

**EASTSIDE LAND USE AND TRANSPORTATION INITIATIVE  
TRANSIT-ORIENTED DESIGN STUDY AND TRAFFIC ANALYSIS**



Transportation Solutions for Today and Tomorrow

**Prepared For:  
SOUTHWESTERN PENNSYLVANIA COMMISSION  
Pittsburgh, Pennsylvania**

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**May 11, 2007**




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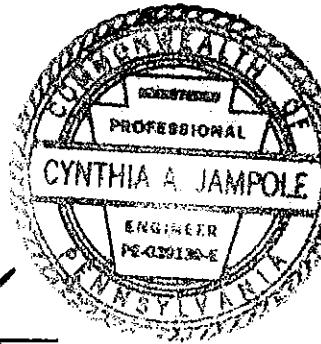
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**May 11, 2007**

## **Eastside Land Use and Transportation Initiative Transit-Oriented Design Study and Traffic Analysis**

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This report presents the results of the developed design options, which are intended to create a path for economic development and transit oriented development to be centered about the Penn Avenue and Centre Avenue intersection in East Liberty.

The East Liberty section of the City of Pittsburgh is a community that is primed for redevelopment which will lead to a promising future. The location of East Liberty, in particular, the Penn Avenue and Centre Avenue corridor, is the perfect location for successful economic development. The intersection of Penn Avenue and Centre Avenue serves as the gateway to East Liberty and Pittsburgh from the east. The study process quickly lead to the conclusion that the critical path to continued economic development in East Liberty runs through this 100 percent intersection, Centre Avenue and Penn Avenue.

### **STUDY PROCESS**

The study process included the following steps:

- Establishment of the Study Advisory Committee, with implementation of a collaborative process;
- Development of Design Guiding Principles;
- Development of design options;
- Explanation of options by discipline;
- Development of a comparison matrix of options; and
- Determination of outcomes and recommendations.

### **ADVISORY COMMITTEE**

Within recent years there have been multiple developments that have begun the revitalization process, and have thus paved the way for future development in this neighborhood. In order to continue this positive trend, the project team established a local Advisory Committee that would provide assistance during the study. The Advisory Committee included representatives from the Southwestern Pennsylvania Commission (SPC), East Liberty Development, Inc, Port Authority of Allegheny County, The Mosites Company, the Urban Redevelopment Authority (URA), the Pennsylvania Department of Transportation (PennDOT), the City of Pittsburgh Department of City Planning, Real Estate Enterprises and East Liberty Quarter Chamber of Commerce, Bike Pittsburgh, Clearview Strategies, Pittsburgh Civic Design Coalition, Whole Foods, Abay Ethiopian Restaurant, Pittsburgh Parking Authority, PA Department of Community and

Economic Development, and the Allegheny County Department of Community and Economic Development. The Advisory Committee process included a series of meetings, the proceedings of which are documented in the Technical Appendix of this report.

## DESIGN GUIDING PRINCIPLES

In conjunction with the Advisory Committee, the consultant team developed design guiding principles for both this study and any future development in this section of East Liberty. These guiding principles, as discussed and agreed upon by the Advisory Committee, are as follows:

- The intersection of Penn Avenue and Centre Avenue should be developed as a “gateway” to East Liberty;
- The intersection of Penn Avenue and Centre Avenue should include the development of an anchor site;
- Urban densities should be increased, and quality architecture should be provided;
- The Penn Avenue and Centre Avenue intersection is problematic in its current five-point design. The inevitable progression of conditions at this intersection would lead to worsening conditions, with deterioration of operating conditions over time;
- Create a sense of place in terms of architecture, sidewalks, and streets;
- Promote diversity and inclusion as guiding community principles;
- Create the kind of on-street conventional street life that constitutes a main street or town center;
- Design the bus station to perform in an optimal manner;
- Establish a visual connection to the East Liberty bus station;
- Provide a pedestrian and bicycle friendly urban experience;
- Provide excellent transportation access;
- Incorporate transit into the street life; and
- The linear and contiguous set of streets currently named Penn Circle South, Penn Circle East, Collins Avenue (300, 400, and 500 Blocks) and Negley Run Boulevard should all be re-named Centre Avenue.

The study also included as one of the basic premises, that the roadways comprising Penn Circle would be converted from one-way to two-way traffic flow all around, as presently approved by and planned for implementation by the City of Pittsburgh.

## TRANSIT-ORIENTED DEVELOPMENT OPTIONS

Transit-Oriented Development (TOD) is economic development investment in sites incorporating or adjacent to transit facilities, providing higher density land use, and encouraging the growth of a walkable, mixed-use community. Numerous Transit-Oriented Development (TOD) conceptual schemes were developed for the parcels in and around the 100% intersection at Penn and Centre Avenues. The focus was maximization of a developable footprint at this location. The 100% intersection is the site of the existing Port Authority of Allegheny County's Penn Mall bus station and the "Eastside" development project. The study team and the Advisory Committee sought to investigate development options that would optimize development options, maintain efficient transit operations, and enhance the community by supporting and advancing the Design Guiding Principles. The urban design principles and typologies included in the Technical Appendix were also considered.

TOD options were developed in order to allow the Advisory Committee the opportunity to consider the impacts of various transit station and development site configurations on the community infrastructure, the size of the development site, and the flow of transit operations. The diagrams illustrated potential conflicts in occupancy of varying magnitudes. The initial TOD schemes (shown in the Technical Appendix) presented to the Advisory Committee were designated as options A, B, C, D and E, and were based upon the following assumptions:

1. The TOD Study Options focused on **functionality**, were diagrammatic, and did not intend to represent refined architecture. Only grade-level, non-multi-story conditions were illustrated.
2. The development site, during this portion of the project analysis, was assumed to be the south side of the 100% intersection.
3. Bus and delivery vehicles were acknowledged to have restricted turning capability. A minimum inside turning radius of 25'-0" and outside turning radius of 55'-0" was assumed for site access.
4. The marketable footprint of the commercial occupancies on the "Eastside" development site south of the 100% intersection was not fixed and was expected to be driven by future building tenants. The square footage assigned to a potential parking deck was a placeholder merely representing development area.
5. A minimum station size was illustrated. The width was 72 feet: (2) 12'-0" travel lanes, (2) 12'-0" berthing lanes, and (2) 12'-0" station shelter/sidewalk zones. The preferred length was 135 feet, accommodating (3) 45'-0" buses in tandem. Not all the schemes presented would accommodate the 135-foot station length. The shorter stations were represented with two tandem buses. Actual station requirements may vary.

6. Bus layover areas separate from the station berthing locations were not illustrated on the development site.
7. The existing Penn Mall bus station was observed to be two stations in one serving: bus routes that remain on neighborhood streets, and bus routes that move between the Martin Luther King, Jr. East Busway and neighborhood streets. Transfers occur between these two stations.
8. A new bus ramp configuration over the existing railroad tracks was not considered to be feasible due to potential costs, liability, and time of development implementation.

The TOD Study Options are described below:

***Option A – On-street bus station at development site with reconfigured Busway ramp to Penn Avenue.***

Development option A consists of transit oriented development (TOD) which utilizes on-street bus stations located on the east approach of the Penn Avenue and Centre Avenue intersection. This option would require the reconfiguration of the East Busway ramp to Penn Avenue. At this new intersection, Penn Avenue and the East Busway ramp would be controlled by an actuated traffic signal. Reconfiguration of this ramp will allow for a development footprint of approximately 58,000 square feet on the southern corner of the Penn Avenue and Centre Avenue intersection. This design would eliminate the five-point intersection of Penn Avenue and Centre Avenue. This design option also assumes the complete two-way traffic conversion of Penn Circle. Design option A is presented graphically in the Technical Appendix to this report.

***Option B – On-street bus station at development site with reconfigured Busway ramp to Shady Avenue.***

Development option B consists of transit oriented development (TOD) which utilizes on-street bus stations located on the east approach of the Penn Avenue and Centre Avenue intersection. This option would require the reconfiguration of the East Busway ramp to touch down at Shady Avenue. At this new intersection, Shady Avenue and the East Busway ramp would be controlled by an actuated traffic signal. By removing the busway ramp from the developments north of the busway, the development footprint on the southern corner of the Penn Avenue and Centre Avenue intersection is maximized to approximately 69,000 square feet. This design would eliminate the five-point intersection of Penn Avenue, Centre Avenue. This design option also assumes the complete two-way traffic conversion of Penn Circle. Design option B is presented graphically in the Technical Appendix to this report.

***Option C – Off-street station parallel or perpendicular to Centre Avenue with existing Shakespeare Street.***

Development option C consists of transit oriented development (TOD) which utilizes off-street bus stations located on Shakespeare Street and within the TOD development. This option would keep the East Busway ramp in the same location as it is today. However, it will gain a new access point through Shakespeare Street. This design would provide a development footprint of approximately 38,000 square feet. Option C would eliminate the five-point intersection of Penn Avenue and Centre Avenue. This design option also assumes the complete two-way conversion of Penn Circle. Design option C is presented graphically in the Technical Appendix to this report.

***Option D – Off-street bus station parallel or perpendicular to Centre Avenue with reconfigured Sheridan Street.***

Development option D consists of transit oriented development (TOD) which utilizes off-street bus stations located on the reconfigured, extended Sheridan Street. This option would keep the East Busway ramp in the same location as it is today. However, it will gain a new access point through the reconfigured Sheridan Street. This design would provide a development footprint of approximately 47,000 square feet. Option D would eliminate the five-point intersection of Penn Avenue and Centre Avenue. This design option also assumes the complete two-way conversion of Penn Circle. Design option D is presented graphically in the Technical Appendix to this report.

***Option E – One on-street bus station either at the intersection of Penn Avenue and Centre Avenue or near Penn Avenue bridge and One off-street bus station serving the East Busway only.***

Development option E consists of transit oriented development (TOD) which utilizes off-street bus stations located on the east approach of the Penn Avenue and Centre Avenue intersection or near the Penn Avenue Bridge. In addition to the on-street bus stations, one off-street station is also located on the East Busway ramp. This option would require the reconfiguration of the East Busway ramp to Penn Avenue. At this new intersection, Penn Avenue and the East Busway ramp would be controlled by an actuated traffic signal. This design would provide a development footprint of approximately 49,000 square feet. Option E would eliminate the five-point intersection of Penn Avenue and Centre Avenue. This design option also assumes the complete two-way conversion of Penn Circle. Design option E is presented graphically in the Technical Appendix to this report.



***TSM Option – East Busway station would be unchanged, with retention of the five-point intersection, Penn Circle would be converted to two-way.***

The Transportation Systems Management (TSM) design option would include operational improvements with only minor station infrastructure modifications. One physical change discussed was the narrowing of the station driveway entrances in order to reduce the length of pedestrian crossings. The TSM option would include the complete two-way conversion of Penn Circle with signal optimization. The East Busway station would remain the same as it does today, and the five point intersection would be maintained. The TSM option is presented graphically in Figure 1.

### **Review by Advisory Committee**

The development options A, B, C, D, E, and TSM were all presented to the Advisory Committee for review during the collaborative process. The Advisory Committee along with the consultant team compared each option to the previously established guiding principles with the purpose of identifying positive aspects and fatal flaws associated with the designs based on operating characteristics.

Through this process, the Advisory Committee members were not able to determine one design vision that stood out as the definite solution for East Liberty. They were, however, able to identify three options that presented promising visions for the neighborhood and deserved further review. Development options A and E were combined due to their similarities to produce a hybrid option referred to as Option A+E, which consolidates the positive attributes of each design. Development option D was also chosen, along with the TSM option. Options A+E and D are presented graphically in Figures 2 and 3, respectively. These options were then further evaluated.

## TRANSPORTATION ANALYSIS

The transportation analysis for the study area was performed using *Synchro Version 6 Traffic Signal Coordination Software* and *SimTraffic Version 6 Traffic Simulation Software*. The analysis consisted of evaluating Options A+E, D, and TSM for the future design year of 2017, with trips associated with all planned developments within the immediate study area included. Using the SimTraffic software, each design scenario was evaluated based on measures of functionality which included network traffic flow, capacity, delay, and vehicle queuing. Comparative results for each design option are detailed further in the development option matrix.

The first step in the future analysis process was the projection of trip generation associated with all of the planned developments within the immediate study area. This effort is detailed below.

### **Trip generation**

Trip generation for the planned developments within the immediate study area was calculated based upon data contained in the reference document entitled Trip Generation, 7th Edition, published by the Institute of Transportation Engineers (ITE). These calculations, on a site-by-site basis, have been summarized in Table 1. As presented in Table 1, a total of 1,023 PM peak hour new trips (504 entering & 519 exiting) are projected to occur as a result of the new developments.

A portion of the trips generated by the proposed developments will be pass-by trips, that is, vehicles already on the roadway will be attracted by the site(s) as an intermediate destination. The ITE Trip Generation Handbook was used to determine the percentage of pass-by trips to be generated by the proposed development. Using this methodology, the proposed developments are projected to generate 376 PM peak hour pass-by trips (180 entering & 196 exiting). Therefore, the planned developments in the study area are projected to generate a total of 1,399 (new plus pass-by trips) PM peak hour trips (684 entering and 715 exiting).

In addition to the planned developments within the immediate study area, trip generation calculations for Bakery Square were performed based upon data contained in Trip Generation, 7th Edition, as presented in Table 2, a total 757 PM peak hour new trips (261 entering & 496 exiting) are projected to occur as a result of the Bakery Square development.

A portion of the trips generated by the proposed Bakery Square development will be pass-by trips. Using the pass-by trip methodology described above, the proposed development of Bakery Square is projected to generate 117 PM peak hour pass-by trips (56 entering & 61

exiting). Therefore, the Bakery Square development is projected to generate a total (new plus pass-by trips) of 874 PM peak hour trips (317 entering and 557 exiting).

The combined trip total (new and pass-by trips combined) for the planned developments within the immediate study area and the development of Bakery Square is 2,273 PM peak hour trips (1,001 entering and 1,272 exiting).

The locations of the developments used for trip generation is graphically presented in Figure 4. Detailed trip generation calculations are included in the Appendix of this report.

## **ECONOMIC DEVELOPMENT ANALYSIS**

Once the TOD options were reduced to the three conceptual schemes identified above, the following economic analysis was conducted.

East Liberty is revitalizing particularly on its periphery. The Home Depot development was the first step in East Liberty's revitalization. The successful Whole Foods store on Centre Avenue has demonstrated East Liberty's ability to penetrate the market beyond East Liberty.

Currently, investment momentum is intense in East Liberty. To the east of Whole Foods, Eastside II, which will contain retail and parking, is under construction. Eastside III is planned across Highland Avenue and adjacent to the Station site.

A Walgreens is under construction on Centre Avenue. The Highland Building will contain condominium units. Over the next couple of years a Borders bookstore, Starbucks, a PLCB Super Wine store, a bank and a day spa will all open on Centre Avenue. Across the street from Whole Foods there is a seven story residential project being planned. The Giant Eagle site and the former YMCA building are to be developed/redeveloped into residential units. Further east, the Wheeler Paint building is being renovated and incorporated into a retail village.

The development momentum is a product of both investment opportunities and public/private cooperation and leadership. Two public housing projects were demolished in the heart of East Liberty and a third is scheduled for demolition. Replacing these units are mixed-income projects such as the New Pennley Place and the planned Liberty Park and Mellon's Orchards South projects. The public/quasi-public sector has leveraged private investment by helping to fund land assembly, demolition and infrastructure development.

The public/quasi-public sector has worked to reinforce connections between East Liberty and adjacent neighborhoods. Examples of this include ELDI's long term master plan aimed at revitalizing the core of East Liberty as well as the periphery. Another initiative is the planned pedestrian bridge linking East Liberty and Shadyside. Finally, the two-way conversion of Penn Circle and the re-instatement of the road grid is a major public investment aimed at supporting the continued revitalization of East Liberty.

It is within this dynamic, exciting environment that the future use of the southwest corner of the intersection of Penn Circle and Penn Avenue (the Subject Site) is being contemplated. This parcel of land is potentially one of the most important properties in East Liberty and its future use will have a significant impact on East Liberty's evolution and development potential. This

property is important from a development/economic development perspective for the following reasons:

- It represents a corner site on a very busy intersection;
- The Busway offers the opportunity for direct transit access which is relatively unique in the marketplace;
- Within East Liberty, the site is a lynchpin between the new commercial and residential development to the west and the new residential neighborhoods planned to the east and north, as well as lynchpin between the retail cluster to the south and the core of East Liberty;
- The site is a Gateway to East Liberty and, as such, its development could impact East Liberty's image and development potential.

Development options have been crafted for the Subject Site. The purpose of the economic development portion of this report is to summarize the advantages and disadvantages of each option from two perspectives: (1) the developer and (2) the economic development developer.

## **ASSUMPTIONS**

The following paragraphs summarize what the consultant team considers to be important to developers and the community. These factors are the criteria employed to evaluate each of the three options.

### **The Developer**

- Time: Time is money to the Developer. To the extent that the Site has near term development potential (which the consultant team believes it does) and all other factors are the same, the Developer will pick the Option that takes the least amount of time to bring the Site to the market. Markets, interest rates, development momentum, and community sentiment can change quickly, so development opportunities must be seized upon when they arise.
- Ease of Implementation/Low Risk: Transit-oriented development on the Subject site will require, at a minimum, that the private developer and Port Authority negotiate a development agreement. Additional parties required to bring the site to the market, multiple tasks required to bring the site to the market, sensitive issues or perceived controversy all reduce the value of the Site to the developer (all other factors being equal).

- A Corner Site At A Four Corner Intersection: Assuming good vehicular and pedestrian access, a corner site at a four corner intersection is typically more valuable than a non-corner parcel. A corner site at a five corner intersection (the current configuration) is not as valuable because both vehicular and pedestrian access is typically problematic.
- Parcel Size: To the extent that there is market to absorb a large project (which the consultant team believes is the case at the Subject Site) a bigger development site is better than a smaller development site.
- Street Frontage: Particularly if retail is supportable, building street frontage is valuable.
- Zoning: Assuming there is sufficient market to support density, the greater the development envelope, the more valuable the site (all things being equal). The consultant team has assumed that the zoning envelope would be the same among the options, so this factor is not at play.

### **Community Perspective**

- Consistent with Vision/Long Term Value: The community may not be as sensitive to time as the developer, because the community perspective is interested in creating long term value for East Liberty (not just economic return from the Subject Site). The community is willing to forego a near term opportunity and wait for the concept that satisfies the Vision.
- Palatable Solution to a Range of Stakeholders: Implementing a project oriented toward creating long term value typically requires cooperation and support from a variety of stakeholders. Preferred options are often those that make sense from a variety of stakeholder perspectives.
- Cost Benefit: The economic development perspective always measures whether the benefits outweigh the costs.
- Capitalizes on Opportunities: Economic developers are rated on the basis of what they get done to benefit the community. Actionable plans are a high priority to the economic development community.
- Complements Existing Uses and/or Planned Projects: Economic development occurs when investments occur that not only benefit the project's investors but the community

as a whole through either the provision of services, setting a new standard, and/or creating new markets. Options that have district-wide advantages are most attractive.

## **TSM OPTION**

### **Description**

The Busway's access and the Subject Site's existing use remains as it is today.

### **Developer Perspective**

#### *Advantages:*

Time: If a transit-oriented development project can be designed on the Site that allows existing bus operations, the project could be implemented the fastest.

#### *Disadvantages:*

- May Not Be Easy To Redevelop Under This Option: Development of the site will be compromised with the bus access points on Penn Circle South and on Penn Avenue. Redevelopment under this Option may be controversial with the community since it fails to resolve issues central to the Vision such as pedestrian friendly streets and a simplified street system. The five point intersection remains under this Option.
- Not A Corner Site At A Four Corner Intersection: A corner site at a five corner intersection (the current configuration) is not as valuable to a developer because both vehicular and pedestrian access is problematic.
- Relatively Small Redevelopment Parcel: It appears that this Option possesses the least amount of redevelopable land.
- Street Frontage: This Option will offer the least amount of building street frontage because of the two driveways for the buses.

### **Economic Developer's Perspective**

#### *Advantages:*

- None

### *Disadvantages:*

- Not Consistent with Vision/Long Term Value: The TSM option fails to resolve issues central to the East Liberty Vision such as pedestrian friendly streets and a simplified street system, since the five point intersection remains under this option.
- Not A Palatable Solution to a Range of Stakeholders: Because of its failure to satisfy the principles of East Liberty's Vision, stakeholder support may be problematic.
- Opportunity Costs Outweigh the Benefit: The benefits do not outweigh the opportunity costs. Option 2 is better from a cost benefit standpoint.
- Does Not Fully Capitalize on Opportunities: Options A+E and D offer a better way to capitalize on near term opportunities.
- Will Not Complement Existing Uses and/or Planned Projects As Much As The Other Options: The two bus driveways and the five point intersection will continue to fragment this area of East Liberty making this the worst Option from this perspective.

## **OPTION A + E**

### **Description**

The Station is moved to Penn Avenue under this Option. This results in only a small portion of the Subject Site being used for Bus access.

### **The Developer Perspective**

#### *Advantages:*

- Time: While certainly not as short as the TSM option, this Option could be implemented relatively quickly.
- Ease of Implementation/Low Risk: This Option frees up considerable land for private development, removes the five-point intersection, and places the buses in the right-of-way which all seem advantageous from a variety of perspectives.



- A Corner Site at a Four Corner Intersection: This Option provides a developable, corner Transit-Oriented Development (TOD) site.
- Parcel Size: This Option appears to provide the largest amount of land available for private development on the Subject Site.
- Street Frontage: This Option has the potential to offer more building street frontage as compared to the TSM Option, but as much as Option D.

*Disadvantages:*

- None

## **The Economic Developer Perspective**

*Advantages:*

- Consistent with Vision/Long Term Value: This Option allows for significant TOD development in a manner that can connect and catalyze surrounding areas.
- Palatable Solution to a Range of Stakeholders: This Option is not time or capital intensive and appears to address transit and development objectives.
- Cost Benefit: There are clear benefits to creating a key corner TOD development site in East Liberty. This benefit is achieved without significant capital cost under this Option.
- Capitalizes on Opportunities: This Option can be implemented quickly thereby allowing it to take advantage of East Liberty's market momentum.
- Complements Existing Uses and/or Planned Projects: This Option allows for the greatest magnitude of TOD development. Such development has the potential to complement existing uses and catalyze investment on surrounding property.

## **OPTION D**

### **Description**

Option D contemplates an off-street Station parallel to Centre with Sheridan Street extended.

## **The Developer Perspective**

### *Advantages:*

- A Corner Site at a Four Corner Intersection: This Option provides a developable, corner site.
- Parcel Size: This Option appears to provide a significant TOD development parcel, but not as large as Option A + E.
- Street Frontage: This Option has the potential to offer the most building street frontage as compared to the other Options.

### *Disadvantages:*

- Time: Because of the need to take land and build new infrastructure, this Option is the worst in terms of time.
- Ease of Implementation/Low Risk: This Option will require multiple stakeholder involvement and the use of eminent domain which can be controversial. This Option is the most complex to implement.

## **The Economic Developer**

### *Advantages:*

- Consistent with Vision/Long Term Value: Because this Option creates an intelligible street grid system it will benefit East Liberty as a whole.
- Complements Existing Uses and/or Planned Projects: Implementing this Option would benefit East Liberty, particularly inside the circle because the transportation network and connectivity are improved.

### *Disadvantages:*

- Palatable Solution to a Range of Stakeholders: Existing property owners and other agencies may be concerned with the eminent domain issue and costs associated with

implementing this Option. Consensus may be difficult to achieve for this Option because it is questionable whether the benefits of this approach justify the costs to implement it.

- Capitalizes on Opportunities: Economic developers are rated on the basis of what they get done to benefit the community. Actionable plans are a high priority to the economic development community. It will take considerable time to “set the table” for private investment under this Option. Market and investment realities may be quite different than they are today by the time this Option leverages private investment.
- Cost Benefit: The economic development perspective always measures whether the benefits outweigh the costs. It is questionable whether the benefits of this approach justify the costs to implement it.

## DEVELOPMENT OPTION MATRIX ANALYSIS

The project team developed a comparison matrix for the three chosen development options (A+E, D, and TSM). This matrix evaluates each option based on: compatibility with the established guiding principles; economic impact; land use and development impacts; roadway impacts and conflicts; station impacts; and traffic impacts. This matrix is presented on the following pages.

**DEVELOPMENT OPTIONS ANALYSIS MATRIX**  
 Eastside Land Use and Transportation Initiative  
 Transit Oriented Design Study and Traffic Analysis

DESCRIPTION	TSM OPTION	A+E OPTION	D OPTION
	Busway remains as-is with two-way Penn Circle conversion and some street width reductions on Centre Avenue and/or Penn Avenue at the Penn/Centre/Busway intersection.	On-Street Station at Development Site with Reconfigured Busway Ramp to Penn Avenue. Penn Circle two-way conversion	Off-Street Station Parallel to Centre Avenue with Reconfigured Sheridan Avenue. Penn Circle two-way conversion
<b>CONCURRENCE WITH PRINCIPLES</b>			
Supports anchor site of Centre/Penn	no	yes	yes
Increases urban density	no	yes	yes
Creates gateway	no	at Penn and Centre	at Penn and Centre
Supports two-way Penn Circle	yes	yes	yes
Addresses five-point intersection	no	yes	yes
Improves pedestrian access to bus station at Penn/Centre	Driveway width to be minimized	Requires architecturally defined pedestrian path to Busway	Requires architecturally defined pedestrian path to Busway
Creates sense of place	no	yes	yes
Supports street life	no	yes	yes
Creates visual connection to MLK East Busway station from Penn/Center area station	Existing pedestrian bridge to remain	no	yes
Provides for pedestrians and bicycles	yes	Requires architecturally defined pedestrian path to Busway	Requires architecturally defined pedestrian path to Busway
Integrates transit and street life	no	yes	no
<b>ECONOMIC IMPACT</b>	No positive economic impact beyond maintaining bus access	Keeps non-taxable uses on public right-of-way and frees up the Station Site for major redevelopment	Relocates bus station effectively and allows streets to be more pedestrian friendly
	Negative impact to the extent that no action is perceived as an indication of no interest/no change/no value enhancement	Effectively creates gateway corner which adds value to property for development	Effectively creates gateway corner which adds value to property for development
	Compromises the development potential of the site and East Liberty inside the loop, since there is no gateway and catalyst project potential	Relative ease of implementation enhances the opportunity for near term development and benefit	Costs of property acquisition and complexity of implementation may outweigh economic development benefits

**DEVELOPMENT OPTIONS ANALYSIS MATRIX**  
**Eastside Land Use and Transportation Initiative**  
**Transit Oriented Design Study and Traffic Analysis**

DESCRIPTION	TSM OPTION			A+E OPTION	D OPTION
	Busway remains as-is with two-way Penn Circle conversion and some street width reductions on Centre Avenue and/or Penn Avenue at the Penn/Centre/Busway intersection.	On-Street Station at Development Site with Reconfigured Busway Ramp to Penn Avenue. Penn Circle two-way conversion	Off-Street Station Parallel to Centre Avenue with Reconfigured Sheridan Avenue. Penn Circle two-way conversion		
LAND USE & DEVELOPMENT IMPACTS	Prohibits or severely limits development of TOD on site	Busway ramp will encroach into development site footprint.	Requires footprint on development site		
	Station driveway widths may be reduced.	Service lane may be required	Service lane may be required		
	Prohibits the ability to create what is potentially the most valuable intersection for development in East Liberty by retaining five point intersection and compromising the "fourth corner" development site.	Maximizes the land available for TOD development	Conflicts with proposed parking deck		
	TOD potential compromised by the need to accommodate bus station and circulation on-site - difficult to create a street edge	This scenario can be implemented in a relatively short timeframe allowing TOD to benefit from current development/image momentum	Land acquisition required for Sheridan extension		
	Lacks the benefits of a four point intersection.	A four point intersection with two potential redevelopment sites on two sides of Penn Avenue (the East Liberty Gateway) provides a significant development opportunity	A four point intersection with two potential redevelopment sites on two sides of Penn Avenue (the East Liberty Gateway) provides a significant development opportunity		
	Minimizes the land available for TOD development.	Maximizes the land available for TOD development	Creates a very valuable development parcel on the northwest corner of Penn Circle South and Penn Avenue		
	Permitted pedestrian, bicycle and vehicular movements continue to be confusing.	Pedestrian and vehicular movements are intelligible which adds value to the development parcels.	Pedestrian and vehicular movements are intelligible which adds value to the development parcels.		
		Valuable frontage on Penn Avenue is being used for bus access which will degrade the pedestrian environment	Best option regarding visibility from street to development parcels		

**DEVELOPMENT OPTIONS ANALYSIS MATRIX**  
 Eastside Land Use and Transportation Initiative  
 Transit Oriented Design Study and Traffic Analysis

DESCRIPTION	TSM OPTION	A+E OPTION	D OPTION
<b>ROADWAY IMPACTS/CONFLICTS</b>	Busway remains as-is with two-way Penn Circle conversion and some street width reductions on Centre Avenue and/or Penn Avenue at the Penn/Centre/Busway intersection.	On-Street Station at Development Site with Reconfigured Busway Ramp to Penn Avenue. Penn Circle two-way conversion	Off-Street Station Parallel to Centre Avenue with Reconfigured Sheridan Avenue. Penn Circle two-way conversion
	Maintains the complex five-point intersection including confusing movements	Signalized intersection at Penn for Busway ramp could be difficult to align with Target site driveway across Penn.	New Sheridan Avenue extension & signalized intersections at its intersections with both Centre Avenue and Penn Avenue will be required.
	Difficult for pedestrians to negotiate intersection	Station at curb or pull-over lane	Extended Sheridan Avenue connection to TOD is congested with buses, service vehicles, autos and pedestrians.
		Queuing on Penn Avenue through Busway signal	Queuing on Penn Ave. through station access intersection
		Pedestrian crossing at Busway ramp	Centre Ave. pedestrian crossing at Penn becomes very wide
		Two-way Penn Circle.	Two-way Penn Circle.
			Southbound station very close to Centre Ave.
	Station remains unchanged	Requires architecturally defined pedestrian path to Busway	Station is visually remote from 100% Intersection (Penn Ave & Centre Ave)
	Minor station physical improvements can be implemented.	No Penn-grade Outbound Station from Busway (LP, 78E, 83B)	Requires architecturally defined pedestrian path to Station
		Eastbound station, last (third) queue space too close to Centre Ave. intersection	Station may be part of Intermodal Transit Center/parking deck
<b>STATION IMPACTS</b>		New station shelters to be provided	New station shelters to be provided.

**DEVELOPMENT OPTIONS ANALYSIS MATRIX**  
**Eastside Land Use and Transportation Initiative**  
**Transit Oriented Design Study and Traffic Analysis**

DESCRIPTION	TSM OPTION	A+E OPTION	D OPTION
TRAFFIC IMPACT	Busway remains as-is with two-way Penn Circle conversion and some street width reductions on Centre Avenue and/or Penn Avenue at the Penn/Centre/Busway intersection.	On-Street Station at Development Site with Reconfigured Busway Ramp to Penn Avenue. Penn Circle two-way conversion	Off-Street Station Parallel to Centre Avenue with Reconfigured Sheridan Avenue. Penn Circle two-way conversion
	Centre Avenue eastbound queue extends from its intersection with Penn Avenue past Highland and out of the study area.	Centre Avenue eastbound queue extends from its intersection with Highland Avenue beyond the study area.	Centre Avenue eastbound queue extends from its intersection with Highland Avenue beyond the study area.
	Shady Avenue northbound queue at its intersection with Penn Avenue extends beyond the study area. This intersection incurs significant overall delays.	The Centre Avenue eastbound queue from its intersection with Penn Avenue to its intersection with Highland Avenue does build up, however it dissipates efficiently.	The Centre Avenue eastbound queue from its intersection with Penn Avenue to its intersection with Highland Avenue does build up, however it dissipates efficiently.
	Highland Avenue southbound queue extends from its intersection with Centre Avenue past Broad Street and out of the study area and is persistent over time.	The Penn Avenue eastbound queue at its intersection with Centre Avenue extends near its intersection with Highland Avenue, however it dissipates efficiently.	Shady Avenue northbound queue at its intersection with Penn Avenue extends beyond the study area, however it dissipates efficiently.
	The Eastside III site driveway does not operate efficiently. Vehicles exiting this driveway incur significant delays.	Exclusive on-street bus stations may cause additional delays for both buses and vehicular traffic.	Penn Avenue eastbound traffic incurs increased delays with the addition of a traffic signal at its intersection with Sheridan Avenue. The eastbound vehicle queue also extends from Centre Avenue past Highland Avenue
	The intersection of Penn Avenue and Centre Avenue incurs significant increases in overall intersection delay with the five legged intersection design and two way traffic flow.		



## STUDY RESULTS AND NEXT STEPS

Through this study, the Advisory Committee, along with the consultant team, was able to identify three options that present promising visions for this neighborhood and deserve further review. These options include A+E, D and TSM.

In order to determine which option should be chosen for implementation in the study area centered about the Penn Avenue and Centre Avenue intersection in East Liberty, additional analysis is required. These options have presented the ground work for future studies that must provide a more detailed analysis for whichever design option is advanced.

Pursuant to the findings derived from this study, the community has identified a potential developer and is currently working with the developer, Port Authority and a consultant group toward the identification of an implementable development plan that is consistent with the community's vision.

## **TABLES**

TABLE 2  
BAKERY SQUARE TRIP GENERATION SUMMARY  
East Side Land Use  
East Liberty, City of Pittsburgh, Pennsylvania

DEVELOPMENT COMPONENT	ITE LAND USE CODE	SIZE (GROSS SQUARE FEET) <sup>(2)</sup>	AVERAGE WEEKDAY TRIP ENDS	VEHICULAR TRIP GENERATION <sup>(1)</sup>											
				AM PEAK HOUR						PM PEAK HOUR					
				ENTER			EXIT			ENTER			EXIT		
				NEW	PASS-BY	TOTAL	NEW	PASS-BY	TOTAL	NEW	PASS-BY	TOTAL	NEW	PASS-BY	TOTAL
Retail	820 (Shopping Center)	130,000 SF	3,907	43	14	57	28	9	37	108	56	164	117	61	178
Office	710 (General Office Building)	150,000 SF	1,276	160	0	160	22	0	22	29	0	29	144	0	144
Hotel	310 (Hotel)	120 Rooms	980	41	0	41	26	0	26	37	0	37	34	0	34
Residential	230 (Residential Condominium/Townhouse)	38 Dwelling Units	156	2	0	2	10	0	10	9	0	9	5	0	5
Fitness Club	492 (Health/Fitness Club)	20,000 SF	461	7	0	7	10	0	10	29	0	29	28	0	28
Park and Ride	90 (Park and Ride Lot with Bus Service)	350 Spaces	1,575	210	0	210	53	0	53	49	0	49	168	0	168
TOTAL	--	--	8,355	463	14	477	149	9	158	261	56	317	496	61	557

(1) Number of vehicle trips generated determined through the use of the methodologies presented in Trip Generation Seventh Edition, published by the Institute of Transportation Engineers (ITE).

(2) Pass-by trips for a Shopping Center are presented in the Institute of Transportation Engineers (ITE) publication Trip Generation Handbook. The pass-by trip percentage during the PM peak hour is 34%. The pass-by trip percentage for the AM peak hour is not given. Therefore, a pass-by trip percentage of 24% was used during the AM peak hour, 10% less than the pass-by trip percentage for the PM peak hour. Trip generation for the Fitness club assumed 20,000 s.f.

(3) Trips for the retail development, residential development, and fitness club excluding the hotel and park and ride were reduced by 30 %. This reduction takes into account a 20% reduction in trips for transit usage, and a 10% reduction for walkers/bicyclists.

Source: Analysis by Trans Associates.

**TABLE 1**  
**TRIP GENERATION SUMMARY**  
**East Side Land Use**  
**East Liberty, City of Pittsburgh, Pennsylvania**

DEVELOPMENT COMPONENT	ITE LAND USE CODE	SIZE (GROSS SQUARE FEET) <sup>(2)</sup>	AVERAGE WEEKDAY TRIP ENDS	VEHICULAR TRIP GENERATION <sup>(1)</sup>											
				AM PEAK HOUR						PM PEAK HOUR					
				ENTER			EXIT			ENTER			EXIT		
				NEW	PASS-BY	TOTAL	NEW	PASS-BY	TOTAL	NEW	PASS-BY	TOTAL	NEW	PASS-BY	TOTAL
<b>RETAIL</b>															
Eastside IIA	820 (Shopping Center)	44,500 SF	1,338	15	5	20	10	3	13	37	19	56	40	21	61
Eastside IIB		43,820 SF	1,317	15	5	20	10	3	13	36	19	55	40	20	60
Subtotal		88,320 SF		30	10	40	20	6	26	73	38	111	80	41	121
6000 Block Penn Avenue	820 (Shopping Center)	40,000 SF	1,203	14	4	18	8	3	11	33	17	50	36	19	55
Target & Additional Retail	820 (Shopping Center)	140,000 SF	4,208	47	15	62	30	9	39	116	60	176	126	65	191
Eastside III	820 (Shopping Center)	110,000 SF	3,306	36	12	48	24	7	31	92	47	139	100	51	151
Former Wheeler Paint/Post Office Building	820 (Shopping Center)	36,000 SF	1,082	12	4	16	8	2	10	30	16	46	32	17	49
Highland Hotel (retail)	814 (Specialty Retail)	7,500 SF	232	6	2	8	5	1	6	4	2	6	5	3	8
<b>RESIDENTIAL</b>															
Highland Building	232 (High-Rise Residential Condominium)	84 units	246	4	0	4	17	0	17	14	0	14	8	0	8
Highland Hotel	310 (Hotel)	140 rooms	1,144	48	0	48	31	0	31	43	0	43	39	0	39
Subtotal	--	--	1,390	52	0	52	48	0	48	57	0	57	47	0	47
Mellon's Orchard South															
	230 (Residential Townhouse)	24 units	99	1	0	1	6	0	6	6	0	6	3	0	3
	210 (Single Family Detached House)	37 units	248	5	0	5	15	0	15	17	0	17	10	0	10
	220 (Apartments)	2 - 12 unit bldgs.	113	1	0	1	7	0	7	7	0	7	4	0	4
Penn Manor	220 (Apartments)	58 units	273	4	0	4	17	0	17	16	0	16	9	0	9
Subtotal	--	--	733	11	0	11	45	0	45	46	0	46	26	0	26
Liberty Park	221 (Low-Rise Apartment)	124 units	572	8	0	8	32	0	32	33	0	33	18	0	18
Baum Lofts	230 (Residential Condominium)	24 units	99	1	0	1	6	0	6	6	0	6	3	0	3
<b>SERVICE</b>															
Park and Ride	90 (Park and Ride Lot with Bus Service)	100 spaces	521	39	0	39	10	0	10	14	0	14	46	0	46
<b>TOTAL</b>	<b>--</b>	<b>--</b>		<b>256</b>	<b>47</b>	<b>303</b>	<b>236</b>	<b>28</b>	<b>264</b>	<b>504</b>	<b>180</b>	<b>684</b>	<b>519</b>	<b>196</b>	<b>715</b>

(1) Number of vehicle trips generated determined through the use of the methodologies presented in Trip Generation Seventh Edition, published by the Institute of Transportation Engineers (ITE).

(2) Pass-by trips for a Shopping Center are presented in the Institute of Transportation Engineers (ITE) publication Trip Generation Handbook. The pass-by trip percentage during the PM peak hour is 34%. The pass-by trip percentage for the AM peak hour is not given. Therefore, a pass-by trip percentage of 24% was used during the AM peak hour, 10% less than the pass-by trip percentage for the PM peak hour.

(3) Trips for the retail developments, and residential developments, excluding the hotel and park and ride were reduced by 30 %. This reduction takes into account a 20% reduction in trips for transit usage, and a 10% reduction for walkers/bicyclists.

Source: Analysis by Trans Associates.

## FIGURES

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 SCALE: N.T.S.	 Transportation Solutions for Today and Tomorrow Twin Towers Suite 400 / 4955 Steubenville Pike Pittsburgh, Pennsylvania 15205 / (412) 490-0630	PROJECT NO. SPCOM00 - 05430	FIGURE 1
		PROJECT: EASTSIDE LAND USE AND TRANSPORTATION INITIATIVE	
		TITLE: TSM OPTION	D.B. CAD C.B. REV.



# Eastside Land Use and Transportation Initiative

## Plan Study A+E

- Legend
- Streets
  - Railroads
  - Buildings
  - Busway
  - Greenway

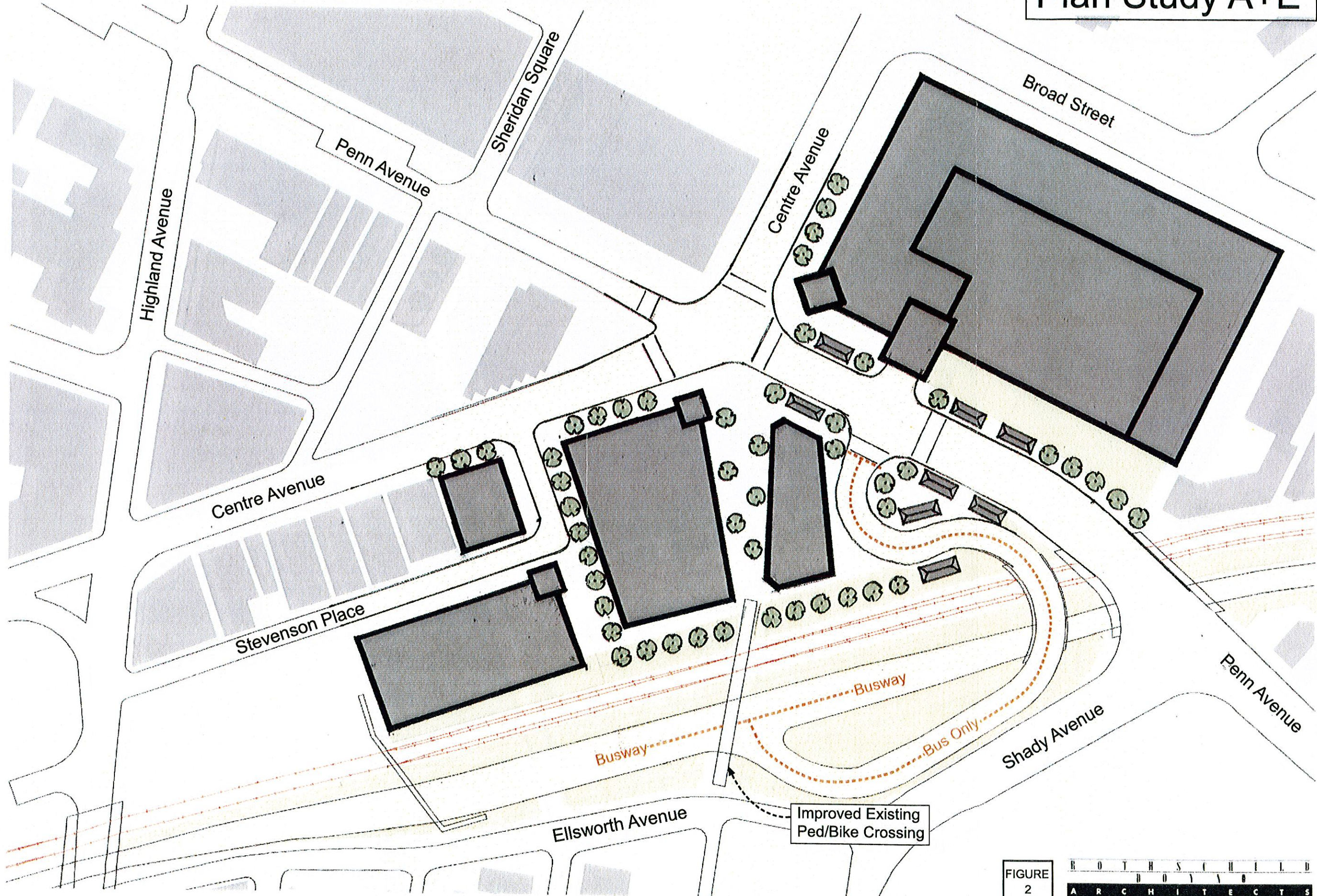
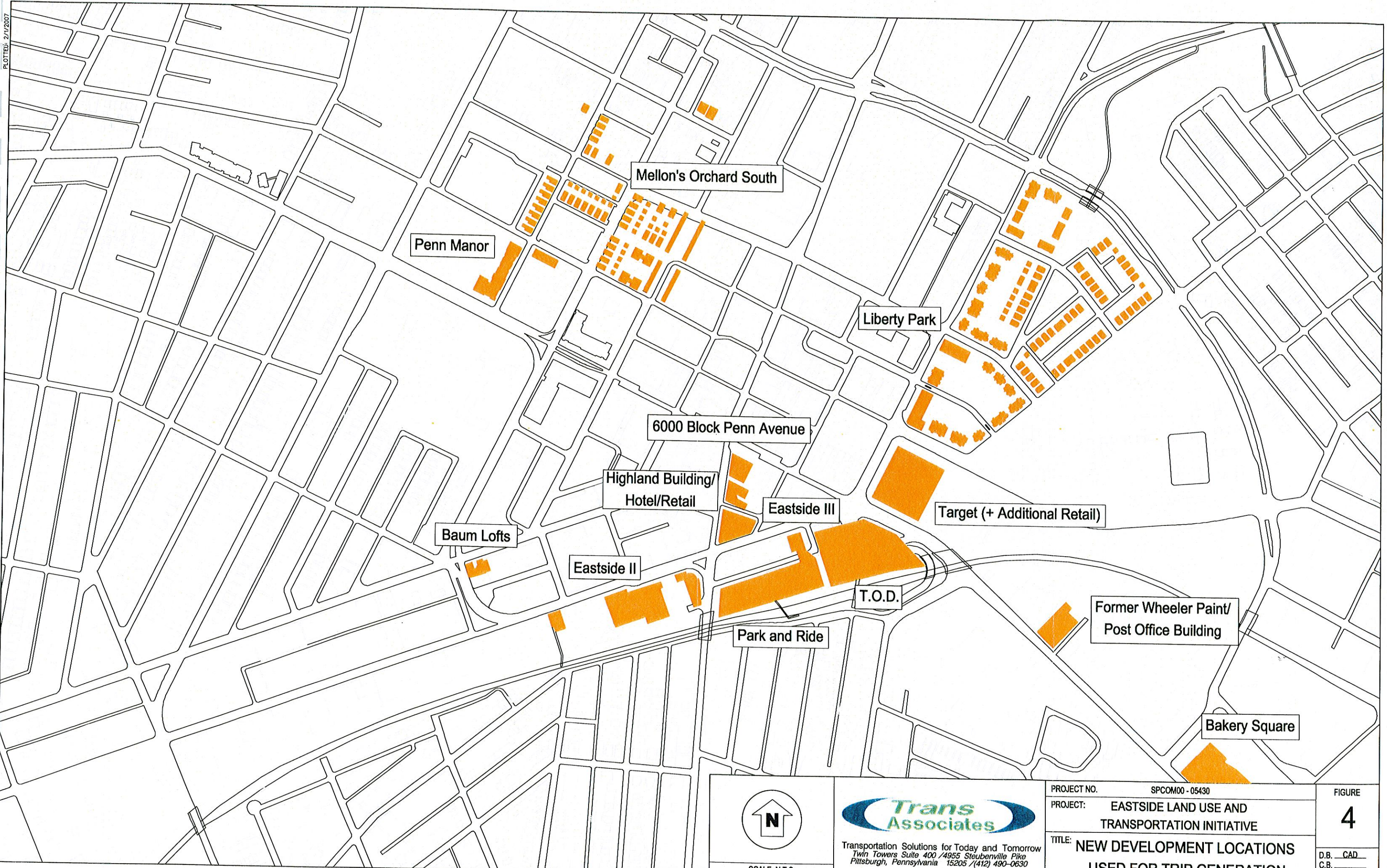


FIGURE 2



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SCALE: N.T.S.



Transportation Solutions for Today and Tomorrow  
Twin Towers Suite 400 / 4955 Steubenville Pike  
Pittsburgh, Pennsylvania 15205 / (412) 490-0630

PROJECT NO.	SPCOM00 - 05430
PROJECT:	EASTSIDE LAND USE AND TRANSPORTATION INITIATIVE
TITLE:	NEW DEVELOPMENT LOCATIONS USED FOR TRIP GENERATION

FIGURE	4
D.B.	CAD
C.B.	
REV.	