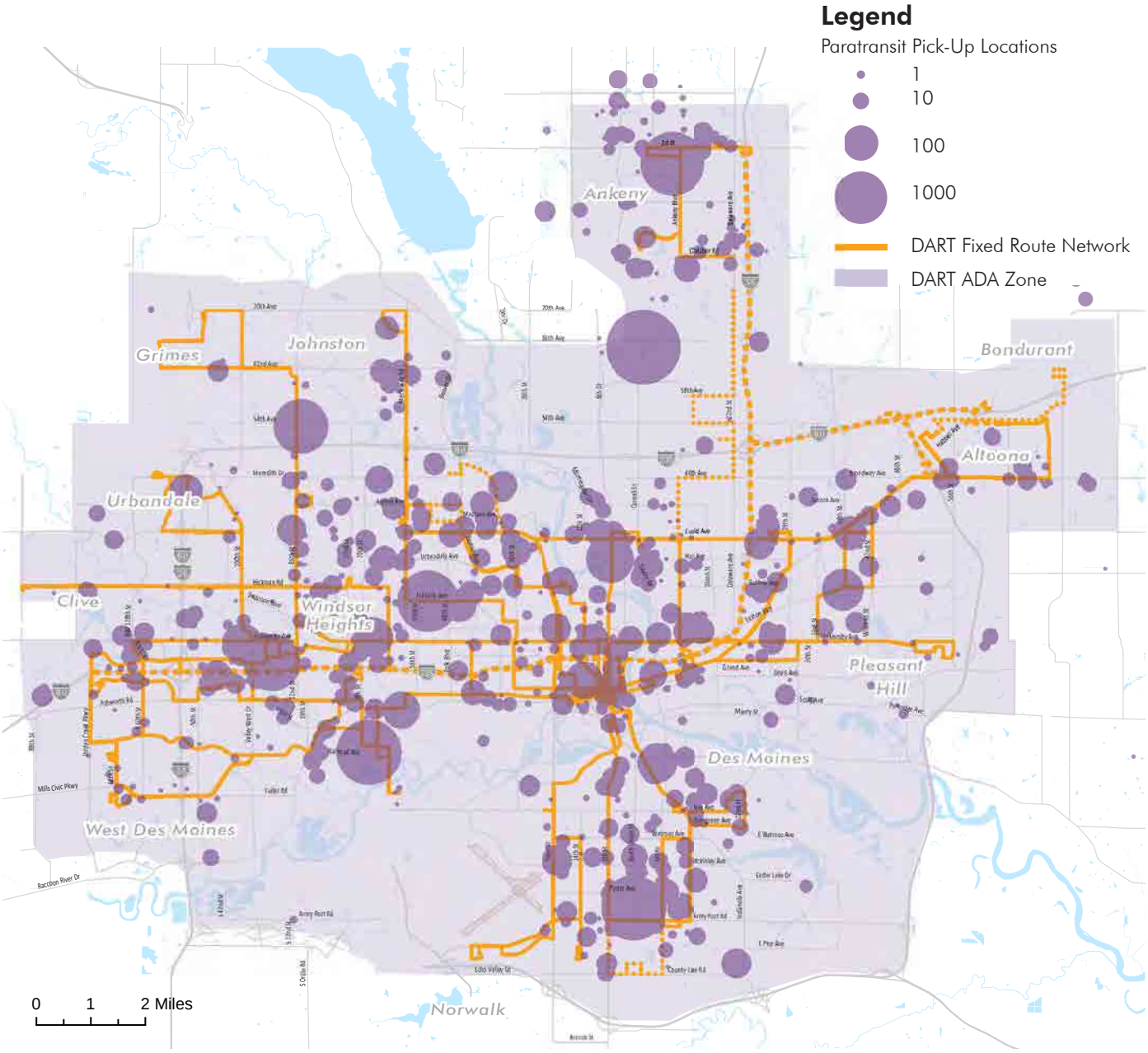
Rider Impact

- Increased mobility option

Cost Impact

- $1.0M/year

MOD Paratransit Improvements



The Goal

- Improve customer experience with flexible, same-day booking option
- Control cost by encouraging lower-cost solutions for ambulatory trips

Proposed Change

- Augment existing service with an on-demand, curb-to-curb TNC option

Rider Impact

- Conventional paratransit option remains available to all
- Some riders take advantage of more convenient option (DART has above-average share of ambulatory paratransit customers)
- Potential reliability issues with TNCs will need to be monitored

Cost Impact

- Potential for cost savings on some existing paratransit trips

Transit Supportive Infrastructure on the Priority Corridor Network

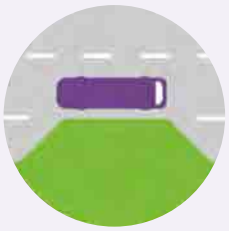
Transit-supportive infrastructure investments may include a variety of improvements aimed at making service faster and more reliable, improving passenger comfort, convenience, and safety, and ensuring seamless mobility between different routes and different modes at hubs throughout the system.

DART will continue to promote and support transit-supportive policies with its member cities, and work with member cities to seek grants to fund infrastructure improvements.

Infrastructure Toolbox:

Upgraded Bus Stops

- Basic pedestrian access to all local bus stops
- Shelters at most stops
- Higher-ridership stops and transfer locations may feature seating, trash receptacles, bike racks, and digital next-bus signs.



Bus Bulbs

- Speeds up transit operations
- Additional space for passenger amenities
- Traffic calming, crosswalk integration

Mobility Hubs

- Key points where multiple DART routes and services converge
- Designed to facilitate convenient transfers between buses, MOD, and other modes including bicycles and cars
- Mobility hubs can accommodate micromobility, carshare, parking for private cars and bikes

Queue Jumps

- Short, bus-only lane at a signalized intersection
- Buses get advanced green lights and bypass general traffic

Dedicated Guideway/Bus Rapid Transit

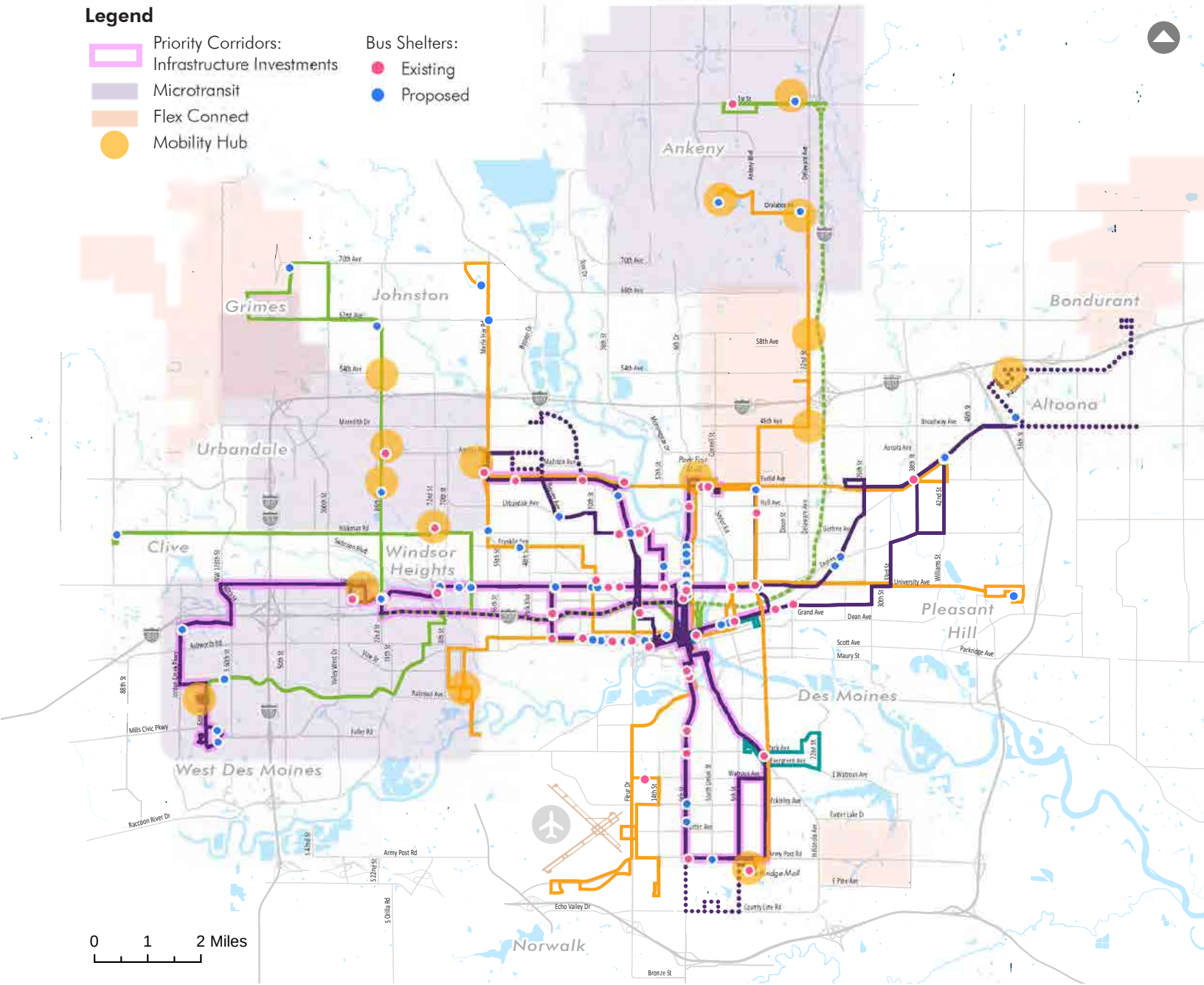
- Dedicated guideway ensures fast, reliable service
- High-frequency
- Customer-friendly amenities and branding
- Combined with features like TSP and enhanced stations
- Rail-like comfort and reliability

Transit signal Priority (TSP)

- Buses get priority at intersections
- Buses can request shorter reds, longer greens

Tie the Network Together with Transit Supportive Infrastructure

Building on DART's most highly utilized corridors, DART will work with local municipalities to invest in transit-supportive infrastructure, particularly along the Priority Corridor fixed route network. Priority corridor investments will ensure that DART's most-used, most-productive, and most-attractive services are also its fastest and most reliable – creating the backbone for the transit network of the future. To integrate its priority network with the rest of DART's family of services, DART will also develop mobility hubs throughout the system to facilitate safe and convenient transfers between buses, MOD, and other modes including bicycles and cars.



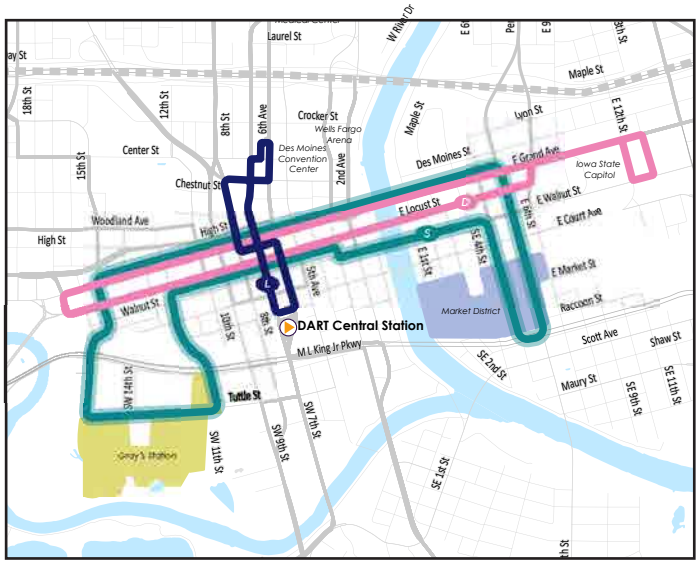
Future Growth Areas

DART continues to monitor future opportunities to serve new markets and communities, including how DART might serve new member cities should they opt to join the system.

Emerging Downtown Neighborhoods

Des Moines is experiencing rapid growth in the residential population within and adjacent to the downtown area, particularly the Market District and Gray's Station neighborhoods where major new residential developments have been completed in recent years and many more are planned. These emerging neighborhoods feature high-density, mixed use, and walkable environments that could be highly supportive of transit use. They also represent a different type of transit demand than other outlying neighborhoods, in which transit to downtown must be competitive with walking rather than driving, and where passengers are more likely to use transit for downtown shopping and recreation in addition to employment and are less likely to transfer to other routes.

The most appropriate type of service for these neighborhoods is high-frequency shuttle service that connects directly to downtown destinations rather than through DART Central Station, similar to the D-Line. This new route is shown in the map to the right as the "S-Line". Since the S-Line would cover much of the same route as the D-Line, the cost of this new service could be partially offset by reducing frequencies on the D-Line, while overall service levels on Grand, Locust, and Walnut would remain the same or increase.



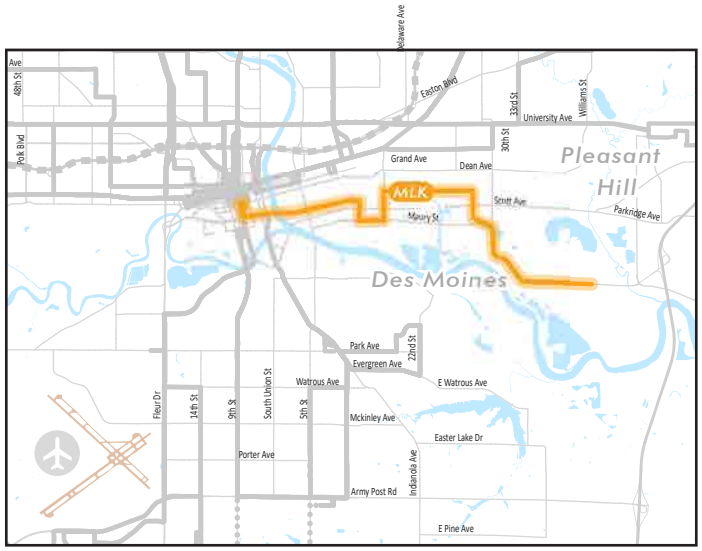
Map: Emerging Downtown Service Options

To further support transportation choice in these emerging developments, DART and the City of Des Moines should work with developers to co-locate transit with complementary micromobility options such as bikeshare, scooter-share, and carshare.

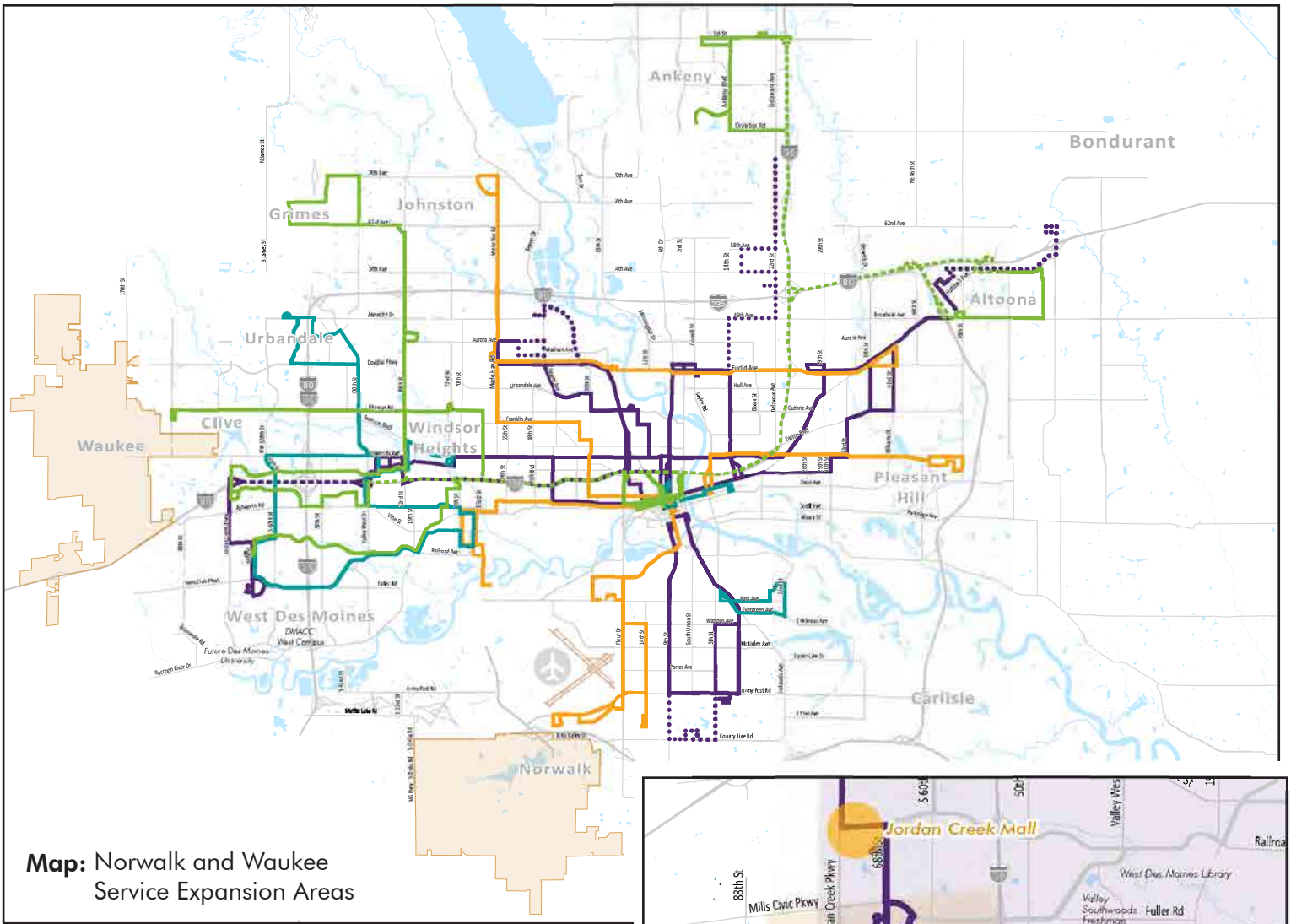
In the future, DART will continue to evaluate new service options in Downtown Des Moines, including expanding residential area service and special event service to the north side of downtown.

East MLK Corridor

DART has received occasional requests to introduce service along E. MLK Jr. Parkway corridor in Des Moines, where there are a large number of manufacturing and other light industrial employers. DART has previously considered introducing new local service along this corridor operating out of DART Central Station (see map to the right). Service should be tailored to the needs of shift workers, and DART will work directly with employers to determine the appropriate days and hours of service. DART will seek financial support from employers to offset the cost of new service.



Map: Service Expansion Area along E. MLK Jr. Pwky

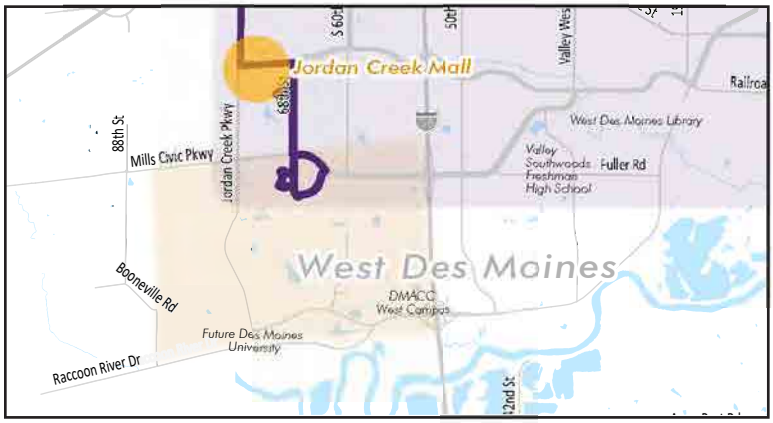


Map: Norwalk and Waukee Service Expansion Areas

Norwalk and Waukee

Should these communities opt to join the DART system, DART should develop services to meet the needs of their residents as well as employees who commute there for work.

- In Waukee, DART would likely focus on the employment corridor along Hickman Road by extending the existing Route 92 west into Waukee. Rerouting the service to add a stop at Valley West Mall would expand mobility in and out of Waukee by providing convenient transfer opportunities without traveling to Downtown Des Moines.
- In Norwalk, DART would likely introduce Flex Connect or Microtransit service to Norwalk, with opportunities to transfer to fixed route service along Fleur Drive or at Southridge Mall, offering frequent opportunities to reach Downtown Des Moines and the rest of the DART network. DART would also work with employers to identify potential reverse commute destinations in Norwalk for potential extension of Route 8 via Fleur Drive.



Map: Southwestern West Des Moines Service Expansion Area

Southwestern West Des Moines

This area is home to the DMACC West facility and the planned Des Moines University campus. These institutions bring new demand for transportation to the southwestern part of West Des Moines, which currently does not have DART service. DART will work with these destination campuses to understand the mobility needs of their employees and students – where they come from, time of day, and overall level of activity – with the goal of eventually expanding service. DART anticipates piloting additional microtransit or other MOD service to this area from a growing mobility hub at Jordan Creek Mall.


dart
ELECTRIC BUS

Autonomous Vehicles

Autonomous vehicles are in advanced stages of testing for personal and commercial use. As this industry continues to evolve, it is important that DART consider the implications of this potentially transformative evolution in transportation.

Autonomous Buses

While fixed-guideway transit has had self-driving technology for years, rubber tire transit is still evolving. There are two primary forms of automation in rubber tire transit:

1. Low-speed Autonomous Shuttles
    - Suitable for campus locations or low-density activity centers
    - Technology is in widespread use today (most still operate as demonstration projects with human attendants on-board)
    - As technology advances to eliminate the need for a safety attendant on-board, operating costs will drop significantly
    - May open low-density areas to cost-effective fixed or on-demand transit service
    - As technology advances and costs decline, may eventually provide a more flexible option for downtown shuttle services as well

2. Autonomous Buses
    - Suitable for higher capacity corridor-based bus routes
    - Automation has potential to allow for higher service frequency at the same operating cost through remote monitoring/operation
    - This technology is still in the early stages of testing. Early deployments are likely to require a dedicated guideway and/or safety attendant on-board. It may still be years before autonomous buses can be fully integrated into mixed traffic operation

Autonomous Cars

Fully or partially autonomous cars are on the street today for private use. Driverless shared use taxi services are being developed by Waymo and other companies and are expected to reach widespread use by 2035.

Image: Waymo trial in Chandler, AZ where general public can request rides via app

With full automation, taxi fares could approach transit fares. Increased door-to-door convenience at similar or lower cost is expected to disrupt traditional fixed route transit. Current autonomous taxi technology is limited to suburban areas in regions with consistently dry weather, but vehicle capabilities are expected to expand to denser environments to make the service economically feasible at scale.

Autonomous taxi fleets with zero people on board between trips and 1-2 passengers during trips could greatly increase traffic congestion, energy use, and environmental impact. Transit agencies like DART can help reduce these impacts by offering financial incentives for pooled trips. DART can also act as a regional mobility broker, ensuring equitable access and multimodal planning and policies to support and manage emerging mobility.

Even in an autonomous taxi future, there will be a role for fixed route transit in the densest, most walkable corridors, where there is sufficient passenger demand to support bus services

Getting Ready

- Investment in DART's Priority Corridor network and dense development along transit corridors can provide opportunities to try autonomous transit technologies and help ensure that traditional transit services are competitive with autonomous taxi services.
- A network of Mobility Hubs with space and amenities to promote multimodal transfers, including autonomous taxis, will help future autonomous taxi services to enhance access to transit.
- DART's mobile application tools for multimodal trip planning, booking and payment should be designed so that future mobility options can be incorporated or integrated.
- Dedicated lanes and other priority features along Priority Corridors are likely to be conducive to deployment of Autonomous Buses.
- Suburban activity centers, such as Jordan Creek Mall, may provide an opportunity for Low Speed Autonomous Shuttles to connect a Mobility Hub with surrounding destinations.
- Monitor the evolution of autonomous transit and consider local opportunities to pilot technologies

Summary and Next Steps

This study represents a vision for the future of transit in Central Iowa that is efficient and effective, and which promotes equity through access to opportunity.

To meet the evolving needs of our growing region, DART will build on what is working well, reduce underperforming service, and try innovative approaches to connecting people to jobs, healthcare, and other essential needs in order to advance DART's mission of Enriching Lives, Connecting Communities, Expanding Opportunities.

Specific next steps identified in this study include:

Implement Near-Term Service Proposals in 2022 and 2023

- Address underperforming bus routes and re-invest resources where they can serve more people
- Continue to pilot Mobility on Demand solutions to provide flexible travel options in areas where fixed-route bus service is less cost effective

Consider funding and partnership opportunities to pursue Potential Future Improvements

- Expand MOD offerings and modify bus routes to improve transfer opportunities and reduce journey times
- Expand hours of service, especially on weekends
- Increase bus frequency on the busiest routes
- Add new bus routes and MOD zones to serve more areas of the region

Partner with local entities to promote and test existing and emerging mobility options

- Collaborate with B-cycle to strengthen connections between bikeshare and DART's services through additional mobility hubs, fare and trip planning integration and system planning
- Work with local partners to explore the feasibility and plan appropriate siting, infrastructure and rules for electric scooters, carsharing and autonomous vehicles so that these opportunities complement transit and regional mobility

Provide a seamless travel experience for DART customers

- Improve mobile trip planning tools to incorporate mobility on demand options, including services not directly operated by DART
- Ensure fare policies and payment methods are equitable and facilitate transfers between MOD and fixed route services
- Provide high quality mobility hubs at key nodes so that customers arriving by various modes have a comfortable and convenient boarding and transfer experience

Work with member communities to invest in complete streets and transit-supportive infrastructure along the Priority Corridor fixed route network to reduce travel time and improve reliability on DART's busiest routes

Encourage transit supportive land use and development patterns throughout the region

Continue to monitor DART's performance and community needs and adjust service accordingly

Ensure that DART has the institutional capacity to deliver on its vision as resources allow

This document serves as a vision, highlighting areas of improvement and providing recommendations. These next steps will be pursued as budget and opportunities allow, and DART will conduct additional public outreach and collaborate with member communities and partner organizations to refine its approach to achieving this vision

Summary of Recommendations

Fixed Route	Transit Supportive Infrastructure Corridor	Recommendation	Annual Cost Impact	Annual Ridership Growth
1	●	No route or schedule changes proposed	N/A	N/A
3	●	Increase weekday frequency from 20 to 15 minutes	$293,000	41,134
4		Eliminate extension to Ankeny north of Park Fair Mall, replace with Route 18	See route 18	See route 18
		Increase weekend midday frequency from 60 to 30 minutes	$138,000	16,644
5		Provide Flex Connect service north of Merle Hay Mall on weekends	See Merle Hay Flex Connect	See Merle Hay Flex Connect
6	●	Increase weekday frequency from 30 to 15 minutes, downtown to Southridge Mall	$456,000	76,853
7	●	Increase weekday frequency from 20 to 15 minutes, downtown to Southridge Mall	$228,000	50,948
		Increase weekend frequency from 60 to 30 minutes	$108,000	25,389
8		Replace with two routes, 8A and 8B, provide all day service to Fleur Drive	$323,000	37,677
10		Continue to monitor ridership and consider appropriate level of service	N/A	N/A
11		Continue to monitor ridership and consider appropriate level of service	N/A	N/A
13		No route or schedule changes proposed	N/A	N/A
14		Increase weekend frequency from 40 to 30 minutes	$170,000	25,576
15	●	Increase weekday frequency from 20 to 15 minutes	$162,000	34,317
16	●	Increase weekday frequency from 20 to 15 minutes, downtown to Merle Hay Mall	$302,000	49,779
		Increase Sunday frequency from 60 to 30 minutes	$83,000	13,283
17	●	Standardize weekday headways at 30 minutes to Wal Mart. Alternating hourly trips to Amazon via Adventureland Drive and to 1st Ave S via 8th St SW	$276,000	19,890
18 (new)		Create new local route to Ankeny with all day service; replaces Route 4 extension	$964,000	169,362

Related changes	Priority	Recommended Enhancements			
		Access to New Places	Longer Hours of Service	"Shorter Wait Times"	Direct Connections
	N/A				
	Long-Term Enhancement			●	
Route 18, Ankeny Microtransit	Modest Enhancement	See route 18	See route 18	See route 18	See route 18
	Modest Enhancement			●	
Merle Hay Flex Connect	Modest Enhancement	●	●		
	Long-Term Enhancement			●	
	Long-Term Enhancement			●	
	Modest Enhancement			●	
	Modest Enhancement		●		
	N/A				
	N/A				
	N/A				
	Modest Enhancement			●	
	Long-Term Enhancement			●	
	Long-Term Enhancement			●	
	Modest Enhancement			●	
Route 99	Near Term	●		●	●
Route 4, 98, Ankeny Microtransit	Modest Enhancement	●	●	●	●

Fixed Route	Supportive Infrastructure Corridor	Recommendation	Annual Cost Impact	Annual Ridership Impact
50		Increase weekday frequency from 40 to 30 minutes	$176,000	8,001
		Add new service on Saturdays and Sundays, running hourly	$115,000	15,982
52	●	Reroute via University and Vista, adjust headway for timed transfer to Route 3	-$241,000	-21,723
		Increase weekday peak period frequency from 40 to 20 minutes, off peak to 30	$737,000	89,489
		Increase weekday peak frequency from 20 to 15 minutes; off-peak from 30 to 20 minutes	$756,000	56,522
54 (new)		Create new crosstown local route from Park Fair Mall to Southridge Mall via E 14th St	$1,034,000	198,095
60	●	Increase weekday frequency from 20 to 15 minutes	$297,000	44,199
		Increase weekend frequency from 40 to 30 minutes	$190,000	28,905
72		Discontinue route; replace with Microtransit and Route 52 reroute	-$1,051,000	15,517
74		Discontinue route; replace with Urbandale/Grimes Flex Connect	$0	0
92		Continue to monitor ridership and consider appropriate level of service	N/A	N/A
93		Continue to monitor ridership and consider appropriate level of service	N/A	N/A
94		Discontinue route; replace with additional MOD service and increased Route 52 frequency	-$133,000	-2,614
95		Discontinue route; replace with additional MOD service and increased Route 52 frequency	-$127,000	-2,168
96		No route-specific service changes proposed	N/A	N/A
98		Restructure: eliminate midday trips, simplify routing in Ankeny	-$203,000	-8,238
99		Discontinue route; reinvest resources in Route 17 (See above)	-$276,000	-510

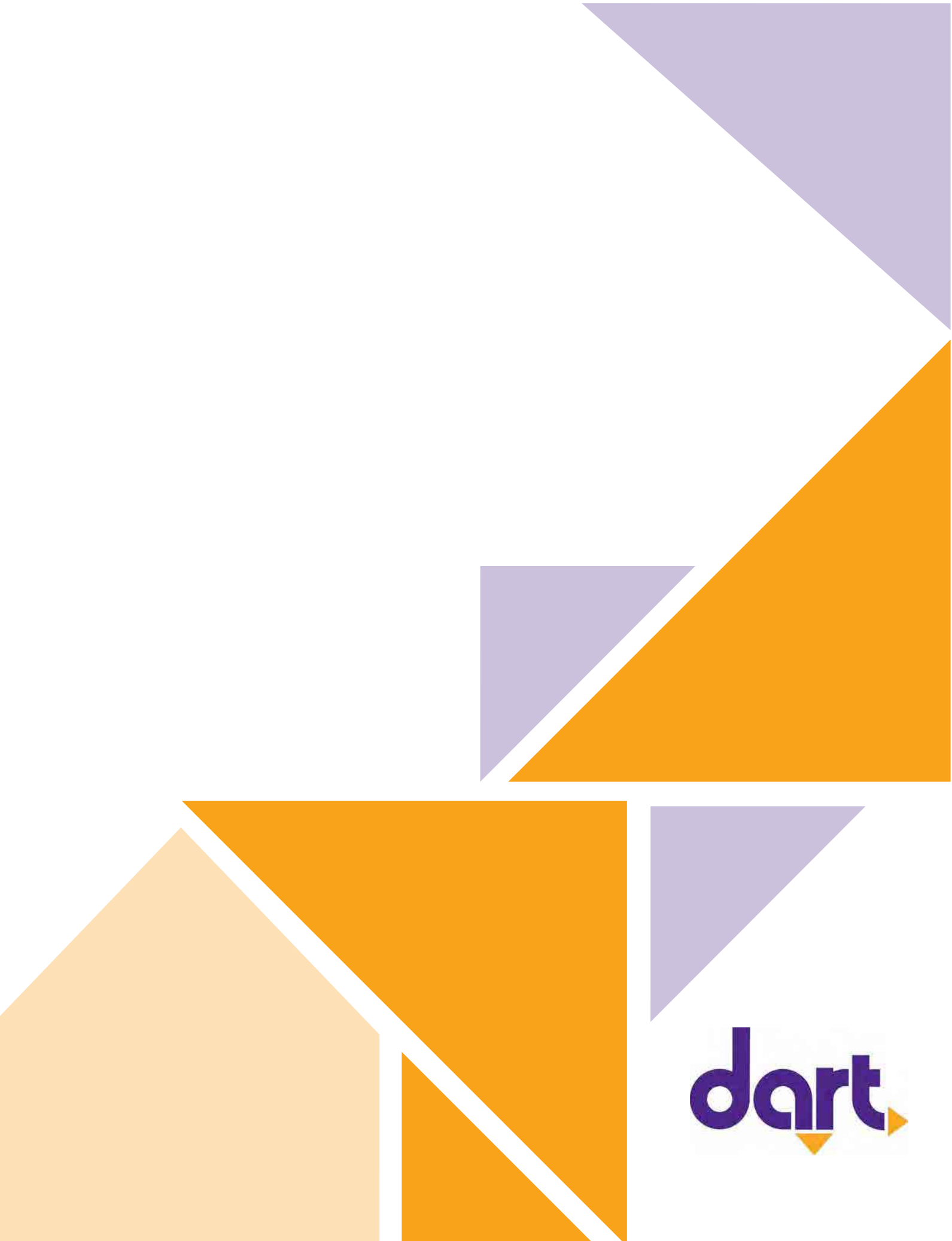
Related changes	Priority	Recommended Enhancements			
		Access to New Places	Longer Hours of Service	"Shorter Wait Times"	Direct Connections
	Long-Term Enhancement			●	
	Modest Enhancement		●		
Route 72	Near Term				●
Route 94, 95	Modest Enhancement			●	
	Long-Term Enhancement			●	
	Long-Term Enhancement	●			●
	Long-Term Enhancement			●	
	Modest Enhancement			●	
Route 52, Microtransit West	Near Term	●		●	●
Urbandale/ Grimes Flex Connect	Near Term	●	●		●
	N/A				
	N/A				
Route 52, Microtransit West	Modest Enhancement	●	●		●
Route 52, Microtransit West	Modest Enhancement	●	●		●
	N/A				
Route 4, 18, Ankeny Microtransit	Long-Term Enhancement				
Route 17	Long-Term Enhancement	●			●

Fixed Route	Recommendation	Annual Cost Impact	Annual Ridership Impact
D-Line	No route or schedule changes proposed. See S-Line.	N/A	N/A
LINK	No route or schedule changes proposed	N/A	N/A
S-Line (new)	New shuttle connecting Gray's Station and Market District neighborhoods through downtown	$432,000	84,681
MLK/Vandalia (new)	New supporting corridor route to serve employment along the E MLK Jr Pkwy corridor. Service planning to be developed in coordination with major employers on the corridor.	TBD	TBD
Systemwide	Expand Saturday and Sunday span of service for all weekend routes	$248,000	34,944

Related changes	Priority	Recommended Enhancements			
		Access to New Places	Longer Hours of Service	"Shorter Wait Times"	Direct Connections
S-Line	N/A				
	N/A				
	Long-Term Enhancement	●	●	●	
	Long-Term Enhancement	●			
	Modest Enhancement		●		

MOD	Recommendation	Annual Cost Impact	Annual Ridership Impact
Urbandale/NW Des Moines Flex Connect	Replace Route 73 with Flex Connect	N/A (already in operation)	N/A (already in operation)
Ankeny Microtransit	Replace Ankeny On-Call, expand hours	$113,000	5,355
	Further expand hours, add weekend service	$118,000	14,121
Microtransit West	New microtransit service replaces portions of Route 72	$510,000	31,789
	Expanded microtransit service replaces Route 94/95 trips	$112,000	3,159
Urbandale/ Grimes Flex Connect	Replace Route 74 with Flex Connect	$0	0
Saylorville Flex Connect	First mile/last mile service to employment with connection to Route 18 and Park Fair Mall	TBD based on demand	TBD
Merle Hay Flex Connect	Provide weekend service on Merle Hay Road north of Merle Hay Mall, along the Route 5 corridor	$58,000	3,848
Urbandale Microtransit	Replace two Flex Connect routes with a microtransit zone in Urbandale	$290,000	16,830
SW West Des Moines MOD	New service to the Des Moines University and DMACC West campuses, based out of Jordan Creek Mall mobility hub. Specific service type, hours, ridership, and cost to be determined in collaboration with universities.	TBD	TBD

Related changes	Priority	Benefits			
		Access to New Places	Longer Hours of Service	"Shorter Wait Times"	Direct Connections
Route 73 (already eliminated)	Near Term	●	●	●	
	Near Term		●	●	
Route 4, 18, 98	Modest Enhancement	●	●		
Route 52, 72	Near Term	●	●	●	●
Route 52, 72, 94, 95	Modest Enhancement	●	●	●	●
Route 74	Near Term	●	●		
Route 4, 18	Modest Enhancement	●			
Route 5	Modest Enhancement		●		
"Urbandale/ Grimes Flex Connect, Urbandale/NW Des Moines Flex Connect"	Long-Term Enhancement		●	●	●
	Long-Term Enhancement	●			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