



**PORT AUTHORITY OF ALLEGHENY COUNTY
TRANSIT-ORIENTED DEVELOPMENT
IN ALLEGHENY COUNTY: A FIVE
YEAR EVALUATION**

ACKNOWLEDGEMENTS

Port Authority of Allegheny County (PAAC) provides public transportation throughout Pittsburgh and Allegheny County.

The Authority's 2,600 employees operate, maintain and support bus, light rail, incline and paratransit services for approximately 220,000 daily riders.

Port Authority is governed by an 11-member board – unpaid volunteers who are appointed by the Allegheny County Executive, leaders from both parties in the Pennsylvania House of Representatives and Senate, and the Governor of Pennsylvania. The board and its committees hold regularly scheduled public meetings.

Port Authority's budget is funded by fare and advertising revenue, along with money from county, state, and federal sources. The Authority's finances and operations are audited on a regular basis, both internally and by external agencies.

Participants
Port Authority of Allegheny County would like to thank agency partners for supporting the TOD Evaluation and all those who participated by dedicating their time and expertise.

This document was reviewed internally by Port Authority's Transit-Oriented Communities (TOC) advisory committee, an inter-departmental body established to support the TOC program. Development of the evaluation was completed by Moira Egler, Transit-Oriented Communities Project Manager and Sarah Rizk, Planning Intern with oversight provided by Breen Masciotra, Section Manager of Planning. Representatives from Mobilify Southwestern Pennsylvania, Southwestern Pennsylvania Commission, Pittsburgh Downtown Partnership, and Allegheny Conference on Community Development also provided valuable external feedback.



Published July 2021

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EXECUTIVE SUMMARY

Port Authority of Allegheny County's (PAAC) Transit-Oriented Communities (TOC) Program has undertaken an evaluation of transit-oriented development (TOD) in the initial period of the agency's TOD efforts. This document outlines those findings and resulting recommendations of how Port Authority's TOD activities can maximize positive impacts going forward.

The analysis was done across PAAC's fixed-guideway system, which includes the East Busway, West Busway, and the Red, Blue, and Silver light rail transit (LRT) lines. Using GIS, we calculated the variables geographically, using the half-mile, networked walksheds around each of the stations.

KEY FINDINGS

One clear theme emerged from our data analysis: there is simply not much change over time in areas where TOD did not occur. Very few shifts in population, number of jobs, and commuting patterns occurred where little to no new development happened between 2013 and 2018. However, where development has occurred, evidence of displacement and decreasing housing affordability was significant.

The absence of TOD promotes the status quo, and the presence of TOD without an equity lens promotes displacement. In order to live up to the principles, goals, and values we have set for ourselves as an agency, we must find a way to encourage more equitable transit-oriented development (ETOD).

MOVING FORWARD

The following recommendations are informed by the results of our analysis and the core values identified in the NEXTransit long-range planning process and TOD guidelines. These are just some of the ways PAAC can work collaboratively to encourage more TOD and ensure that it equitable.



TOD Zoning

- City of Pittsburgh and other municipalities
 - Amend zoning codes in boroughs with transit access.
 - Lead public process to gain input on amending code.
- Port Authority of Allegheny County
 - Enhance zoning advocacy through work with CONNECT and other local stakeholders.



Parking

- City of Pittsburgh and other municipalities
 - Amend zoning codes and create TOD overlay with parking reduction as a focus.
 - Streamline collection data
- Port Authority of Allegheny County
 - Parking built during joint development process should be "unbundled".



Finance Mechanisms

- Explore the feasibility of decision-making and financing models to enable the creation of new TRIDs in Allegheny County.
- Create or advocate for a TOD Fund focused on financing affordable housing near transit.



Infrastructure Investments

- City of Pittsburgh and other municipalities
 - While Port Authority identifies projects, it is the municipality or other entity that will fund, invest, and implement infrastructure in the area.
- Port Authority of Allegheny County
 - Anticipate TOD with infrastructure investments
 - Utilize First Last Mile and Station Area plans



Affordable Housing Policy

- Adopt inclusionary housing policy for development on PAAC land, mandating that a certain percentage of housing must be made affordable.
- Explore creating a discounted land policy.



Employment-Based TOD

- Consider incentives that encourage non-residential development and construction.
- Encourage equity in procurement processes and job creation to ensure low-income, minority neighborhoods are benefiting from new development and employment opportunities.



Sustainability *Tree Cover and Landscaping*

- City of Pittsburgh and other municipalities
 - Prioritize tree cover and shade trees in low-income, minority neighborhoods in new development and street standards.
- Port Authority of Allegheny County
 - Adopt a policy that every effort to preserve mature trees onsite must be made and that increases the total amount of tree cover throughout the project.



Sustainability *Green Projects*

- Prioritize green infrastructure alternatives for stormwater management.
- Support projects that meet green building criteria and encourage these certifications in new development.
- Encourage open space that is equitable and green and support incentives that prioritize it.



Sustainability *Sustainable Transportation*

- Encourage zoning incentives that support transportation demand management (TDM).
- Support increased access and equity in shared micro-mobility transportation, including bike and scooter shares.

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1.



INTRODUCTION

INTRODUCTION

Port Authority of Allegheny County's (PAAC) Transit-Oriented Communities (TOC) Program has undertaken an evaluation of transit-oriented development (TOD) in the initial period of the agency's TOD efforts. This document outlines those findings and resulting recommendations of how Port Authority's TOD activities can maximize positive impacts going forward.

WHAT IS TOD?

In order to measure our success, we must first define what we mean by transit-oriented development. Transit-oriented development is deliberately planned higher-density, mixed-use development within walking distance of a transit station¹. Planning dense, walkable, mixed-use developments near transit has many added benefits, including increased transit ridership, job creation, and increased safety for pedestrians and bicyclists².

At Port Authority, we most often focus our attention on TOD at our fixed-guideway stations because the infrastructure of those lines provides more permanence and more ridership capacity. These are stations located along the East and West Busways (bus rapid transit), the Red, Blue, and Silver Lines (light rail transit), and the Monongahela Incline. Examples of existing TOD in Pittsburgh include Eastside Bond at East Liberty Station along the East Busway, Glasshouse at Station Square, and The Flats at Summit Station adjacent to Library Station along the Silver Line.

Over the period examined in this analysis, development occurred in many of the station areas we studied. Not all of that development meets the definition of TOD, but much of it does. The projects shown above are examples of new TOD established during the period of this evaluation. In this analysis, we looked at the half-mile walkshed around each of our fixed guideway stations, regardless of whether or not TOD has been built there. Our analysis is based on estimated data (e.g. Census) and is meant to identify trends that might be attributable to the absence or presence of TOD in a given walkshed.

OVERVIEW OF TRANSIT-ORIENTED COMMUNITIES PROGRAM

Started in 2015 as the agency's first transit-oriented development initiative, the purpose of the TOC Program is to improve transit access in Allegheny County through planning, implementation, and advocacy for TOD and first and last mile connections. Improved access facilitates ridership, raises revenue, and makes valuable contributions to the following agency priorities:

- Maintain and enhance system-wide safety and well-being of riders and workforce.
- Enhance rider experience and public image.
- Support financial sustainability through innovative operations and growth with budget.
- Continuously improve business practices while fostering sustainable operations and economic growth.
- Ensure compliance with regulatory and governing agencies.
- Facilitate greater workforce stability, accountability, and talent growth.



Glasshouse Apartments



Eastside Bond

The Port Authority has three major roles in the implementation of TOD in the region:

1. As a **sponsor** for joint development (projects built on Authority property or connected physically or functionally to a busway or light rail Port Authority station).
2. As a **stakeholder** for any development occurring within the "zone of influence" of current or future stations (1/2 mile around station, roughly the same area as a walkshed),
3. As an **advocate** for sustainable land use decisions along all of the region's transit corridors, whether undertaken by PAAC or others, as our regional transit network grows.

INTRODUCTION

The TOC team oversees several initiatives aimed at furthering the implementation and success of TOD in Allegheny County.

Station Improvement Program: The purpose of the Station Improvement Program is to invest capital resources into existing fixed-guideway assets to catalyze transit ridership and real estate investment. Station area plans (SAP) explore TOD feasibility, station access, and station design, teeing up projects for implementation in each of those areas. Three SAPs have been completed to date (Negley, Station Square, and Dormont Junction), and a fourth is ongoing at South Hills Junction.

Joint Development: TOD that occurs on transit agency property is considered joint development as it's made possible through a partnership of the agency and a developer. The TOC team identifies possible locations for joint development, explores opportunities through station area planning, and solicits for development partners.

First and Last Mile (FLM): The TOC team provides support and advocacy for projects that help connect people to transit with other modes, such as walking and cycling. The goals of this program are to increase ridership, increase non-single occupancy vehicles access to transit service, and increase access to high frequency transit service to those who most depend on it. The First and Last Mile Program Plan, completed in 2019, provides an analysis of our fixed guideway stations that determined a prioritized list of stations where first and last mile projects should be implemented.

Collaboration: PAAC's TOC team brings the transit voice to land use planning and other similar efforts that are strengthened by incorporating mobility, connectivity, and access. Staff regularly participate in local municipal and neighborhood planning projects. In 2018-2019, TOC partnered with CONNECT to bring TOD zoning technical assistance to 10 local municipalities.

GOALS AND PRINCIPLES

In April 2016, PAAC's Board adopted TOD Guidelines that outline the agency's expectations for TOD, including the following goals and principles.

PAAC recognizes that high quality TOD on and near PAAC-owned properties can be a means for accomplishing the following goals:

- Increase transit ridership.
- Optimize the value of assets and generate long-term investment revenue.
- Increase the stability of PAAC's financial base through value capture strategies.
- Improve the rider experience at stations, including safe multimodal access.
- Improve quality of life at and around PAAC stations, transforming stations from stand-alone infrastructure into assets which enhance the community in which they're located.

- Support the creation of employment centers and other economic development engines.
- Create and promote equitable mixed-income and mixed-use communities around transit, including access to affordable housing.
- Ensure existing plans are respected and stakeholders are engaged.
- Enhance Port Authority, and the Pittsburgh Region, by fostering relationships with local jurisdictions, regional agencies, transit agencies, local businesses, and other stakeholders to support TOD.

Several planning principles are key to informing the type and quality of TOD that would help accomplish these goals:

Accessibility: Ensure that our planning work accommodates people of all abilities. We create planning and design work that can be utilized by people of all abilities, and, at the bare minimum, is compliant with the Americans with Disabilities Act. This includes designs for public space and improved connections to our stations and other properties. Where possible, we strive to exceed legal requirements for accessibility in our designs, ensuring access for all.

Sustainability: Ensure that sustainable elements are at the core of our design work, through the promotion of high density, walkable TOD. TOD plays an essential role in creating physically sustainable spaces that are easily accessible without a car. We promote designs that foster environmental awareness, reduce energy consumption, decrease air pollution, and reduce road congestion.

Affordable Housing: Low-income individuals make up a significant portion of our ridership. It is imperative that, where possible, we ensure that transit access is readily available where transit-dependent populations work, live, and play. Affordable housing is in high demand, particularly in communities with higher property values that are already well-served by transit. Locating affordable housing near transit ensures that those who rely on it most will have reliable service nearby.

Public Health: High-density, mixed use developments near transit have a significant impact on the health and wellness of their users. People walk and bike more to, from, and within these developments as a result of their proximity to transit and easy-to-navigate routes. By designing sites with pedestrians and cyclists in mind, the TOC team seeks to improve public health by increasing the amount of people who walk and bike to access transit.

INTRODUCTION

Mode Priority: A mode hierarchy guides decision-making to ensure planning and development make the best use of limited space close to a transit station. Infrastructure that supports pedestrian access to transit is at the top of the mode hierarchy, meaning that PAAC will prioritize projects that provide safer, more convenient access to transit for pedestrians. without the need for vehicular storage. Space for drop-offs and pick-ups is beneficial for paratransit, ride-hailing services, taxis, and the family and friends who may drive a rider to transit service. Accommodating riders' flexible access to vehicles also helps reduce the dependency on personal vehicle ownership.

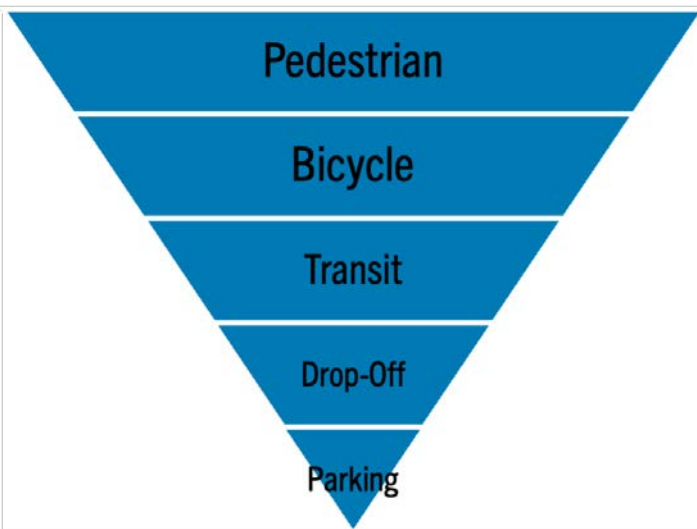


Image 3: Mode Hierarchy

WHY THIS DOCUMENT?

This document builds upon the work of the TOD Guidelines to get a current picture of TOD in Allegheny County after five years of having a formal program, as well as challenges and opportunities for the future.

The purpose of this analysis is to measure the extent to which local development near transit is meeting the agency's goals for TOD. This document is not intended to judge individual TOD projects but rather is meant to be a reflection on how and where to pursue the goals of TOD for the betterment of all people utilizing the system. The results are not exclusive to development adjacent to the fixed guideways, but all development within the station areas.

We selected variables that corresponded to our goals and principles in order to determine the impact of TODs (or the lack thereof) along our fixed guideways over a five-year period.

The results of this analysis will inform recommendations made in this document to help the TOC team, and the Port Authority as a whole, get closer to accomplishing our goals and embodying our principles.

CHAPTER ENDNOTES

1 Port Authority of Allegheny County, "TOD Guidelines", p. 3

2 <https://ctod.org/pdfs/2006CommunicatingBenefitsTOD.pdf>



METHODOLOGY

METHODOLOGY

PROCESS

The analysis was done across PAAC's fixed-guideway system, which includes the East Busway, West Busway, and the Red, Blue, and Silver light rail transit (LRT) lines. Using GIS¹, we calculated the variables geographically, using the half-mile, networked walksheds around each of the stations. Walksheds represent the possible walking range within a half-mile radius of each station. Each station walkshed is unique, determined by the street networks and pathways available to pedestrians. The evaluation used the same walksheds created for the 2016 Transit-Oriented Development Guidelines and 2019 First Last Mile Plan.

The demographic, housing, mode split, and household income data came from the Census American Community Survey 5-year estimates, at the census tract level. The years 2013 and 2018 were used for this analysis, as 2018 was the most recent year available at the time. The economic employment data came from the Census Longitudinal Employer-Household Dynamics (LEHD) On the Map tool. The years 2013 and 2017 were used for this analysis, as 2017 was the most recent year available.

SOURCES

We primarily used Census American Community Survey (ACS) data to identify patterns and trends related to changes in the number of housing units, jobs, property values, and other variables that will be discussed in detail in Chapter 4. The ACS data are estimates and may not reflect the exact number of units built in this five-year period.

The Port Authority ridership data used was a mixture of automatic passenger counts on busways and manual counts on the light rail system. Both kinds of data were gathered internally for the time frames available that most closely aligned with the time frames used in the Census analysis.

Accurate data on parking construction are difficult to find in the Pittsburgh region. Aside from a student-lead study done for PAAC in 2018, it is virtually non-existent at the county level, and the City of Pittsburgh has very limited data. With the help of the Pittsburgh Department of City Planning, we gained access to parking data collected by an online permitting system, OneStop PGH. Because this system came on line in 2019, we only have a little over one year of data from May 2019 to October 2020. While this is a start, there is not enough data available to analyze any change over time in parking spaces built vs. what is required by the code.

Sustainability and public health are important as guiding principles of the TOD program at Port Authority and have measurable impacts regionally. Based on the availability of data, these metrics were primarily researched at the county level. While our analysis of these metrics cannot be directly attributed to TOD, we find them to be useful in our work moving forward. Public health data was sourced from Federal Highway Administration, Environmental Protection Agency, Group Against Smog and Pollution, Allegheny County Health Department, and the Pennsylvania Department of Health. Sustainability data was sourced from Tree Pittsburgh.

Demographics

- Age
- Race
- Total Population

Housing

- Total # units
- Housing Tenure
- Housing Cost Burden
- Average home value & gross rent

Mode Split

- Residents commute patterns in driving, public transportation, walking, biking, taxi, and working from home
- Number of workers

Economic

- Total # jobs
- Demographic Breakdown of Workers
- Industry Sectors
- Household Income

Image 4: Census Variables Analyzed

METHODOLOGY

FULL SYSTEM MAP

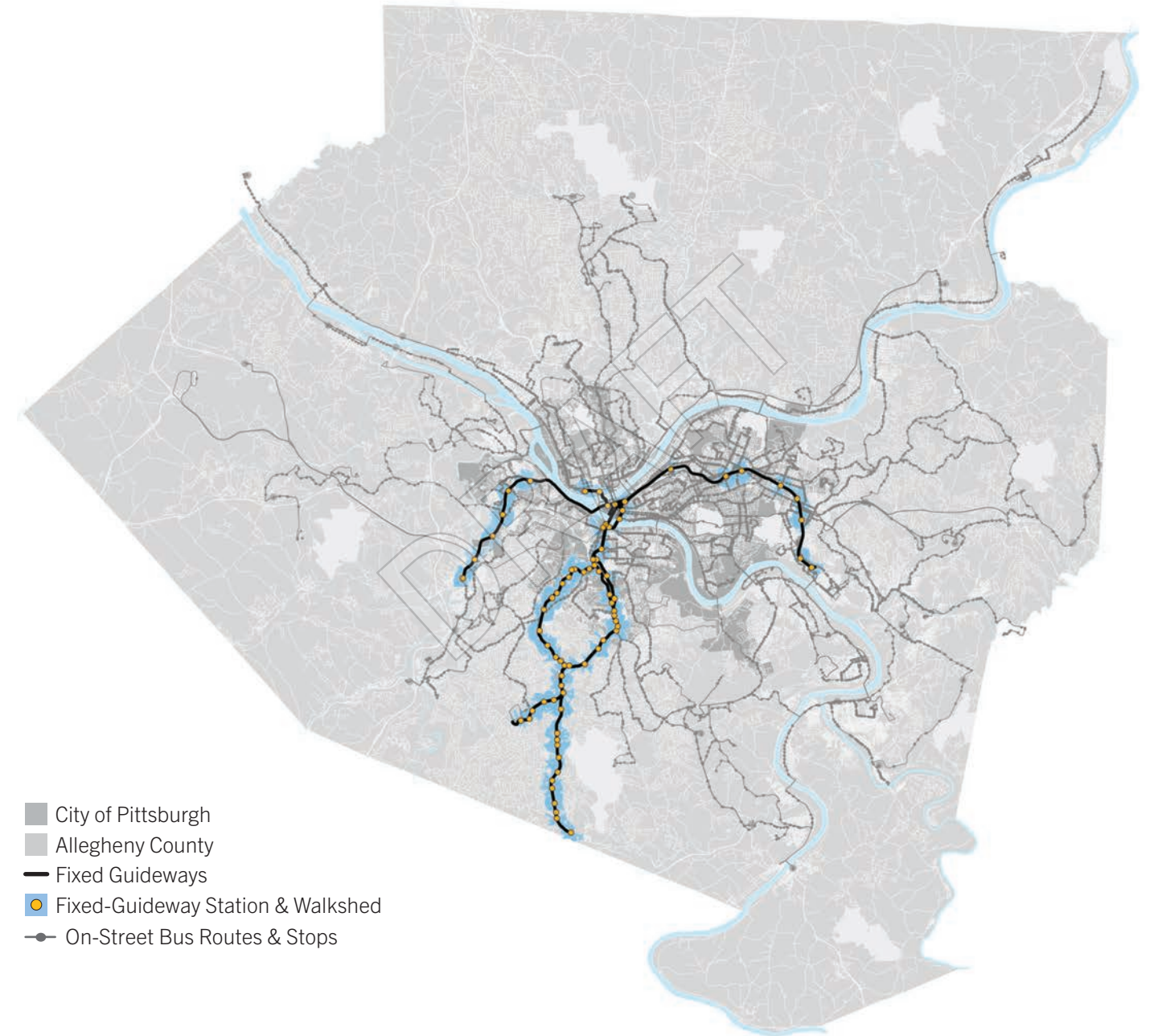


Image 5: Port Authority System Map with Half Mile Walksheds

CHAPTER ENDNOTES

1 A detailed breakdown of the GIS methodology can be found in Appendix I.

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EVALUATING TOD IMPACT

EVALUATING TOD IMPACT

The TOD program was evaluated through surveys and collaborative discussions with Port Authority stakeholders and through data analyses of the station areas.

EVALUATION SURVEY

At the start of this evaluation, the TOC team created a stakeholder survey¹, aimed at capturing local understanding of and attitudes towards TOD, as well as gathering feedback from stakeholders on the progress of the program’s goals. Through this survey, we have identified key opportunities for reflection and growth of the TOD program in Allegheny County.

Survey respondents were asked to rate their perception of the impacts, goals, and successes of TOD, as well as the biggest challenges of TOD implementation. We found that transit ridership was of high importance to the respondents. It was rated it the most important measure of TOD success, the third most important goal of the TOD program, as well as highly impacted by TOD.

The survey asked respondents to identify the most important goal of the TOD program. The top three answers were:

1. Improve the quality of life at and around Port Authority service, transforming stations from stand-alone infrastructure into assets that enhance the community in which they’re located.
2. Create and promote equitable mixed-income and mixed-use communities around transit, including access to affordable housing.
3. Increase transit ridership

The three biggest challenges to implementing TOD were identified as:

1. Lack of institutional commitment
2. Land acquisition costs
3. Insufficient density and walkability near stations

And the most important factors the respondents believed to measure the success of TOD were identified as:

1. Transit ridership
2. Pedestrian activity/pedestrian safety
3. Density of population and housing

Respondents identified, on a scale of 1-5, that TOD has the most significant impact on:

1. Transit ridership
2. Increased connections to other modes at transit stations
3. Reduced vehicle miles traveled
4. Reduced household transportation costs,

where 3 and 4 were ranked the same.

Additionally, the following are common themes that emerged as priorities for the TOD program moving forward:

- Concentration of mixed-use communities, including emphasis on potential community impact and affordable housing
- Ongoing public engagement and collaboration, including advocacy and formal integration into planning processes
- Education and promotion, including web-based and specifically for non-planners and community members
- Increased TOD implementation, particularly equitable TOD
- Land use regulations, including joint development incentives and partnerships
- Infrastructure investments and modernization

DATA ANALYSIS

In early 2020, near the five-year mark of the TOD program’s founding at the Port Authority, it was evident that reflection on the agency’s TOD goals could catalyze future growth. A system of analysis was developed to find the percentage change of what we believe to be the most informative metrics and indicators of our goals.

Indicator	What is Being Measured
Demographics	Change in population demographics allows us to see if certain groups are being impacted by development (or a lack thereof).
Housing	Cost burdened renters, vacant housing, and home value can indicate if the Affordable Housing guiding principle is being met.
Mode Split	Mode priority and multi-modal access are top priorities of TOD. Mode Split measures how people are commuting.
Economic	Supporting the creation of employment centers and other economic development engines is a goal of TOD. Development patterns can be seen by population & number of jobs in service area.
Port Authority ridership	Determines if TOD’s goal of increased ridership is being met.
Sustainability	Tree cover is an important metric to a community for several sustainability reasons, including increased stormwater absorption, improved air quality, and beautification.
Public Health	As TOD encourages more walkable communities, air quality and asthma are measurable indicators of public health.

CHAPTER ENDNOTES

1 The survey results can be found in Appendix II.

4.



RESULTS

RESULTS

The results outlined in this chapter of the report indicate the most significant findings of our data analysis¹.

DEMOGRAPHICS

This section focuses on the demographic variables of population, race, age, and household income of fixed-guideway station walksheds across our system. The goal with this analysis was to explore the extent to which these characteristics changed over time within the population. Each section begins with county-level data to illustrate if changes (or lack thereof) along a certain line were similar or different from those that occurred in Allegheny County as a whole.

Total Population and Race

The total population in Allegheny County changed very little between 2013 and 2018, decreasing by 0.11%. While this is not a significant shift, it is more positive for the region than the large population decreases we have experienced previously.

Table 1: Change in total population, Allegheny County, 2013-2018

	2013	2018	Percentage Change
Total Population	1,226,933	1,225,561	-0.11%

While the total population showed little to no change, there were some notable shifts in the racial makeup of the county. Most notably, Hispanic, Asian, and Multiracial² populations increased. White and Black populations decreased slightly, both by 1%. While the Hispanic and Asian populations remain a small percentage of the County's total population, the significant increases in these five years show progression toward more diverse communities throughout the County.

Table 2: Allegheny County Racial Breakdown, 2013-2018

Race	2013	2018	Percentage Change
Hispanic or Latino	20,358	24,925	22.43%
White	998,456	981,847	-1.66%
Black or African American	159,750	157,891	-1.16%
American Indian and Alaska Native	1,515	1,354	-10.63%
Asian	36,286	44,791	23.44%
Native Hawaiian and Other Pacific Islander	352	334	-5.11%
Some other race	4,749	5,670	19.39%
Multiracial	25,825	33,674	30.39%

The East Busway stations had notable increases in population and shifts in their racial makeup. The Downtown station areas also saw an increase in population. These two geographies also have much higher total populations in their station areas.

Along the East Busway, the Black population decreased in almost every station area, with the exception of Roslyn and Swissvale where there was an increase of about 30% in both walksheds. The most drastic decrease is in East Liberty with 34% and Penn Station with 57% (Table 3).

The change in population in the West Busway stations was little to none, with small shifts in racial patterns, including increases in the Black population at Ingram and Sheraden stations. Idlewood and Ingram both saw increases to the white population. Similarly, LRT stations saw little change in their racial breakdown, with notable exceptions at Boggs and Bon Air. The Black population decreased by 57% in both station areas, representing a loss of 208 and 185 people respectively.

Overall, the most notable changes occurred along the East Busway – showing a pattern of general population increases in almost all station areas, but a decrease in the Black population at East Liberty, and in increase in the Black population at Roslyn and Swissvale.

RESULTS

Table 3: Change in Black Population, East Busway, 2013-2018

Station Area	2013	2018	Percentage Change
East Liberty Station	419	275	-34.39%
Hamnett Station	1439	1106	-23.13%
Herron Station	105	75	-28.85%
Homewood Station	1563	1467	-6.15%
Negley Station	1398	1108	-20.73%
Penn Station	196	85	-56.53%
Roslyn Station	663	864	30.34%
Swissvale Station	720	961	33.50%
Wilkinsburg Station	1421	1281	-9.84%

Age

In areas with higher TOD activity and high levels of development, we see the demographics shifting younger, whereas in more suburban areas with less development, we see an older average median age. At the county level, the average median age remained around 41 years old between 2013 and 2018. Of note, the average median age Downtown is increasing but is comparable to the average median age on the East Busway.

The average median age on the East Busway is about 36 years old, with the biggest shift in the East Liberty Station walkshed. The median age has only changed a bit, but overall, the people living along the East Busway are getting younger.

The average age on the West Busway is 38.5, which is right between the East Busway and the light rail system. Overall, we primarily see increases in the 65-84 years age bracket.

The average median age on the LRT System is about 40 years old, however the Downtown walksheds skew younger. After removing the Downtown walksheds, the average median age along the LRT becomes 42. While the shifts are minimal, overall, we see an increase in age, particularly in the Allegheny and North Side station walksheds. Notably in these aforementioned walksheds, the average median ages were early twenties in 2013, but increased to be mid-thirties in 2018.

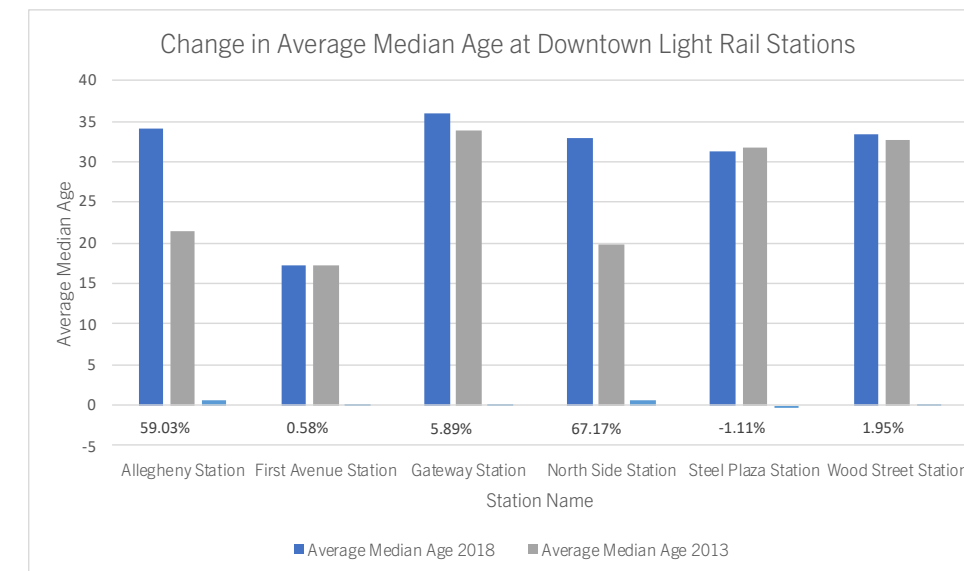


Figure 1: There were significant changes in the average median age at Downtown Light Rail Stations. The chart shows the percentage change at the station between 2018 and 2013. All stations besides Steel Plaza Station saw an increase in the average median age, most drastically at Allegheny and North Side station walksheds. The average median age is the highest in the Gateway Station walkshed, at 36 years old in 2018, approximately four years less than the county average.

RESULTS

Household Income

The analysis revealed shifts in the average household median income on the East Busway. Every station saw an increase in average median income, though it was most dramatic at Herron and Homewood Station, with an average increase of about \$24,000 and \$16,000 respectively. Overall, on the East Busway we see a 23% increase in average median income during the 5-year time frame, a difference of about \$8,640.

Along the West Busway and LRT, we are seeing similar increases of average median income, though not by nearly as much. The county data show an increase of about 14% over the five years, so while the East Busway is above the county average, the West busway and LRT are about the same.

Although the light rail did not see significant changes average household income, the number of total households at the Downtown station walksheds increased by about 30-40% in the 5-year period.

Table 4: Change in Average Household Income, Median Income (dollars), 2013-2018

Geography	2013	2018	Percentage Change
Allegheny County	\$51,366	\$58,383	13.66%
East Busway	\$37,682	\$46,324	22.93%
West Busway	\$48,671	\$55,340	13.70%
Light Rail	\$56,709	\$63,135	11.33%

HOUSING

Household Units, Occupancy, and Tenure

Countywide there was a very small increase in the total number of housing units (2%). The number of occupied units only increased 2%, and the number of vacant housing units decreased 3%. There was a small increase in the number of renter-occupied housing units of 5%, and a decrease in owner-occupied units of 2%.

Table 5: Change in Housing Units, Allegheny County, 2013-2018

Housing Units	2013	2018	Percentage Change
Total Units	588,644	598,424	1.66%
Owner-Occupied	212,892	209,601	-1.55%
Renter-Occupied	169,743	177,847	4.77%

Along the East Busway, there were no major percent changes in the number of total housing units. Small increases were present at East Liberty and Hamnett, and small decreases at Herron and Roslyn. This is somewhat deceptive. Even though the percent increase at East Liberty is small, it has the highest total increase of units in any station area at 218. The tables below show the change in number of units in East Liberty compared to stations along the West Busway. This illustrates how the difference between the number of units and change in units can drastically differ across lines.

RESULTS

Table 6: Change in number of housing units, East Busway, 2013-2018

Station Area	2013	2018	Percentage Change
East Liberty Station	2903	3121	7.51%
Hamnett Station	2480	2662	7.34%
Herron Station	509	474	-6.91%
Homewood Station	1402	1454	3.68%
Negley Station	4353	4300	-1.22%
Penn Station	472	635	34.41%
Roslyn Station	1029	979	-4.83%
Swissvale Station	799	792	-0.83%
Wilkinsburg Station	1095	1110	1.30%

Table 7: Change in number of housing units, West Busway, 2013-2018

Station Area	2013	2018	Percentage Change
Bell Station	330	322	-2.13%
Carnegie Station	1026	1015	-1.13%
Crafton Station	1390	1380	-0.74%
Idlewood Station	555	544	-2.02%
Ingram Station	1150	1136	-1.23%
Sheraden Station	922	937	1.68%

The number of owner-occupied units decreased across all East Busway walksheds, while renter-occupied units increased in all but Herron.

Along the West Busway, there was very little change in the total number of units and occupancy rates. All station areas had more owner-occupied units than renter-occupied, with the exception of Sheraden.

RESULTS

Table 8: Change in Vacancy Rates, Silver and Red lines, 2013-2018

Station Area	2013	2018	Percentage Change
North Side Station	120	46	-61.44%
Allegheny Station	203	81	-60.02%
South Hills Village Station	26	13	-48.49%
Dorchester Station	42	22	-47.67%
Bethel Village Station	73	38	-47.38%
Arlington Station	28	48	68.71%
Willow Station	48	91	87.85%
Castle Shannon Station	28	53	91.59%
Overbrook Junction Station	38	74	96.15%
Mt. Lebanon Station	61	148	142.26%

There was little change in the total number of housing units along the LRT lines outside of Downtown. There were big percent changes in vacancy rates across the rail system: both increases and decreases; however, this is because of a relatively low number of total vacant units. The table below shows the top five station areas with the biggest percent increases in vacancy rates, and the bottom five station areas with the biggest percent decreases in vacancy rates. While percent changes are high, the actual number of units is relatively small.

Downtown saw the most drastic increase in housing units with every station seeing an increase of over 30%. Wood Street saw a significant increase in occupied units (45%), and a significant decrease in vacant units (60%). First Avenue, Gateway, and Steel Plaza all had increases in vacant housing units, the most notable being Gateway with an increase of 68%. There was very little change in the number of occupied units. This might suggest that new housing built near First Avenue, Gateway, and Steel Plaza is not being filled up at the same rate as the new housing being built around Wood Street.

Owner-occupied units increased by 39% at Wood Street, while renter-occupied units also increased by 55%. Owner-occupied units decreased at all other stations, and renter-occupied units decreased at both Gateway and First Avenue by 18%.

Residential Property Value

An economic impact study completed in 2018 for PAAC showed that housing located near the busways, light rail stations, and other frequent service had higher property values than housing located elsewhere. The study found that housing in the east and west near the busways was between 6% and 20% more valuable than property not near transit, and that housing along LRT lines in the southern part of the county was between 3% and 14% more valuable than housing not located near transit. Our analysis showed a similar pattern of increasing residential property values in walksheds along the East and West Busways and LRT³.

Across Allegheny County, both median home value and median rent increased. Median home value increased by 21%, and Median rent increased by 15%.

Table 9: Change in Median Home Value and Rent, Allegheny County, 2013-2018

Variable	2013	2018	Percentage Change
Median value (dollars) Owner-Occupied Units	\$122,400.00	\$147,700.00	20.67%
Median Rent (dollars)	\$751.00	\$865.00	15.18%

RESULTS

Table 10: Average Change in Median Home Value and Rent by line, 2013-2018

Line	Average Difference in Median Home Value	Average Difference in Median Rent
East Busway	27.39%	19.34%
West Busway	11.61%	7.8%
Light Rail	23.71%	15.38%

Table 9 shows the average increase of median rent and median home value by line. Every line showed significant increases in both. Along the East Busway, median home value increased in every walkshed except Wilkinsburg, which had a marginal decrease of 1.3%. East Liberty experienced the biggest increase by 42%.

Median rent increased in all walksheds, most drastically in Homewood (30%) and East Liberty (26%), least drastically at Wilkinsburg with less than 3% change.

All West Busway station areas saw an increase of their median home values by between 10 and 13%. Median rent increased at Crafton and Ingram by 17% and 13%, respectively, and 10% at Sheraden.

Along rail lines, home values increased in every single station area by quite a lot. Only four station areas' median home values increased by single digits (Belasco, Dorchester, Beagle, Casswell). Top five were Shiras (81%), Stevenson (78%), St. Anne's (68%), Library (43%), and Station Square (36%).

Most station areas along LRT lines saw increases in rent, and only five (Fallowfield, Overbrook Junction, Allegheny, Westfield, and South Park) saw decreases.

Downtown station areas saw striking increases in both home value and rent. Values increased in all station areas, with the most notable increase at Wood Street (86%). Median rents increased at all station areas by double digits except Gateway. The highest increase was 56% at Steel Plaza.

Household Cost Burden

Housing cost burden is measured by the percentage of a household's income that is paid toward housing expenses. If a household pays over 30% of its income to housing, it is considered to have housing cost burden. We looked at data for households that rent their homes as well as those that own them. We are using this variable as a measure of affordable housing need and availability.

The county saw a 3% decrease in renters paying over 30% of their income to housing, but a 3% increase in those paying over 35% of their income to housing. This suggests that the overall number of housing cost burdened households is increasing, and that more households are paying more toward housing costs than they were previously.

There was a 27% decrease in housing cost burdened owners paying over 30%, and a 17% decrease in those paying over 35%.

Along the East Busway, Roslyn (47%) and Swissvale (58%) had drastic increases in housing cost burdened renter households, and East Liberty had an increase of nearly 50%, the largest increase in the number of housing cost burdened renters (366). There was a considerable decrease at Herron (-31%). Herron was also the only station area to see a reduction in total rented units, suggesting that the rental units lost were those experiencing housing cost burden.

Housing cost burdened owner households decreased in every walkshed, with the most drastic being Swissvale (-57%), Roslyn (-52%), Hamnett (-44%), and East Liberty (almost -39%).

RESULTS

Table 11: Change in Housing Cost Burdened Renters, East Busway, 2013-2018

Station Area	2013	2018	Percentage Change
East Liberty Station	734	1100	49.82%
Hamnett Station	584	625	7.11%
Herron Station	101	70	-31.12%
Homewood Station	328	297	-9.66%
Negley Station	1305	1431	9.66%
Penn Station	122	155	27.83%
Roslyn Station	177	261	47.02%
Swissvale Station	136	216	58.27%
Wilkinsburg Station	275	255	-7.31%

Along the West Busway overall, the number of homeowners paying more than 30% of their income to housing costs is relatively low in all station areas, with no substantial changes over time. For renters, there were notable increases at Crafton (37% increase or 56 units) and Sheraden (15% or 27 units). A notable decrease occurred at Carnegie (28% or 65 units). While these numbers are all in the double digits (as opposed to triple digits seen along the East busway), they are notable because the overall number of units in these station areas is relatively small.

Most LRT station areas saw significant decreases in the number of owner-occupied units paying over 30% of their income to housing costs, in line with the countywide trend. 18 stations out of 54 saw increases, while the rest decreased. Where increases did occur, several including South Hills Junction (44%), South Hills Village (34%), and Hillcrest (26%) were notable. A similar pattern occurred with housing cost burdened renters, with the most notable exception being an increase of 44% or 54 households at Allegheny Station.

Summary

Our data analysis has revealed overall trends across the system showing little change where TOD activity has not occurred and shifts in demographics, job opportunity, housing cost burden, and economic growth in areas where development has occurred. Particularly, the East Busway has seen significant development over the past 5 years and through the analysis of this 5-year time frame, it is clear TOD supports increased transit use, total housing and occupied housing units, and median income. This analysis shows us that where TOD does occur, significant shifts in the housing market can occur, particularly when it comes to the number of housing cost burdened households. It also shows that property values increase at greater than average rates, in line with the findings of PAAC's economic impact study. Encouraging Equitable TOD (ETOD) in station areas along the West Busway and at certain LRT stations could help these areas reap the positive benefits TOD can bring, while minimizing the negatives.

The analysis has also revealed a dramatic decrease in the Black population and increases in the white and Asian populations. While certain walksheds have seen an increase in the Black population, it is accompanied by a decrease in the white population. In areas with less TOD activity, like the West Busway, demographics are still shifting, but there are minimal other changes associated with the benefits of TOD. This trend emphasizes the need to center TOD policies and opportunities around racial, economic, and social equality.

EMPLOYMENT

This section is focused on individuals who work in Allegheny County – not those who live there. It should be noted that we looked at 2013 and 2017 for this data, as the 2018 data was not yet available when we completed this analysis.

Total Number of Jobs, Earnings, and Sectors

The total number of jobs in the County changed very little between 2013 and 2017, increasing by about 1%.

RESULTS

Table 12: Change in total number of jobs, Allegheny County, 2013-2017

	2013	2017	Percentage Change
Number of Jobs	720,054	727,603	1.05%

Jobs earning more than \$3,333 a month increased by 11%, jobs making less than that per month decreased by about 14%.

The employment sectors that employ the most people county-wide are Healthcare, Finance and Insurance, and Retail Trade.

Changes in the numbers of workers occurred in several sectors, including Increases in Construction (13%, or 3,408 jobs), Utilities (12% or 518 jobs), Transportation and Warehousing (7% or 1,576 jobs).

There were decreases in Mining/Quarrying, Natural Gas Extraction (32% or 1,117 jobs), Wholesale Trade (12% or about 3,000 jobs), and Admin/Support, Waste Management (7% or 3,278 jobs).

Along the East Busway, the two most dramatic increases in the number of jobs are around Homewood and Negley. Homewood lost a high number of jobs (-59%), while Negley saw a 55% increase in the total number of jobs. Many of these were in the Administration & Support of Waste Management and Remediation. The only industry where Homewood gained jobs was in Transportation and Warehousing – every other category saw job losses between 2013 and 2017.

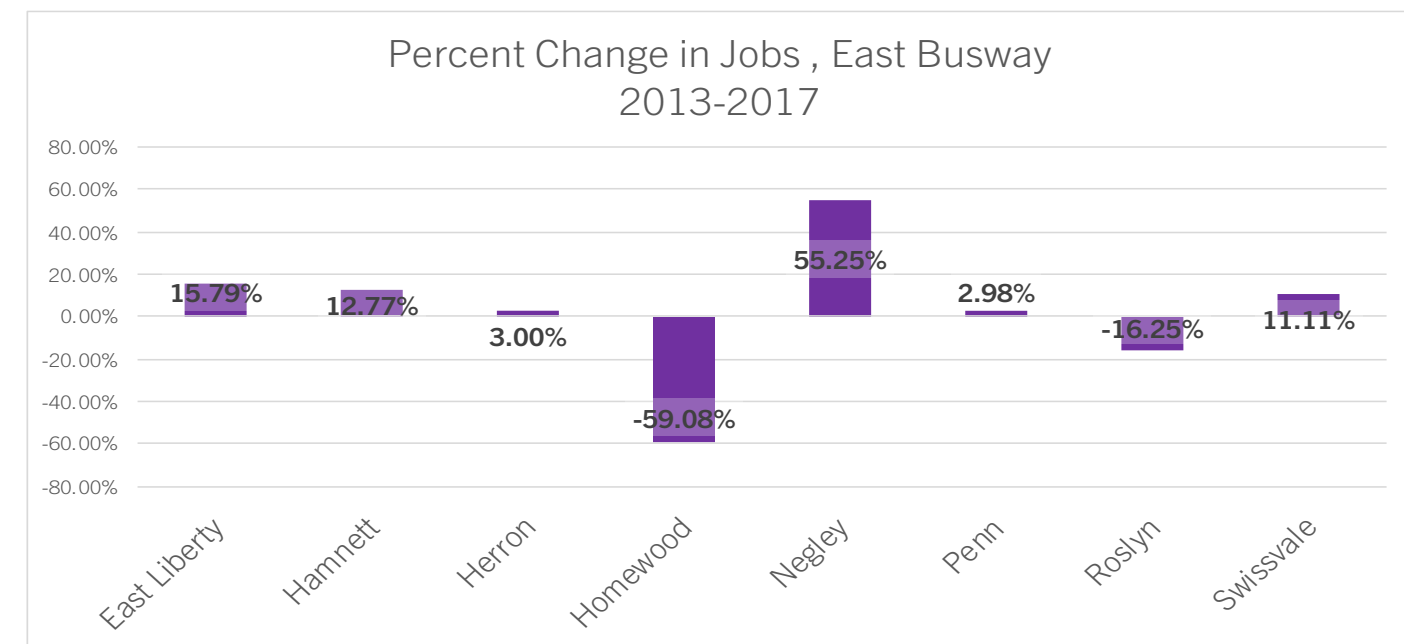


Figure 2: This graph shows the percentag change of jobs in the East Busway walksheds. Negley Station shows the largest increase of 55% and Homewood Station shows the largest decrease of 59%. While there was a change in the number of jobs, the job sectors in the East Busway also saw shifts between the years 2013 and 2017. Changes in these walksheds illustrate the ongoing activity on the busway.

In East Liberty and Negley, jobs of all wages increased. In other station areas, earnings increased or decreased at similar rates to the overall number of jobs. In other station areas where jobs increased, wages also increased. In station areas where the number of jobs decreased, wages also decreased.

There was a shift in major employment sectors from Wholesale Trade/Manufacturing jobs to “tech” industry jobs like Professional, Scientific, and Technical Services (especially around Herron and Negley). Accommodation and Food Service is higher in emerging areas like Herron (which includes part of the Strip District), Negley, and East Liberty. Health Care and Social Assistance account for many jobs in Negley, East Liberty, and Wilkinsburg. There was also a major increase (69%) in these types of jobs around Hamnett Station. Retail Trade saw large increases in Negley and East Liberty, but a substantial decrease (70%, from 231 jobs to 69) in Roslyn.

The over-arching theme for West Busway employment is that not much changed. The biggest increase was at Carnegie with 4% or 65 jobs, and the biggest decrease at Sheraden with 9% or 73 jobs. Carnegie has the most jobs of any station area with 1,686 in 2017. Carnegie also showed a 43% increase in jobs making more than \$3,330 per month, and a decrease in other jobs making below that amount.

RESULTS

The LRT station areas were analyzed in clusters. Unsurprisingly, the North Shore, Station Square, and Downtown clusters have the most jobs and saw the most notable changes. Stations along the Silver and Red lines have very few jobs for spanning such a large area and saw very small changes. Some key takeaways from these clusters are below.

Downtown

- Almost no change to the total number of jobs (-0.19%)
- Decrease in jobs making below \$3,333 a month (-16%)
- Jobs making above \$3,333 make up 61% of the share of total jobs Downtown.
- Biggest employment sectors are Finance/Insurance, Professional/Scientific and Technical services, and Management of Companies and Enterprises. First two increased slightly, Management jobs decreased.
- 30% increase in jobs in Mining, Quarrying and Oil and Natural Gas Extraction (adding 153 jobs)
- 71% decrease in Wholesale Trade (loss of 660 jobs)
- 47% decrease in Retail Trade (loss of 889 jobs)
- 20% increase in Accommodation and Food Services (adding 1,124 jobs)

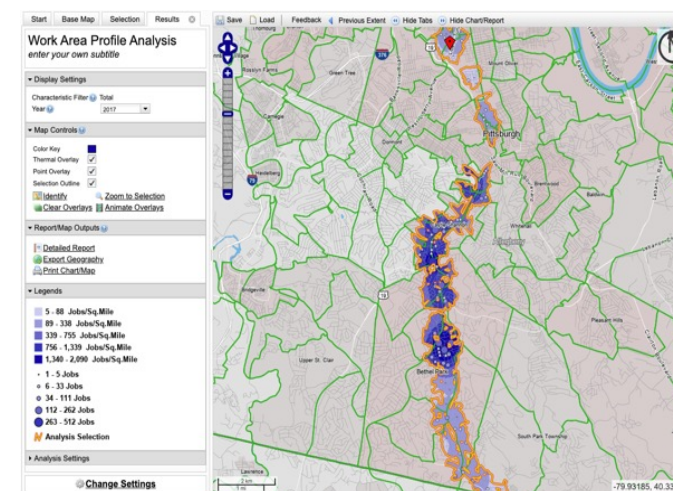
North Shore

- A total of 9% decrease in jobs between the two years -- a loss of 886 jobs
- 34% decrease in the number of jobs making between \$1,250 and \$3,333 a month, but only a 2% decrease in those making over \$3,333 a month
- Jobs making over \$3,333 a month make up the majority of the work force on the North Shore, showing that the jobs lost were more middle class.
- Food Service/Accommodation and Arts/Entertainment/ Recreation are biggest employment sectors, and gained jobs (16% and 14%, respectively).
- The biggest job sector loss was in Health Care (-376%) going from 1,996 in 2013 to 419 in 2017.

Station Square

- 50% loss in total jobs (from 3,932 to 1,913)
- 90% decrease in Educational Services (loss of 2,088 jobs)
- 50% decrease in Accommodation and Food Services (174 jobs)
- 400% increase in Wholesale Trade (Adding 92 jobs)
- 37% increase in Management of Companies & Enterprise (156 jobs)

RESULTS



Silver Line (South of Station Square)

- 2% increase in jobs, addition of 116 jobs
- Wages are split almost evenly across earnings brackets
- Main employment sectors are Construction (42% increase), Retail Trade (27% increase), Accommodation and Food Services (6% increase).
- Losses in Information (57% or 57 jobs), Transportation & Warehousing (25% or 76 jobs), Professional, Scientific, and Technical Services jobs (25% or 57 jobs).

Image 6 (left): Job Distribution, Silver Line, 2017

Red Line (South of Station Square)

- 1% increase in jobs, an addition of 122 jobs
- Increases in Real Estate/Rental/leasing (52% or 42 jobs), Healthcare (23% or 339 jobs), Public Administration (230% or 233 jobs)
- Decreases in Wholesale Trade (44% or 98 jobs), Finance/Insurance (23% or 94 jobs), Waste Management (15% or 128 jobs).

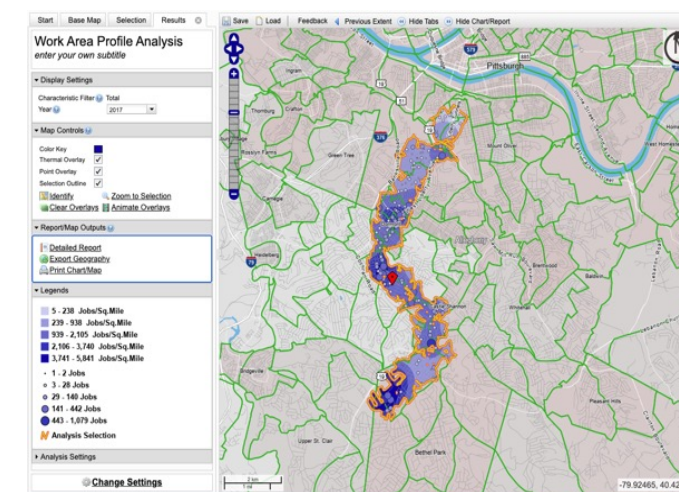


Image 7 (right): Job Distribution, Red Line, 2017

Summary

The most dramatic shifts in employment occurred along the East Busway, with a clear shift away from manufacturing sectors to tech-based sectors and hospitality. In keeping with the trend for other variables, little changed along the West Busway with regard to jobs, and very few people are employed in those station areas generally.

North Shore and Station Square saw notable changes in the number of jobs, as well as shifts between sectors. This makes sense given the large amount of office space that has been built in these areas in the last decade. Interestingly, Downtown showed little change in the actual number of jobs, but big shifts in employment sectors.

RESULTS

Service Area Population and Jobs

The Guide to Joint Development for Public Transportation Agencies (2021) summarized a variety of conceptual metrics for joint development outcomes, including the percentage of a region's housing and jobs within a half-mile of transit. In the Port Authority of Allegheny County's annual service report, these metrics are shown within the service area, in order to understand development patterns. This analysis is done for the entire service area, so is not able to be compared to other data within this report that only considers the walksheds in the fixed guideway system.

The 2020 Annual Service Report states that "providing effective transit services means providing services that maximize access to the variety of destinations around Allegheny County. This includes not only residents and jobs, but also medical institutions, shopping, cultural centers, places of worship, parks and recreational areas, and other community assets. The Port Authority defines effectiveness in a variety of ways - on a system level, this includes looking at how many residents and jobs are accessible to transit within a reasonable walking distance (the walkable service area)" [as well as on-time performance and crowding].

The service area is defined as those who live within a half-mile of all transit service. When considering weekday service between 2015 and 2020, there are very small changes in the overall service area, with a decrease of only 7.5 square miles. Both population and jobs increased very slightly at the county level but with slight decreases within the weekday service area. The population decreased by 53,3000 people and jobs decreased by 39,000.

These are not substantial percentage changes, but do reveal that overall job growth in Allegheny County is occurring outside the Port Authority service area. This analysis exemplifies the need for further TOD, showing that development near and around transit greatly effects successful access to jobs. The principles of TOD extend beyond the fixed guideway system and can increase the density of employment and housing opportunities.

Table 13: Service Area Population and Jobs, 2015

Service Days	Service Area		Population		Jobs	
	Total (miles ²)	Percent of Total	Total	Percent of Total	Total	Percent of Total
Five Day Service Walkshed	121.0	16.2%	546,078	44.6%	404,821	57.8%
Six Day Service Walkshed (No Sunday Service)	83.2	11.2%	457,746	37.4%	370,754	52.9%
All Days Service	81.7	11.0%	428,046	35.0%	362,524	51.8%
All of Allegheny County	745.0	-	1,223,348	-	700,358	-

Table 14: Service Area Population and Jobs, 2020

Service Days	Service Area		Population		Jobs	
	Total (miles ²)	Percent of Total	Total	Percent of Total	Total	Percent of Total
Five Day Service Walkshed	113.33	15.2%	492,707	40.2%	365,854	50.7%
Six Day Service Walkshed (No Sunday Service)	88.81	11.9%	437,774	35.7%	344,143	47.7%
All Days Service	83.28	11.2%	410,286	33.5%	336,395	46.6%
Frequent Service	30.59	4.1%	232,871	19.0%	274,384	38.0%
All of Allegheny County	745	-	1,225,561	-	721,175	-

RESULTS

Table 15: Difference in Service Area Population and Jobs, 2020- 2015

Service Days	Service Area		Population		Jobs	
	Total (miles ²)	Percent Change	Total	Percent Change	Total	Percent Change
Five Day Service Walkshed	-7.67	-6.34%	-53,371	-9.77%	-38,967	-9.63%
Six Day Service Walkshed (No Sunday Service)	5.61	6.74%	-19,972	-4.36%	-26,611	-7.18%
All Days Service	1.58	1.93%	-17,760	-4.15%	-26,129	-7.21%
All of Allegheny County	0	0.00%	2,213	0.18%	20,817	2.97%

TRANSPORTATION

Port Authority Ridership

Based on the availability and accuracy of data, ridership was calculated for the years 2014 and 2018. Ridership was steady between those 4 years, with minimal increases on both the West and East Busway. The East Busway has significantly higher ridership than the West Busway, by an average of about 14,000 rides in 2018. In 2018, the average weekday ridership on the West Busway was about 4,270 rides and the East Busway had an average weekday ridership of about 18,350 rides. Our analysis findings support that historically dense, walkable, mixed use areas with higher TOD activity, like the East Busway, are areas with higher transit ridership.

Although the change was minimal, all six stations on the West Busway did see an increase in ridership between 2014 and 2018. On the East Busway, ridership has been steady over the same time period with minimal increases and decreases. At East Liberty Station, where there has been significant TOD activity over the last five years, we saw a small increase of just over 400 rides. East Liberty Station has the second highest ridership over both busways, after Wilkinsburg Station, therefore drastic increases in ridership over a five year span would not be expected.

In 2018, the average weekday ridership for the entirety of the light rail system was approximately 74,350 rides. The earliest data for rail ridership available is the weekday onboarding data for 2015. When comparing the onboarding data between 2015 and 2018, there is a 16% increase in light rail ridership in 2018, an increase of about 5000 average weekday rides. It is important to note that the light rail system does not have automatic passenger counters, so ridership is extrapolated from manual counts. This makes rail ridership data less reliable and more difficult to compare to the busway ridership data.

Table 16: Change in Port Authority Ridership by Line

Line	2014	2018	Difference	Percent Change
East Busway	17,837	18,351	514	2.88%
West Busway	3578	4271	693	19.36%
Light Rail ¹	31098	36096	4998	16.07%

¹ Ridership for Light Rail compares 2015 data, instead of 2014

RESULTS

Mode Split

Mode split is the percentage of workers who commute by various modes as defined by the Census. Those modes include driving (both alone or carpool), biking, walking, taking public transportation, a taxicab or other means, or workers who work from home. These data examine how people living in the walkshed commute to work but do not show where they are commuting to.

Overall, an analysis of these data have revealed that the largest changes in commute patterns happened along the East Busway and Downtown, with shifts in walking, driving, and public transportation. The most significant changes in mode split occurred on the East Busway, whereas the West Busway changed minimally over the five-year period. However, of note on the West Busway, there was a significant increase in driving in the Carnegie Station area of about 17%.

At the county level, mode split has not changed much, with minimal decreases in driving (about 1%) and walking (about 4.5%) and a minimal increase in public transportation (about 1%). Of note, the county saw about a 38% increase in working from home and 20% increase in biking.

The analysis shows a small increase of total workers along the East Busway, with the most being at Negley Station. The commute patterns of workers walking and taking public transit in the Negley Station walkshed changed drastically, with a significant decrease in walking and increase in public transit use. We can assume that there are fewer workers living near employment in this walkshed, since walking has decreased.

Along the East Busway, driving alone saw an increase, and carpooling a decrease, though the difference in numbers is very small. Notably, Herron Station was the only station that decreased in driving alone but increased in carpool. Despite small increases in driving along the East Busway overall, the percentage of those who drive is much larger than any other mode. For example, of the 3,381 workers in East Liberty, about 1,760 of them drive (either alone or carpool).

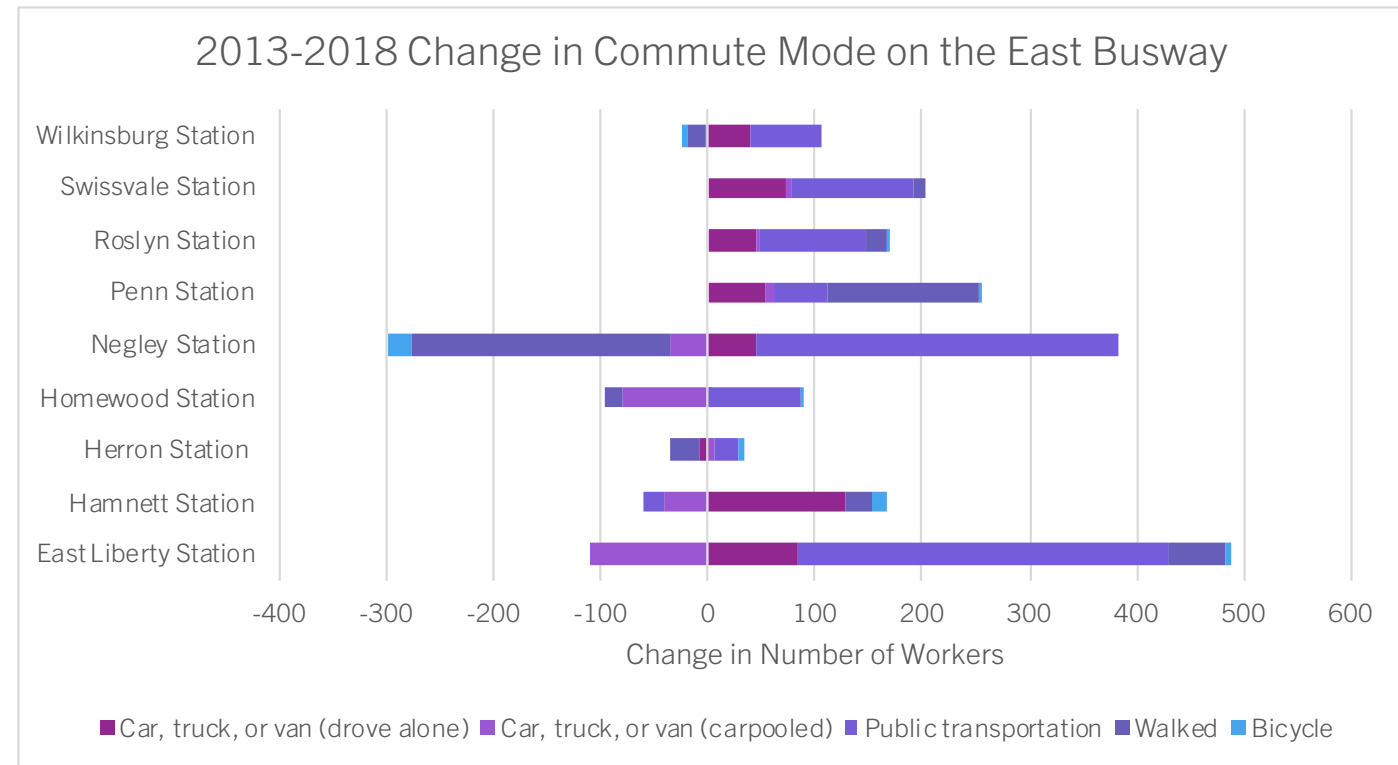


Figure 3: Mode split on the East Busway primarily saw changes in public transportation, walking, and carpooling between 2013 and 2018. However, we also see small changes in those living in the Wilksburg Station, Roslyn Station, Negley Station, and Hamnett Station walksheds who commuted via bicycle. The numbers in figure 3 indicate the change in the number of people who commute and their respective mode choice between 2013 and 2018.

RESULTS

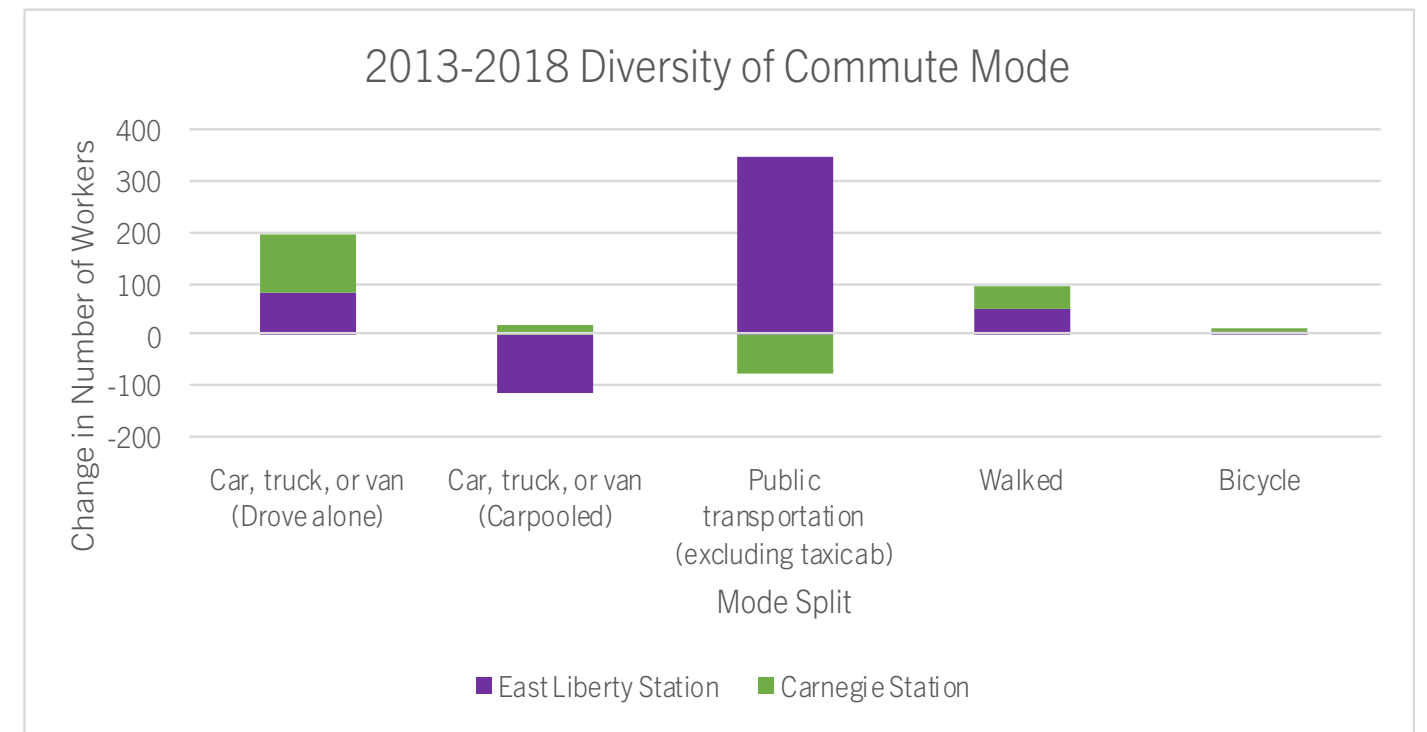


Figure 4: Shows mode split for those living in the East Liberty Station and Carnegie Station walksheds. The comparison of these stations exemplifies the stark diversity of commute mode, particularly between the two busways. We see a significant increase in public transportation at East Liberty Station and a decrease at Carnegie Station. Additionally, see a small increase in carpooling at Carnegie Station and a decrease at East Liberty Station. In contrast to the diversity of driving and public transportation, walking and biking is comparable at the two stations.

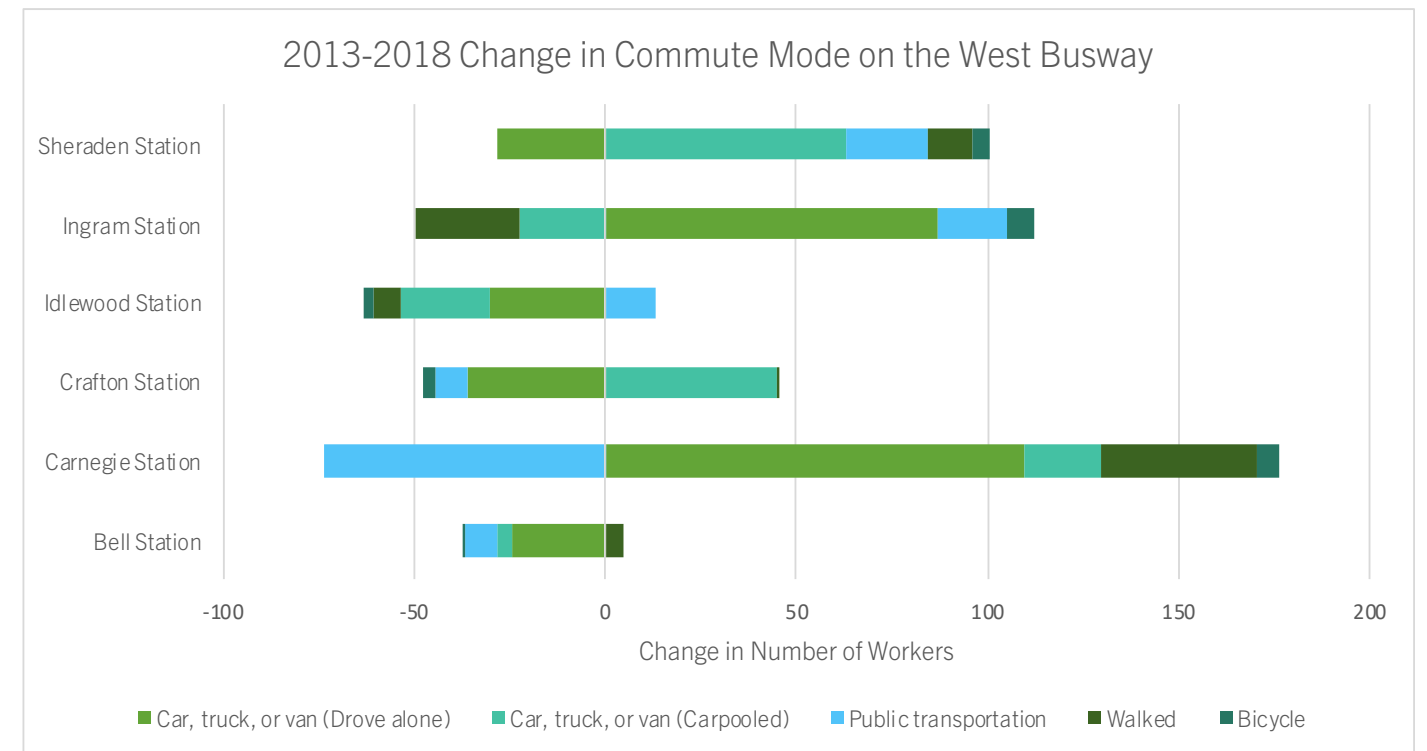


Figure 5: Mode Split on the West Busway saw shifts in public transportation, walking, and driving. The largest shift occurred in the Carnegie Station walkshed, but Sheraden and Ingram Station walksheds also saw changing commute modes.

RESULTS

Additionally, Downtown, the analysis reveals significant increases of driving, both alone and carpooling. However, walking in the downtown areas also increased, seeing the most change in walking commutes across the entire rail system. For the majority of the rail station walksheds, commute patterns did not change with any significance. Dormont Station walkshed saw a notable decrease of public transit commutes, while Dorchester Station walkshed saw a similar level of increase.

SUSTAINABILITY

Tree Cover

Tree cover is important to a community for several reasons, including increased stormwater absorption, improved air quality, and beautification. Increased tree cover can also contribute to a reduction in the urban heat island effect, lessening the amount of energy that nearby buildings must expend on cooling.

Tree Pittsburgh published a tree canopy survey report in 2018 that analyzed the change in the tree canopy of Allegheny County between 2010 and 2015. The report showed that canopy cover in the county declined from 265,257 acres or 56 percent in 2010, to 255,109 acres or 54 percent in 2015⁴. While three to five percent of the loss can be attributed to natural causes such as aging, disease, and pests, the remaining canopy loss (approximately 9700 acres) is attributed to man-made losses.

As of this writing, Tree Pittsburgh is working on an update to this analysis that will compare 2020 data to 2010 and 2015, which is expected to be available in 2022. While the results of this are still pending, there are some positive steps being taken to increase tree cover. The City of Pittsburgh's Shade Tree Commission published their Equitable Street Tree Investment Strategy in early 2021. Specific timelines and metrics are laid out to accomplish their overall goal of increasing the tree canopy of 10 targeted neighborhoods by 20% by the end of 2022⁵. Given this, we expect the new data from Tree Pittsburgh to show a slowing of the negative trend of tree canopy loss.

PUBLIC HEALTH

Air Quality and Asthma

Transportation modes are sources of air pollution and these environmental impacts are crucial in evaluating the health of our communities. Toxins in the air pose greater risks in urban areas because of increased emissions and larger populations, causing a variety of environmental concerns and public health concerns, such as asthma⁶. Because it is challenging to understand the source of air quality, we were unable to evaluate it at the scale of Port Authority station walksheds.

At a national level, the Federal Highway Administration released data showing that as a result of the pandemic, vehicle miles traveled (VMT) in the United States dropped by 13.2% between 2019 and 2020, equating to an approximate reduction of 170 million metric tons of carbon dioxide emissions⁷. We see here, as an example, that a reduction in driving can result in significantly cleaner air, emphasizing the need to reduce single-occupancy vehicle use to achieve sustainability goals. Regionally, Allegheny County has multiple sources to understand air quality, including Group Against Smog and Pollution (GASP)⁸ and the Allegheny County Health Department (ACHD)⁹.

ACHD prioritizes air quality as one of the region's most critical public health challenges. In 2019, the annual air quality report was released¹⁰ and measured 138 good days, 212 moderate days, 11 days that were unhealthy for sensitive groups, and 4 unhealthy days, based on the Air Quality Index (AQI). Additionally, The Pennsylvania Department of Health has an information exchange tool, EDDIE¹¹, that measures ozone and PM2.5. Overall, as a region, we did not see a noticeable change in air quality between 2013 and 2018.

RESULTS

Table 17: Number of Days with Ozone Levels over NAAQS, 2013- 2018

County	Year(s)	Number of days with ozone levels over the National Ambient Air Quality Standard (NAAQS)	Number of person-days with ozone levels over the National Ambient Air Quality Standard (NAAQS)
Allegheny	2018	8	9,747,616
Allegheny	2013	7	8,620,689

Table 18: Annual Average Ambient Concentration of PM_{2.5} 2013- 2018

County	Year(s)	Annual average ambient concentration of PM _{2.5}
Allegheny	2018	11.52
Allegheny	2013	11.98

These tables showing the number of days with hazardous ozone levels and number of days over the annual average ambient concentration of PM2.5 were generated using the PA Department of Health's EDDIE tool. Per the website, "These data were provided by the Pennsylvania Department of Health. The Department specifically disclaims responsibility for any analyses, interpretations, or conclusions."

As mentioned, there is a correlation between air quality and public health concerns, such as asthma. It is one of the most common diseases in children, but it also affects many adults nationwide. Symptoms are often the result of inhaled allergens, including traffic pollution. In Allegheny County, the ACHD reports that 9% of adults have been diagnosed with asthma by a healthcare professional, 1% lower than the Pennsylvania value of 10% and almost 6% lower than the national value of 14.7%.

KEY FINDINGS

One clear theme emerged from our data analysis: there is simply not much change over time in areas where TOD did not occur. Very few shifts in population, number of jobs, and commuting patterns occurred where little to no new development happened between 2013 and 2018. However, where development has occurred, evidence of displacement and decreasing housing affordability was significant.

The East Busway corridor saw the most notable increases in development out of any other during the time period between 2013 and 2018. As a result, the East Busway stations show more change over time than others, excluding the Downtown stations. This includes positive changes like an increase in the number of jobs and general population. However, increases in households experiencing housing cost burden and decreases in the Black population show signs of longtime residents being displaced. Little to no TOD occurred along the West Busway or Red and Silver lines during this time period, and the mostly static nature of our data illustrates that.

What's clear is that the absence of TOD promotes the status quo, and the presence of TOD without an equity lens promotes displacement. While taking the time to acknowledge these changes, this analysis used station area development as a proxy for TOD, rather than evaluating individual projects. However, in order to live up to the principles, goals, and values we have set for ourselves as an agency, we still must find a way to encourage more equitable transit-oriented development (ETOD).

CHAPTER ENDNOTES

1 Tables in these sections represent the most significant findings. Tables for all variables are made available as excel files.

2 This category combines several Census categories representing two or more races.

3 EConsult Solutions, Inc. "Port Authority of Allegheny County Economic impact Study," 2018.

4 <https://www.post-gazette.com/local/city/2018/02/27/Tree-canopy-loss-significant-flooding-landslides-pests-development-ash/stories/201802270136>

5 https://apps.pittsburghpa.gov/redtail/images/13230_final_Equitable_Street_Tree_Investment_Strategy_-_2_24_21_-_apc.pdf

6 <https://www.epa.gov/mobile-source-pollution/how-mobile-source-pollution-affects-your-health>

7 <https://cms8.fhwa.dot.gov/newsroom/us-driving-last-year-was-lowest-two-decades-new-data-show>

8 <https://gasp-pgh.org/>

9 <https://www.alleghenycounty.us/Health-Department/Programs/Air-Quality/Air-Quality.aspx>

10 <https://www.alleghenycounty.us/Health-Department/Resources/Data-and-Reporting/Air-Quality-Reports/Air-Quality-Reports-and-Studies.aspx>

11 <https://www.phaim1.health.pa.gov/EDD/WebForms/AirQualityCntyChrt.aspx>

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5.



RECOMMENDATIONS

RECOMMENDATIONS

We have seen in East Liberty that TOD can have a positive impact on population, the number of jobs, wages, and property values. The East Busway is the only geography that has seen large-scale TOD, and is the only one to exhibit large shifts in these indicators, demonstrating a strong connection between the two. PAAC can do more to encourage TOD along other lines that have seen no change or negative change as a result of disinvestment. Thus far PAAC has supported TOD by prioritizing station upgrades, leveraging PAAC-owned property adjacent to stations for TOD, and partnering with municipalities to implement TOD zoning best practices.

The main goal of this analysis was to use the findings to determine if TOD is meeting our goals, principles, and values, and if not, how could we set priorities that would help us advance TOD that does. This section highlights recommendations for actions the Port Authority could consider pursuing to help further the goals and principles of the TOC program and the values identified by the NEXTransit planning process.

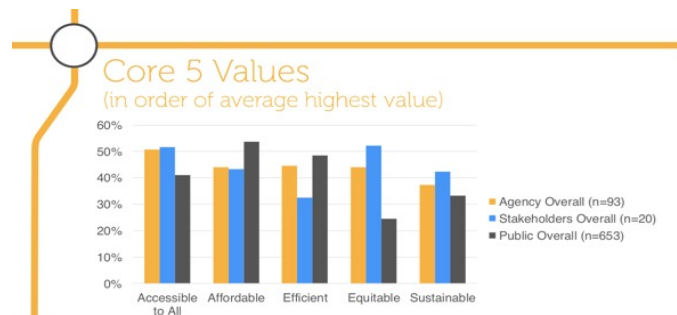


Image 8: NEXTransit Core 5 Values

NEXTransit is the Port Authority's long-range plan that will guide the next 25 years of the Authority's strategies around investments, projects, and policies. One of the first steps in the planning process was a survey of riders, PAAC employees, and other stakeholders to identify what core values of a transit agency were most important to them. Survey participants were asked to identify values they thought a transit agency should prioritize¹.

Five core values were identified by the survey: Accessible, Affordable, Efficient, Equitable, and Sustainable. The principles and goals in the TOD Guidelines served as a guide for our analysis and the selection of variables used to measure our progress over the last five years, and they, along with these core values, helped us shape our recommendations.

When utilizing the recommendations in this report to encourage more TOD, PAAC must also ensure that it is doing so equitably. It is not simply enough to build housing units adjacent to transit: we must ensure that those who are most dependent on public transit can live and work in these developments and are not displaced as a result of them.

Chicago's Equitable TOD (ETOD) Policy Plan (2020) defines ETOD as "development that enables all people regardless of income, race, ethnicity, age, gender, immigration status or ability to experience the benefits of dense, mixed-use, pedestrian-oriented development near transit hubs."

While the recommendations throughout this section are meant to further ETOD, there are several specifications PAAC could consider taking to prioritize ETOD across our system:

- Create a formalized cross-agency, cross-discipline ETOD Task Force to ensure coordination on ETOD advocacy and projects.
- Adopt measurable ETOD goals, metrics, and an evaluation framework to track PAAC's progress. Apply these to our internal joint development and project evaluation processes first. Then, conduct an analysis of other evaluation frameworks at the municipality and County level to determine gaps. Integrate necessary pieces of ETOD framework into existing processes.
- Commit to inclusive external engagement and collaboration throughout public planning processes, particularly in communities that have historically been underrepresented. For example, the Sound Transit ETOD Policy (2018) outlines approaches that seek to gather input that empowers the communities and provides engagement resources that are equal in opportunities and accessibility. This includes using innovative methods and technology to engage and communicate effectively with all stakeholders.

In all of our recommendations, we must be mindful of displacement that can occur as a result of TOD. In order to combat displacement of longtime residents and business owners in neighborhoods where TOD occurs, it is critical to ensure that the TOD itself is equitable while also paying attention to the ripple effects a development can have on the surrounding neighborhood. PAAC should work with partners in community development and related fields to coordinate development goals and projects at the local level and pursue strategies that promote equity in both housing and commercial space to aid in accomplishing this goal. The following recommendations are informed by the results of our analysis and the core values identified in the NEXTransit long-range planning process. These are just some of the ways PAAC can work collaboratively to encourage more TOD and ensure that it is equitable.

TOD ZONING

A major barrier to building more TOD in Allegheny County is zoning. Most of our zoning codes do not offer a mechanism for municipalities to encourage that higher-density development be built near transit. Amending zoning codes to incentivize higher-density development near transit could encourage that more TOD be built across the region. Allowing higher density in existing zoning classifications and reducing parking requirements are some of the ways that municipalities can encourage more TOD through zoning.

Many cities have already implemented similar changes to their zoning codes. For example, the City of Minneapolis eliminated exclusive single-family zoning citywide, meaning that higher density development would be allowed across the city in addition to single-family homes².

RECOMMENDATIONS

Their goal is to encourage higher density development everywhere across the city, including near transit stations. It also has important impacts on housing affordability.

In Denver, a TOD Typology was added to the city's zoning code designed to encourage TOD in specific parts of the city using context-sensitive form-based code³. When Denver transitioned to a form-based zoning code in 2010, five Station Typologies were created to classify different station areas based on appropriate density and walkability. In addition, three "functional overlays" were designed to incentivize certain land uses close to transit⁴.

Only the municipalities themselves have the power to amend their zoning codes to make these changes possible. While we do not have jurisdiction over local zoning codes, PAAC could continue its advocacy for stronger TOD-focused zoning in the City of Pittsburgh and surrounding municipalities, looking to cities like Minneapolis and Denver as examples.

Recommendations

City of Pittsburgh and other municipalities

- Amend municipal zoning codes in boroughs throughout Allegheny County with transit access, particularly ones with fixed guideway stations, to allow greater density and ensure there is affordable housing and mixed-used development near transit.
- Lead a public process to gain public input on changing the City of Pittsburgh's zoning code. Changes to promote TOD could include allowing and prioritizing higher-density development near transit, allowing more mixed-use development near transit, and adapting form-based zoning typologies to incentivize design that is appropriate close to transit stations.

PAAC

- Enhance zoning advocacy: build upon previous work with CONNECT to help additional communities adapt their zoning codes to be more TOD-friendly.
- Collaborate with local stakeholders to advocate for the City of Pittsburgh to amend its zoning code to include TOD-focused zoning.

PARKING

As mentioned in the TOD guidelines, a reduction in car-dependent travel is a major goal of our program. One way to accomplish this is to build less parking for developments near transit. While that sounds easy, municipal zoning codes can be a major barrier to accomplishing this. Zoning codes often require an overabundance of parking spaces and do not take into account a given development's proximity to transit. Amending zoning codes to require less parking can both encourage transit use and make the project more financially feasible.

In 2018, PAAC was the client for a student-led study of parking utilization of four developments within walking distance of East Liberty Station along the East Busway. Looking at a mix of residential and commercial developments, parked cars were counted on several days during the week and weekend. The analysis showed that at its peak on weekends, only 59% of built parking spaces were being used in these developments. On the weekdays, it was 55%⁵. This indicates that parking is overbuilt even in heavily trafficked developments such as Eastside Bond and the East Liberty Target. Reducing parking requirements for development built near transit could increase transit ridership and reduce the overall cost of construction, freeing up resources for more affordable housing, green space, and other public amenities.

There are many examples of cities reducing the number of required parking spaces for developments built near transit. In Los Angeles, the city has established TOD districts surrounding LA Metro stations. Within these districts the city allows developers to reduce parking by 40% in new residential development and 60% for some commercial and civic uses⁶.

Another strategy to reduce parking built near transit is advocating for policies that require "unbundling" of parking costs from housing costs. The practice of "unbundling" usually occurs for residential developments where the cost of renting or owning a housing unit is separated from the cost of utilizing a parking space built for that development. This allows residents to opt out of a parking space and could increase the number of new residents riding nearby transit. In the Bay Area, BART requires all projects built on BART-owned property to unbundle housing costs from parking costs⁷.

As mentioned in the Methodology Data section, better data collection is needed on the number of parking spaces built. Municipalities could create parking management databases that provide information on parking spaces built and the number required by code for new and existing developments.

Recommendations

City of Pittsburgh and other municipalities

- Amend zoning codes to lessen parking requirements near TOD; create TOD overlays with parking reduction as the central focus.
- Streamline parking data collection on both new and existing developments, make this data available to the public.

PAAC

- Require that parking built during any PAAC joint development process be "unbundled", and that the cost of renting or purchasing a housing unit be separated from the cost of a parking space.

RECOMMENDATIONS

FINANCE MECHANISMS

Funding is always a barrier to building more TOD, especially projects that include affordable housing or complex infrastructure. PAAC could ensure dedicated funding sources for TOD by exploring the creation of a TOD Fund as well as how to more efficiently and effectively use Transit Revitalization Investment Districts (TRIDs).

Denver created the Denver Regional TOD Fund in 2010 to finance the acquisition of property to support constructing or preserving affordable housing near transit⁸. The City and County of Denver deposited the initial \$2.5 million into the fund, which, with the help of private and philanthropic donations, ultimately grew to provide \$34 million in financing for property acquisitions. The TOD Fund has contributed to the construction or preservation of 1,450 affordable housing units near transit across the Denver region.

Passed in 2004 and amended in 2016, Pennsylvania’s TRID law allows taxing bodies to divert a portion of new tax revenue from TOD into a fund to support transit-related infrastructure. To date, many TRIDs have been studied but only one district has been established to collect and distribute funds. Further study is needed to determine how TRID can be operationalized more quickly and in more locations.

Recommendations

- Create or advocate for a TOD Fund focused on financing affordable housing near transit. Working with local and regional partners to raise capital for the fund and identify long term funding sources.
- Explore the feasibility of decision-making and financing models to enable the creation new TRIDs in Allegheny County.

INFRASTRUCTURE INVESTMENTS

Smart Growth America states that in today’s market, the demand for walkable, urban development is rapidly growing as the need to support dense and mixed-used communities increases⁹. Investment in transit, biking, and pedestrian infrastructure lead the way for transformative transit-oriented development. Ample first and last mile infrastructure, such as bike and pedestrian infrastructure, promotes a pedestrian friendly environment, therefore lessening the need for single occupancy vehicle trips. In PAAC’s Station Improvement Program Station Evaluation (2015), one of the first identified steps in the pursuit of TOD is to make capital investment in transit stations via a station improvement program. This is to both encourage an increase use from riders and to attract interest for development near the stations. In other words, by investing in the station, we catalyze development.

In support of the survey evaluation responses and programs such as First Last Mile and Station Improvement, we encourage infrastructure investments and support cost effective infrastructure that emphasizes modernization and equity.

When prioritizing infrastructure investments, we look towards BART’s TOD Work Plan (2020) that favors cost effective projects and recognizes that infrastructure investments make TOD projects “exemplary and integrate them into the surrounding communities”, as well as “ensuring adequate funding exists to build and maintain [these spaces] is critical to the success of TOD¹⁰”. Thus, these investments reinforce PAAC’s TOD goals and principles.

Recommendations

City of Pittsburgh and other municipalities

- While the Port Authority identifies projects near PAAC owned property, it is the municipality or other entity that will fund, invest, and implement infrastructure in the area.

PAAC

- Anticipate TOD with infrastructure investments: collaborate with municipalities to prioritize first and last mile connections to PAAC property to prime stations for future TOD investment.
- Continue utilizing the First and Last Mile and Station Improvement Plans to determine priority investment areas. Particularly, support sidewalk infrastructure that safely connects neighborhoods, destinations, and transit, as well as station access improvements.
- Support the assessment of current infrastructure performance and adequacy.
- Prioritize infrastructure investments in historically low-income, minority neighborhoods, as well as in accordance with the other metrics outlined in the Port Authority’s First Last Mile Plan (2019). Bike and micro-mobility infrastructure that ensure accessibility to and from transit should be highly prioritized.

RECOMMENDATIONS

AFFORDABLE HOUSING POLICY

Perhaps the most important recommendation in this report is the formalization of an affordable housing policy by PAAC. As demonstrated in East Liberty, affordability is a challenge in and around TOD. In future projects, PAAC could advocate for the inclusion of affordable housing adjacent to transit. In projects on PAAC-owned land, a policy could be created to require that a certain number of units built must be affordable so that riders most dependent on transit can easily access it.

For example, Bay Area Rapid Transit (BART) has a board-adopted goal of ensuring that at least 35% of units built on their property, and 20% of units in each station area are affordable. They have a long-range goal of building 7,000 homes on BART-owned land by 2040¹¹.

Additionally, many agencies have policies and subsidies available that discount land as incentives for affordable housing developments. Percentage of discounts are variable between agencies and often are determined by the achieved affordable housing outcomes. BART is willing to discount land up to 60% of its value if the development is comprised of more than 35% affordable housing; LA Metro may discount up to 30% of fair market value¹².

Recommendations

- Adopt inclusionary housing policy for development on PAAC land, mandating that a certain percentage of housing must be made affordable. PAAC could commission a study to determine appropriate affordable housing targets for our region and adopt a similar policy to ensure affordable housing is a high priority for the agency’s joint development goals.
- Explore creating a discounted land policy, analyze which properties in the PAAC portfolio might be good candidates for sale at a discounted price to affordable housing developers.

ENCOURAGE EMPLOYMENT-BASED TOD

Investment in employment-based TOD is the prioritization of developments that include job generation. As seen by our analysis, LRT station areas have very few jobs. Locating jobs along the system can encourage reverse commute trips and distribute congestion more equitably. PAAC could seek opportunities to develop new employment centers, such as office or commercial space in LRT station areas with few jobs but high transit access.

For example, BART’s TOD Program Work Plan (2020) addresses the regional job-housing imbalance and recommends creating more jobs near the BART system in order to alleviate congestion and create sustainable ridership patterns. They commit to strategically reserving potential TOD development sites that demonstrate economic competitiveness, equaling 4.5 million square feet of commercial space by 2040.

Recommendations

- Consider incentives that encourage non-residential development and construction.
- Encourage equity in procurement processes and job creation to ensure low-income, minority neighborhoods are benefitting from new development and employment opportunities.

SUSTAINABILITY

As an agency, the Port Authority has begun the process of a Sustainability Plan, further outlining the green mission¹³, stating the commitment to sustainable measures that help the environment, further transit use, and encourage intermodal commuting.

Tree Cover and Landscaping

While the Tree Pittsburgh report referenced earlier does not align exactly with the timeframe of Census data we analyzed, it does show an alarming trend in the County of tree removal. Tree canopy in the County should be increasing, not decreasing, if only by a small percentage amount. Both the TOD Guidelines and FLM Program Plan mention trees and other landscaping as a way to improve TOD projects and enhance first and last mile connections, but a stronger PAAC policy is needed to ensure we are helping to grow to the County’s tree canopy, not contributing to its decline. Going beyond what current municipal codes require as far as tree plantings would ensure PAAC is making a positive contribution to our County’s tree canopy.

Recommendations

City of Pittsburgh and other municipalities

- Low-income, minority neighborhoods are less likely to have substantial tree cover, putting those communities at higher risks for extreme temperatures¹⁴. Prioritize tree cover and shade trees in these neighborhoods in new development and street standards.

PAAC

- For projects built on PAAC-owned land, adopt a policy that every effort to preserve mature trees onsite must be made, and that increases the total amount of tree cover throughout the project. PAAC could hold itself to a higher standard and create tree planting requirements for themselves that are greater than that of the local zoning code.

Designing and Building Greener Projects

With sustainability being a principle of the TOD program at Port Authority, public space and green project design are important factors to integrate moving forward in order to mitigate environmental effects and encourage sustainable development.

RECOMMENDATIONS

Recommendations

- Prioritize green infrastructure alternatives for stormwater management in new development in order to minimize water runoff and overflow. For example, the Kansas City TOD Policy Introduction and Implementation Strategy (2020) recommends a combination of street design standards and updated development requirements to address stormwater management and on-site stormwater storing and filtering.
- The presence of open spaces and greenery enhances the well-being of the community. Encourage open space that is equitable and green and support incentives that prioritize it.
- Support projects that meet green building criteria and encourage these certifications in new development. For example, the Chicago ETOD Policy Plan (2020) uses Chicago's existing Green Permit Program to expediate projects that meet the green standards and criteria.

Sustainable Transportation

Improving multimodal accessibility decreases the dependence on automobiles. With overlap of parking and infrastructure investments recommendations, it is important to acknowledge how multimodal access also help reach sustainability and environmental goals.

Recommendations

- Encourage zoning incentives that support transportation demand management. For example, the Chicago ETOD Policy Plan (2020) suggests establishing a point-based system that requires developers to implement a certain number of sustainable transportation and traffic demand options, such as transit passes or bike memberships.
- BART's TOD Work Plan (2020) encourages sustainable mobility, outlining transportation demand management (TDM) requirements for developers. These requirements will encourage less single vehicle, drive-alone trips and will therefore favor walking, biking, transit, and carpooling/vanpooling options instead.
- Support increased access and equity in shared micro-mobility transportation, including bike and scooter shares. Prioritize investments in sustainable transportation options within and between low-income, minority communities.

THIS DOCUMENT MOVING FORWARD

This report will be used to facilitate and guide future work within the Transit Oriented Communities program and within the Port Authority of Allegheny County. It will be used with the intention of being available to the public, shared with stakeholders of the program, and for internal use at the agency.

Additionally, the results of this report will be used to pursue implementation of our recommendations. Strategies to advance the dialogue regarding education, outreach, and advocacy, as well as coordinate implementation beyond the control of the agency, will be determined among stakeholder groups. These stakeholders include other transit agencies, local governments, regional planners, community groups, and developers.

- Continue to ensure future plans are aligned with the principles and goals of the program, as well as with the recommendations of this report.
- Commit to an ongoing review of TOD projects and report progress as applicable.
- Collaborate with all partners and stakeholders to facilitate implementation and adhere to best practices and standards.

CHAPTER ENDNOTES

1 See Appendix III for list and definitions used for each of the 7 values.

2 <https://www.lincolnst.edu/publications/articles/2020-01-rezoning-history-minneapolis-policy-shift-links-affordability-equity>

3 <https://www.denvergov.org/content/denvergov/en/transit-oriented-development/setting-the-stage.html>

4 <https://www.denvergov.org/content/denvergov/en/transit-oriented-development/typology.html>

5 Batog, Jeanne. "Measuring the Parking Characteristics of Transit-Oriented Developments: MLK Busway – East Liberty Station, Pittsburgh, PA." December 10, 2018.

6 <http://www.mitod.org/todtargetedparkingregulations.php?tab=0&panel=5&return=reducepark6>

7 Bay Area Rapid Transit, "BART Transit-Oriented Development Transportation Demand Management Program", August 2020, p.4

8 <https://www.denvergov.org/content/denvergov/en/housing-information/news/2019/Transit-Oriented-Development-Fund-Extension.html>

9 <https://smartgrowthamerica.org/program/locus/advocacy/policy-positions/transportation-and-infrastructure/>

10 Bay Area Rapid Transit, "BART's Transit Oriented Development Program Work Plan", pg. 33

11 San Francisco Bay Area Rapid Transit, BART's Transit-Oriented Development Program Work Plan, August 2020

12 [https://www.metro.net/projects/joint_dev_pgm/affordable-housing/#:~:text=A%20new%20objective%20that%2035,area%20median%20income%20\(AMI\).](https://www.metro.net/projects/joint_dev_pgm/affordable-housing/#:~:text=A%20new%20objective%20that%2035,area%20median%20income%20(AMI).)

13 <https://www.portauthority.org/inside-Port-Authority/community-involvement/going-green/>

14 <https://www.bloomberg.com/news/articles/2013-05-15/the-inequality-of-urban-tree-cover>

6.



APPENDICES

APPENDIX I: GIS WALKSHED METHOD

In order to properly analyze the walksheds, the census tracts had to be adjusted for area.

The walksheds used in this analysis are not perfect circles, but rather the best representation of a walkable half mile network that is utilized by pedestrians in order to access the station. Because of the imperfect shape of these walksheds, most census tracts do not fall entirely within one walkshed. In order to properly analyze the census data that falls within the walksheds, the tracts were adjusted for area to fit perfectly within the walkshed.

The images below display the Herron Station walkshed in light gray and the census tracts that overlap it in blue. Herron Station is indicated by the yellow circle. Image 1 (left) indicates how the census tracts look before the area adjustment and Image 2 (right) indicates how it looks afterwards.

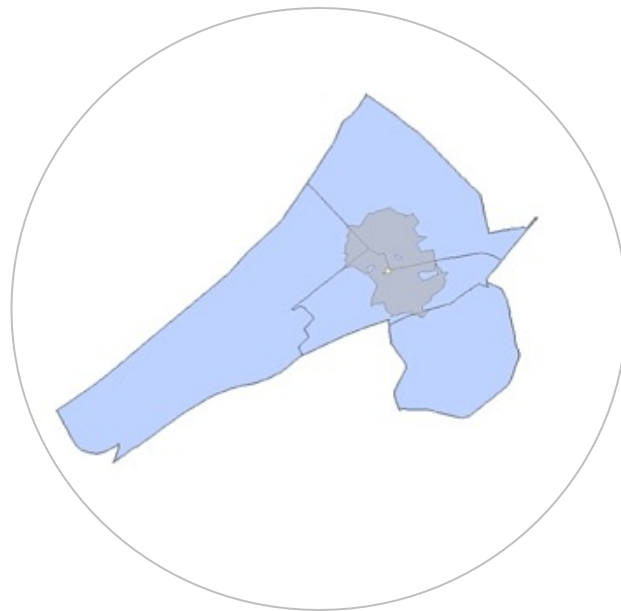


Image 1: Census tracts shown in blue intersect with the Herron Station walkshed, in gray.



Image 2: Clipped census tracts shown in blue now perfectly align with the Herron Station walkshed.

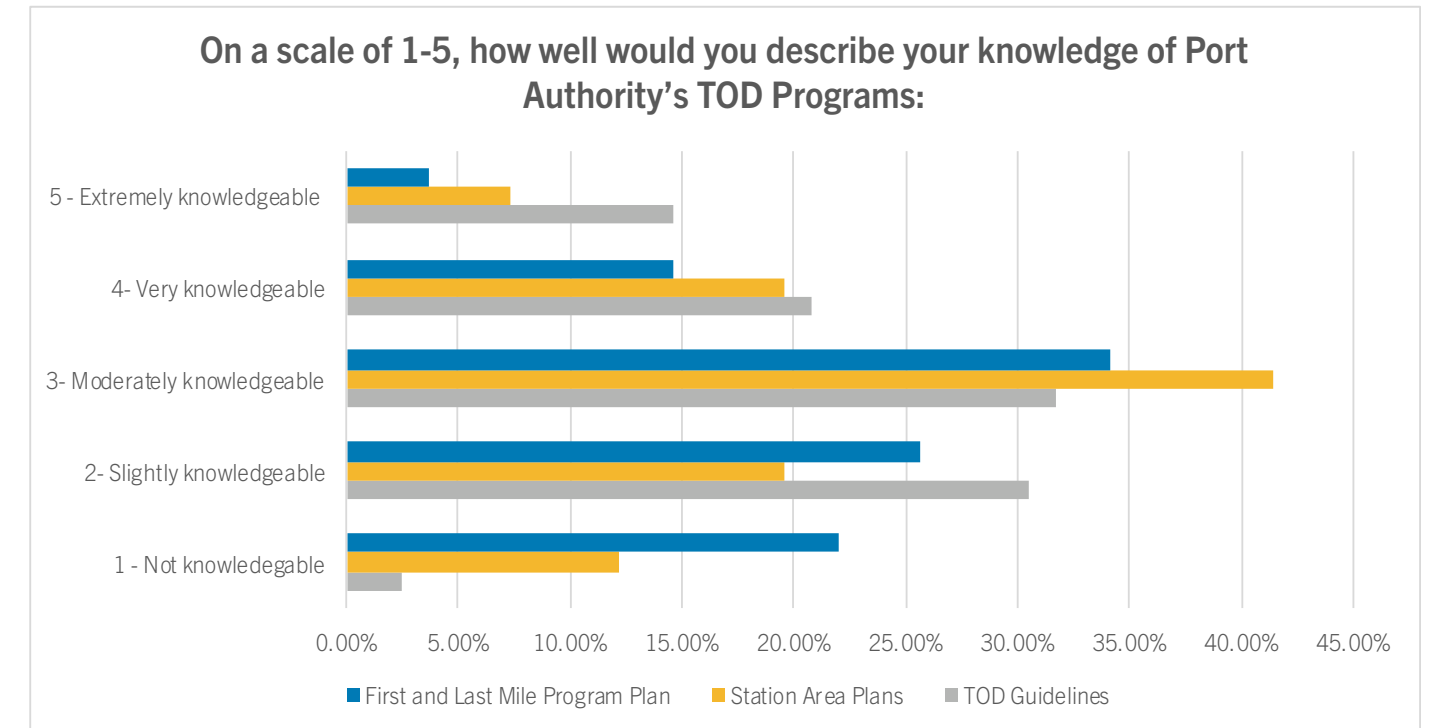
The area adjustment was done using Geographic Information Systems (GIS) software. Each walkshed was individually extracted, in order to make sure overlapping walksheds did not interfere with the analysis. The Allegheny County census tracts that intersected each walkshed were then clipped and calculated for area (miles²). This process was repeated for each of the stations.

After the area adjustment was completed, the data from each census tract was multiplied by the area of the respective tract. The adjusted census data was then summed to the total walkshed. For example, if census tracts 1, 2, and 3 intersected with walkshed A, then the adjusted data for census tracts 1, 2, and 3 would be added together, equaling the total for walkshed A.

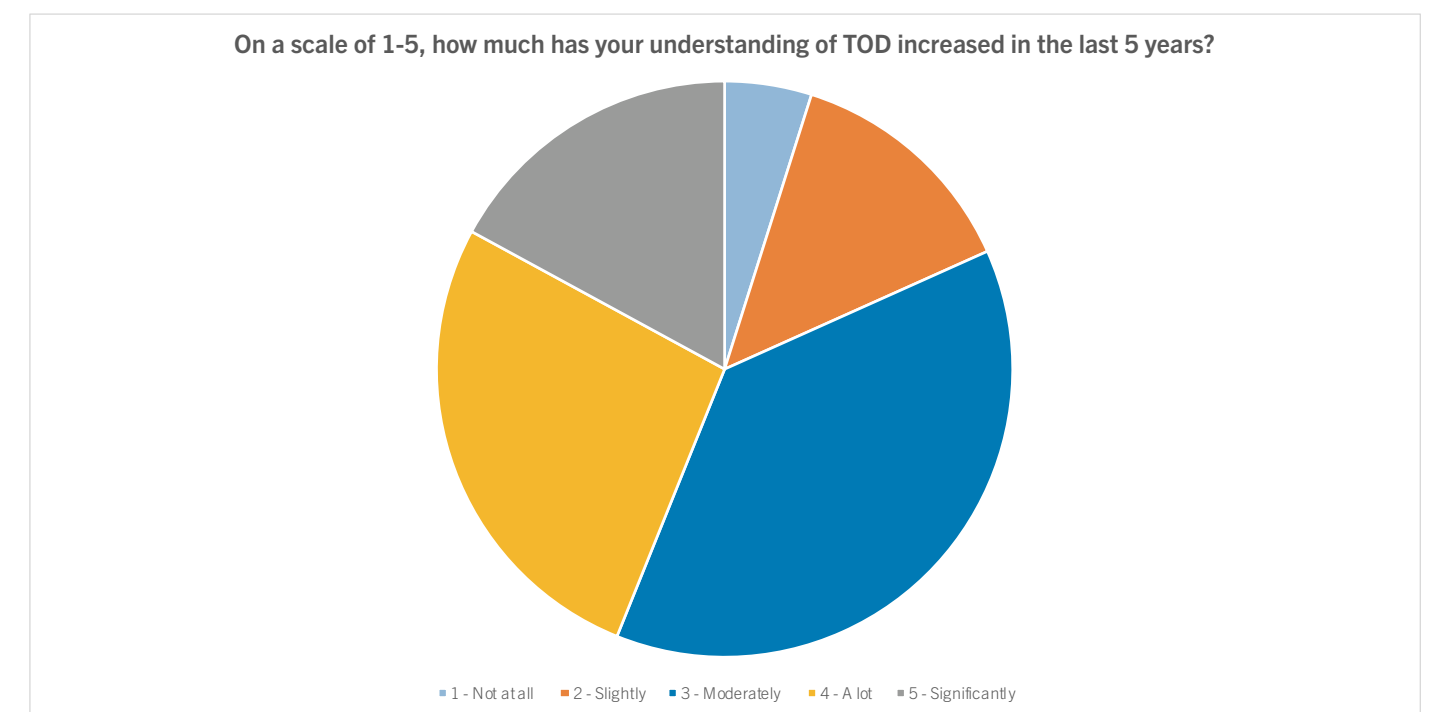
APPENDIX II: SURVEY RESULTS

The anonymous evaluation survey was designed to assess local understanding of and attitudes towards TOD. There were 82 respondents in total and 11 content-based questions, including open ended questions that will be summarized in this appendix.

Question 1

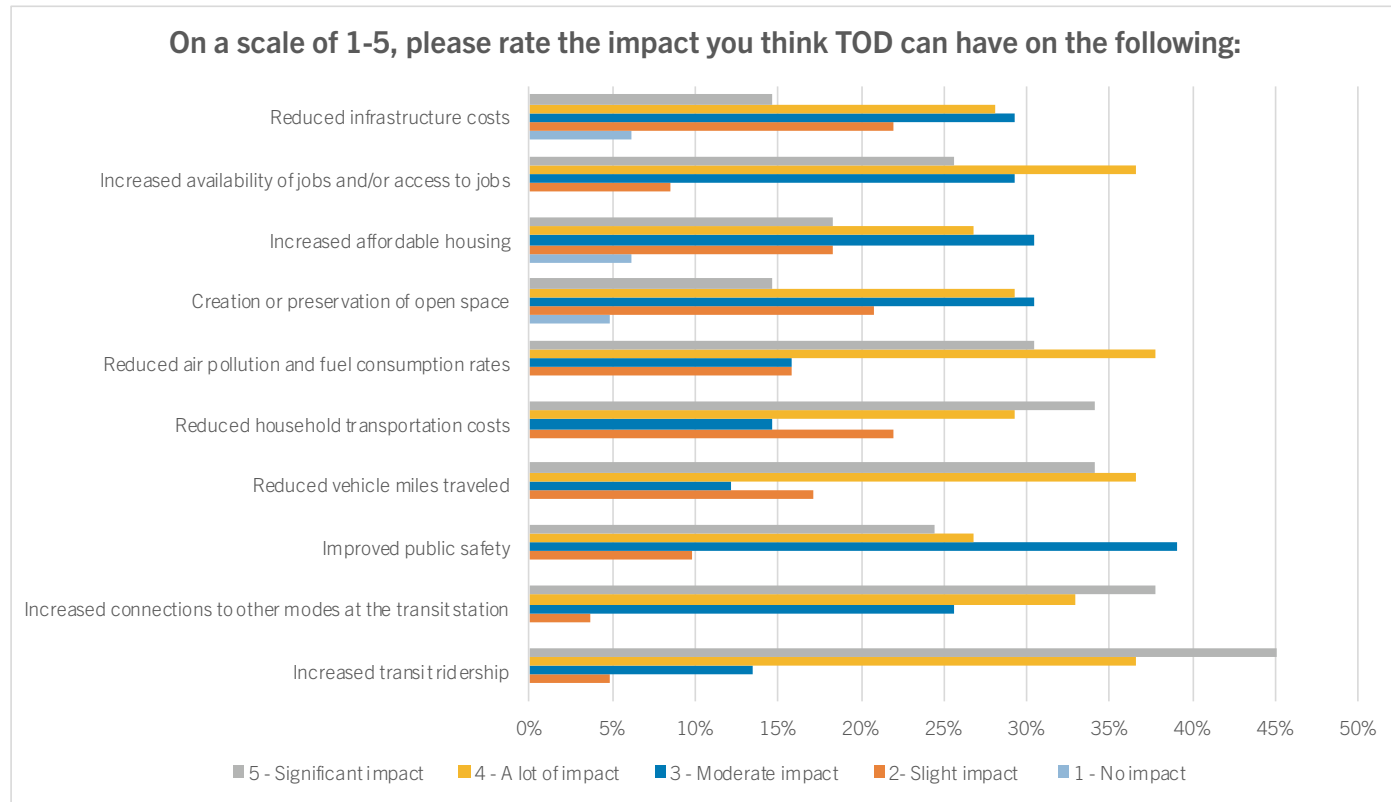


Question 2

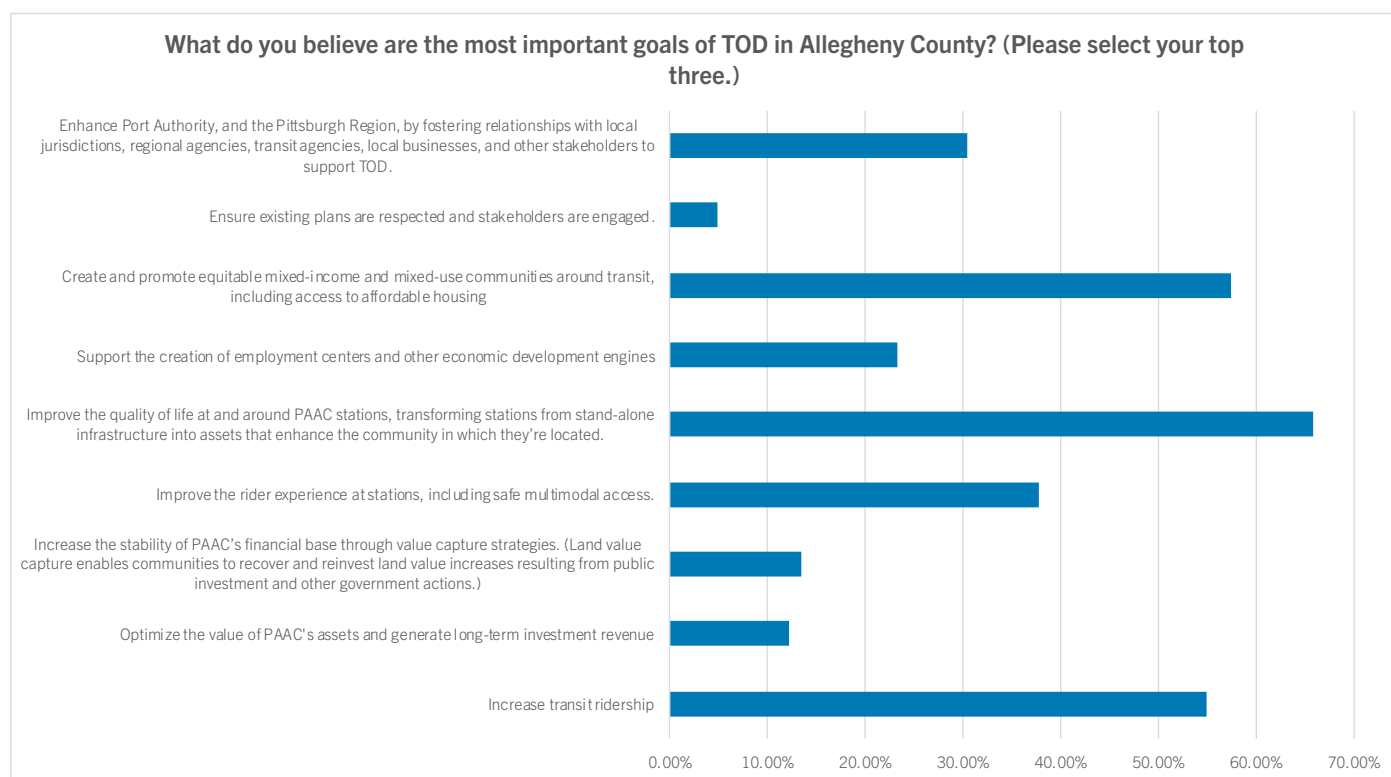


APPENDIX II: SURVEY RESULTS

Question 3

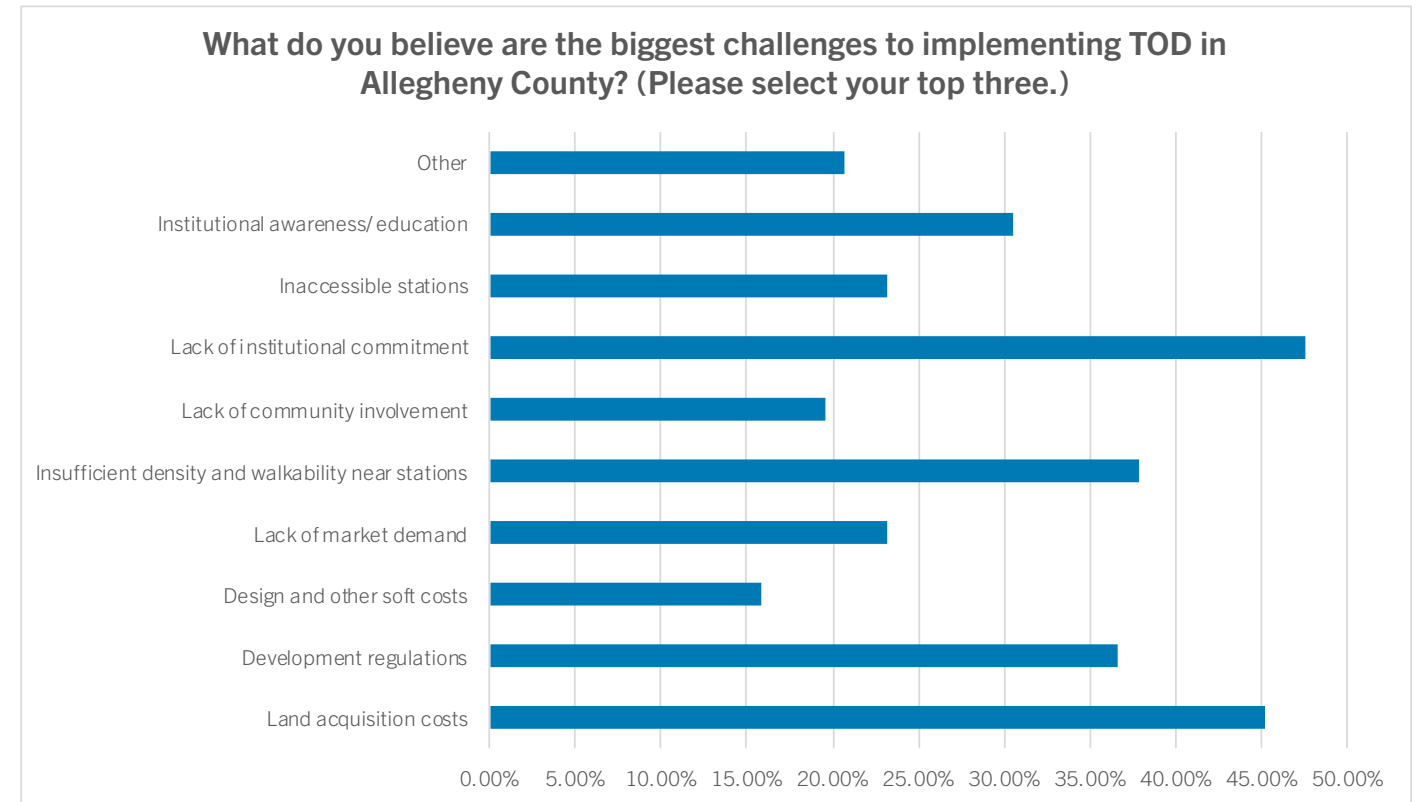


Question 4

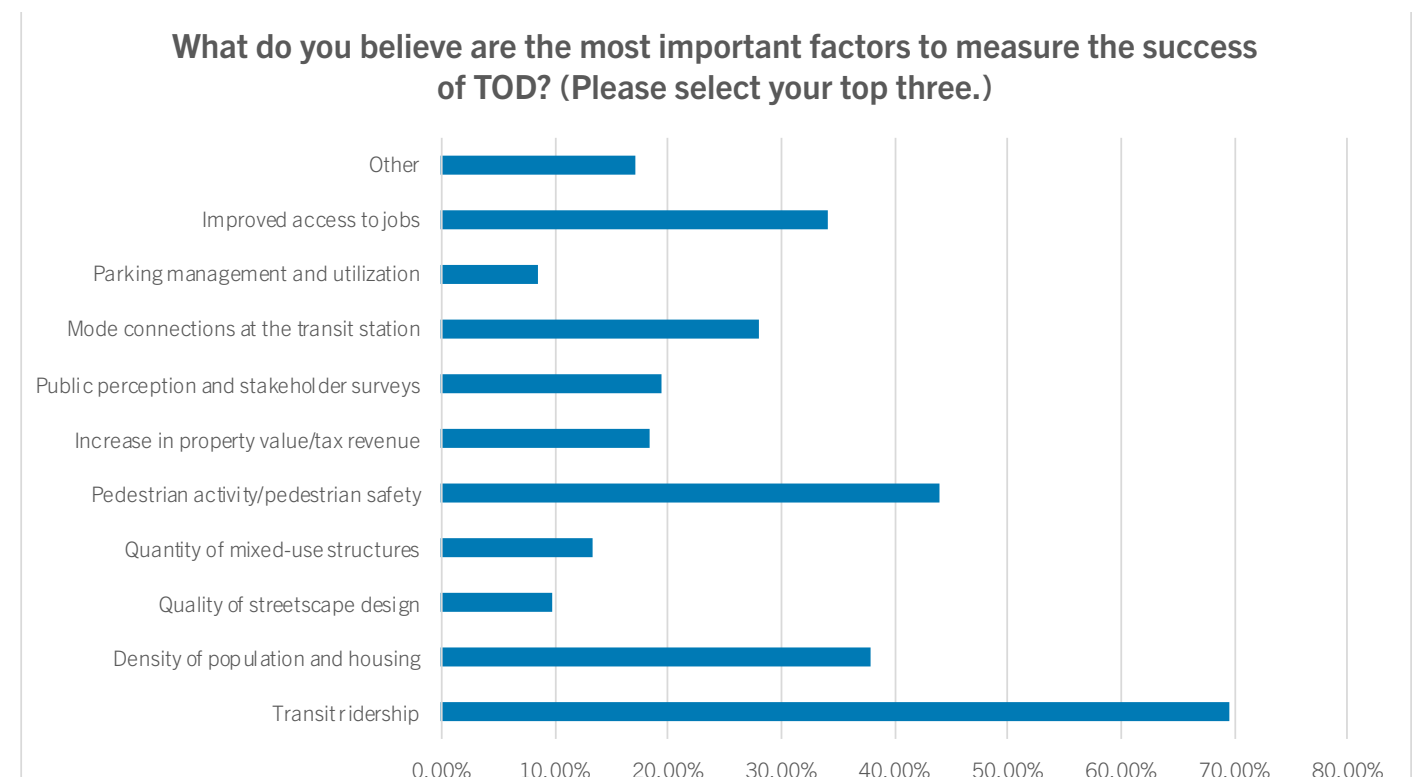


APPENDIX II: SURVEY RESULTS

Question 5

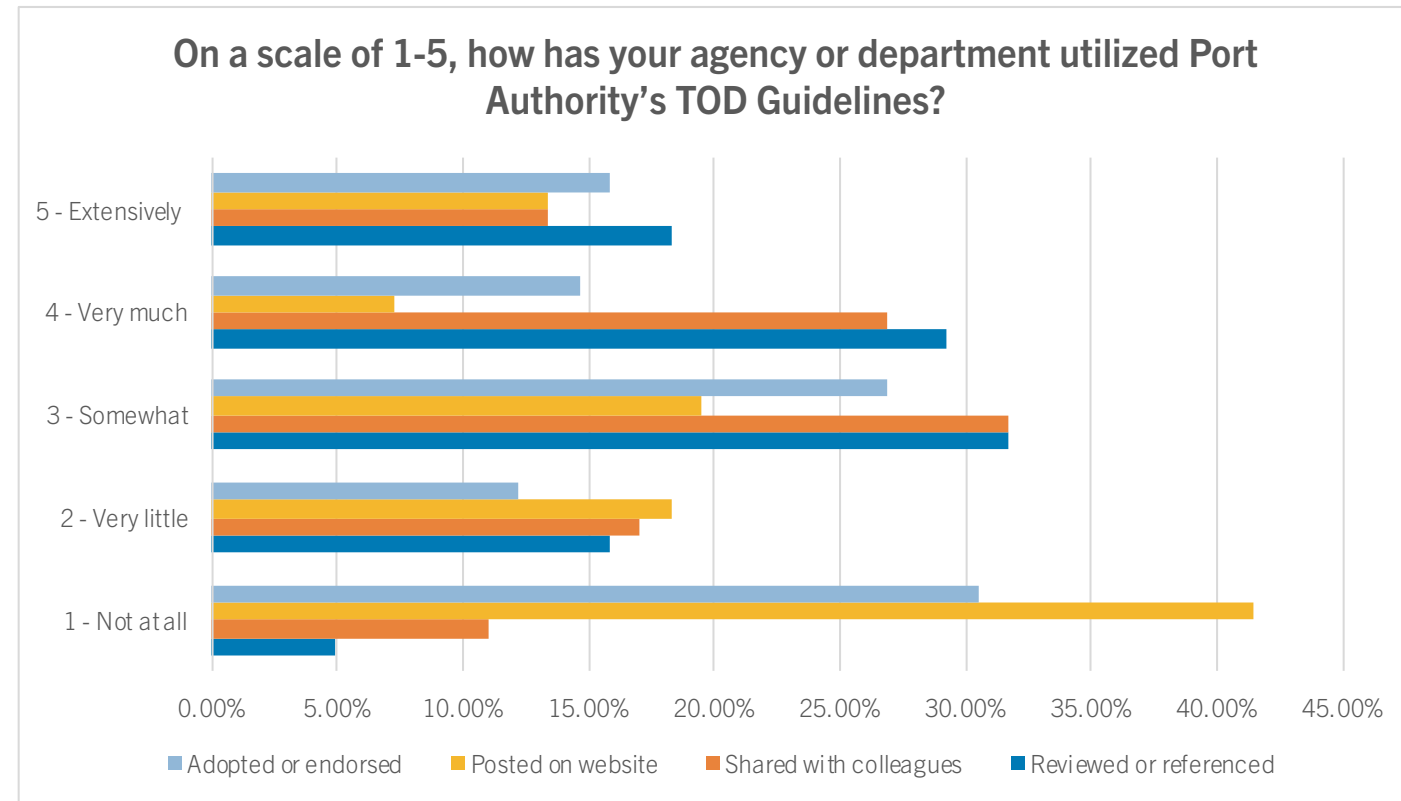


Question 6

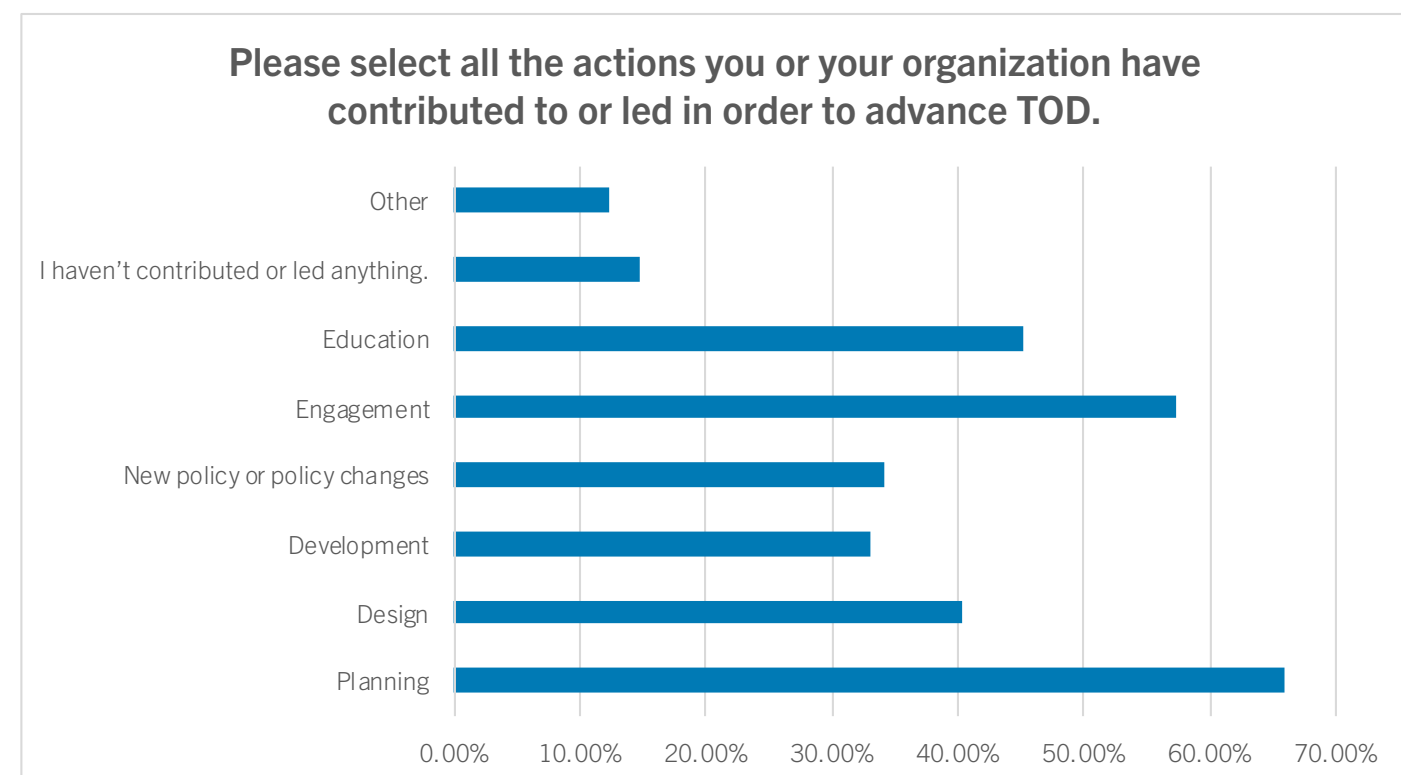


APPENDIX II: SURVEY RESULTS

Question 7

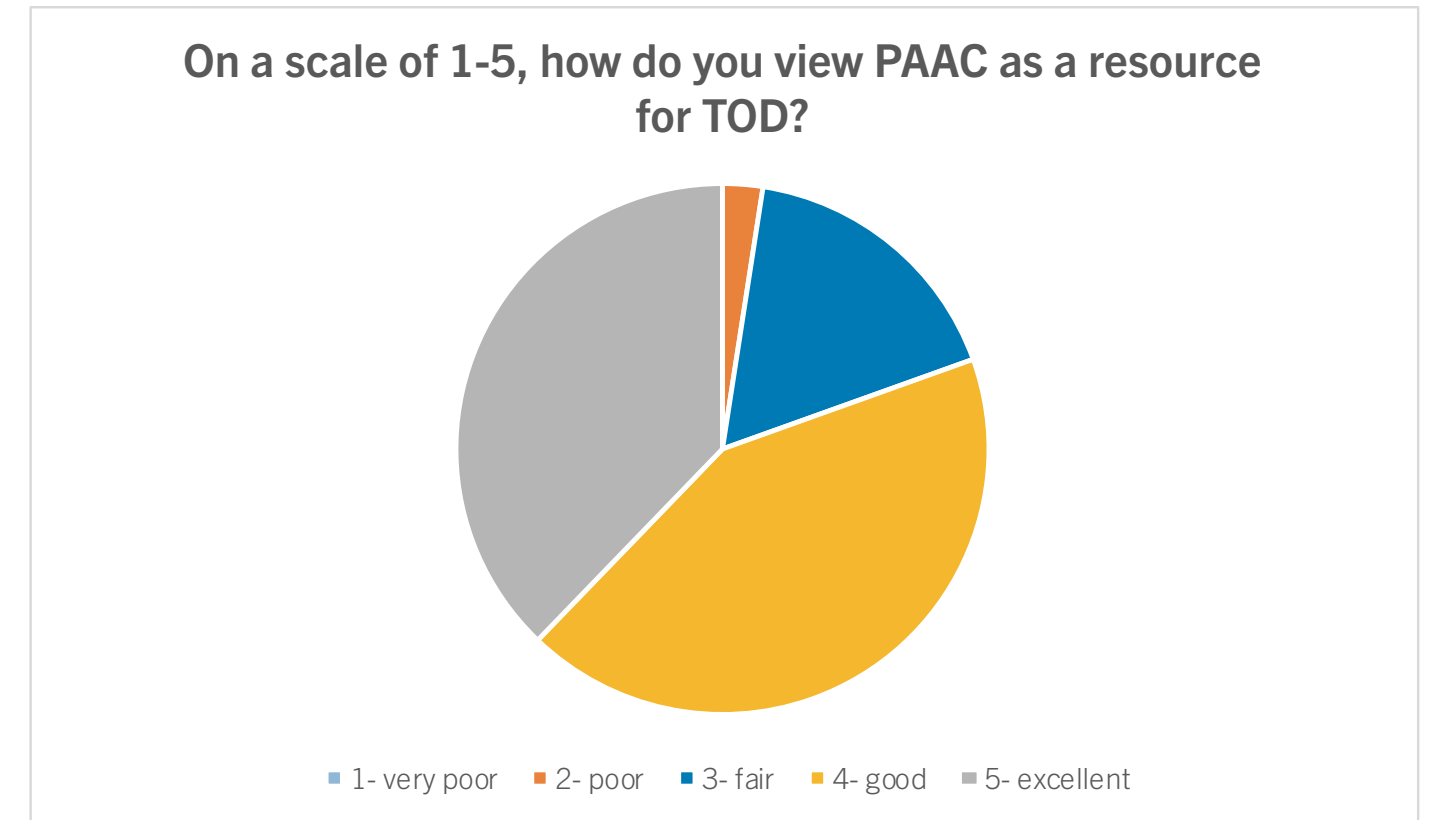


Question 8



APPENDIX II: SURVEY RESULTS

Question 9



What would you or your organization like to see more of from Port Authority's TOD program?

Mixed-Use Communities

- Emphasis on the potential impact on surrounding communities
- Affordable housing is a priority

Public Engagement and Collaboration

- TOD advocacy and formal integration of TOD into future planning processes
- Continued collaboration with other government bodies, agencies, stakeholders, and organizations

TOD Education and Promotion

- Web-based opportunities for outreach
- Making education about the value of TOD accessible to non-planners

Increased TOD Implementation

- Property development and project implementation
- Equitable TOD

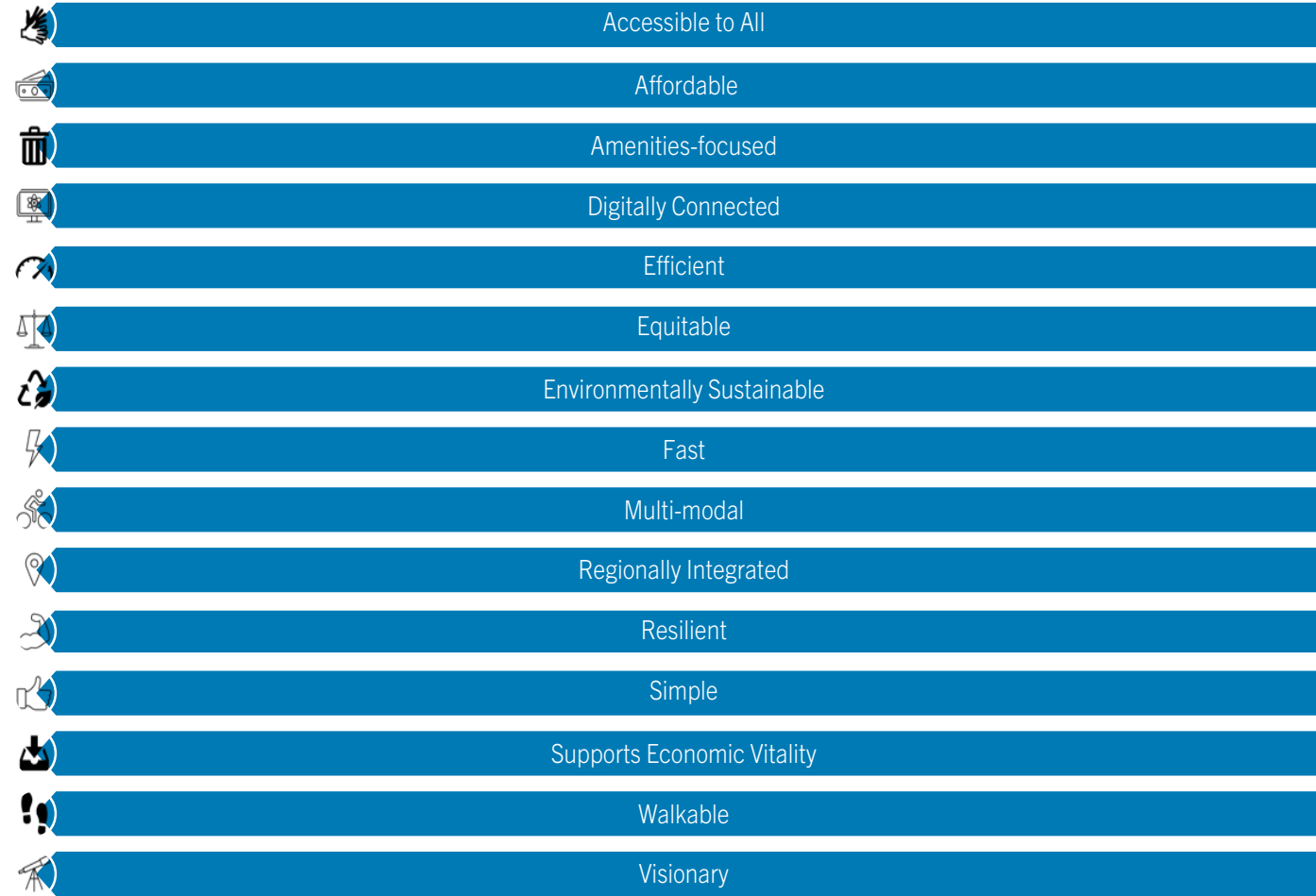
Land Use Regulations

- Zoning changes that increase TOD potential
- Decreased parking
- Joint development initiatives and partnerships

Infrastructure Investments

- Efforts to modernize infrastructure
- Continue to improve pedestrian connections

APPENDIX III: CORE VALUES



APPENDIX IV: ALLEGHENY COUNTY

Demographics, Allegheny County

Variable	2013	2018	Percentage Change
Total Population	1,226,933	1,225,561	-0.11%
Age			
Under 19 years	273,899	263,902	-3.65%
20-34 years	252,974	264,317	4.48%
35-64 years	493,315	475,372	-3.64%
65-84 years	493,315	475,372	-3.64%
85 years and over	36,556	36,098	-1.25%
Median Age	41.1	40.8	-0.73%
Race			
Hispanic or Latino	20358	24925	22.43%
White	998456	981847	-1.66%
Black or African American	159750	157891	-1.16%
American Indian Alaska Native	1515	1354	-10.63%
Asian	36286	44791	23.44%
Native Hawaiian and Other Pacific Islander	352	334	-5.11%
Some other race	4749	5670	19.39%
Multiracial	25825	33674	30.39%

APPENDIX IV: ALLEGHENY COUNTY

Housing, Allegheny County

Variable	2013	2018	Percentage Change
Total Housing Units	588,644	598,424	1.66%
Occupied housing units	526,004	537,960	2.27%
Vacant Housing units	62,640	60,464	-3.47%
Owner-occupied housing			
Median value (dollars) Owner-Occupied Units	\$122,400.00	\$147,700.00	20.67%
Housing units with a mortgage	212,892	209,601	-1.55%
Housing Cost Burden (owners)			
Under 30%	158,332	165,588	4.58%
Over 30%	54,560	44,013	-19.33%
Renter housing			
Median Rent (dollars)	\$751.00	\$865.00	15.18%
Occupied units paying rent	169,743	177,847	4.77%
Housing Cost Burden (renters)			
Under 30%	90,171	97,003	7.58%
Over 30%	79,572	80,844	1.60%

APPENDIX IV: ALLEGHENY COUNTY

Mode Split, Allegheny County

Variable	2013	2018	Percentage Change
Workers (16 years +)	588,387	613,550	4.28%
Car, Truck, or Van (total driving)	477,770	490,226	2.61%
Car, Truck, or Van (drove alone)	421,285	438,688	4.13%
Car, Truck, or Van (carpool)	55,897	52,152	-6.70%
Public Transportation	55,308	58,287	5.39%
Walked	25,301	25,156	-0.57%
Biked	2,942	3,681	25.13%
Taxicab, motorcycle, or other means	5,884	4,908	-16.58%
Worked at home	21770	31,291	43.73%

Household Income, Allegheny County

Variable	2013	2018	Percentage Change
Total Households	526,004	537,960	2.27%
Less than \$10,000	41,028	37,119	-9.53%
\$10,000 to \$14,999	29,456	25,822	-12.34%
\$15,000 to \$24,999	60,490	54,872	-9.29%
\$25,000 to \$34,999	56,808	51,106	-10.04%
\$35,000 to \$49,999	68,381	64,555	-5.59%
\$50,000 to \$74,999	93,629	91,991	-1.75%
\$75,000 to \$99,999	63,646	66,707	4.81%
\$100,000 to \$149,999	64,172	78,542	22.39%
\$150,000 to \$199,999	24,196	31,740	31.18%
\$200,000 or more	24,196	35,505	46.74%
Median income (dollars)	\$51,366.00	\$58,383.00	13.66%

APPENDIX IV: ALLEGHENY COUNTY

Employment, Allegheny County

Variable	2013	2018	Percentage Change
Total Jobs	720,054	727,603	1.05%

Jobs By Worker Age

Age 29 or younger	160,171	162,921	1.72%
Age 30 to 54	386,627	378,555	-2.09%
Age 55 or older	173,256	186,127	7.43%

Jobs By Earnings

\$1,250 per month or less	165,059	156,422	-5.23%
\$1,251 to \$3,333 per month	231,055	208,771	-9.64%
More than \$3,333 per month	323,940	362,410	11.88%

Jobs by Sector

Agriculture, Forestry, Fishing and Hunting	79	155	96.20%
Mining, Quarrying, and Oil and Gas Extraction	3,393	2,276	-32.92%
Utilities	4,134	4,652	12.53%
Construction	26,546	29,954	12.84%
Manufacturing	37,931	36,743	-3.13%
Wholesale Trade	26,572	23,294	-12.34%
Retail Trade	75,039	75,045	0.01%
Transportation and Warehousing	21,907	23,483	7.19%
Information	14,099	14,190	0.65%
Finance and Insurance	53,114	54,506	2.62%
Real Estate and Rental and Leasing	9,688	9,237	-4.66%
Professional, Scientific, and Technical Services	61,555	66,549	8.11%
Management of Companies and Enterprises	30,726	29,197	-4.98%
Administration & Support, Waste Management and Remediation	42,813	39,470	-7.81%
Educational Services	65,173	62,769	-3.69%
Health Care and Social Assistance	129,530	134,754	4.03%

APPENDIX IV: ALLEGHENY COUNTY

Variable	2013	2018	Percentage Change
Arts, Entertainment, and Recreation	13,395	14,203	6.03%
Accommodation and Food Services	59,919	63,287	5.62%
Other Services (excluding Public Administration)	24,909	25,369	1.85%
Public Administration	19,532	18,470	-5.44%

APPENDIX V: ALL DATA

The entire data analyses, by line, are linked below in excel format.

[Allegheny County](#)

[East Busway](#)

[West Busway](#)

[Rail System](#)

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