Trend Study: Understanding the Impacts of Northwest Corridor Express Lanes on Northwestern Metro-Atlanta Communities

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PREPARED FOR

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Independent Study

In Collaboration with

HNTB

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Executive Summary

In support of the Northwest Corridor (NWC) Express Lanes implementation on I-75 and I-575, researchers at Georgia State University (GSU) with support from the Georgia Department of Transportation (GDOT) conducted four annual surveys over the period 2017-2022, to obtain information on mode of travel, frequency of use, reasons for use, travel-time savings, and trip-time reliability of users of both the express lanes and general purpose lanes within the corridor. This trend study aims to determine if there is an unequal distribution of burdens or benefits for environmental justice (EJ) populations that live near and use the NWC corridor. Additionally, the study aims to determine if the express lanes improved commuting for all NWC Metro-Atlanta commuters. This study was conducted by GSU researchers in partnership with Noble Insight, LLC, and HNTB with support from GDOT.

Opened to traffic in September 2018, the NWC Express Lanes were Georgia's second reversible toll lanes, providing 29.7 miles of express lanes along I-75 from Akers Mill Road to Hickory Grove Road and along I-575 from I-75 to Sixes Road. The reversible lanes are open to southbound travelers in the morning and northbound travelers in the afternoon to help improve traffic flow during peak-period times. To access the NWC Express Lanes, commuters are required to obtain a Peach Pass to pay the toll (fee). The toll amount is based on a dynamic pricing structure with the cost rising as express lanes demand increases and falling as demand decreases.

For the purpose of this study, EJ group status was defined in two ways: that of low-income, or poverty-only and that of poverty and racial minority status. That is, researchers examined responses of multiple groups: non-EJ, or those living in census block groups that do not exceed regional poverty or racial minority thresholds; EJ poverty, or those living in census block groups where the percentage of those who are low-income exceeds the regional average; and EJ poverty and race, or those who reside in census block groups where both the poverty levels and percent of racial minority exceed regional averages.

This is a trend study, which means a new sample was collected for each of the four years the research team went into the field to collect data. Disproportionate stratified sampling was used to ensure equal numbers of EJ and non-EJ respondents were collected. Weights were used with all analyses to bring the sample back into proportion with the area population. Each year, approximately 20 weeks were spent in data collection. Face-to-face interviews were the primary mode of administration prior to 2020 and COVID-19, because self-administered survey response rates are currently below 10%.[1] A convenience sample was also collected (grid sample) to replace targeted sample members who refused or were ineligible to participate in the study.

Based on statistical regressions presented in this trend study, no statistically significant differences exist between EJ groups in terms of commute times to and from work or in terms of their attitudes and perceptions of their commutes and the new NWC Express Lanes. Commute times did shorten significantly after the express lanes opened; however, the second post-opening wave of data collection is completely confounded with the COVID-19 pandemic. Therefore, the shorter commute time cannot be attributed to the new NWC Express Lanes. Finally, a significant proportion of residents use the express lanes daily, the majority use it occasionally, and less than 20% never use it. This has led to actual declines in commute times.

In short and based on the data analysis, we find no inequities for EJ groups in terms of their commutes after the introduction of the NWC Express Lanes.

[1] Dillman, D., J. Smyth, and L. Christian (2014). "Response rate and measurement differences in mixed-mode surveys using mail, telephone, interactive voice response (IVR) and the Internet." *Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method.* Hoboken, NJ: Wiley.

1 Introduction

In September 2018, GDOT opened the NWC Express Lanes. The NWC Express Lanes were Georgia's second set of reversible toll lanes, providing 29.7 miles of express lanes along I-75 from Akers Mill Road to Hickory Grove Road and along I-575 from I-75 to Sixes Road in Cobb County (See Figure 1). The reversible lanes are open to southbound traffic in the mornings and northbound traffic in the afternoons during peak-travel hours.

To access the NWC Express Lanes, commuters are required to pay a toll (fee) using a Peach Pass transponder. The toll is determined through dynamic pricing with the cost rising as demand increases and falling as demand decreases.

Researchers at GSU with support from GDOT conducted annual surveys over a four-year period (2017-2022), to determine if there is an unequal distribution of burdens or benefits for EJ groups by the creation of the NWC Express Lanes, and if the express lanes improved commuting for all Northwest Metro-Atlanta commuters. To answer these questions, researchers designed a four-year trend survey study of the residents most likely to use the new express lanes heading to and from work. The first survey was implemented one year prior to the opening of the NWC Express Lanes (2018), and the next three were implemented one, two, and three years after the opening.

This report uses all four years of data from the trend study to answer the question of potential impacts to EJ populations from the NWC Express Lanes. The researchers examine travel pattern differences that may exist between EJ groups and non-environmental (non-EJ) groups and whether there are differences in the attitudes toward express lanes. The next section will define EJ groups, and list how they have been defined in other studies. The subsequent section presents the data and methods of analysis followed by a section of results, discussion, and conclusions.

1.1 Environmental Justice Groups

According to the Federal Highway Administration (FHWA) Environmental Justice Reference Guide, addressing EJ means "identifying and addressing disproportionately high and adverse effects of the agency's programs, policies, and activities on minority populations and low-income populations to achieve an equitable distribution of benefits and burdens."[2] EJ populations, then, include both minority populations and low-income populations.

Minority populations. The definition of a minority from the FHWA Order 6640.23A includes a person who is:

1. Black: a person having origins in any of the black racial groups of Africa;
2. Hispanic or Latino: a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race;
3. Asian American: a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent;
4. American Indian and Alaskan Native: a person having origins in any of the original people of North America, South America (including Central America), and who maintains cultural identification through tribal affiliation or community recognition; or
5. Native Hawaiian or Other Pacific Islander: a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

[2] *FHWA Environmental Justice Reference Guide, 2015.*

Low-income populations. The FHWA defines a "low-income" individual as a person "whose median household income is at or below the Department of Health and Human Services poverty guidelines."[3] These guidelines are established for federal aid programs and differ slightly from the U.S. Census Bureau's definition of poverty thresholds, which are a statistical measure of poverty developed from household income and family size, adjusted yearly for inflation. Given the data available for analysis, researchers used the Census Bureau's poverty threshold measures to define low-income populations.

In most situations, following the FHWA definition of EJ groups that includes minority and low-income, is appropriate. Litman and Brenman (2012)[4] found that distinguishing between demographic versus functional status is more appropriate for a study evaluating the implementation of toll lanes. Litman and Brenman suggest that demographic categories, such as race and age, are less meaningful for socially equitable transportation planning than are functional statuses, such as poverty and physical disability.

As an FHWA case study, the city of Dallas, Texas, recently evaluated the EJ impact of their new toll lanes and defined EJ solely as based on economic status.[5] Therefore, it is reasonable to define the EJ population in this study as low-income groups and leave racial minority status out of the EJ identification process, while still examining differences in express-lane usage among various minority and non-minority groups.

Within the study area (5-mile radius around the express lanes, see below for more information), 39% of the population is African American according to the 2019 American Community Survey's five-year average. While racial minority status is certainly very important and its impact is assessed in this study, it is not evident that minority status in and of itself creates barriers to using tolled facilities. Therefore, it is reasonable to define the EJ population in this study as low-income groups and leave racial minority status out of the EJ-identification process—while still examining differences in toll lane usage among various minority and non-minority groups.

2 Data and Methods

The first step in the study was to define the appropriate population. A population was selected from a 5-mile buffer area, surrounding the corridor (see Figure 1). The buffer was selected around the I-575 access points and the four, northernmost access points of the express lanes on I-75 as there would not likely be users of the express lanes south of this location. The buffer was then divided into a set of 212 census block groups that included areas where residents were most likely to use the NWC Express Lanes traveling into Atlanta for work.

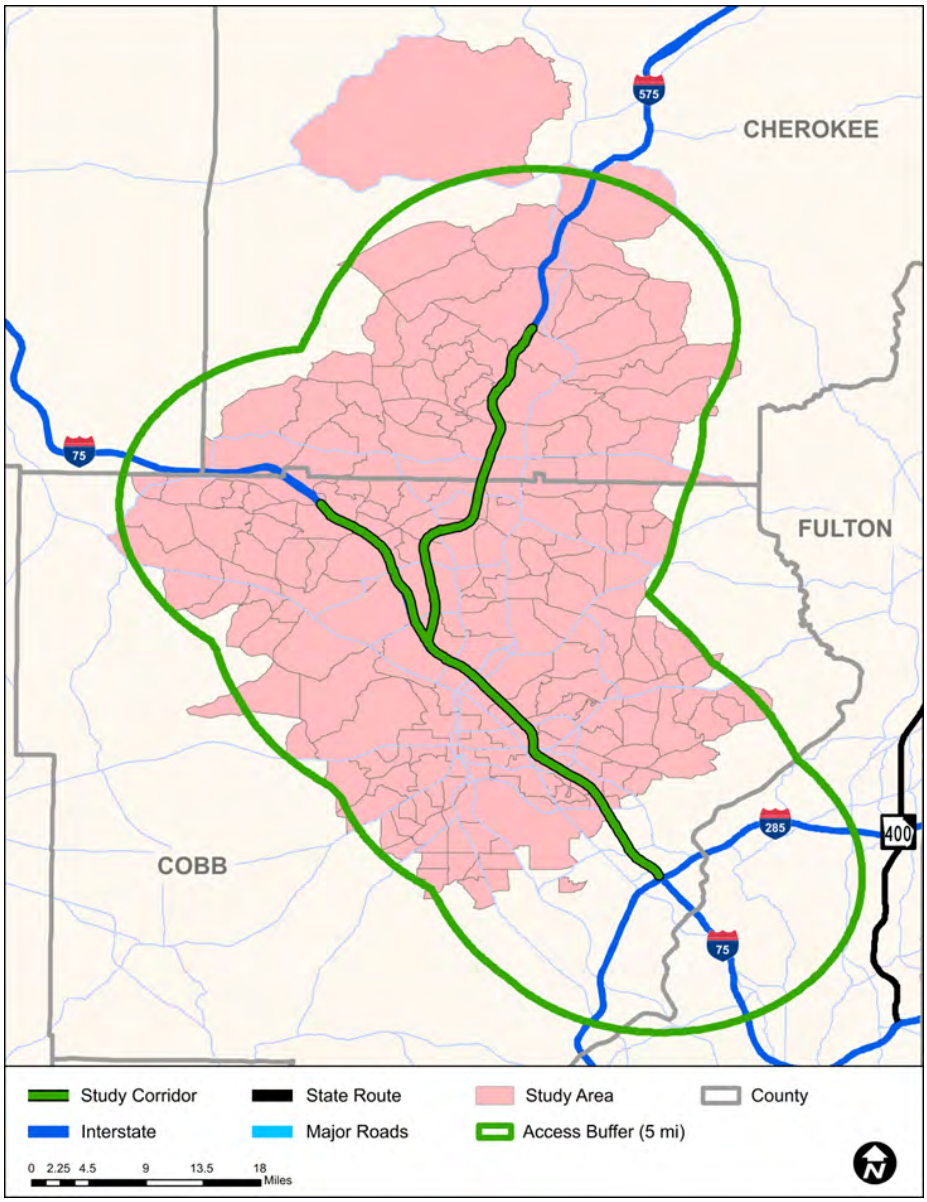
In order to ensure representation from non-EJ and EJ groups, researchers developed the samples using an area-based EJ definition, as is common practice in transportation planning. That is, EJ and non-EJ populations at the block group level were defined based on geographic-area income and racial minority characteristics following the Atlanta Regional Commission's (ARC) definition of EJ areas rather than the individual characteristics of the households (as these would be impossible to identify prior to sampling). ARC defines low-income EJ populations as those households whose incomes that fall below the median poverty rate for the 10-county metropolitan Atlanta area. Likewise, ARC defines an area with racial minority populations that exceeds the median for the metropolitan Atlanta region as an EJ minority area. The 10-county metropolitan Atlanta area includes Cherokee, Clayton, Cobb, DeKalb, Douglas, Fayette, Fulton, Gwinnett, Henry, and Rockdale counties, as well as the city of Atlanta.

[3] *FHWA Environmental Justice Reference Guide 2015, p. 10.*

[4] *Litman, T. and M. Brenman. 2012. "A New Social Equity Agenda for Sustainable Transportation," Presented at 2012 Transportation Research Board Annual Meeting, paper 12-3916, http://www.vtpi.org/equityagenda.pdf.*

[5] *Wesch, Sandy and Brandy T. Huston, 2012. Regional Tolling Analysis Informs NEPA Assessment of Cumulative Impacts on Low-Income Populations. Texas Department of Transportation.*

Figure 1. The Geographic Area that Includes the Northwest Corridor Metro-Area Population



The American Community Survey (ACS), the most robust demographic tool available to calculate the EJ thresholds as specified by ARC, was used to create geographically-defined EJ groups. For each year of data collection, new thresholds were calculated based on the most recent ACS five-year averaged dataset available. Researchers assigned each census block group to an EJ-related status. For the pre-opening year of data collection, the 2011 five-year averaged ACS data were used. The final year of data collection, three years after the express lanes opened, the 2019 ACS five-year data were used. Census block groups are not stagnant. Therefore, census block groups that met the EJ definition for one year of data collection may not meet the definition in another year of data collection. In fact, 84% of census block groups shifted between EJ group statuses over the period of the study.

All occupied residential addresses within the 212 census block groups were retrieved from Dunhill, a company licensed to manage and sell U.S. post office addresses. The GSU research team did not include group quarter defined addresses (e.g., nursing home), business addresses, vacant addresses, or P.O. Boxes.

For each of the four years of data collection, the research team selected a distinct sample in order to conduct the trend study to assess behavior change within residents of the 212 census block groups over time.

Researchers used a disproportionate stratified probability sampling method. All census block groups were first stratified by the aforementioned racial minority and poverty thresholds into four groupings:

1. Greater than threshold poverty and racial minority composition levels;
2. Greater than poverty threshold composition level;
3. Greater than threshold racial minority composition level; and
4. Less than threshold poverty and racial minority composition levels.

This sampling allowed the researchers to achieve a balanced design as well as providing the greatest flexibility in defining EJ status. Weights were calculated and used in all analyses in order to make the sample proportionate to the original population, and thus, representative.

2.1 Sampling

Participant eligibility was further defined as those residents of the area who commute on the NW corridor heading toward Atlanta for work. Researchers cannot know whether potential participants are eligible prior to implementing the survey. This meant the researchers surveyed the households in the sample to determine eligibility by asking participants whether they used NWC to commute toward Atlanta for work. If a participant answered that they did not use NWC to commute toward Atlanta for work, they were considered 'ineligible' to participate in the study. If the participant answered the eligibility question and was found to be ineligible, the researchers identified the participant as ineligible and the survey was deemed complete. If the participant was found to use NWC to commute toward Atlanta for work, they were considered eligible, and the remainder of the survey was conducted.

An alternate grid sample was introduced when a targeted respondent refused to participate, was ineligible, the address was bad, or the participant never responded. Researchers located an eligible neighbor, defined as living on the same block as the target, to participate in the study. Analyses show that grid sample participants did not introduce bias into the earlier bivariate analyses. However, researchers created an indicator variable for the grid sample and included it in all regression analyses to remove any potential bias it might have in the multivariable analyses. In collecting the grid sample, the team averaged visiting two homes per block to complete one survey. This increased both the completed survey totals, and it increased the denominator used to calculate the response rates.

At baseline, prior to the express lanes opening, the researchers selected a sample size of 1,304. The research team engaged in several contact methods:

- mailing a postcard with online link
- emailing respondents for whom the researchers had an email address
- mailing surveys for self-administration and return mail
- phoning those for whom the researchers had a phone number
- face-to-face survey interviewing (when other methods did not work).

The research team received a final response rate of 47% or 589 targeted respondents. Of these only 27% or 159 met the eligibility requirement (see Table 1). The addition of 236 grid respondents increased the sample to 825 and the adjusted response rate is 48%.

For data collection efforts in Year 1, Year 2, and Year 3 post-opening of the express lanes, the researchers made several adjustments. First, the research team discontinued using mail, email, and phone calling and focused immediately on face-to-face interviewing. Secondly, researchers added a grid sample technique.

The research team had a 44% response rate for Year 1 post-opening. The Year 2 and Year 3 post-opening survey efforts were both impacted by state and GSU imposed COVID-19 pandemic research restrictions. During data collection in 2020, the citizens of the state of Georgia were placed under the state of emergency mandated restrictions which disrupted traditional travel patterns. Consequently, the Georgia State University Institutional Review Board (IRB), modified all research to ensure the health and safety of all researchers and research participants. The project team researchers were reauthorized to resume data collection, but only to collect data by nonintrusive measures. Researchers mailed postcards with online links and surveys with self-addressed, stamped envelopes. Post-COVID-19, the research team gathered very few additional respondents (n=68) in Year 2 despite increased time and additional mailings. This low response rate, which follows national trends, is due mainly to the fact that fewer participants are willing to participate in self-administered surveys. Nationally, the response rates for self-administered surveys are now below 10%.[6]

In addition to lower-than-expected response rates, COVID-19 also has the potential to bias, or shape, the findings of this study, because the closures from the pandemic directly affected travel behavior. In the Year 3 report, this was found to be the case. Minorities, living in block groups where the percentage of the population below the poverty level is lower than the Atlanta metropolitan area average, were most likely to participate in the study post-COVID-19 and still be eligible compared to other racial and economic groups. Thus, a COVID-19 indicator variable was created and used in all multivariable analyses to control for the statistical bias this introduced.

Table 1. Sample Sizes Across Years of Data Collections

	Baseline	Year 1	Year 2+	Year 3+	Total
Adjusted Viable Sample Size	1,247	1,162	1,195	1,537	5,141
Completed Surveys	589	500	53	282	1,424
Response rate target only	47%	43%	4.4%	18.3%	28%
Eligible Target	159	61	19	17	256
Ineligible Target	430	439	34	265	1,168
Eligible Grid	236	107	15	28	386
Total Target & Grid	825	607	68	310	1,810
Total Eligible	395	168	34	45	642
Response Rate*	48%	44%	5.6%	19%	30%

**Response rate calculated as (completed +grid)/(sample size + (grid *2))*
+Adjusted data collection methods due to COVID restrictions

[6] Dillman, D., J. Smyth, and L. Christian (2014). "Response rate and measurement differences in mixed-mode surveys using mail, telephone, interactive voice response (IVR) and the internet." *Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method.* Hoboken, NJ: Wiley.

2.2 Survey Instrument

The survey is divided into three main sections with a total of 50 questions. The first section addresses travel behaviors and experiences, along with travel knowledge of the Atlanta-metropolitan area. The second section focuses on attitudes, preferences, and perceptions of travel in Atlanta. The last section focuses on respondent demographics (refer to Appendix A for a copy of the survey).

3 Findings

Findings for this trend study are divided into two primary topics. First, trends in commute behaviors and patterns for EJ group differences are presented. The section thereafter examines EJ group differences in attitudes, preferences, and perceptions of travel and congestion in Atlanta. All analysis variables are introduced within each section.

3.1 Commuting Behavior Trends

Table 2 presents measures of central tendency for the variables used in this section (means and percentages) by year of data collection for the full sample. Distance in miles from home to work ranges from 24 at pre-opening to 31 in Year 1. The outcomes of interest for this section are commuting times to and from work measured in minutes. At pre-opening, very few participants had a Peach Pass transponder. By Year 1, over half the sample had one. Table 3 presents Peach Pass ownership by EJ group definition (also illustrated in Figures 2 and 3). There is no statistically significant difference in Peach Pass ownership between EJ and non-EJ groups, except for Year 1 under the Race and Poverty EJ definition, with non-EJ population being more likely to own a Peach Pass. The trend of Peach Pass ownership within EJ and non-EJ groups is consistent across all study years, with lower ownership (between 4.0 and 7.8%) from survey respondents pre-opening of the Northwest Corridor express lanes and increasing to over half the sample post opening.

Atlanta's metro area depends heavily on cars to commute to work with over 90% on average consistently driving alone on the Northwest Corridor. Commute times to work ranged from 42 minutes to 47 minutes, on average across all time points. Commute times are generally longer on the commute home from work, averaging between 46 and 59 minutes. Over the course of the study, use of the express lanes increased. Again, Years 2 and 3 are anomalous due to COVID-19. Well over 80% of respondents commute to work and from work during the rush hours.

Table 2. Descriptions of Commute Variables (Means or Percent)

	Pre-opening	Year 1	Year 2	Year 3
Distance to Work	24.36	30.79	26.23	29.09
Commute Mode:				
Drive alone	95%	96%	96%	84%
Have Peach Pass	6.6%	61%	56%	58%
Commute Time:				
To Work	47.00	46.44	42.41	44.96
From Work	59.32	55.70	46.24	50.43
Use Express Lanes on Morning Commute				
Daily	0%	24%	32%	19%
A Few Times/Week	0%	21%	0%	23%
1-2 Times/Week	0%	8%	29%	23%
A Few Times/Month	0%	16%	31%	15%
Once/Month	0%	4%	5%	0%
Never	100%	27%	3%	19%
Commute During Morning Rush	83%	92 %	88 %	91%
Use Express Lanes on Evening Commute				
Daily	0%	35%	31%	12%
A Few Times/Week	0%	15%	4%	37%
1-2 Times/Week	0%	16%	16%	19%
A Few Times/Month	0%	13%	21%	10%
Once/Month	0%	2%	18%	8%
Never	100%	19%	10%	14%
Commute During Evening Rush	77%	92%	88%	86%
N (sample size)	395	168	34	45

Table 3. Peach Pass Ownership Percent over Time by EJ Group Definitions

	Poverty-Only		Race and Poverty	
	EJ	**Non-EJ**	**EJ**	**Non-EJ**
Baseline	4.0%	7.5%	4.3%	7.8%
Year 1	48.2%	63.8%	54.4%*	69.8%*
Year 2	55.0%	56.5%	53.2%	60.0%
Year 3	59.2%	56.3%	60.0%	54.6%

** indicates statistical significance at the .05 level ($p<.05$)*

Figure 2. Peach Pass Ownership Percent over Time for Poverty-only EJ Status

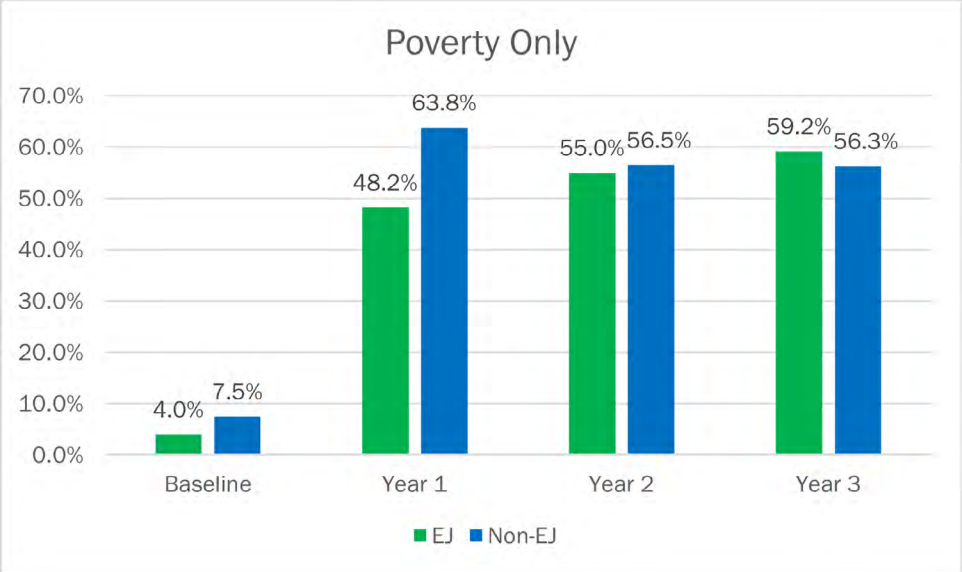
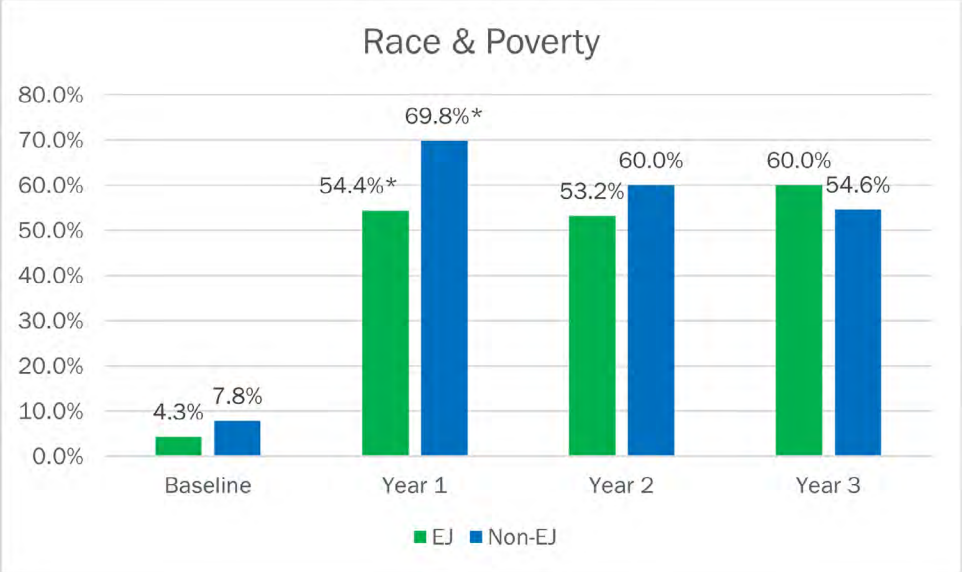


Figure 3. Peach Pass Ownership Percent over time for Race and Poverty EJ Status



** indicates statistical significance at the .05 level (p<.05)*

In the regressions that follow, using the express lanes is treated as a series of indicator variables. A variable for 'daily use' was created, a variable for 'never use' was created, and a variable for 'occasional use' was created. The 'occasional use' of express lanes variable will be treated as the reference category (comparison group).

Three regression models were developed to examine the trends and changes to commute times over the study period compared to the baseline, and whether there were any significant differences between EJ and non-EJ groups.

Model 1 examines the differences in commute time between EJ groups not controlling for any other potential explanations of commute time. This model should provide the largest EJ group difference; a starting point. The trend in commute times over the four years of data collection are not linear; therefore, Model 1 includes a dummy variable to distinguish each post-opening year of the express lanes from the baseline or prior to opening of the express lanes.

The next two models attempt to eliminate any EJ group differences. Model 2 adds the commute distance to regressions. Model 3 (if needed) adjusts for use of express lanes (daily or no use) and commuting during peak periods (morning rush commuting to work or evening rush commuting from work).

Table 4 shows the variables used under each regression model. The following sections presents the regression models' results applied to the survey data collected over the study period.

Table 4. Regression Model Variables

N=616	Model 1	Model 2	Model 3
Intercept	x	x	x
EJ Group	x	x	x
1 Year Post-Opening (2019)	x	x	x
2 Years Post-Opening (2020)	x	x	x
3 Years Post-Opening (2022)	x	x	x
Distance Traveled (miles)		x	x
Use Express Lanes Daily			x
Never Use Express Lanes			x
Commute During Evening Rush			x

3.1.1 Commute Time to Work: Poverty-Only

Table 5 presents the first sets of linear regressions predicting commute time (in minutes) to work for EJ and non-EJ group members based on the poverty-only EJ definition. On average, Model 1 shows that EJ group members spend one minute less on their commute compared to non-EJ group members, but it is not a statistically significant difference. The trend in commute times over the four years of data collection are not linear; therefore, Model 1 includes a dummy variable to distinguish each post-opening year of the express lanes from the baseline or prior to opening of the express lanes. Year 1 post-opening of the express lanes shows a decline in commute times by an average of three minutes.

Model 2 adds the commute distance to regressions and finds that controlling for commute time, the EJ group difference is attenuated from 1.15 minutes to an average of half a minute, and is not statistically significant. Distance traveled is positively associated with increased commute times as would be expected. Once we control for distance traveled to work, we see statistically significant reductions in commute time after the express lanes opened, averaging a six-minute decline. The introduction of "distance traveled" results in a significant increase in the R-square for Model 2 compared to Model 1.

Model 3 (results not shown) was run controlling for usage of the express lanes and commuting during the morning rush. These variables were not significantly associated with the commute time and did not impact the association between EJ groups and commute time heading to work.

Table 5. Regressing Commute Time (in minutes) Heading to Work by EJ Status (poverty-only)

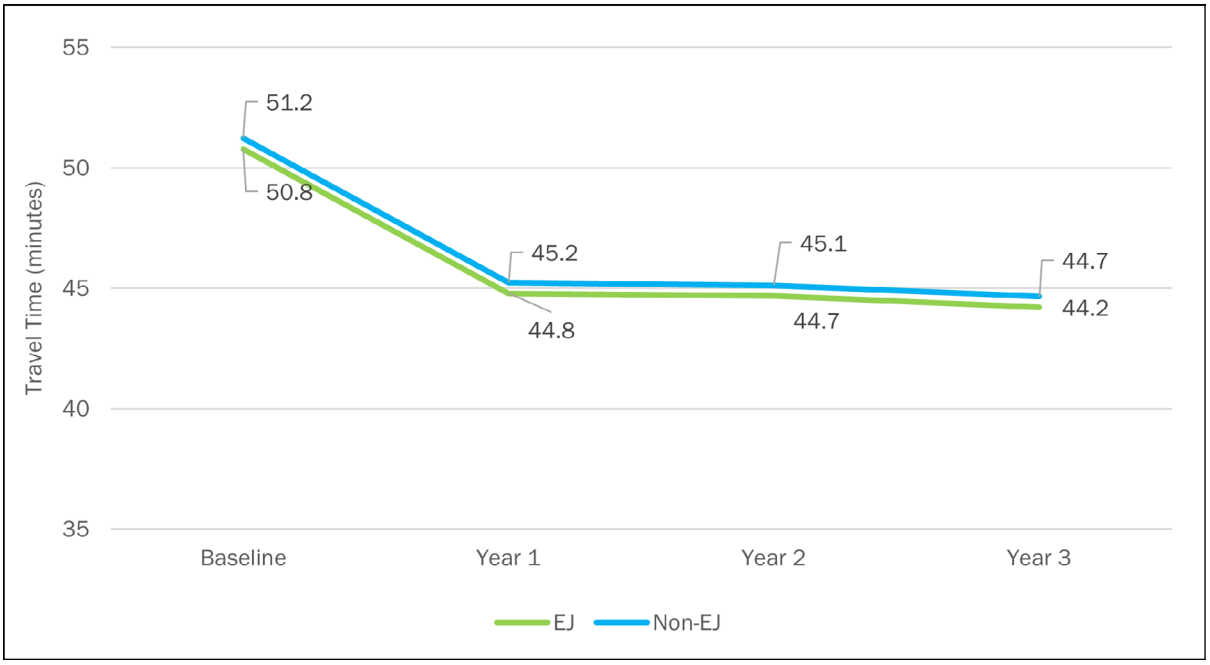
N=616	Model 1	Model 2
Intercept	48.59 (1.52)*	51.23 (1.29)*
EJ Group	-1.15 (1.90)	-0.45 (1.61)
1 Year Post-Opening (2019)	-0.59 (1.96)	-6.00 (1.70)*
2 Years Post-Opening (2020)	-3.96 (2.91)	-6.11 (2.47)*
3 Years Post-Opening (2022)	-2.30 (3.45)	-6.58 (2.93)*
Distance Traveled (miles)		0.83 (0.05)*
Use Express Lanes Daily		
Never Use Express Lanes		
Commute During Morning Rush		
R-square	.08	.29

Notes: Controlling for grid sample. Reference category: Non-EJ, baseline, use express lanes occasionally. Standard errors in parentheses.

** indicates statistical significance at the .05 level (p<.05)*

Figure 4 illustrates the average commute times from Table 5, Model 2 for EJ and non-EJ groups. The graphic shows the 'reference' category (i.e., the intercept) that represents the non-EJ group in the Baseline year. Changes in commute times for the years post-opening are calculated by adding the regression variables for post-opening. The commute times for the EJ group are represented by adjusting the non-EJ commute times by the variable representing the EJ group. The researchers found a significant decline in commute times after the express lanes opened that remained for the next two years.

Figure 4. Estimated Travel Times (in minutes) Heading to Work by Poverty-Only EJ Status (Model 2)



3.1.2 Commute Time to Work: Race and Poverty

Table 6 presents the regression model results, examining EJ differences in commute times by the race and poverty EJ definition. Residents of census block groups that exceed the thresholds for racial minority composition, but do not exceed the poverty threshold, are now treated as EJ group members. Under this EJ definition, Model 1 shows that EJ group members spend 1.15 fewer minutes on their commute compared to non-EJ group members, but it is not a statistically significant average difference. There are no statistically significant declines over time after the opening of the express lanes in this model.

Under regression Model 2, the EJ group difference in commute times was reversed to favor non-EJ group members after adjusting for distance traveled but, again, the difference is not statistically significant. Distance traveled is positively associated with increased commute times as would be expected. Once we control for distance traveled to work, we see statistically significant reductions in commute time after the express lanes opened, averaging a six-minute decline. The introduction of distance traveled to Model 2 results in significant increase in the R-square compared to Model 1.

Model 3 (results not shown) was run that controlled for using the express lanes and commuting during the morning rush. These variables were not significantly associated with the commute time and did not impact the association between EJ groups and commute time heading to work.

Table 6. Regressing Commute Time (in minutes) Heading to Work by EJ Status (race & poverty)

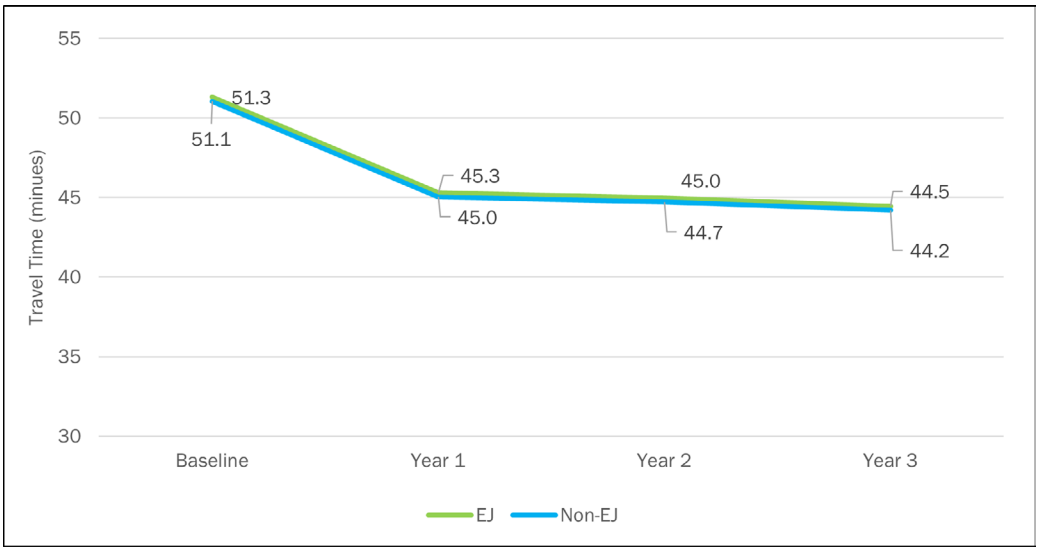
N=616	Model 1	Model 2
Intercept	48.66 (1.54)*	51.05 (1.31)*
EJ Group	-1.15 (1.71)	0.26 (1.45)*
1 Year Post-Opening (2019)	-0.243 (1.99)	-6.02 (1.73)*
2 Years Post-Opening (2020)	-4.03 (2.88)	-6.34 (2.44)*
3 Years Post-Opening (2022)	-2.83 (1.68)	-6.86 (2.90)*
Distance Traveled (miles)		0.83 (.05)*
Use Express Lanes Daily		
Never Use Express Lanes		
Commute During Morning Rush		
R-square	.08	.29

Notes: Controlling for grid sample. Reference category: Non-EJ, baseline, use express lanes occasionally. Standard errors in parentheses.

** indicates statistical significance at the .05 level (p<.05)*

Figure 5 models the average commute times from Table 6, Model 2 for EJ and non-EJ groups. A significant decline in commute times is found after the first post-opening year that remains for the next two years. When higher income, racial minority neighborhoods are treated as EJ, the gap between the EJ groups reverses with EJ group members having slightly worse commute times.

Figure 5. Estimated Travel Times (in minutes) Heading to Work by Race & Poverty EJ Status (Model 2)



3.1.3 Commute Time from Work: Poverty-Only

Table 7 presents the first sets of linear regressions predicting commute home from work in minutes for EJ and non-EJ group members based on the poverty-only EJ definition. Again, Model 1 examines the differences in commute time between EJ groups not controlling for any other potential explanations of commute time. On the commute home from work, there are no statistically significant EJ group differences. However, on the commute home, the commute time has improved significantly for Year 2 post-opening. Year 2 is an anomaly given the entire data collection was undertaken during COVID-19 state-mandated restrictions, which affected commute times and survey study participation.

Model 2 results show a reduction of EJ group differences to 0.46 minutes, on average, after adjusting for distance traveled. Distance traveled is positively associated with increased commute times as would be expected. By adjusting the regression for distance traveled, the R-square for Model 2 increases significantly compared to Model 1. Once we control for distance traveled to work, we see statistically significant reductions in commute time after the express lane opened, averaging a nine-minute decline in Year 1, a 15-minute decline in Year 2 post-opening and a decline of 13 minutes in Year 3 post-opening. We should be cautious interpreting the Year 2 effects given that they are confounded by contemporaneous COVID-19 restrictions.

Model 3 results show that the EJ pattern as well as the reduction in commute times over time remains fairly consistent after adjusting for use of express lanes and commuting during the evening rush. Using the express lanes daily or never using the express lanes does not improve commuting times compared to those who use the express lanes occasionally. Commuting during the evening rush hours adds more than 10 minutes to the average evening commute times regardless of EJ group status. The observed change in R-square by adding usage of the express lanes and commuting in the evening rush is relatively small in comparison to the changes observed after introducing distance traveled.

Table 7. Regressing Commute Time (in minutes) Heading Home from Work by EJ Status (poverty-only)

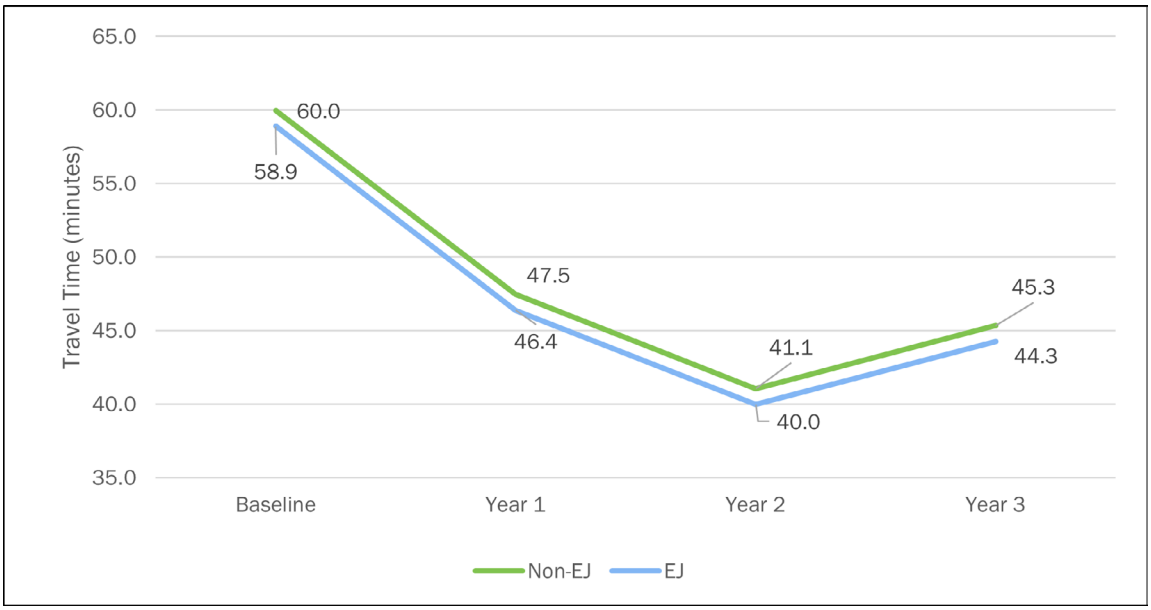
N=616	Model 1	Model 2	Model 3
Intercept	60.98 (2.02)*	63.94 (1.85)*	59.96 (5.89)*
EJ Group	-1.25 (2.54)	-0.46 (2.28)	-1.08 (2.24)
1 Year Post-Opening (2019)	-3.30 (2.62)	-9.36 (2.40)*	-12.50 (5.32)*
2 Years Post-Opening (2020)	-13.34 (3.89)*	-15.75 (3.48)*	-18.91 (6.00)*
3 Years Post-Opening (2022)	-8.35 (4.60)	-13.14 (4.14)*	-14.62 (6.37)*
Distance Traveled (miles)		0.93 (0.08)*	0.94 (.07)*
Use Express Lanes Daily			-1.59 (4.25)
Never Use Express Lanes			-3.32 (5.32)
Commute During Evening Rush			10.38 (2.10)*
R-square	.03	.22	.25

Notes: Controlling for grid sample. Reference category: Non-EJ, baseline, use express lanes occasionally. Standard errors in parentheses.

** indicates statistical significance at the .05 level (p<.05)*

Figure 6 models the average commute times from Table 7, Model 3 for EJ and non-EJ groups. A significant decline in commute times is found initially, and they remain lower than pre-opening through Years 2 and 3. Differences between EJ groups are not statistically significant.

Figure 6. Estimated Travel Times (in minutes) Heading Home from Work by Poverty-only EJ Status (Model 3)



3.1.4 Commute Time from Work: Race and Poverty

Table 8 presents the same sets of linear regressions predicting commute home from work in minutes for EJ and non-EJ group members based on the race and poverty EJ definition. Again, Model 1 examines the differences in commute time between EJ groups not controlling for any other potential explanations of commute time. EJ group members now include residents of upper income, racial minority census block groups. On the commute home from work, no statistically significant EJ group difference is found. The commute time has improved significantly for Year 2 post-opening, which cannot be fully attributed to the express lanes, given the entire data collection was undertaken during COVID-19 state-mandated restrictions, which affected both commute times and survey study participation.

Model 2 results show a reduction to the EJ group differences to -0.13 after adjusting for distance traveled. Distance traveled is positively associated with increased commute times as would be expected. Once we control for distance traveled to work, we see statistically significant reductions in commute time after the express lanes opened, averaging a nine-minute decline in Year 1, a 15-minute decline in Year 2 post-opening and a decline of 13 minutes in Year 3 post-opening. We should be cautious interpreting the Year 2 effects given that they are confounded by contemporaneous COVID-19 restrictions.

Model 3 adjusts for use of express lanes and commuting during the evening rush. The EJ pattern of similar commute times as well as the reduction on commute times over time remains fairly constant. Those who use the express lanes daily or never use the express lanes do not experience better commute times compared to those who use the express lanes occasionally. Commuting during the evening rush hours adds more than 10 minutes to the commute time regardless of EJ group status. As observed before, the introduction of traveled distance results in the largest change in R-square when comparing the three regression models.

Figure 7 models the average commute times from Table 8, Model 3 for EJ and non-EJ groups. The research team found a significant decline in commute times initially, and they remain lower than pre-opening commute times through Years 2 and 3.

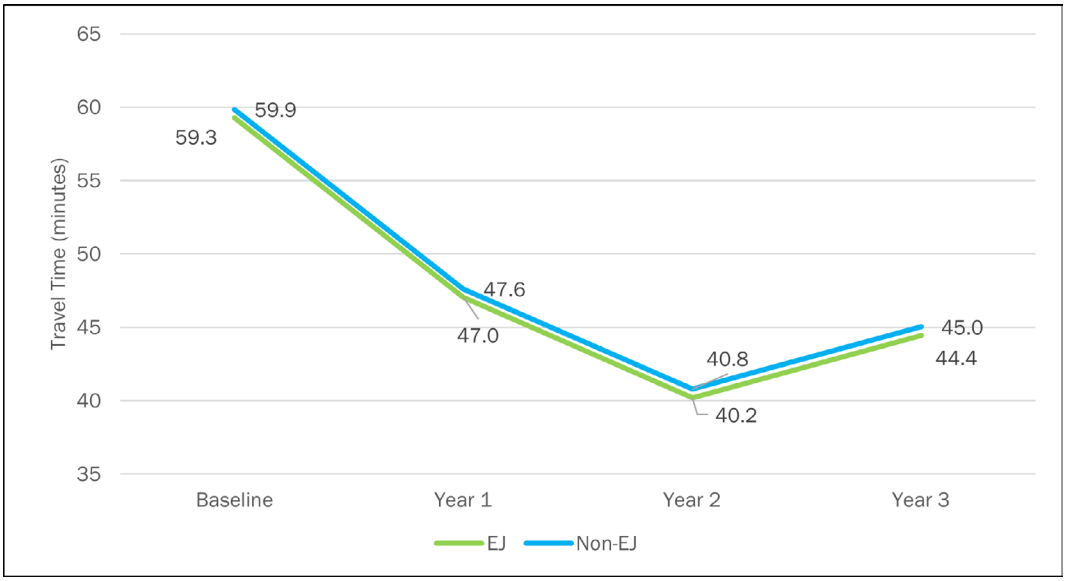
Table 8. Regressing Commute Time (in minutes) Heading Home from Work by EJ Status (race & poverty)

N=616	Model 1	Model 2	Model 3
Intercept	61.20 (2.53)*	63.87 (1.85)*	59.85 (5.89)*
EJ Group	-1.71 (2.29)	-0.13 (2.05)	-0.59 (2.02)
1 Year Post-Opening (2019)	-2.82 (2.67)	-9.29 (2.44)*	-12.23 (5.32)*
2 Years Post-Opening (2020)	-13.28 (3.84)*	-15.88 (3.44)*	-19.06 (5.99)*
3 Years Post-Opening (2022)	-8.29 (4.54)	-13.29 (4.09)*	-14.82 (6.31)*
Distance Traveled (miles)		0.93 (.08)*	0.94 (.08)*
Use Express Lanes Daily			-1.63 (54.25)
Never Use Express Lanes			-3.27 (5.32)
Commute During Evening Rush			10.36 (2.10)*
R-square	.03	.22	.25

Notes: Controlling for grid sample, COVID-19 restrictions. Reference category: Non-EJ, baseline, use express lanes occasionally. Standard errors in parentheses.

** indicates statistical significance at the .05 level (p<.05)*

Figure 7. Estimated Travel Times (in minutes) Heading Home from Work by Race & Poverty EJ Status (Model 3)



In sum, the data suggest that EJ groups have not suffered travel-time inequities due to the implementation of the NWC Express Lanes. Commute times have improved for all commuters both during the morning to work, and the evening return home.

3.2 Attitudes, Preferences, and Perceptions

Perceptions of inequities can be as important as actual inequities. Therefore, attitudes and perceptions were also addressed in the surveys. Respondents were asked if they thought their commute had improved since the opening of the NWC Express Lanes. Table 9 provides their responses on a five-point scale that ranged from consistently worse to consistently better. A pattern started to emerge of perceived improvements in commutes from Year 1 to Year 3 post-opening of the express lanes. Note that both Years 2 and 3 had very few respondents due to COVID-19 data collection restrictions. It appears as if the majority think commute times have improved at all three time points.

Table 9. Perception of Commute Time Post-Opening of NWC Atlanta Express Lanes

Since Opening of Express Lanes my Commute is	Consistently Worse	Somewhat Worse	The Same	Somewhat Better	Consistently Better
Year 1 Post-Opening	2.4%	3.3%	25%	32.6%	36.7%
Year 2 Post-Opening	0.0%	0.0%	3.9%	44.6%	51.5%
Year 3 Post-Opening	0.0%	0.0%	12.3%	30.6%	57.2%

Table 10 presents regressions of the perceptions of improved commute times. The first column shows results for the poverty-only EJ definition and the second column shows results for the race and poverty definition. Note that there is a difference with this analysis compared to earlier analyses in that the baseline (pre-opening year of data collection) is excluded, as the question specifically refers to post-opening perceptions. The analytic sample is smaller, and Years 1 and 2 are compared to Year 3 in this analysis.

Table 10. Regression Perception of Commute Improving Post-Opening

N=215	Poverty-Only	Race & Poverty
Intercept	3.41 (0.24)*	3.42 (0.24)*
EJ Group	-0.09 (0.14)	-0.12 (0.12)
1 Year Post-Opening (2019)	-0.61 (0.21)*	-0.58 (0.19)*
2 Years Post-Opening (2020)	-0.17 (0.23)	- 0.18 (0.23)
Distance Traveled (miles)	0.01 (0.01)	0.01 (0.14)
Use Express Lanes Daily	0.80 (0.15)*	0.79 (0.16)*
Never Use Express Lanes	-0.01 (0.19)	-0.00 (0.19)
Commute During Rush Hours	0.02 (0.19)	0.04 (0.19)
R-square	.19	.19

Notes: Controlling for grid sample, COVID-19 restrictions. Reference category: Non-EJ, Year 3 post opening, use express lanes occasionally. Baseline data is not included in this analysis. Standard errors in parentheses.

** indicates statistical significance at the .05 level (p<.05)*

The perceptions of commuting are on a five-point scale ranging from zero to four. The intercept values of 3.41 and 3.42 respectively, can be interpreted as the average commute perception at Year 3. Thus, at Year 3, on average, commuters perceived their commute as somewhat better. There are no EJ group differences in perceptions of commute improvements for either EJ definition. Respondents at Year 1 post-opening were significantly less likely to perceive their commute as somewhat better compared to respondents at Year 3. In Year 2, respondents' perceptions of their commute did not differ significantly from that of Year 3 respondents. Distance traveled was not associated with perception of commuting time. Daily use of express lanes was associated with an increased perception that the commute was better compared to those who only occasionally used the express lanes. Never using the express lanes and traveling during the rush hours were not statistically associated with perceptions of commute times.

Figures 8 and 9 present the trends in perceptions of improved commuting by the poverty-only EJ definition followed by the race and poverty EJ definition. Note that any value above a two signifies perception of improved commute. These graphs show no difference by EJ groups for either definition, but do show a trend in perception that commutes have improved.

Figure 8. Perception of Improvement in Commuting Time Post-Opening of Express Lanes by Poverty-Only EJ Status

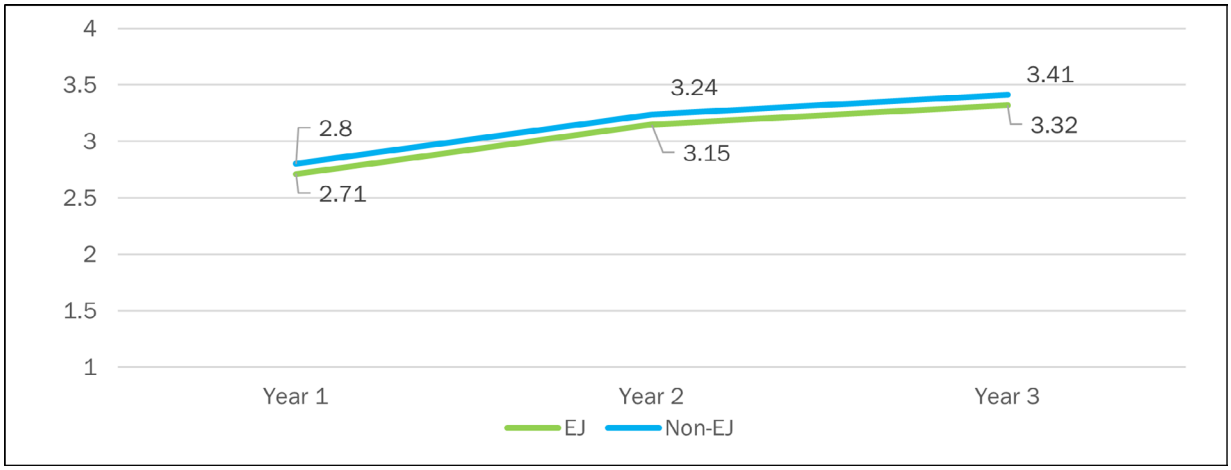


Figure 9. Perception of Improvement in Commuting Time Post-Opening of Express Lanes by Race & Poverty EJ Status

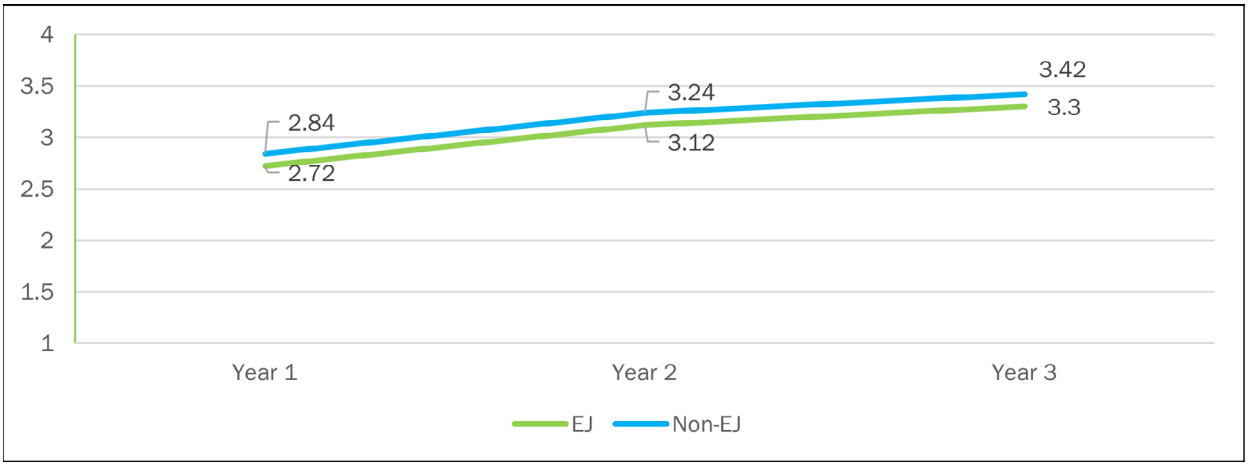


Table 11 presents five attitudinal questions regarding commuting to and from work from the Northwest Metro-Atlanta area. The five questions all have five response options: Strongly disagree; Disagree; Neither agree nor disagree; Agree; and Strongly agree. In general, well over 50% of respondents at all four time points of the trend study, agree or strongly agree that they spend too much time in traffic, commuting is stressful, frustrating, and they are often late due to heavy traffic.

The first step in understanding these types of attitudinal questions is to determine if they are all addressing the same concept. The researchers assess this first with Cronbach's alpha, a measure of how well questions reliably hang together. If they do, researchers then assess their validity through factor analysis.

The Cronbach's alpha, a measure of reliability that ranges from 0 (completely unreliable) to 1.0 (completely reliable), for the five questions was 0.70. This is low but acceptable. One question, "I'd be willing to pay a toll to lessen my commute," did not correlate well with the other questions. Dropping that question from the analysis, Cronbach's alpha improved to 0.78.

The next step was to run factor analyses. The first factor analyses run included all five questions. The model did fit a single attitudinal concept but only explained 50% of the total variance (it should explain 60% minimum to be considered acceptable). Again, the question about tolls was dropped from the analyses and rerun. This time a clear single factor emerged that explained over 61% of the total variance—an acceptable level. This provides evidence that four questions reliably and validly represent participants' attitudes toward Atlanta's traffic congestion. Empirically, this demonstrates what is easy to see: that this question is hypothetical whereas the other four questions are based on concrete experiences.

Table 11. Attitudes toward NWC Metro-Atlanta Commute (Means or Percent)

N=613	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I spend too much time in traffic.	1.1%	5.4%	7.8%	37.5%	48.2%
I find commuting to be stressful.	1.6%	13.5%	14.7%	35.4%	34.8%
I'd be willing to pay a toll to lessen my commute.	8.9%	21.8%	17.0%	36.1%	16.2%
I find commuting to work to be frustrating.	2.7%	16.0%	14.3%	38.6%	28.3%
I often get home late from work due to heavy traffic.	3.6%	19.8%	12.0%	33.6%	31.1%

The attitude factor generated by the factor analyses is a standardized continuous variable. This means it has a mean (average) of zero and a standard deviation of one. Higher values will indicate worse attitudes toward commuting in Northwest Metro Atlanta. Table 12 presents regression analyses of the attitudes toward Atlanta's traffic for both the poverty-only EJ definition and the race and poverty EJ definition.

Findings are similar across EJ definitions in Table 12. There are no differences in attitudes toward traffic in Northwest Atlanta between EJ and non-EJ groups across either definition. Attitudes toward traffic improved after the express lanes opened for all NWC commuters. Commuting during rush hours worsened attitudes toward NWC Atlanta traffic.

Table 12. Regressions of Attitudes toward Atlanta Traffic

N=610	Poverty-Only	Race & Poverty
Intercept	0.26 (0.26)	0.23 (0.26)
EJ Group	-0.01 (0.09)	0.005 (0.08)
1 Year Post-Opening (2019)	-0.72 (0.17)*	-0.70 (0.22)*
2 Years Post-Opening (2020)	-0.70 (0.17)*	-0.73 (0.24)*
3 Years Post-Opening (2022)	-0.96 (0.21)*	-1.00 (0.26)*
Distance Traveled (miles)	0.01 (0.00)	0.01 (0.00)
Use Express Lanes Daily	0.08 (0.17)	0.08 (0.17)
Never Use Express Lanes	-0.41 (0.22)	-0.40 (0.22)
Commute During Rush Hours	0.38 (0.13)*	0.37 (0.13)*
R-square	.06	.06

Notes: controlling for grid sample, COVID-19 restrictions. Reference category: Non-EJ, baseline, use express lanes occasionally. Standard errors in parentheses.

** indicates statistical significance at the .05 level (p<.05)*

Figures 10 and 11 present trends in attitudes toward Atlanta's traffic by the poverty-only EJ definition followed by the race and poverty EJ definition. The trends show that attitudes improved greatly immediately after the opening of the express lanes. Gradually, as area residents acclimated to the change in transportation infrastructure, attitudes, while still more positive than prior to the opening, began to slowly return to their starting place. Additionally, these graphs make it clear there are no differences in attitudes toward Atlanta's traffic by EJ groups for either definition.

Figure 10. Attitudes toward Atlanta Traffic by Poverty-Only EJ Status

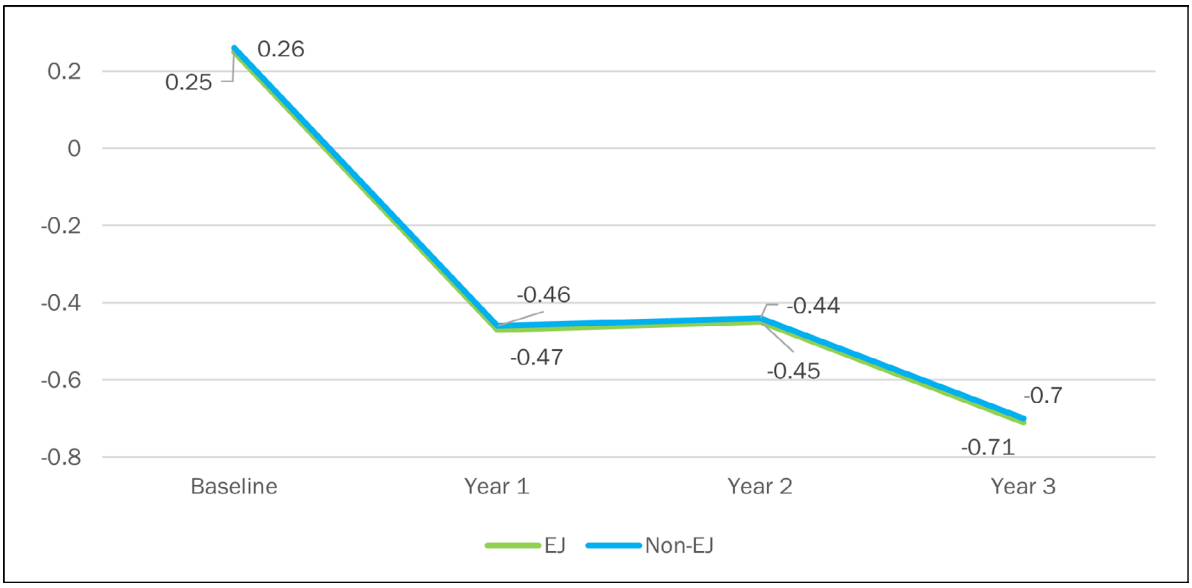


Figure 11. Attitudes Toward Atlanta Traffic by Race & Poverty EJ Status

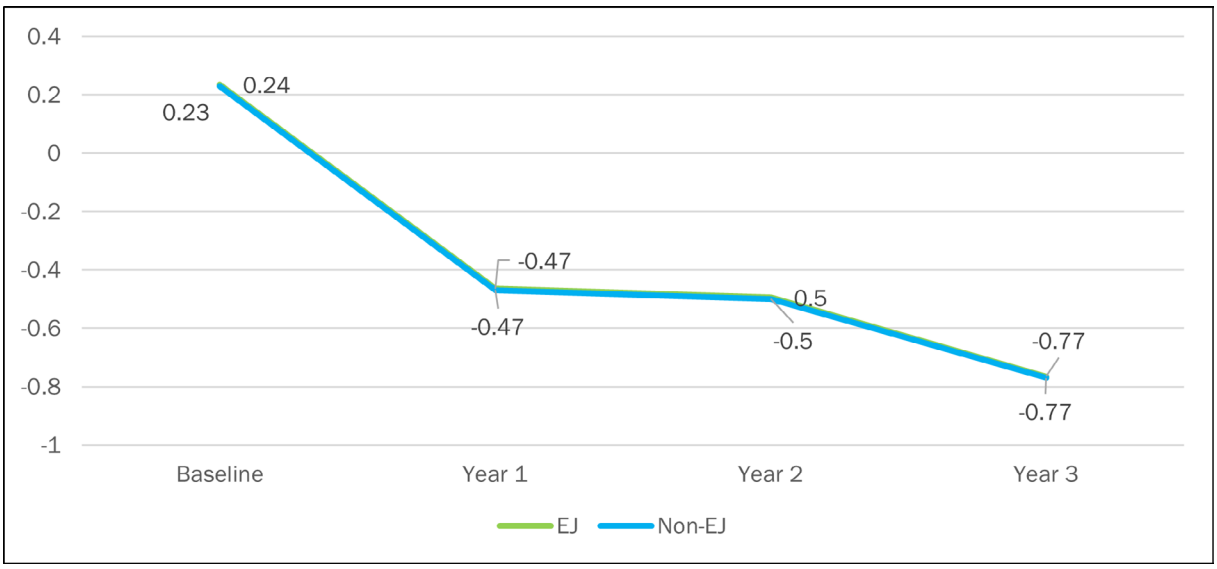


Table 13 presents seven perception and attitudinal questions regarding express lanes. In general, few agree or strongly agree that they cannot afford to use express lanes (14.6% and 6.5% respectively). Few also agree or strongly agree that express lanes benefit low-income commuters (<10% and <1% respectively). There is more agreement that express lanes are fair (50.8% agree, 12.5% strongly agree), improve traffic for all (45.7% agree or strongly agree), and 75% agree or strongly agree that express lanes benefit higher income commuters. Less positively, 41% of commuters agree or strongly agree that while they can afford express lanes, they probably would not take them, and 33% agree or strongly agree that there are too few access points.

Table 13. Perceptions of Express Lanes (Means or Percent)

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I can't afford to take express lanes.	12.9%	40.0%	26.0%	14.6%	6.5%
Express lanes benefit low-income commuters.	25.7%	38.4%	25.7%	9.9%	0.4%
Express lanes are fair because they charge tolls only to those who choose to use them.	6.9%	13.6%	16.3%	50.8%	12.5%
Express lanes improve traffic for all commuters.	9.1%	21.2%	24.0%	37.5%	8.2%
Express lanes benefit higher-income commuters.	1.7%	7.9%	15.4%	49.5%	25.5%
I can afford to pay to take express lanes, but I probably would not take them.	6.2%	28.9%	23.8%	28.1%	13.0%
There are too few places to enter and leave the express lanes for my commute.	7.1%	21.9%	37.6%	25.6%	7.9%

The seven perception and attitude questions listed in Table 13 do not belong to a single concept. Three questions do reliably and validly fit together: Express lanes benefit low-income commuters, Express lanes are fair, and express lanes improve traffic for all commuters. The factor explains ~60% of the variability in these three questions. This concept is called Perception of Express Lanes Benefits. The mean of express lanes benefits is zero with a standard deviation of one. Higher values signify perceptions of greater benefits.

Table 14 presents regression analyses of the attitudes toward express lanes benefits for both the poverty-only EJ definition and the race and poverty EJ definition. Findings are similar across EJ definitions in Table 14. There are no differences between EJ and non-EJ groups across either definition. There are also no significant predictors of perceptions of express lanes benefits found at all. Because there are no significant predictors of express lanes benefits, we provide no trend graphs.

Regressions on the remaining individual attitudes are not presented as they also do not show statistically significant differences between EJ groups for either EJ definition nor do they show any statistically significant trends over time.

Table 14. Regressions of Perception of Express Lane Benefits

N=603	Poverty-Only	Race & Poverty
Intercept	0.30 (0.27)	-0.30 (0.27)
EJ Group	-0.00 (0.10)	-0.00 (0.09)
1 Year Post-Opening (2018)	-0.19 (0.22)	-0.19 (0.22)
2 Years Post-Opening (2019)	-0.14 (0.25)	-0.14 (0.25)
3 Years Post-Opening (2020)	0.04 (0.27)	0.04 (0.26)
Distance Traveled (miles)	0.00 (0.00)	0.00 (0.00)
Use Express Lanes Daily	0.04 (0.18)	0.04 (0.17)
Never Use Express Lanes	-0.18 (0.22)	-0.18 (0.22)
Commute During Rush Hours	-0.15 (0.13)	-0.15 (0.13)
R-square	.01	.01

Notes: controlling for grid sample, COVID-19 restrictions. Reference category: Non-EJ, baseline, use express lanes occasionally. Standard errors in parentheses.

4 Conclusion

In September 2018, GDOT opened the NWC Express Lanes. These were Georgia's second reversible toll lanes, providing 29.7 miles of express lanes along I-75 from Akers Mill Road to Hickory Grove Road and along I-575 from I-75 to Sixes Road. The reversible lanes are open to southbound traffic in the mornings and northbound traffic in the afternoons during peak-travel hours.

Researchers at GSU with support from GDOT conducted annual surveys over a four-year period (2017-2022), to determine if there is an unequal distribution of burdens or benefits for environmental justice (EJ) groups by the creation of the NWC Express Lanes, and if the express lanes improved commutes for all northwest Metro-Atlanta travelers.

This report finds no statistically significant differences by EJ group status in either commute times, use of express lanes or perceptions toward the express lanes. In other words, the opening of the express lanes did not disadvantage EJ group members with regard to commute times in the NWC region. This finding holds regardless of EJ definition used. Furthermore, a significant proportion of residents use the express lanes daily, the majority use it occasionally, and less than 20% never use it two to three years after its opening.

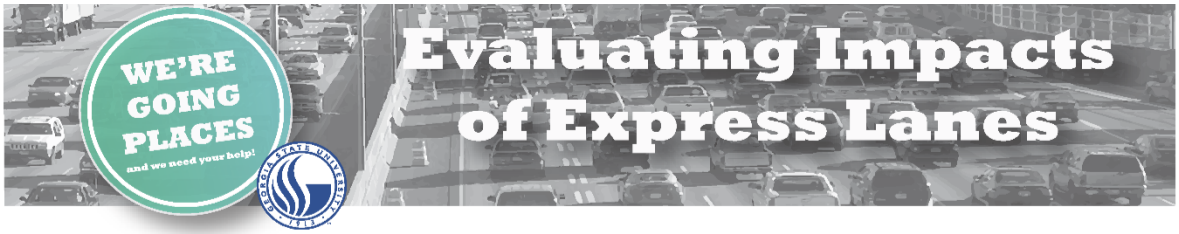
This usage has led to actual declines in commute times. While commute times increased in Year 3, it is still lower than prior to the express lane opening.

However, the Year 2 post-opening data collection is completely confounded with the COVID-19 pandemic and the Year 3 post-opening data collection effort is partially confounded with the COVID-19 pandemic. This means it is impossible to separate the improvements in commute times at Year 2 as due to the addition of the express lanes versus the pandemic shut down and restrictions in data collection methods.

Perceptions of inequities can be almost as important as actual inequities. No attitudes or perceptions of the new NWC Express Lanes were found that demonstrated a potential source of inequity for EJ groups. Furthermore, there were no permanent changes in perceptions over time.

In conclusion, the researchers' data and analysis reveal that there are no discernible EJ group inequities arising from the NWC Express Lanes.

APPENDIX A. The Survey



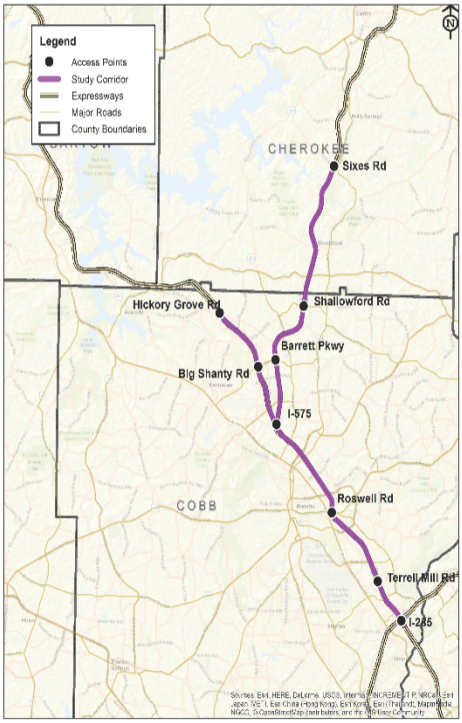
I. Travel To and From Work

This set of questions assesses your travel experience on the days you go to work. Transportation planners are interested in workplace location because travel to work activity often affects other daily travel. Please answer all questions that follow. Check the box that best represents your answers to the question posed, or fill in the blank as specified.

1. On a typical day going to or from work, do you travel (driving, bus, vanpool, carpool, etc.) on the Interstate 75 (I-75) corridor heading towards Atlanta's downtown? (See map below) ☐ YES ***(Skip to Q3)*** ☐ NO

2. If no, why not? ☐ I don't drive. ☐ I am retired. ☐ I take an alternate route to Atlanta. ☐ I work in the suburbs. ☐ I work from home. ☐ Other _____

If no, thank you very much for your time. We are interested in those who travel I-75. You can stop here.
Please put this in the self-addressed, stamped envelope and mail it.



This section assumes that you have a single job. If you have more than one job, please answer for the job for which you travel I-75 toward downtown Atlanta. Consider this your primary job. Only answer for the days you travel to work for the primary job, which means you will not be traveling more than 7 days in a typical week.

3. Did you travel on I-75 toward Atlanta to get to work last year?
☐ YES ***(Skip to Q4)*** ☐ NO

3a. If no, what changed that you now drive on I-85 toward Atlanta for work? (choose one response)
☐ Changed job or got a job
☐ Construction on usual route to work
☐ I-75 Express Lanes improved time to work
☐ COVID-19
☐ Other; please specify _____

4. What is the zip code of your employer? __ __ __ __ __

5. How many days per week do you travel to work? _____ (number of days)

6. In miles, how far is your primary workplace from your home? _____ (miles)

7. In a typical week, how do you generally get to work? (choose one answer)
☐ I work at home ☐ I drive by myself ☐ I carpool ☐ I ride in a vanpool
☐ I take public transit (bus) ☐ Ride share (Uber or Lyft) ☐ Other _____

8. On a typical day, when do you leave to go to work?
___ (hour) ___ (minute) ___ (am / pm)

9. On a typical day, about how many minutes is your commute to work?
____ (minutes) (enter 0 if you work at home)

10. If there was little to no traffic, how many minutes would it take you to get to work? ____ (minutes) (enter 0 if you work at home)

11. On days when you know there is heavy traffic, how much additional commuting time do you give yourself in order to get to work on time? ____ (minutes) (enter 0 if you work at home)

12. On a typical day, when do you leave work at the end of your day or shift? ___ (hour) ___ (minute) ___ (am / pm)

13. On a typical day, about how many minutes is your return commute home from work? _____ (minutes) (write 0 if you work at home)

OVER

14. In a typical week, how many days do you consistently get to work on time? (Circle the best answer)
None One Two Three Four Five Six Seven

15. Do you usually make additional stops on your way to or from work (for example, dropping off or picking up children, spouse, or friend)?

☐ **YES** ☐ **NO** ***(Skip to Q16)***

15a. If yes to Q15, on average, about how many minutes does this add to your commute time? _____ (minutes) (enter 0 if you work at home)

16. COVID-19 state restrictions affected some people's commute times. During the 2020 pandemic lockdown did you
☐ Work as normal, but enjoy a faster commute
☐ Work as normal and commute time remained the same
☐ Switch to working from home
☐ Have hours reduced, or lost your job
☐ Other; please specify _____

II. Commute Preferences

Express Lanes are toll lanes built alongside the existing roads, adding a travel option for motorists. They support transit by proviing free access for buses and vanpools. In addition, individual drivers can use these lanes by paying a toll using a Peach Pass Transponder. Toll rates will increase and decrease based on demand, ensuring travel speeds of 45 mph. These Express Lanes are reversible, allowing drivers to use the lanes to get into downtown Atlanta during weekday morning commute times, and out of, or away from, downtown Atlanta during the evening rush hours.

17. Do you have a Peach Pass Transponder?
☐ **YES** ☐ **NO** ***(Skip to Q23)***

18. In a typical month, how often do you use the Express Lanes to get to work?
☐ Daily ☐ A few times per week ☐ Once or twice a week ☐ A few times per month ☐ About once per month ☐ Never

19. In a typical month, how often do you use the Express Lanes to get home after work?
☐ Daily ☐ A few times per week ☐ Once or twice a week ☐ A few times per month ☐ About once per month ☐ Never

20. Do you use the Express Lanes for other travel needs?
☐ **YES** ☐ **NO**

21. How has your commute time changed now that the Express Lanes are in operation?
☐ Commute time is consistently worse
☐ Commute time is somewhat worse
☐ Commute time is same
☐ Commute time is somewhat better
☐ Commute time is consistently better

22. Under what circumstances do you tend to use the Express Lanes the most? (Choose all that apply)
☐ Personal reason (e.g. running late)
☐ Traffic is particularly heavy to or from work
☐ Weather is bad
☐ Traffic is particularly heavy due to downtown event
☐ Traffic is light, so toll is inexpensive
☐ Other; please specify _____

23. How much do you agree or disagree with the following statements? (Check the box that matches your level of agreement)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
23a. I spend too much time in traffic.	☐	☐	☐	☐	☐
23b. I find commuting to be stressful.	☐	☐	☐	☐	☐
23c. I'd be willing to pay a toll to lessen my commute time.	☐	☐	☐	☐	☐
23d. I find commuting to work to be frustrating.	☐	☐	☐	☐	☐
23e. I often get home late from work due to heavy traffic.	☐	☐	☐	☐	☐

24. How much do you agree or disagree with the following statements about Express Lanes?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
24a. I can't afford to take Express Lanes.	☐	☐	☐	☐	☐
24b. Express Lanes benefit low-income commuters.	☐	☐	☐	☐	☐
24c. Express Lanes are fair because they charge tolls only to those who choose to use them.	☐	☐	☐	☐	☐
24d. Express Lanes have improved traffic for all commuters.	☐	☐	☐	☐	☐
24e. Express Lanes benefit higher income commuters.	☐	☐	☐	☐	☐
24f. I can afford to pay to take Express Lanes, but I probably would not take them.	☐	☐	☐	☐	☐
24g. There are too few places to enter and leave the Express Lanes for my commute.	☐	☐	☐	☐	☐

25. How much do you agree or disagree with the following statements about why you live where you do? I choose to live where I do because:	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
25a. It is an easy commute to work (for me or someone in my household).	☐	☐	☐	☐	☐
25b. It is affordable.	☐	☐	☐	☐	☐
25c. It is in a good school district.	☐	☐	☐	☐	☐
25d. I know the area well.	☐	☐	☐	☐	☐
25e. It is near my family or friends.	☐	☐	☐	☐	☐
25f. It is convenient to public transportation.	☐	☐	☐	☐	☐
25g. Other (write in): _____	☐	☐	☐	☐	☐

III. Socio-Demographics

To understand how the Express Lanes affect individuals and households in the different communities who live near the new lanes, we need to understand the types of people who live in these communities. Your household was chosen to represent others in your community; therefore, ***it is really important that you answer ALL the following questions****. Your answers will help us to understand how your community currently uses the highway and how the new Express Lanes are being used.*

Please remember that we are keeping your personal information confidential. Only the researchers at Georgia State University will ever see individual responses. We will not share this data, nor will it be used for any purpose other than to understand the effect of toll lanes on nearby communities.

All responses to these questions will be grouped by community, and analyses will be focused on averages - not on individual responses.

26. How many people, including yourself, live in your household? _____ (number of persons)

27. How old are you? ☐18-25 ☐ 26-35 ☐ 36-45 ☐ 46-55 ☐ 56-65 ☐ 66-75 ☐ Over 75

28. What is your gender? ☐ Male ☐ Female

29. Which racial/ethnic group best represents you? ☐ (non-Hispanic) Black or African American ☐ (non-Hispanic) White or Caucasian ☐ (non-Hispanic) Asian or Asian American ☐ Latino/a, Hispanic American ☐ Multiracial ☐ Other, please specify _____

OVER

30. What is the primary language spoken in your home? ☐ English ☐ Spanish ☐ Portuguese ☐ Mandarin Chinese ☐ Other _____

31. What is the highest degree or level of schooling you have completed? ☐ Not a high school graduate ☐ High school graduate (includes GED)
☐ Some college ☐ Associate degree or technical school degree ☐ Bachelor's or undergraduate degree
☐ Graduate degree (includes professional degree like MD or JD) ☐ Other, please specify _____

32. Which of the following best describes your current situation? ☐ Employed full-time at one job ☐ Employed part-time
☐ Employed at several jobs ☐ Regular volunteer ☐ Retired ☐ Full-time homemaker ☐ Full-time student ☐ Disabled
☐ Unemployed looking for work ☐ Unemployed not looking for work ☐ Other, please specify _____

33. How many years have you lived at your current address (round up or down to nearest year)? _____ (years)

34. What was your total household income last year? ☐ Less than $10,000 ☐ $10-$19,999 ☐ $20-$29,999 ☐ $30-$39,999
☐ $40-$49,999 ☐ $50-$64,999 ☐ $65-$79,999 ☐ $80-$99,999 ☐ $100,000 or more

35. What could the Georgia Department of Transportation (GDOT), State Road and Tollway Authority (SRTA), Georgia Regional Transportation Authority (GRTA), or other agencies do to improve your commute?

_____

_____

_____

_____

_____

_____

_____

That's it! Thank you so much for taking the time to answer our questions. The information you shared will be very helpful for evaluating commuting on I-75's northwest corridor.