



**ACCESSIBILITY  
OBSERVATORY**

UNIVERSITY OF MINNESOTA

**Driven to Discover<sup>SM</sup>**

# Addressing Accessibility and Equity along Transitways: Towards a Mixed Methods Toolkit—Part I

Metropolitan Council TAC Meeting  
02.11.2021

Kristin Carlson  
Researcher  
Accessibility Observatory  
[carl4498@umn.edu](mailto:carl4498@umn.edu)

Andrew Owen  
Director  
Accessibility Observatory  
[aowen@umn.edu](mailto:aowen@umn.edu)

# Project Overview

- Transitway Impacts Research Program (TIRP)
  - Technical Advisory Panel with members from the Metropolitan Council, Metro Transit, Hennepin, Ramsey, and Washington counties
  - Research jointly funded by the TAP member agencies
  - Administrative support provided by the Center for Transportation Studies
- Accessibility analyses included:
  - B, D, and E Lines, Gold and Rush Lines
  - Grocery, healthcare, and public education destinations
  - AM peak, midday peak, PM peak, evening hours
  - Disaggregated by age, monthly earnings, educational attainment, race, sex
- Selection of results
  - B, D, and E Line: Healthcare access by race
  - Findings across all demographic-destination analyses
  - Report and data available at UMN's data repository: <https://hdl.handle.net/11299/217707>

## Funded baseline:

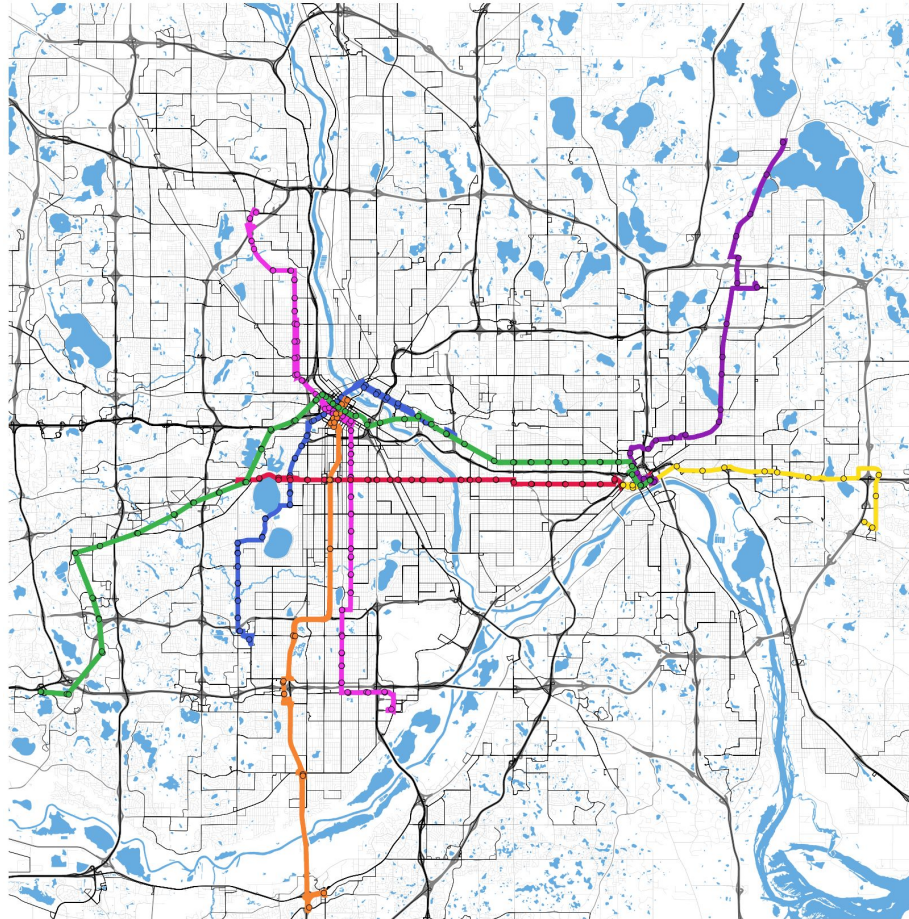
- Metro Transit and MVTA schedules
- Green Line Extension
- Orange Line

## Stage one alternative:

- B Line
- D Line
- E Line

## Stage two alternative:

- Gold Line
- Rush Line

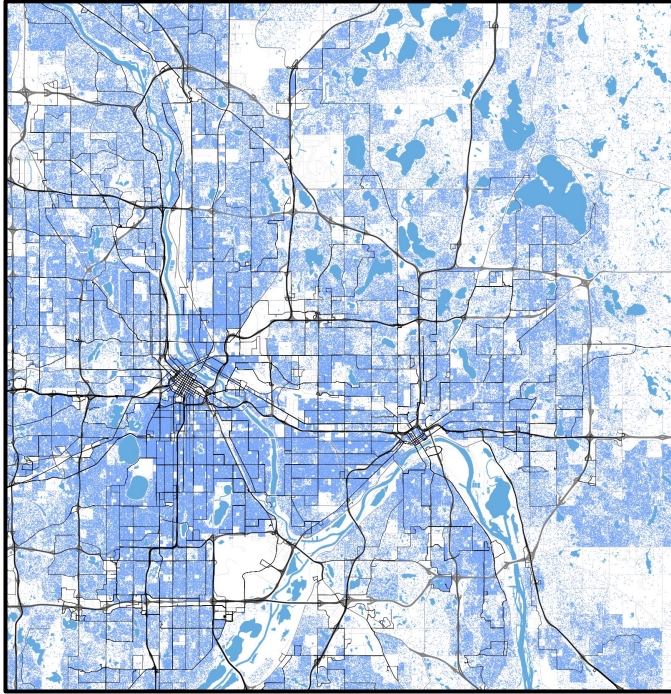


## Legend

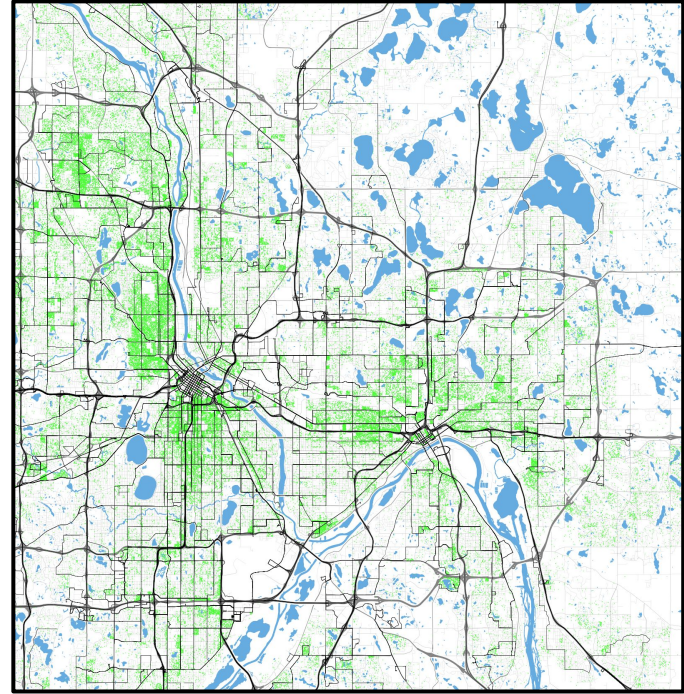
- Green Line Extension
- Orange Line
- B Line
- D Line
- E Line
- Gold Line
- Rush Line
- Transit routes
- Roadway

B, D, and E Lines: Healthcare access by race

# Density of workers by race in the Twin Cities



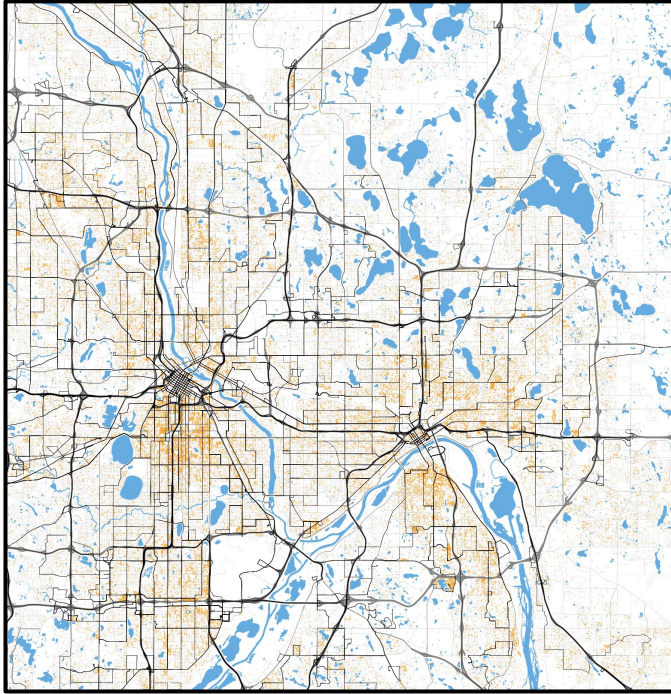
White workers



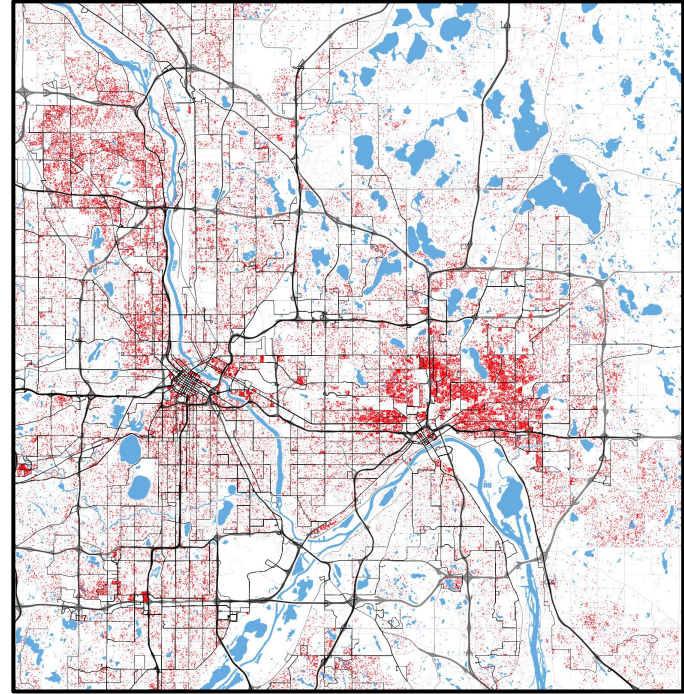
Black/African American workers



# Density of workers by race in the Twin Cities (cont.)

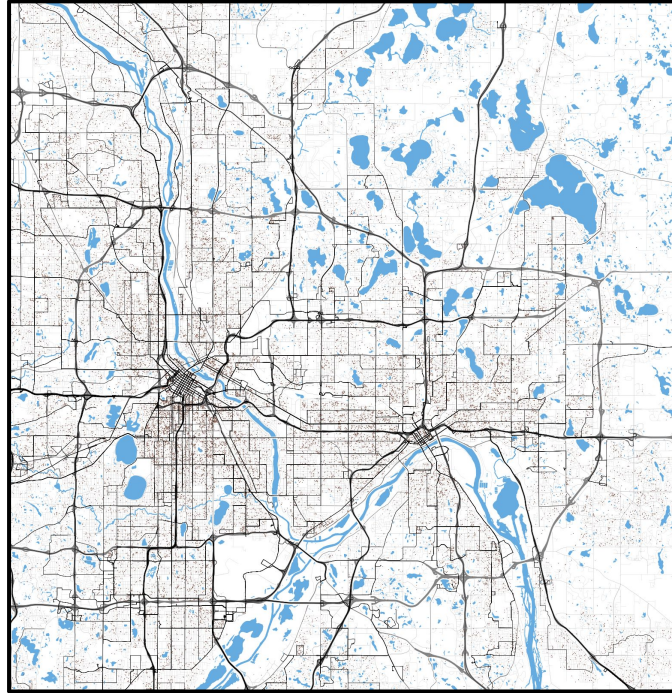


Hispanic / Latino workers



Asian workers

# Density of workers by race in the Twin Cities (cont.)



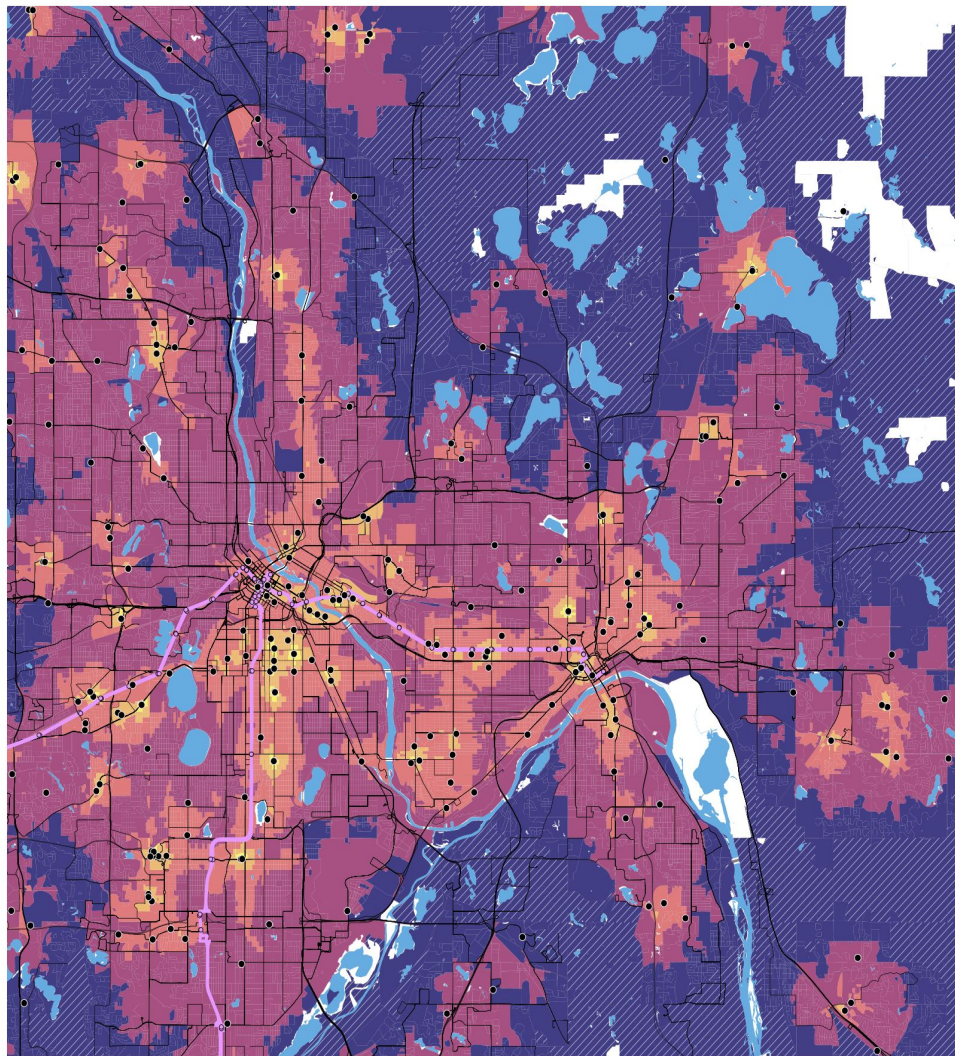
Other race / American Indian / Multi-racial workers



Minimum travel  
time to two  
healthcare  
destinations

Funded  
baseline

11:00 - 1:00 PM



Travel time (min)

0 - 5

5 - 10

10 - 20

20 - 40

40 - 60

60+

Healthcare

Baseline

Alternative

Proposed local route

Existing local route

Transit routes

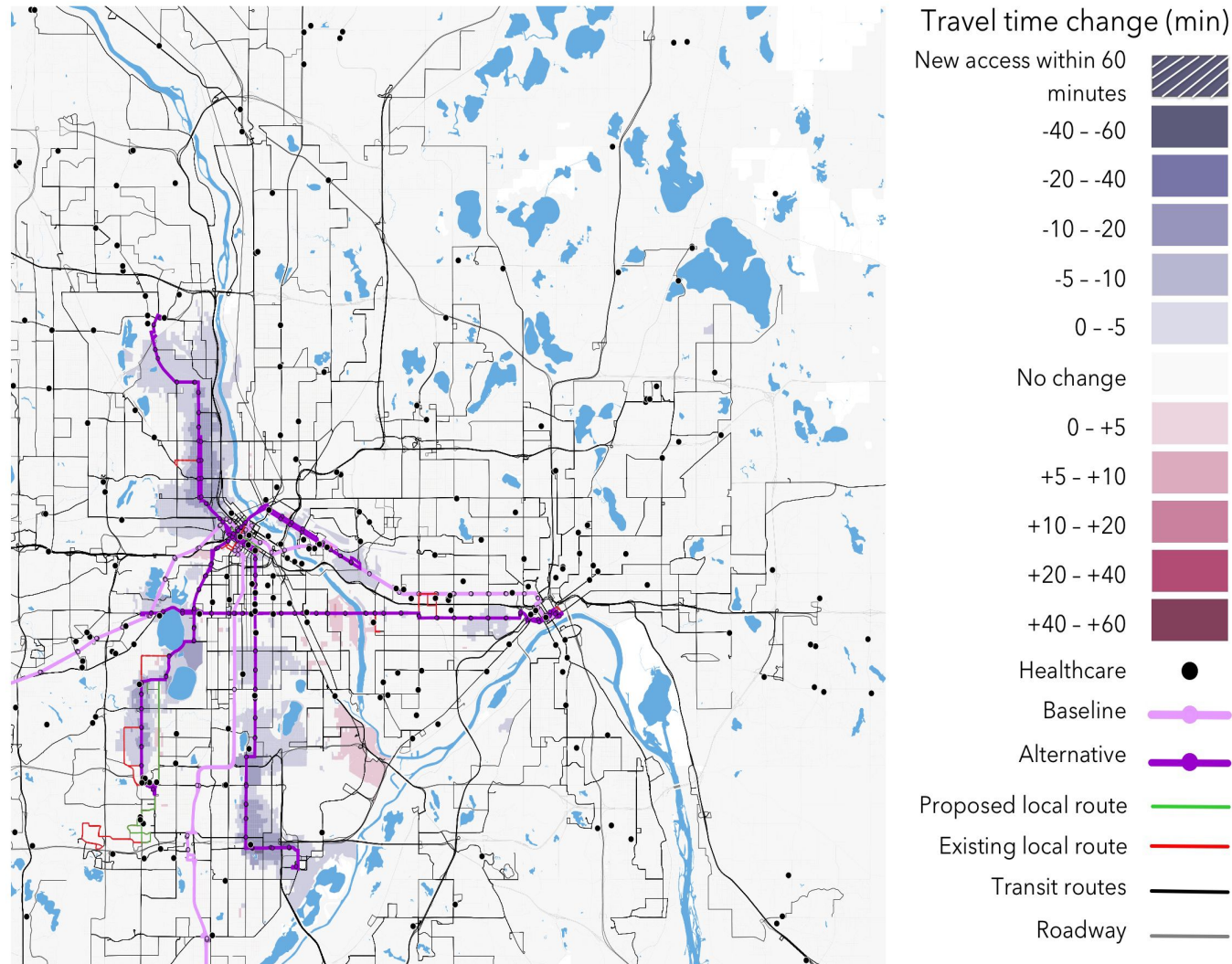
Roadway



# Change in minimum travel time to two healthcare destinations

B, D, and E Line

11:00 - 1:00 PM



Prevailing travel times

White workers experience the longest minimum travel time to two healthcare facilities, 29 minutes.

Minimum travel time to two healthcare destinations by percent of worker population by race in the Twin Cities transit service area for the funded baseline and B, D, and E Line scenarios, 11:00–1:00 PM.

Scenario	Race	10%	25%	50%	75%	90%	Average*
Funded baseline	White	14	20	28	41	54	29
	Black/Afr. Amer.	11	17	25	34	45	26
	Hispanic or Latino	12	17	25	35	49	26
	Asian	13	18	27	37	49	27
	Amer. Indian/Alaskan Native	11	16	24	35	48	25
	Hawaiian/Pacific Islander	14	18	27	38	52	27
	Multi-racial	12	18	25	36	49	26
B, D, and E Line	White	13	19	28	41	54	29
	Black/Afr. Amer.	11	17	24	34	45	25
	Hispanic or Latino	12	17	25	35	49	26
	Asian	13	18	26	37	49	27
	Amer. Indian/Alaskan Native	11	16	23	34	48	25
	Hawaiian/Pacific Islander	13	18	26	38	52	27
	Multi-racial	12	17	25	36	49	26

\*Worker-weighted average includes travel times 60 minutes or less.



White workers experience the longest minimum travel time to two healthcare facilities, 29 minutes.

White workers who live the closest to healthcare (25th percentile travel times) experience shorter travel times by 1 minute after the B, D, and E Lines are added.

Minimum travel time to two healthcare destinations by percent of worker population by race in the Twin Cities transit service area for the funded baseline and B, D, and E Line scenarios, 11:00–1:00 PM.

Scenario	Race	10%	25%	50%	75%	90%	Average*
Funded baseline	White	14	20	28	41	54	29
	Black/Afr. Amer.	11	17	25	34	45	26
	Hispanic or Latino	12	17	25	35	49	26
	Asian	13	18	27	37	49	27
	Amer. Indian/Alaskan Native	11	16	24	35	48	25
	Hawaiian/Pacific Islander	14	18	27	38	52	27
	Multi-racial	12	18	25	36	49	26
B, D, and E Line	White	13	19	28	41	54	29
	Black/Afr. Amer.	11	17	24	34	45	25
	Hispanic or Latino	12	17	25	35	49	26
	Asian	13	18	26	37	49	27
	Amer. Indian/Alaskan Native	11	16	23	34	48	25
	Hawaiian/Pacific Islander	13	18	26	38	52	27
	Multi-racial	12	17	25	36	49	26

\*Worker-weighted average includes travel times 60 minutes or less.

Minority workers experience lower travel times to healthcare by 2–4 minutes compared with White workers.

Minimum travel time to two healthcare destinations by percent of worker population by race in the Twin Cities transit service area for the funded baseline and B, D, and E Line scenarios, 11:00–1:00 PM.

Scenario	Race	10%	25%	50%	75%	90%	Average*
Funded baseline	White	14	20	28	41	54	29
	Black/Afr. Amer.	11	17	25	34	45	26
	Hispanic or Latino	12	17	25	35	49	26
	Asian	13	18	27	37	49	27
	Amer. Indian/Alaskan Native	11	16	24	35	48	25
	Hawaiian/Pacific Islander	14	18	27	38	52	27
	Multi-racial	12	18	25	36	49	26
B, D, and E Line	White	13	19	28	41	54	29
	Black/Afr. Amer.	11	17	24	34	45	25
	Hispanic or Latino	12	17	25	35	49	26
	Asian	13	18	26	37	49	27
	Amer. Indian/Alaskan Native	11	16	23	34	48	25
	Hawaiian/Pacific Islander	13	18	26	38	52	27
	Multi-racial	12	17	25	36	49	26

\*Worker-weighted average includes travel times 60 minutes or less.

Minority workers experience lower travel times to healthcare by 2–4 minutes compared with White workers.

Black or African American workers experience an average travel time savings of 1 minute to healthcare destinations after the B, D, and E Lines are added to the network.

Minimum travel time to two healthcare destinations by percent of worker population by race in the Twin Cities transit service area for the funded baseline and B, D, and E Line scenarios, 11:00–1:00 PM.

Scenario	Race	10%	25%	50%	75%	90%	Average*
Funded baseline	White	14	20	28	41	54	29
	Black/Afr. Amer.	11	17	25	34	45	26
	Hispanic or Latino	12	17	25	35	49	26
	Asian	13	18	27	37	49	27
	Amer. Indian/Alaskan Native	11	16	24	35	48	25
	Hawaiian/Pacific Islander	14	18	27	38	52	27
	Multi-racial	12	18	25	36	49	26
B, D, and E Line	White	13	19	28	41	54	29
	Black/Afr. Amer.	11	17	24	34	45	25
	Hispanic or Latino	12	17	25	35	49	26
	Asian	13	18	26	37	49	27
	Amer. Indian/Alaskan Native	11	16	23	34	48	25
	Hawaiian/Pacific Islander	13	18	26	38	52	27
	Multi-racial	12	17	25	36	49	26

\*Worker-weighted average includes travel times 60 minutes or less.



Change in travel times

About 5.2% of White workers experience travel time savings—lower than other groups.

Accessibility impacts to two healthcare destinations for workers by race within the transit service area when B, D, and E Line are added to the funded baseline scenario, 11:00 AM–1:00 PM.

Race	Total workers	10–15 min closer	5–10 min closer	1–5 min closer	No change	1–5 min farther	Total closer	Total farther	Average change* (min)
White	848,844	0.0%	1.0%	4.1%	94.2%	0.6%	5.2%	0.6%	-2.4
Black/Afr. Amer.	127,996	0.0%	3.7%	6.5%	89.5%	0.3%	10.2%	0.3%	-3.9
Hispanic or Latino	61,314	0.0%	2.3%	4.8%	92.4%	0.5%	7.1%	0.5%	-3.5
Asian	92,619	0.0%	1.6%	3.6%	94.6%	0.2%	5.2%	0.2%	-3.3
Amer. Indian/Alaskan Native	7,351	0.0%	1.9%	5.5%	92.0%	0.6%	7.3%	0.6%	-2.8
Hawaiian/Pacific Islander	971	0.0%	0.8%	5.6%	93.4%	0.2%	6.4%	0.2%	-3.0
Multi-racial	23,724	0.0%	2.1%	5.6%	91.7%	0.5%	7.7%	0.5%	-3.3

*\*Worker-weighted average includes travel times 60 minutes or less.*

About 5.2% of White workers experience travel time savings—lower than other groups.

About 0.6% of White workers experience longer travel times—higher than other groups.

Accessibility impacts to two healthcare destinations for workers by race within the transit service area when B, D, and E Line are added to the funded baseline scenario, 11:00 AM–1:00 PM.

Race	Total workers	10–15 min closer	5–10 min closer	1–5 min closer	No change	1–5 min farther	Total closer	Total farther	Average change* (min)
White	848,844	0.0%	1.0%	4.1%	94.2%	0.6%	5.2%	0.6%	-2.4
Black/Afr. Amer.	127,996	0.0%	3.7%	6.5%	89.5%	0.3%	10.2%	0.3%	-3.9
Hispanic or Latino	61,314	0.0%	2.3%	4.8%	92.4%	0.5%	7.1%	0.5%	-3.5
Asian	92,619	0.0%	1.6%	3.6%	94.6%	0.2%	5.2%	0.2%	-3.3
Amer. Indian/Alaskan Native	7,351	0.0%	1.9%	5.5%	92.0%	0.6%	7.3%	0.6%	-2.8
Hawaiian/Pacific Islander	971	0.0%	0.8%	5.6%	93.4%	0.2%	6.4%	0.2%	-3.0
Multi-racial	23,724	0.0%	2.1%	5.6%	91.7%	0.5%	7.7%	0.5%	-3.3

*\*Worker-weighted average includes travel times 60 minutes or less.*



About 5.2% of White workers experience travel time savings—lower than other groups.

About 0.6% of White workers experience longer travel times—higher than other groups.

Of the White workers that experience travel time impacts, the weighted average savings is 2.4 minutes.

Accessibility impacts to two healthcare destinations for workers by race within the transit service area when B, D, and E Line are added to the funded baseline scenario, 11:00 AM–1:00 PM.

Race	Total workers	10–15 min closer	5–10 min closer	1–5 min closer	No change	1–5 min farther	Total closer	Total farther	Average change* (min)
White	848,844	0.0%	1.0%	4.1%	94.2%	0.6%	5.2%	0.6%	-2.4
Black/Afr. Amer.	127,996	0.0%	3.7%	6.5%	89.5%	0.3%	10.2%	0.3%	-3.9
Hispanic or Latino	61,314	0.0%	2.3%	4.8%	92.4%	0.5%	7.1%	0.5%	-3.5
Asian	92,619	0.0%	1.6%	3.6%	94.6%	0.2%	5.2%	0.2%	-3.3
Amer. Indian/Alaskan Native	7,351	0.0%	1.9%	5.5%	92.0%	0.6%	7.3%	0.6%	-2.8
Hawaiian/Pacific Islander	971	0.0%	0.8%	5.6%	93.4%	0.2%	6.4%	0.2%	-3.0
Multi-racial	23,724	0.0%	2.1%	5.6%	91.7%	0.5%	7.7%	0.5%	-3.3

*\*Worker-weighted average includes travel times 60 minutes or less.*

About 10.2% of Black or African American workers experience shorter travel times as a result of the B, D, and E Line transitways.

10.2% is two percentage points higher than any other group of people or destination type evaluated for the B, D, and E Line scenario.

Accessibility impacts to two healthcare destinations for workers by race within the transit service area when B, D, and E Line are added to the funded baseline scenario, 11:00 AM–1:00 PM.

Race	Total workers	10–15 min closer	5–10 min closer	1–5 min closer	No change	1–5 min farther	Total closer	Total farther	Average change* (min)
White	848,844	0.0%	1.0%	4.1%	94.2%	0.6%	5.2%	0.6%	-2.4
Black/Afr. Amer.	127,996	0.0%	3.7%	6.5%	89.5%	0.3%	10.2%	0.3%	-3.9
Hispanic or Latino	61,314	0.0%	2.3%	4.8%	92.4%	0.5%	7.1%	0.5%	-3.5
Asian	92,619	0.0%	1.6%	3.6%	94.6%	0.2%	5.2%	0.2%	-3.3
Amer. Indian/Alaskan Native	7,351	0.0%	1.9%	5.5%	92.0%	0.6%	7.3%	0.6%	-2.8
Hawaiian/Pacific Islander	971	0.0%	0.8%	5.6%	93.4%	0.2%	6.4%	0.2%	-3.0
Multi-racial	23,724	0.0%	2.1%	5.6%	91.7%	0.5%	7.7%	0.5%	-3.3

*\*Worker-weighted average includes travel times 60 minutes or less.*

The B, D, and E Lines improve access times to healthcare facilities for all groups by race.

Minority workers benefit the most from faster connections to healthcare facilities, saving 2.8–3.9 minutes on average.

Accessibility impacts to two healthcare destinations for workers by race within the transit service area when B, D, and E Line are added to the funded baseline scenario, 11:00 AM–1:00 PM.

Race	Total workers	10–15 min closer	5–10 min closer	1–5 min closer	No change	1–5 min farther	Total closer	Total farther	Average change* (min)
White	848,844	0.0%	1.0%	4.1%	94.2%	0.6%	5.2%	0.6%	-2.4
Black/Afr. Amer.	127,996	0.0%	3.7%	6.5%	89.5%	0.3%	10.2%	0.3%	-3.9
Hispanic or Latino	61,314	0.0%	2.3%	4.8%	92.4%	0.5%	7.1%	0.5%	-3.5
Asian	92,619	0.0%	1.6%	3.6%	94.6%	0.2%	5.2%	0.2%	-3.3
Amer. Indian/Alaskan Native	7,351	0.0%	1.9%	5.5%	92.0%	0.6%	7.3%	0.6%	-2.8
Hawaiian/Pacific Islander	971	0.0%	0.8%	5.6%	93.4%	0.2%	6.4%	0.2%	-3.0
Multi-racial	23,724	0.0%	2.1%	5.6%	91.7%	0.5%	7.7%	0.5%	-3.3

*\*Worker-weighted average includes travel times 60 minutes or less.*



Main findings from all  
demographic-destination analyses

## B, D, and E Lines

- All demographic groups have a percentage of their workers (4.3%–10.2%) which experience travel time savings to grocery, healthcare, and public education destinations.
- Workers who are young, lower educated, lower earning, and in minority groups benefit the most from the service improvements offered by the B, D, and E Line transitways.
- Some workers in each category experience longer travel times due to changes on local routes 5, 6, and 21.
- Longer travel times are expected to be mitigated by future coordination of transit schedules.

# Future access to destinations evaluations

- New destinations can be evaluated where point of interest data is available.
- Repeated analyses could answer how destination access changes over time.
- Measures of access equity can be refined to target where investments should be made, either through changes to land use or transportation systems.
- The National Accessibility Evaluation project will implement access to healthcare and education measures in the 2022 reporting year.

# Addressing Accessibility and Equity along Transitways: Towards a Mixed Methods Toolkit—Part I

Kristin Carlson  
Researcher  
Accessibility Observatory  
[carl4498@umn.edu](mailto:carl4498@umn.edu)  
(612)-626-4052

Andrew Owen  
Director  
Accessibility Observatory  
[aowen@umn.edu](mailto:aowen@umn.edu)  
(612)-624-7550

