



**PORT AUTHORITY OF ALLEGHENY COUNTY
STATION IMPROVEMENT PROGRAM:
STATION 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 200,000 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.

Port Authority began serving the community in March 1964. In early 2015, the Port Authority began investing in a transit-oriented development program.

Participants

Port Authority of Allegheny County would like to thank agency partners for supporting the Station Improvement Program: Station Evaluation, and all those who participated by dedicating their time and expertise.

The evaluation received input and feedback internally from the Port Authority's TOD advisory committee, an inter-departmental body established to support the TOD program. Current members include: Mike Cetra, Darcy Cleaver, Lynn Fulton, Bob Phillips, Chuck Rompala, Amy Silbermann, Brad Straight, Todd Tusick, Ed Typanski, and David Wohlwill.

Guidance was also provided by a group of Port Authority stakeholders. Participants included: Molly Nichols (Pittsburghers for Public Transit), Ann Ogoreuc (Allegheny County Department of Economic Development), James Price (University of Pittsburgh's Congress for Neighboring Communities), Henry Pyatt (Office of Mayor William Peduto, City of Pittsburgh), Chris Sandvig (Pittsburgh Community Reinvestment Group), and Dave Totten (Southwestern Pennsylvania Commission).

The evaluation and analysis was conducted by Andrea Elcock, Community Planning Coordinator, and Jackson Whitmore, a graduate intern from Carnegie Mellon University, under the management of Breen Masciotra, TOD Program Manager, and Amy Silbermann, Senior Analyst.

The design of the document follows the format created for the Transit-Oriented Development Guidelines developed by the Port Authority of Allegheny County in collaboration with Studio for Spatial Practice (SfSP).

CONTENTS

1. The Evaluation	
Introduction and Goals	1
Process	2
Results	4
2. Appendixes	
I: List of Stations	5
II: Transit Weight System	6
III: Station Walksheds	7
IV: Walkshed Analysis Methodology	9
V: Orientation Weight System	11
VI: Development Weight System	12
VII: Final Rankings	13
VIII: Annual Implementation	15

INTRODUCTION AND GOALS

Introduction

Port Authority of Allegheny County delivers outstanding transportation services that connect people to life.

The Port Authority of Allegheny County (PAAC) was created in 1959 and began servicing the community in March 1964. Today, PAAC serves approximately 215,000 daily riders through bus, light rail, incline, and paratransit services. With a new source of stable funding resulting from Act 89, PAAC is focused on initiatives to improve service, enhance customer amenities, and promote Transit-Oriented Development (TOD), all of which will grow ridership and operating revenue for the agency. When development occurs within a half-mile of transit stations and is designed for mixed-use, higher density, and easy pedestrian and multimodal access, TOD creates a density of live/work/play amenities around transit locations. PAAC has identified TOD as a strategy for supporting users and ridership, and has created an action plan for how it will support and pursue TOD in the near future.

Port Authority of Allegheny County is the steward of a significant public investment, which includes important real property assets essential to PAAC's operation. These assets can be used to leverage the viability of the transit system and add to its value in the community. Initiatives that direct and concentrate TOD around transit facilities also enhance the value of these assets.

PAAC seeks to enhance its financial sustainability and further other agency goals by supporting TOD that will foster an increase in ridership and generate increased farebox and joint development revenues. The agency will work closely with the jurisdictions within which it operates to identify and implement TOD opportunities.

Process Goals

One of the first identified steps in the pursuit of TOD is to make capital investment in transit stations via a station improvement program to both encourage an increase use from riders and to attract interest for development near the stations. For the purposes of Port Authority's TOD program, a station is defined as any stop along a fixed-guideway. To identify which of the fixed-guideway stations receive investment as part of the Station Improvement Program, an objective process and evaluation method was established. The purpose of this evaluation was to identify the factors that contribute to successful TOD locations, create a methodology for evaluation of current stations and surrounding neighborhoods, conduct evaluations, gather data for all fixed-guideway stations, and analyze findings to make recommendations.



East Liberty - Purple Line



Washington Junction - Blue Line



Roslyn Station - Purple Line

PROCESS

Transit

With the intention to improve the condition of PAAC stations, evaluation of the existing station conditions was the first step in the process. Naturally, evaluation of station conditions includes attention to the physical characteristics, most of which the agency has some control over. These evaluated items were labeled as the Transit category. Before conducting these evaluations, a standard was developed to identify the physical characteristics that make good TOD and good stations. With research on best practices from organizations like the Center for Transit Oriented Development (CTOD), the Metropolitan Atlanta Rapid Transit Authority (MARTA), the Transportation Research Board of the National Academies and Bay Area Rapid Transit (BART), a list of TOD station features was established. These physical features were separated into categories such as pedestrian access, safety, visibility, information, and sustainability.

Two stakeholder groups were presented with a comprehensive list of all the best practices identified in the research and asked to identify which features were most important and which were less relevant for the PAAC system. The first stakeholder group -- comprised of PAAC staff-- provided input on agency priorities while the second group contributed ideas of external stakeholders representing the perspectives of independent advocacy, local government, city, and county groups.

With the input of the internal and external advisory groups, the list was narrowed to reflect top priorities for TOD stations. This list was then reformatted into an evaluation questionnaire for use in on-site evaluation. Some information was added to the collection list for other agency data collection needs, although it would not be included in the final TOD evaluation criteria data. Over the course of two weeks, the entire fixed-guideway system (South Busway, Purple, Red, Green and Blue lines) was reviewed using the evaluation questionnaire. Formal and informal station access points (stairs, pathways, etc.) were mapped along with amenities such as maps, bike racks, and ticket vending machines (TVMs). In total, 55 pieces of information were gathered or mapped at each of the 73 stations¹.

Following the collection of the information, the evaluation results were translated into data using a 0-1 scale with one correlating to the lack of a desirable feature and zero correlating to the presence of a desirable feature. With this scoring system, the highest scoring stations are where TOD features are lacking and therefore where work is most needed. Questions receiving "Not applicable (NA)" received either a zero or one based on whether the feature in question was standardized or a missing amenity. For

¹ The Port Authority of Allegheny has 82 identified fixed-guideway stations. However, some locations serve multiple fixed-guideway routes and are therefore counted as two stations. The list of stations including consolidated station can be found in Appendix I.

example, for the question regarding safety from falling from a height, "NA" translated to zero points as a station platform flush with the ground does not result in a safety risk. However, for the question that asked if a bike rack is covered, "NA" responses received a one as there is no bike rack in consideration. As mentioned previously, not all collected data was used in the evaluation (i.e. number of advertising cases). Additional data was also added from publically-available information (i.e. platform height) and internal agency data (i.e. station crime statistics).

With all evaluation responses translated to data, the results show each station's score ranked based on a maximum of 44 points. However in this raw state, each piece of data collected is weighed equally (e.g. the presence of a covered bike rack is worth the same amount of points as safety measures such as a call box). To account for the relative importance of some data pieces over others, 100 points were distributed among each rating with the goal of assigning a higher weight to the most TOD-relevant pieces.

Determining the distribution of the 100 points involved another stakeholder process in which internal staff members gathered for a second time to determine what stations features are most important for TOD. To assist in the process, the internal stakeholder group first distributed points to broad categories (i.e. user access, safety, design). Project personnel met later to distribute the designed category points to each data set.

The final determination of weights was sent out via email to the stakeholder group, which then offered thoughts and approval. The final weight system resulted in multipliers for the 44 data features resulting in a total possible score of 100 points. The final weight system can be seen in Appendix II.

Walksheds

In the process of evaluating the 73 fixed-guideway stations, all informal and formal pathways/access points were mapped. Using GIS software, these were then combined with Allegheny County's road network to create a network that was representative of a pedestrian's options for accessing each station. From these updated networks, half-mile walksheds were developed for each station. These walksheds represent the real distances a pedestrian can travel by walking a half-mile given designated walkways and therefore, correspond with the area within which TOD would be considered.

These walksheds were critical to the remaining evaluation to accurately identify the data which represents the true influences on the station area.

All station walksheds can be found in Appendix III. Details regarding the methodology for creating the walksheds can be found in Appendix IV.

PROCESS

Orientation

Many other factors in these walksheds determine the appropriateness and success of TOD projects beyond the station. The next step in the process was to identify these additional factors that impact TOD projects. Reports by organizations such as the Transportation Research Cooperative Program (TCRP), the Center for Transit Oriented Development (CTOD), and Southwestern Pennsylvania Commission were reviewed in addition to the TOD evaluation processes of other transit agencies, such as Sound Transit. Again, a comprehensive list of all criteria that has influence on the success of TOD was created. With a significant amount of overlap, the list was narrowed and the most applicable and relevant factors were chosen by staff members. Two themes presented themselves within the chosen factors. These two themes join Transit to become the final two parts of the evaluation: Orientation and Development.

The first theme, Orientation, represents the existing arrangement of the land (i.e. street network) and people (i.e. density) within the walksheds of the stations. The factors identified as part of the Orientation criteria are: density (residents and jobs), job-to-resident-ratios (to represent amount of mixed use), the presence of sidewalks, intersection density, and walkshed size. The presence of sidewalks was determined during the station evaluation visits and as discussed, the walksheds were created from the pathways mapped during those visits. Density and the job-to-resident-ratios were calculated based on data gathered from the 2000 U.S. Decennial Census, the 2009-2013 Five-Year American Community Survey, and the 2002 and 2011 Longitudinal Employer-Household Dynamics Origin-Destination Employment Statistics datasets, all of which are maintained by the U.S. Census Bureau. Intersection density was calculated using the Allegheny County road network dataset maintained by the Allegheny County Division of Computer Services Geographic Information Systems Group.

Following the collection of the data, all factors were weighted equally in determining neighborhood orientation. Much like with the Transit factors, however, it became clear that some factors hold more importance than others. To prevent all factors from contributing equally to the final score, 100 points were distributed amongst the factors to allow some factors to hold more weight than others. Since all the scores for all factors were normalized into a 0-1 scale, the total maximum points for the Orientation category would then be 100. Density was highlighted as the most important feature of Orientation and assigned 50 percent of the score. All weight assignments can be found in Appendix V.

Development

The final criteria in the TOD evaluation is Development or the opportunity for development to occur within the walksheds based on a) what has been happening and b) what can happen. These two categories essentially represent a) development market momentum and b) the potential for development.

To measure development market momentum, five factors were included in the evaluation. Data from the U. S. Census Bureau's 2000 Decennial Census, 2009-2013 American Community Survey and 2002 and 2011 Longitudinal Employer-Household Dynamics Origin-Destination Employment Statistics datasets were used for capturing changes in density (residents and jobs), changes in rent, and changes in home value. Additionally, the presence of a TOD plan within the station community and emerging development projects within the station community were also added to the measure of development market momentum. Together, the changes in density, home value and rent add to the current status of TOD plans and development projects to summarize how the market is changing.

The potential for development, on the other hand, captures where the market could go based on the availability of land (represented by underutilized acres) and the political will and capacity of typical development leaders (represented by government and community-based organization capacity). Many of these factors followed the example set by the Center for Transit-Oriented Development's work with the Pittsburgh Community Reinvestment Group (PCRG) to create Transit-Oriented Development Typology Strategy for Allegheny County.

To determine underutilized acres, county parcel data was used to identify the buildings and land value of every parcel touching the station walkshed. Any parcels for which the land value was greater than the building value was classified as underutilized, meaning there is a potential financial benefit in redeveloping the land or building on the land to better match the land's market value. Following removal of municipal, government, parks and recreation, and cemetery parcels, all underutilized parcel acreage was added together to get a total acreage of underutilized land. Library Station on the Blue Line has the maximum amount of underutilized acreage and therefore all stations were scored based on how their underutilized acreage compared (as a percentage) to Library's acreage.

The other potential development factors -- government and community-based organization capacity -- as well as the market momentum factors regarding TOD Plans and Emerging Development, came directly from the PCRG study, which ranked neighborhood municipalities and development organizations on their capacity to support TOD planning, zoning, organizing, visioning, development, and fundraising as well as the presence of TOD Plans and development projects. With a 0-3 scale (0 representing no capacity or projects, 3 being stable capacity and active projects) the PCRG numbers were

PROCESS AND RESULTS

updated to represent any changes that have occurred since GoBurgh completed the study in late 2011. Updates were derived from staff active in development discussion and with support from the University of Pittsburgh's Congress of Neighboring Communities (CONNECT).

As with all other processes of the evaluation, weights were assigned to the various development factors in order to capture the most critical market and momentum contributions. The process of assigning weights occurred at the same time, with the same process as described for the Orientation data. The final weights of the Development section can be found in Appendix VI.

Evaluation Results

The goal of the evaluation was to provide an objective, informative tool identifying stations for the Station Improvement Program. The Station Improvement Program invests resources into existing fixed-guideway stations and the immediate surrounding areas to grow revenue through increased transit ridership and joint development of Port Authority land. With this goal in mind, the final results of the Transit, Orientation and Development scores were combined into one complete score that does not value all categories equally. To identify where return on investment would be highest, the Orientation and Development scores were determined to be the most important factors in the evaluation. Orientation and Development scores each contribute 40 percent to the final evaluation score, while Transit makes up the last 20 percent. This weight system ensures Orientation and Development are twice

as important as station status alone, which prevents the scores from recommending investments in stations located in neighborhoods that have no potential to support appropriate TOD.

The final results can be seen in Appendix VII. Based on these results, the Purple Line (East Busway) and Downtown (Red and Blue Light Rail Lines) stations largely dominate the top ten stations. The highest scoring station is East Liberty with a score of 75.93 out of a total possible score of 100. The positioning of East Liberty as the clear lead in the score reflects well on the evaluation as the area surrounding the East Liberty station is currently being redeveloped as TOD.

As indicated by the placement of the recently reconstructed East Liberty, some factors are not considered in this evaluation and therefore, not all stations will be appropriate foci for the Station Improvement Program. Staff will examine and parse priorities annually for an action plan that guides planning and invest at station areas. See Appendix VIII for further details.

Station	Transit	Orientation	Development	Total	Rank
East Liberty	26.70	95.64	80.84	75.93	1
Negley	29.40	94.95	64.19	69.54	2
Wood Street	40.10	87.63	62.85	68.21	3
Wilkinsburg	40.10	94.40	51.14	66.24	4
Steel Plaza	33.40	87.93	56.70	64.53	5
Station Square	34.30	82.37	61.47	64.40	6
Hampshire	57.10	71.65	60.09	64.12	7
First Avenue	28.00	85.45	58.50	63.18	8
Herron	30.70	77.15	64.40	62.76	9
Hamnett	34.90	88.62	47.96	61.61	10
LEGEND					
PURPLE LINE	MULTI-LINE	RED LINE	BLUE LINE	GREEN LINE	YELLOW LINE

Example of evaluation results

APPENDIX I: LIST OF STATIONS

Non-duplicated Stations

1. Swissvale
2. Roslyn
3. Hamnett
4. Wilkinsburg
5. Homewood
6. East Liberty
7. Negley
8. Herron
9. Penn Station
10. Carnegie
11. Bell
12. Idlewood
13. Crafton
14. Ingram
15. Sheraden
16. Glenbury
17. Overbrook Shelter
18. Inglewood
19. Central
20. Whited
21. Edgebrook
22. Pennant
23. Westfield
24. Fallowfield
25. Hampshire
26. Belasco
27. Shiras
28. Stevenson
29. Potomac
30. Dormont Junction
31. Mt. Lebanon
32. Poplar
33. Arlington
34. Castle Shannon
35. Overbrook Junction
36. Casswell
37. Highland
38. Bethel Village
39. Dorchester
40. South Hills Village
41. St. Anne's
42. Smith Road
43. Washington Junction
44. Boggs
45. Bon Air
46. Denise
47. McNeilly
48. Killarney
49. Memorial Hall
50. Willow
51. Hillcrest
52. Lytle
53. Mesta
54. South Park Road
55. Munroe
56. Sarah
57. Logan Road
58. King's School Road
59. Beagle
60. Sandy Creek
61. West Library
62. Library
63. Allegheny
64. North Side
65. Gateway
66. Wood Street
67. Steel Plaza
68. First Avenue
69. Upper Incline (not yet included)
70. Lower Incline (not yet included)

Combined Stations

71. Dawn Station
 - South Busway Station (71)
 - Red Line Station (72)
72. Palm Garden
 - South Busway Station (73)
 - Red Line Station (74)
73. Station Square
 - South Busway Station (75)
 - Red and Blue Line Station (76)
74. South Bank
 - South Busway Station (77)
 - Blue Line Station (78)
75. South Hills Junction
 - South Busway Station (79)
 - Blue and Red Line Station (80)

Removed Stations

- South Busway at Pioneer Ave (81)
- Reason: Although appearing as a station in some databases, this location is not listed on the official South Busway map. It is technically a ramp onto the fixed-guideway.
- Purple Line at Garage (82)
- Reason: This is an employee stop only not available to the general public.

APPENDIX II: TRANSIT WEIGHT SYSTEM

Points for weight were first distributed to eight topic areas. The highest amounts of points were assigned to the most important features for TOD. The weight distribution resulted as such:

Category	Points
User Access	22
Design	17
Amenities	16
Safety	16
Accessibility	10
Information	10
Bike Amenities	8
Advertising	1
Total	100

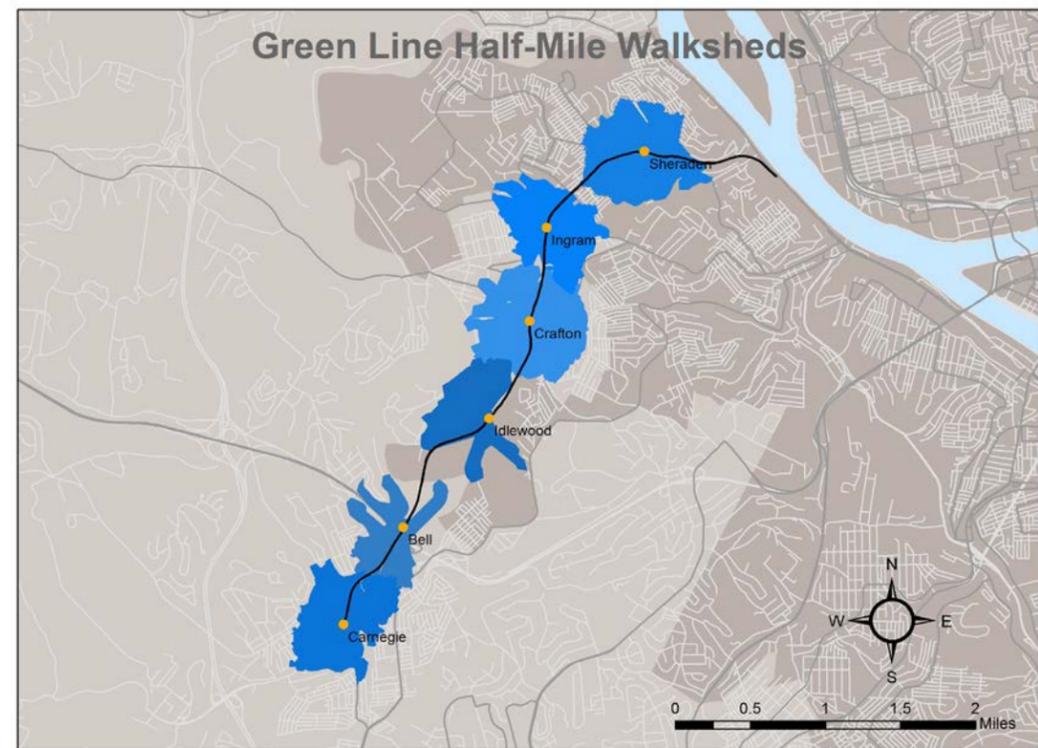
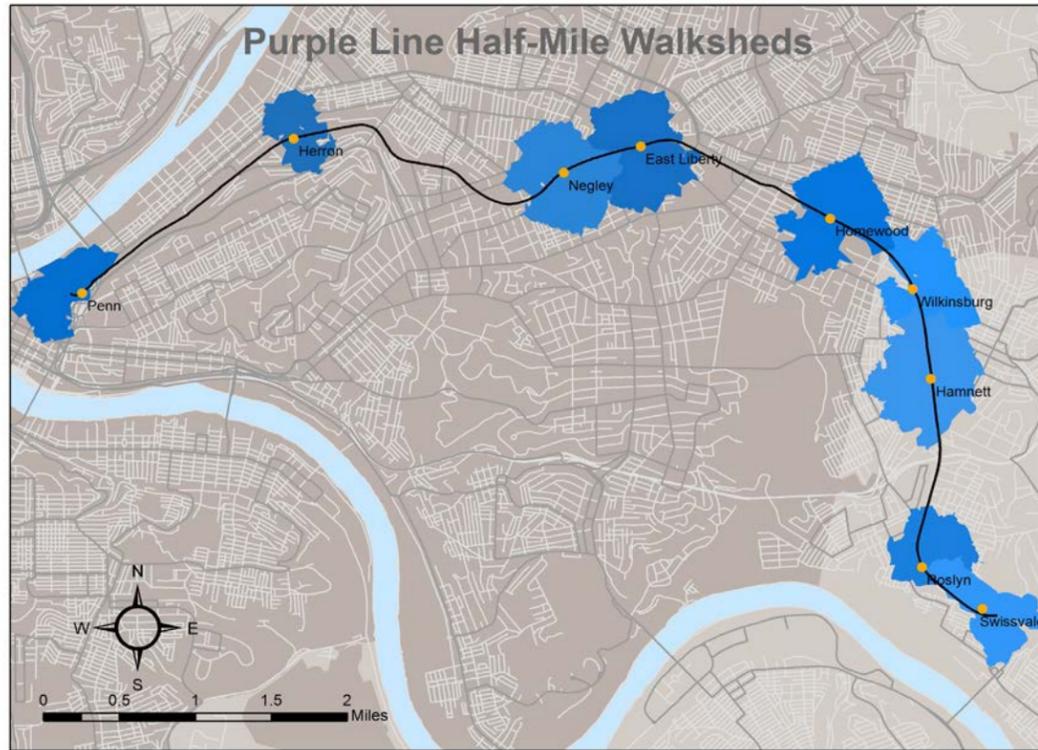
The points awarded to each category were then distributed to the 44 features that make up the various categories. Again, distribution was based on the importance to successful TOD.

All 44 factors can be seen below and to the right. As stations were evaluated, if a feature was NOT present, the question answered with "No" the station would be awarded points. For crime, transit connections, visibility shed rank, and appearance scale, points were awarded for higher crime, less transit connections, less visibility, and worst appearances. With this system, the stations that do not have the desired TOD conditions received the most points as a method to identify where investment is needed.

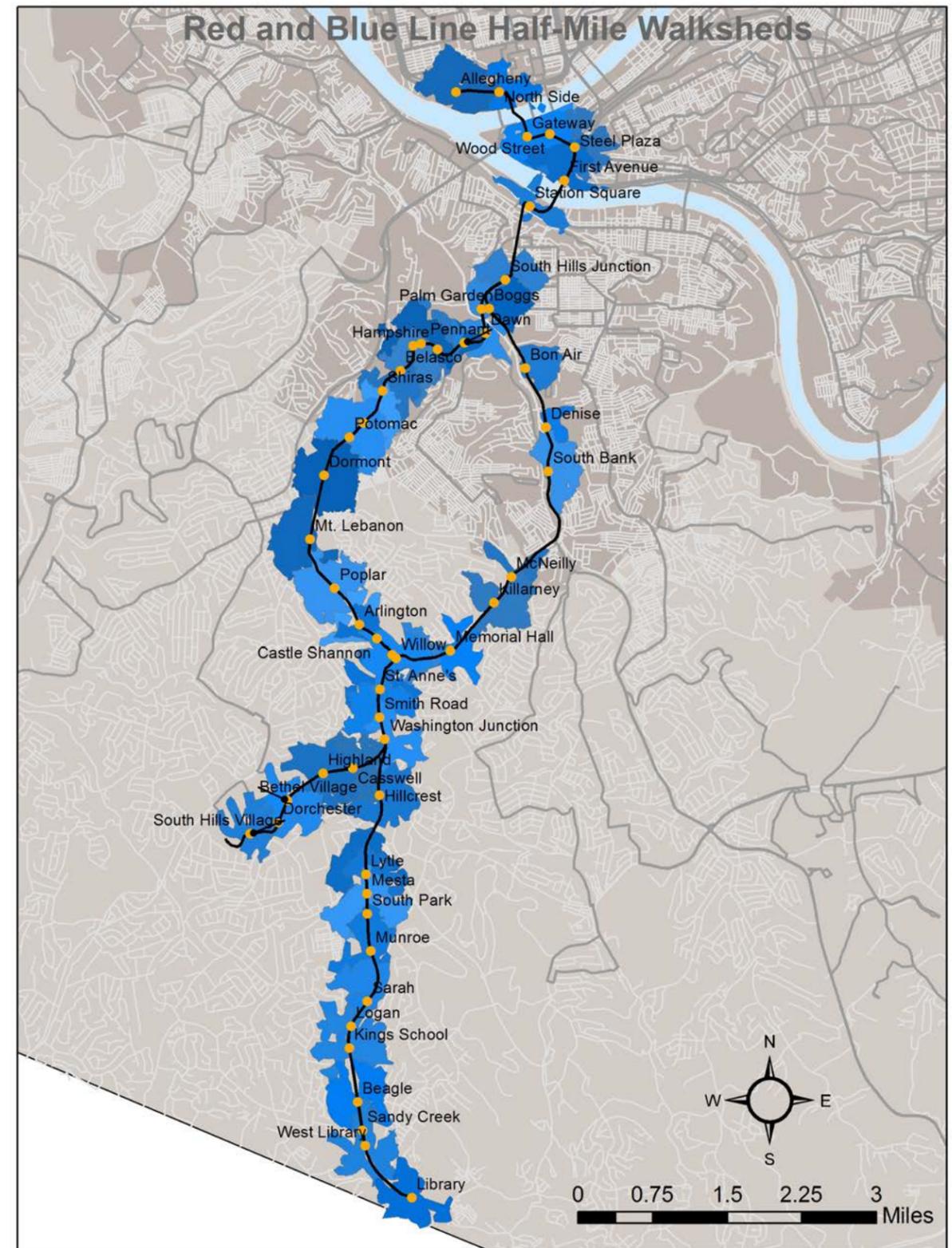
User Access	
Safe way to enter and exit the station?	5
Is the entrance/exit visible?	2
Is the entrance/exit convenient?	5
Is the cross path in the station safe?	1
Is the cross path in the station visible?	1
Transit Connections	2
Visibility Shed Rank	6
Design	
Art?	2
Sense of Place?	4
Landscaping?	3
Appearance Scale	6
Sustainable Design?	2

Amenities	
Amenities Inbound platform shelter from above?	3
Amenities Inbound Shelter from side?	1
Inbound passenger seats?	2
Amenities Outbound platform shelter from above?	3
Amenities Outbound shelter from sides?	1
Outbound passenger seats?	2
Amenities Trash Receptacles?	1
Validator?	1
TVM(s)?	2
Safety	
Safety Jersey Barriers?	1
Safety Can people see me beyond station?	4
Safety Can I see people beyond station?	4
Safety Safe Routes and No Entrapment?	3
Safety Are there convex mirrors if needed?	1
Safety Security Cameras Present?	1
Safety Call Box?	1
Crime	1
Accessibility	
Shelter Space for Wheelchair?	1
Accessible Signage?	1
Is Station Accessible?	4
Accessible boarding?	4
Information	
Directional Signage?	4
Station Name Signage?	3
Route Signage?	2
PA/VMS?	1
True Time?	0
Bike Amenities	
Bus sign more than 3ft from platform?	2
Bike Rack 1 Covered?	1
Bike Rack 2 Covered?	1
Ratio of 'Spaces: Bike' 1 or greater?	4
Advertising	
Advertising Present?	1
Total	100

APPENDIX III: STATION WALKSHEDS



APPENDIX III: STATION WALKSHEDS

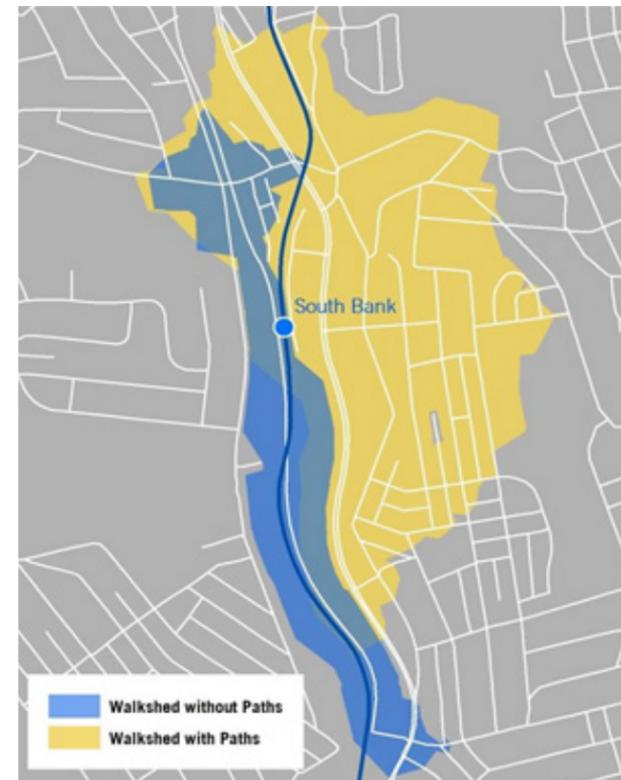


APPENDIX IV: WALKSHED ANALYSIS

Port Authority used Geographic Information System (GIS) software to create the half-mile walksheds used to assess the TOD potential of the land around its fixed-guideway transit station. The following methodology describes the steps taken to create these walksheds as well as how they were used to evaluate each station's TOD potential.

Walkshed Creation

Prior to the creation of the walksheds, Port Authority visited each of the stations and mapped all of the formal and informal walking paths that could be used to directly access the station by pedestrians. These paths were then merged with the street network dataset maintained by Allegheny County. After the merger, limited access highways, access ramps, service drives, tunnels, and the authority's busways were removed to create a street and path network that was more representative of the network utilized by pedestrians to access the stations.



A mapped walkshed, with and without the adjustment to include the mapped pathways.

The modified street and path network was loaded into the network analyst tool in the ESRI ArcGIS software suite along with each of the stations. The analyst tool was then used to compute a separate half-mile service area for each station with options set to allow for "U-turns" and to disregard the directionality of streets to better account for how pedestrians utilize the street network. Each walkshed was allowed to overlap with others to capture the maximum service area for each station as well as to avoid making assumptions about the station choices of residents living in areas covered by more than one station.

Census Data

To assess the development potential of the land contained in each station's walkshed, Port Authority retrieved data from three data sources maintained by the U.S. Census Bureau: the 2000 Decennial Census, the 2009-2013 American Community Survey, and the 2002 and 2011 Longitudinal Employer-Household Dynamics Origin-Destination Employment Statistics datasets. This data was obtained at the Census Block Group level, the smallest geography available for each dataset. Additionally, a shapefile representing the block groups in Pennsylvania was obtained from the U.S. Census Bureau's TIGER repository.

Combination of Census Data and Walksheds, and Computation of TOD Metrics

To create the walkshed data required for the computation of the TOD metrics, the tabular Census data was imported into ArcGIS and joined to a version of the block group shapefile, which had been clipped to exclude areas of water. The version of the block group shapefile with the Census data joined to it was then intersected with the walkshed shapefile to create a shapefile representing which block groups fell entirely or partially within each walkshed.

The block group data was then aggregated to the walkshed level to provide an assessment of each walkshed's development potential. However, prior to this step, the census data for each block group (with the exception of rent and income data) was weighted by the percentage of each block group's total area that fell inside the walkshed in question to account for the fact that the walkshed and block group boundaries were not coterminous. This procedure assumes that the weighted metrics, such as population, are evenly distributed within each block group, a relatively safe assumption given the small geographic size of each block group.

METHODOLOGY

Intersection Density

The intersection density of each walkshed was computed using the aforementioned street and path network dataset. The nodes of the dataset, each representing an intersection, were converted to a point layer in ArcGIS and duplicate points were then removed. The resulting intersection shapefile was then spatially joined with the walkshed layer to obtain the total number of intersections in each walkshed. Finally, this number was divided by the walkshed's total area to obtain the intersection density.

Underutilized Land

To calculate the amount of underutilized land in each walkshed Port Authority obtained parcel data from the Allegheny County Office of Property Assessments. For each parcel, a ratio of land value to building value was computed. Parcels that did not have a building worth as much as the land (i.e. a value over one) were determined to be underdeveloped. Working under the assumption that land with no assessed value is flawed and therefore, of no worth, the parcels of land with no assessed value were not determined to be underdeveloped.

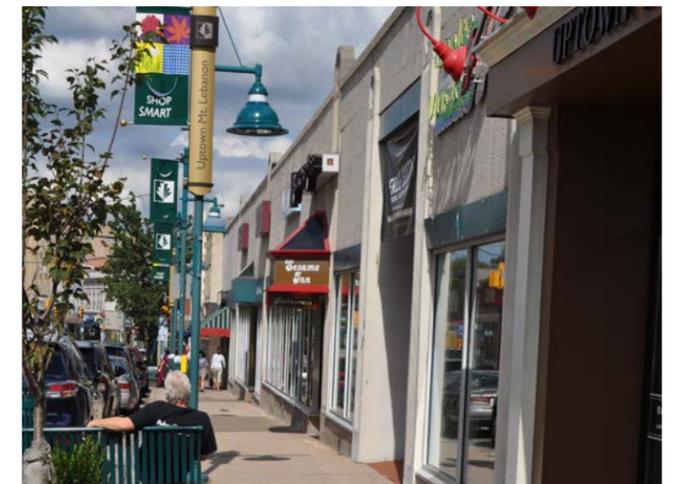
The parcels were then intersected with the half-mile walkshed layer in ArcGIS to determine which parcels fell entirely or partially within a walkshed. Utilities, parks, churches, cemeteries, and governmental parcels -- with the exception of those designated for urban renewal -- were removed from the parcels touching a walkshed as they were deemed undevelopable. The resulting data were not adjusted by the percentage of the parcel within the walkshed under the assumption that if a portion of a parcel fell within in the walkshed then, for all intents and purposes, the entire parcel was accessible from the station.

Transit Routes

To determine the number of transit routes near each station Port Authority recalculated quarter-mile walksheds using the same process used to create the half-mile walksheds. These walksheds were then intersected with a shapefile representing each of the Port Authority's bus stops. Each route with a stop within the walkshed was then counted to arrive at the total number of transit routes within a quarter-mile walk.



Downtown Carnegie in walking distance to Carnegie Station - Green Line



Business district in walking distance to Mt. Lebanon Station - Red Line



Suburban residential in walking distance to South Hills Village Station - Blue Lines

APPENDIX V: ORIENTATION WEIGHT SYSTEM

Category	Points
Density (Jobs + Resident per square mile)	50
Mixed Use (Jobs : Residents Ratio)	10
Presences of Sidewalks	20
Intersection Density	10
Walkshed Size	10
Total	100

Density (Jobs + Resident per square mile)	50
-------------------------------------------	----

A point in density is distributed based on the quartiles of data representing the highest to lowest densities. The top quartile receives the full point, the second greatest quartile receives .75 points, etc.

Mixed Use (Jobs : Residents Ratio)	10
------------------------------------	----

A point in mixed use is distributed so the further a site's ratio moves away from the perfect 1:1 ratio, the lower points they receive.

Presences of Sidewalks	20
------------------------	----

A point for sidewalks is determined by the presences of sidewalks from the transit station into the street network. If a station (a) has sidewalks, it receives the full point, (b) has some sidewalks but not on every road or on every side, it receives half a point, and (c) has no sidewalks, no points are distributed. Presence of sidewalks was determined during visits to the station and does not represent sidewalks throughout the walkshed, just what was observable from the station.

Intersection Density	10
----------------------	----

A full point in intersection density is awarded to every station with 400+ intersections with in the walkshed. As the number of intersections decreases, so does the point distribution. 300-400 intersections results in 0.8 points, 200-300 results in 0.6 points, 100-200 points results in 0.4 points and onwards.

Walkshed Size	10
---------------	----

With perfect access allowing a walking commute in all directions for a ½ mile, the perfect walkshed is a circular 0.79 square miles. The stations were awarded points based on the size in relation to (as a percentage of) the perfect 0.79 square miles.

Total	100
--------------	------------

APPENDIX VI: DEVELOPMENT WEIGHT SYSTEM

Category	Points
Development Momentum	50
Change in Density	5
Change in Rent	15
Change in Home Value	15
Presence of TOD Plan	10
Emerging Development	5
Development Potential	50
Underutilized Land (Acreage as a percentage of the highest amount of acreage in the system)	40
Government Capacity	5
Community Based Organization Capacity	5
Total	100

Development Momentum	50
-----------------------------	-----------

Change in Density	5
-------------------	---

To capture how the neighborhood was changing in density, a point was awarded to any station that experienced over 20% increase in density. As the amount of change decreases so does the amount awarded. 20-6% receives 0.75 points, 6-0% increase receives 0.5 points, and 0%-(-5)% receive 0.25 points.

Change in Rent	15
----------------	----

A full point is awarded for any station which had an 80%+ increase in rent. As rent change decreases, so does the point value. Ranges include 80-60% (0.8 points), 60-40% (0.6 points), 40-20% (0.4 points), 20-0% (0.2 points).

Change in Home Value	15
----------------------	----

A full point is awarded for any station which had an 60%+ increase in home value. As home value change decreases, so does the point value. Ranges include 60-45% (0.8 points), 45-30% (0.6 points), 30-15% (0.4 points), 0-15% (0.2 points).

Presence of TOD Plan	10
----------------------	----

Four point options exist in this category. A full point is awarded to any station with a comprehensive TOD plan such as a TRID study. Fewer points (0.6) were awarded for station area plans that address TOD without specifics and even fewer points (0.3) were awarded if there is a community plan that does not address TOD. If no plan is present, no points were awarded.

Emerging Development	5
----------------------	---

Points for emerging development were based on the commitment to development occurring near the station. Plans in discussion, financing, and construction were awarded 0.3, 0.6, and 1.0 points respectively.

Development Potential	50
------------------------------	-----------

Underutilized Land	40
--------------------	----

Each station's amount of underutilized acreage was taken as a percentage of the highest amount of underutilized acreage identified in the system. The highest being Library with 89.02 acres, points were awarded as the station's underutilized acreage divided by 89.02.

Government Capacity	5
---------------------	---

Government capacity was taken as an average of rankings assigned to "planning or related agency staff in place" plus "adopted TOD supportive zoning". Points were awarded in relation to high, medium, low, or non-existent capacity as determined by an updated GoBurgh review.

Community Based Organization Capacity	5
---------------------------------------	---

Community Based Organization capacity was taken as an average of rankings assigned to "community organizing", "land use planning/visioning", "development" plus "fundraising". Points were awarded in relation to high, medium, low, or non-existent capacity as determined by an updated GoBurgh review.

Total	100
--------------	------------

APPENDIX VII: FINAL RANKINGS

Station	Transit	Orientation	Development	Total	Rank
East Liberty	26.70	95.64	80.84	75.93	1
Negley	29.40	94.95	64.19	69.54	2
Wood Street	40.10	87.63	62.85	68.21	3
Wilkinsburg	40.10	94.40	51.14	66.24	4
Steel Plaza	33.40	87.93	56.70	64.53	5
Station Square	34.30	82.37	61.47	64.40	6
Hampshire	57.10	71.65	60.09	64.12	7
First Avenue	28.00	85.45	58.50	63.18	8
Herron	30.70	77.15	64.40	62.76	9
Hamnett	34.90	88.62	47.96	61.61	10
Gateway	16.80	86.45	56.78	60.65	11
Homewood	25.50	80.35	56.70	59.92	12
Fallowfield	41.40	71.83	56.45	59.59	13
Stevenson	50.90	88.02	35.41	59.55	14
Belasco	64.10	71.03	44.11	58.88	15
Poplar	51.50	73.14	48.00	58.75	16
Carnegie	20.20	84.75	51.83	58.67	17
Shiras	66.10	72.72	40.13	58.36	18
Penn Station	48.10	83.37	37.41	57.93	19
North Side	34.60	81.45	43.82	57.03	20
Dormont	38.80	87.72	34.60	56.68	21
Westfield	39.90	70.16	51.12	56.49	22
Potomac	28.40	90.95	35.27	56.17	23
Arlington	49.40	69.46	45.18	55.73	24
South Hills Junction	33.20	64.69	57.36	55.46	25
Mt. Lebanon	20.60	87.36	40.71	55.35	26
St. Anne's	45.90	71.75	42.80	55.00	27
Castle Shannon	26.30	75.58	42.80	52.62	28
Overbrook Shelter	55.20	58.92	45.01	52.61	29
Allegheny	22.80	82.82	35.87	52.03	30
Overbrook Junction	36.10	78.78	32.91	51.90	31
Roslyn	24.70	93.34	23.80	51.79	32
Glenbury	46.00	46.03	58.38	50.96	33
Killarney	40.00	59.42	46.95	50.55	34
Willow	22.90	75.38	36.60	49.37	35
South Park Road	55.30	54.41	39.94	48.80	36
Whited	36.60	45.20	57.87	48.55	37
LEGEND					
PURPLE LINE	MULTI-LINE	RED LINE	BLUE LINE	GREEN LINE	YELLOW LINE

APPENDIX VII: FINAL RANKINGS

Station	Transit	Orientation	Development	Total	Rank
Boggs	48.60	59.72	36.38	48.16	38
Dawn	71.70	35.86	48.43	48.06	39
Pennant	80.80	35.73	43.19	47.73	40
Bell	37.60	51.77	48.72	47.71	41
Crafton	17.70	76.69	33.58	47.65	42
Ingram	20.40	72.31	36.55	47.63	43
Mesta	48.80	53.68	39.44	47.01	44
Edgebrook	58.70	33.27	54.59	46.88	45
Smith Road	51.40	40.50	48.72	45.97	46
Swissvale	34.90	63.07	34.29	45.93	47
South Bank	45.70	48.50	42.03	45.35	48
Inglewood	53.80	60.87	22.69	44.18	49
Palm Garden	59.80	46.61	33.14	43.86	50
Bethel Village	47.10	62.90	22.92	43.75	51
McNeilly	38.10	33.74	54.86	43.06	52
Munroe	54.10	51.31	28.18	42.62	53
Idlewood	22.60	35.14	56.76	41.28	54
Highland	73.80	51.22	13.45	40.63	55
Central	71.40	23.21	42.39	40.52	56
Sheraden	18.30	50.79	39.05	39.60	57
Logan	76.20	32.95	27.80	39.54	58
Library	33.70	22.40	59.50	39.50	59
Hillcrest	70.30	36.37	26.35	39.15	60
Dorchester	48.40	46.73	25.06	38.40	61
Lytle	22.70	42.13	39.94	37.37	62
Denise	41.60	23.10	49.23	37.25	63
South Hills Village	29.20	44.42	31.94	36.39	64
Memorial Hall	35.30	39.37	33.37	36.15	65
Kings School	74.60	21.82	28.67	35.12	66
Sarah	69.00	27.74	24.90	34.86	67
Sandy Creek	83.20	21.25	23.26	34.44	68
Washington Junction	33.80	24.87	42.30	33.63	69
West Library	52.20	22.66	28.19	30.78	70
Beagle	63.60	21.18	20.05	29.21	71
Bon Air	48.30	24.86	23.55	29.02	72
Casswell	48.50	23.70	17.54	26.19	73
LEGEND					
PURPLE LINE	MULTI-LINE	RED LINE	BLUE LINE	GREEN LINE	YELLOW LINE

APPENDIX VIII: ANNUAL IMPLEMENTATION

The goal of this evaluation process was to identify the stations with the best potential for successful TOD. As described above, the evaluation process produced a ranking of 73 stations (lower and upper incline stations to be added). It is the goal of the Station Improvement Program to invest in priority stations each fiscal year to support TOD.

The results of the evaluation, when scores were placed in order from largest to smallest, ranked the stations in the order of best station investment locations. However, while the evaluation identified many factors for determining TOD preparedness and potential, other planning factors that impact the real investments of Port Authority were not captured in the evaluations. To account for these other planning factors, the top 50 percent (36 stations) will be continuously reviewed at least annually to identify the priorities of the Station Improvement Program.

A few practicalities must be addressed prior to investing in stations. As the Station Improvement Program is planned for the future, the Port Authority will make an informed and coordinated efforts to follow the evaluation while remaining fiscally responsible. The Station Improvement Program will not look to invest in stations that are newly built or updated. Additionally, the Station Improvement Program will not address stations that do not serve a distinct rapid service. This includes the South Busway stations, which, despite being a part of the evaluation, do not receive the rapid service of other fixed-guideway stations.¹

Another practicality is that at any given time, some stations will have future changes planned or in planning by internal and external parties. Internally, this means that staff will compare the Station Improvement Program with State of Good Repair projects and long-term planning. When possible, Station Improvement Program investments and State of Good Repair investments will be coordinated so as to minimize disruption and capitalize on construction opportunities. Additionally, development rights may be under negotiation, station funding may be pending, or attention and support from other external entities may be under way. In these situations, stations will be put on hold and will not to be part of the program in order to ensure station investments reflect both current and future uses. These stations are likely appropriate investment sites in a different year, once other internal/external projects have come to fruition; TOD improvements can be

¹ The South Busway, despite offerings a segregated, dedicated right-of-way, does not warrant or receive the standards of service seen with the other fixed-guideways being analyzed in this evaluation. Specifically both span and frequency of service are significantly less and it is the only guideway that does not have a dedicated route servicing only its stations. PAAC's Annual Service Guidelines designates the routes using the South Busway as either Local or Express routes. The Purple, Green, Blue, Red and Inclines routes, however are all designated as Rapid. Additionally, the areas surrounding the South Busway are more disconnected from the stations than other corridors. In all, these factors were determined to be too significant to be considered for TOD. The evaluation for all South Busway Stations was complete as time may change the service and surroundings of the South Busway.

integrated into station-area plans at that time.

Lastly, PAAC-owned property near stations allows the potential for PAAC to develop the land as TOD. Therefore, all stations with adjacent developable PAAC land will be identified and, due to the value the land development offers PAAC, moved to the top of the rankings. The remaining stations fall to the bottom of the rankings, but remain in order of total score.

Each fiscal year, the Station Improvement Program will plan following review of the top 36 stations and with these considerations in mind. Working from this list, three classifications of investment will be assigned to each station to broadly categorize what is needed, what is possible and what is the right process for needed improvements. Following the same framework used by the Bay Area Rapid Transit (BART), the three categories include: (1) Early Wins, (2) Gateway Projects and (3) Station Area Plans. With all three types, knowing where PAAC owns property around the stations is useful in understanding where improvements would extend into the municipality and community.

- Early Wins consist of small to medium scale improvements that are entirely on PAAC property. The investment for Early Wins is smaller and has a shorter time frame. For these stations, the first step is to design station improvements.
- Gateway Projects are larger projects than the Early Wins; improvements are medium to large scale with higher levels of investment and a longer time frame. Gateway Projects occur entirely on our property and transform the way the property looks and operates. The strategy to implement Gateway Projects is to start with a conceptual design.
- Lastly, Station Area Plans are large scale and require cooperation from the municipality and community to identify and design improvements. Access to stations and TOD opportunity are both priorities in Station Area Plans meaning improvements will likely extend beyond PAAC property. Cooperation is required to create shared vision and implementation.

These categories in addition to the evaluation process will enable the Station Improvement Program to be strategically planned over time and over the most appropriate stations.