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Prepared by WILMAPCO  
for the Fox Point Association

*As it is...*



## Edgemoor, Delaware Transit Oriented Development Analysis



*As it could be...*



**WILMAPCO**

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## EXECUTIVE SUMMARY

WILMAPCO used the EPA Smart Growth Index Model to assess the benefits of Transit Oriented Development with a new Septa station in the Fox Point. Transit Orient Development (TOD) locates a mix of land-uses, including housing, offices, retail, services and civic uses within walking distance of a transit station. Using attractive, pedestrian-friendly design, TODs make trips by walking, bicycling and transit appealing and convenient while decreasing the need for trips by driving.

As an abandoned shopping center, or greyfield mall, Merchant's Square is a blight to the Fox Point community but holds vast potential as a location for a TOD. Across the county, greyfields have successfully been redeveloped to bring economic activity and community pride. Currently, the area around Merchant's Square has a wide variety of housing types with densities that support transit use, providing a one needed component of a successful TOD. Three bus routes serve the area. Employees at Merchant's Square would be within easy walking distance of both existing transit and the conceptual Fox Point Train Station. Likewise, residents from throughout the study area could easily walk to Merchant's Square if sidewalk improvements were made.

The EPA Smart Growth Index Model is a tool to evaluate the effect of different land use and transportation scenarios. We analyzed three scenarios:

- ***Scenario 1: Merchant's Square Redevelopment and Local Transportation***  
This scenario assumed the redevelopment of Merchant's Square to include 1,250 jobs and transportation improvements limited to sidewalks.
- ***Scenario 2: Enhanced Land Use and Redevelopment***  
This includes redevelopment of Merchant's Square, the renovation of 85 apartments, and construction of 58 townhouses with no transportation changes.
- ***Scenario 3: Transit Station Community***  
This scenario contains all the parts for a successful TOD with all changes in scenarios 1 and 2 and the Fox Point Train Station.

We found that all scenarios greatly improve the balance between jobs and housing, thus allowing more trips by means other than driving. Completion of the pedestrian network improved workability. Scenario 3, with the train station, showed the largest decrease in vehicle trips with an 18.5 percent decline in vehicle miles traveled. While this analysis looked only at local impacts, we expect the benefits would prove even greater if further analysis was done at a regional level. Redeveloping Merchant's Square would benefit the Fox Point community and help improve the region's air quality by reducing the need to drive. Further work should be done to explore development opportunities combined with a possible train station.

## INTRODUCTION

The Wilmington Area Planning Council (WILMAPCO), as the regional transportation planning agency for the Wilmington Metropolitan Area, seeks to coordinate transportation decisions with land use planning and promote travel choices including transit, walking and bicycling. WILMAPCO has conducted this analysis for the Fox Point Association to support the community's efforts to revitalize the Merchant's Square Shopping Center and restore train service to the area.

Using the EPA Smart Growth Index Model, we have demonstrated how transit oriented redevelopment and transportation enhancements can reduce congestion, improve air quality, and increase the usability of transit and nonmotorized travel modes in this established, older suburb of Wilmington. The report also includes analysis of elements needed for successful transit oriented development and examples of how decaying shopping malls can be redeveloped to support transit and serve as a community center.

## WHAT IS TRANSIT ORIENTED DEVELOPMENT

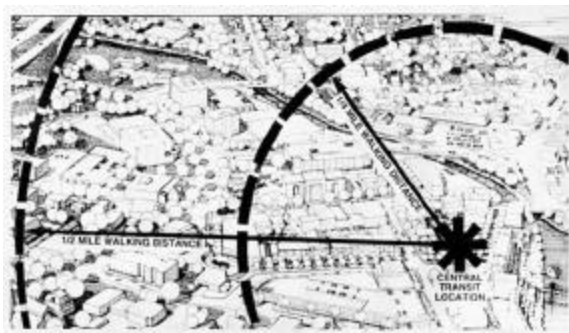
Transit Oriented Development (TOD) locates a mix of land-uses, including residential, office, shopping, civic uses and entertainment, within easy walking distance from a transit station. This mix of uses, combined with attractive community spaces, plazas, etc., forms a vibrant village-like neighborhood. Such a village is compact in size, pedestrian-friendly, and offers a wide variety of housing and transportation options, with easy access to shopping, services, jobs, and recreation.

Transit-oriented development is a way to locate people near transit services to decrease their dependence on driving. From a transportation perspective, TOD is the land-use and economic development version of transportation demand management. A result of TOD is fewer trips using single-occupant vehicles and more trips by walking, bicycling, carpooling, and taking a bus or train.

TOD development brings potential riders closer to transit facilities rather than building away from population centers and making people more dependent on roads and automobiles. TOD makes transit investments work more efficiently by increasing ridership on existing buses. To reduce local trips by driving, TOD projects should be located in higher-density, mixed-use, urban pedestrian districts with high-quality transit service. External SOV trips can be reduced as much or more by people walking within a mixed-use urban district as they can by using transit within and between urban centers.

To be most effective, TOD should be "urban" even in a suburban setting. Pedestrian-scale design draws people to return repeatedly. Urban development supports transit; suburban development does not.

Once that idea takes hold in a community, it becomes a powerful motivator for changing the built environment. The concept includes mixed-use, higher-density buildings at the sidewalk; less private and more public open space; smaller blocks; narrow streets with wider sidewalks, street trees and lights; lower parking-to-occupant ratios; shared parking; parking behind buildings; and on-street parallel parking.



**The 5-minute walk:** People will walk ¼ mile to catch a bus, but when rail transit is available and the route is pleasant, they'll walk up to ½ mile. Too many transit stops are engulfed by parking lots and freeways rather than compatible development.

### ***Impacts of Transit Oriented Developments***

<b>MEASURES</b>	<b>RESULTS</b>
Vehicle Trips	18% Reduction in auto trips
Vehicle Miles Traveled	12% Less total VMT in AM Peak
Travel Time	18-28% Reduction on Network
Air Quality	Deterioration of Air Quality Retarded
Land Use	Less land required for roads and lower public cost of development
Pedestrian Flows	Promotes greater pedestrian movements and traffic

Source: FTA

### ***Effects of Land Use and Urban Design on Transit Mode Share***

<b>URBAN DESIGN/LAND USE CHARACTERISTIC</b>	<b>IMPACT ON TRANSIT RIDERSHIP</b>
Availability of Convenience Services	3.7% increase
Mix of Land Use	3.5% increase
Accessibility of Services	3.3% increase
Areas Perceived as Safe	1.8% increase
Aesthetically Pleasing Environment	4.1% increase

Source: FTA

## GREYFIELD REDEVELOPMENT

All of us are familiar with shabby, often empty, shopping centers or malls. Viewed as failed retail centers whose times have passed, they dot the roadside in older, developed areas. If such places deteriorate to an extreme point, they may become greyfield malls (Gf). A greyfield mall is defined as one with \$150 per square foot sales or less. A study by the Congress for New Urbanism found that greyfields represent about 7 percent of existing malls in the U.S. An additional 12 percent of regional malls are in danger of becoming greyfields in the next 5 yrs. Gf's tend to be malls with significantly lower occupancy than non-gf's. They tend to be smaller, with a gross leaseable area of under .5 million sq. ft., and on average 8-10 years older than non-gf's. In addition, they compete with an average of 22 other retail centers within 5 miles. Not only an eyesore for the community, gf's also have the power to economically depress an entire area. A gf mall indicates lost tax base, lost job opportunities, and valuable land sitting unused. Without significant intervention by the community or the public/private sector, the total value of a gf mall may drop to land value minus the costs of structural demolition.

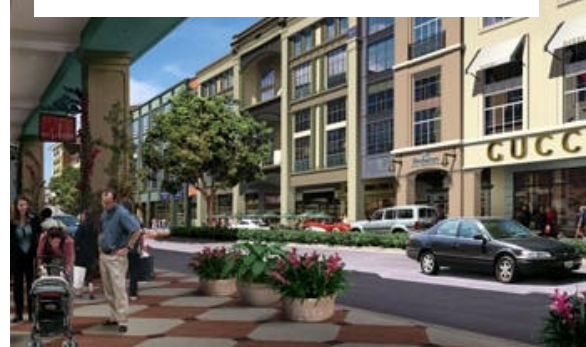
A variety of factors can cause a mall to deteriorate to gf status. The most prevalent one is newly constructed competition. Larger, modern malls have more "customer drawing power" and may have nationally recognized, high quality anchors that older malls often lack. Other factors are the decline of rental rates (resulting from increased vacant space), loss of income, turnover in tenant mix, and overall decline. Finally, malls that are in a sensitive economic position may be pushed into gf status by poor overall economic conditions.

While greyfields are blights to their community, they also hold vast potential to improve the quality of their community's design. Traditional redevelopment of gf's into higher density, mixed-use areas can have profoundly positive impacts. Not only does it bring jobs and economic activity to a stagnant area, it also benefits the surrounding viable and healthy malls. Such infill increases the population of an area (demand) while decreasing existing retail space (supply). This means increased sales in established retail centers. Gf redevelopment supports transit by filling low-density space with high-density communities that include housing, stores, jobs, and schools. In this way, it concentrates origins and destinations--crucial if transit is to be a serious, viable option. Many gf's tend to be in well-established communities and shopping districts, and therefore are often on a transit line already. Size is another factor that adds to the appeal of gf sites. These sites are large enough to justify the undertaking of infill development, and facilitate the application of a full range of new urbanist principles. Finally, these sites offer us the rare opportunity to add important community aspects that may have been overlooked in the original planning of an area. Two such aspects that help foster vibrant, diverse communities are civic space and mixed income housing. Both these things are seriously lacking in many of our current communities. There needs to be affordable housing for the young to the elderly, and well defined space for citizen to mingle in order for our communities to be balanced and livable.

**Santana Row: Before Redevelopment**



**Santana Row: After Redevelopment**





Fortunately, gf's have been successfully converted into vibrant mixed-use areas in multiple communities across the U.S. One example is Mizner Park in Boca Raton, Florida. Once a decaying gf mall, it was converted into a now popular neighborhood combining offices, retail, residences, and public space. A similar plan is now being built out for Eastgate Mall in Chattanooga, Tennessee. It has become one of Chattanooga's proudest achievements.

Many times, however, more conventional attempts are made to save struggling malls. Owners often try to expand, redecorate, or attract a new anchor. This seems doomed to failure because with each new retail center that is built, the bar once again is raised. Sometimes malls are converted to offices or data centers. This is not a preferable solution since surrounding communities then lose what little civic function the mall provided. Only with careful planning and the necessary mix of housing, retail, office space, and public space does an economic rebound of these areas seem probable.

Principles to consider when redeveloping greyfield malls include:

- Reorient activity on the site to face the street.
- Reestablish a street pattern that connects with the streets of surrounding communities.
- Use site planning and architectural elements to make the site fully a part of its community.
- Integrate multiple uses on the site (employment and housing)
- Emphasize public space for shared activity.
- Provide a range of housing types for people of all ages and incomes.



*Infill development on strip shopping center site.  
Source: [www.jointventure.org](http://www.jointventure.org)*

## STUDY AREA

The study area is bordered by Governor Printz Boulevard to the south, Lea Boulevard to the west, Sellers Park and Beeson Avenue to the north, and Hillcrest Avenue, River Road and River Road Park to the east. This area is 492 acres and is .8 miles from the Northeast Corridor at the furthest point.

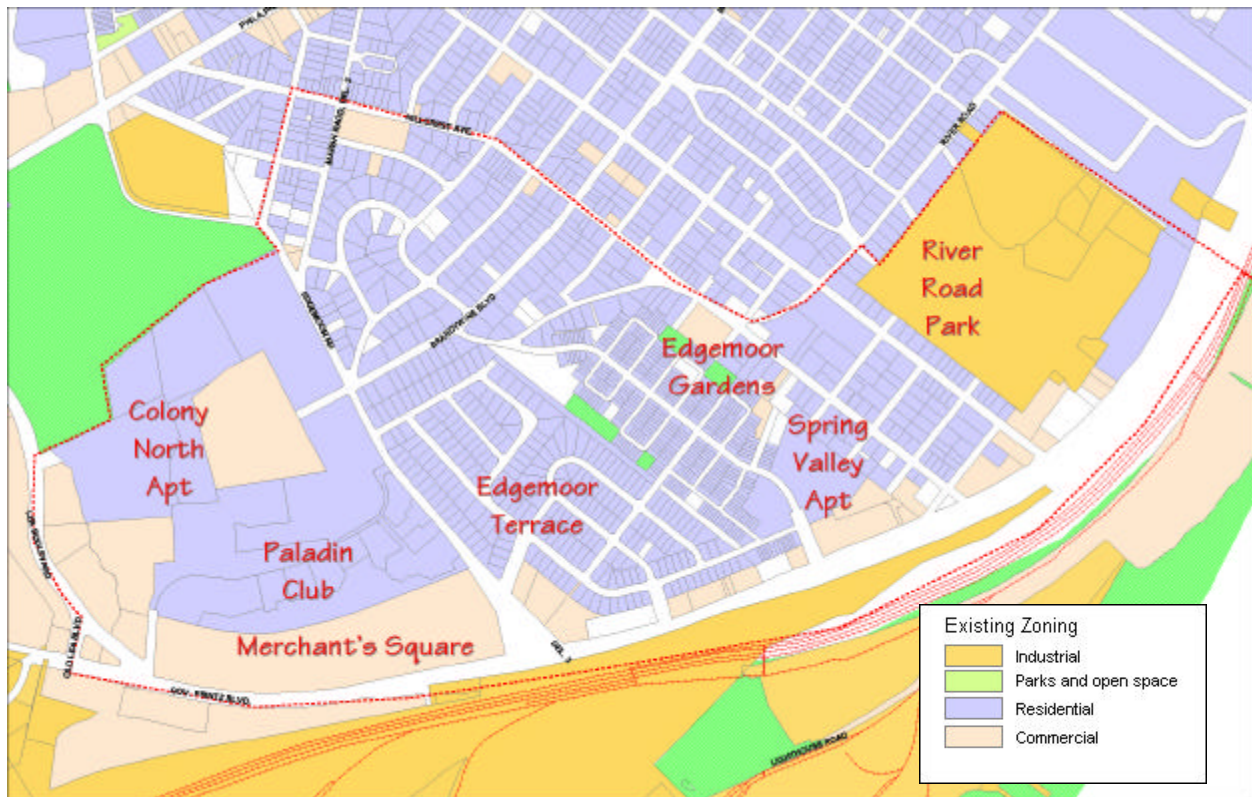
The area incorporates housing at a desirable density and mix for transit-oriented development. This includes the Paladin Club, 65 acres with 1, 2 and 3 bedroom condominiums, Edgemoor Gardens with single-family units on .04 to .15 acre lots, Spring Valley Apartments, and Colony North Apartments.

The study area also includes the 25-acre Merchant's Square, across Governor Printz Boulevard from the Northeast Corridor. This once thriving shopping center now sits largely vacant, fitting the definition of a greyfield mall. Merchant Square includes two two-story buildings and a one-story building with a total of 298,279 square feet, a FAR (floor area ratio) of 0.2. Other smaller vacant commercial parcels also line Governor Printz and a 12-acre commercial property is vacant between Colony North and the Paladin Club. Banc One is currently planning to redevelop the Delaware Olds site across from Merchant's Square.



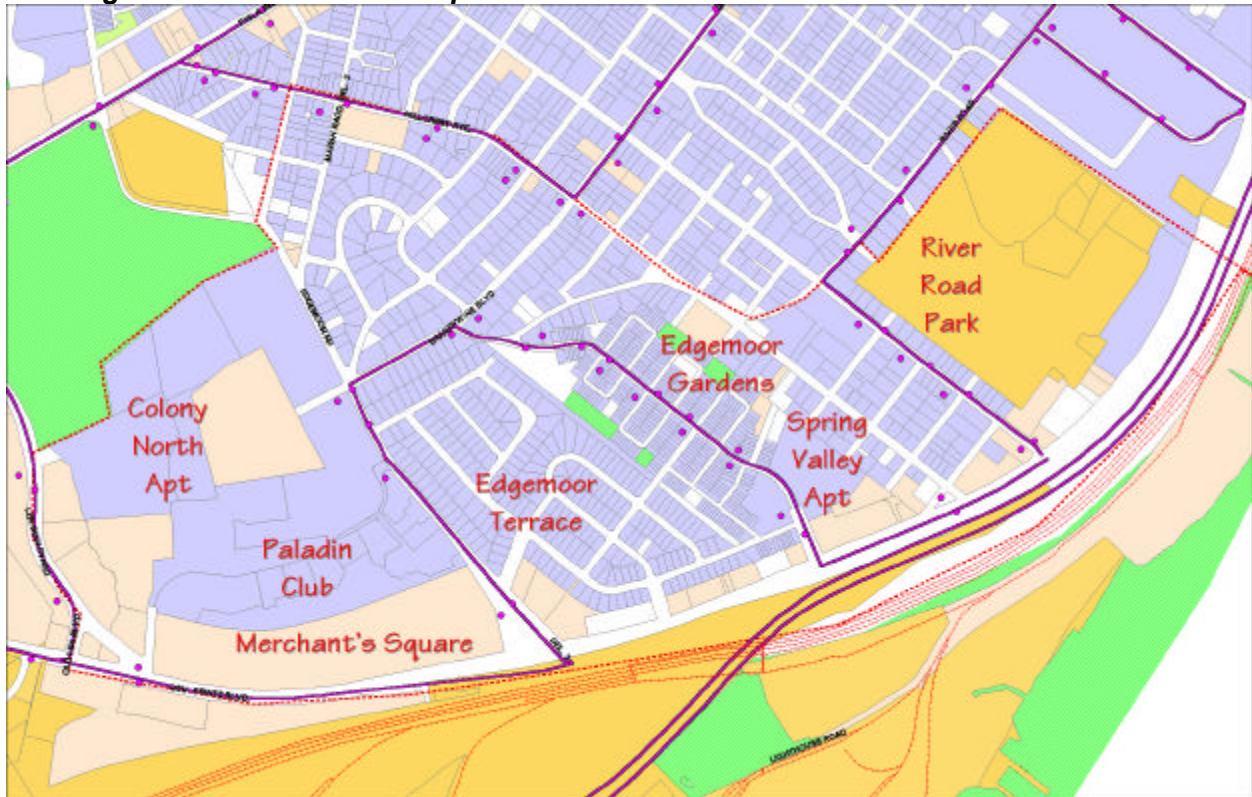
*Merchant's Square on Christmas Eve: mall sits deserted on this busy shopping day.*

### Study Area





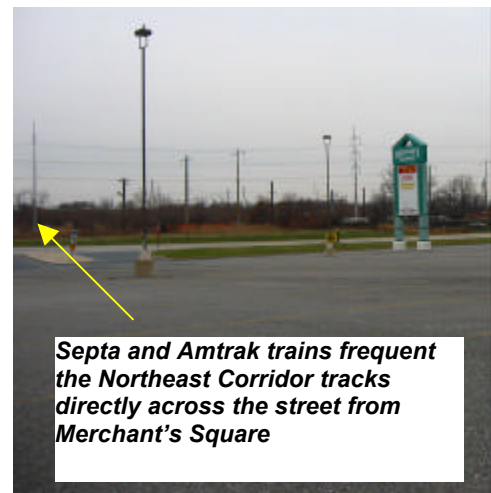
## Existing Transit Routes and Stops



The study area is currently served by three DART bus routes:

- **Route 1** connects Edgemoor with Wilmington and Tri-State Mall via Philadelphia Pike with frequent rush hour service and hourly mid-day, evening and Saturday service.
- **Route 3** has frequent weekday and Saturday Service between Lea Boulevard at Northeast Boulevard and Wilmington.
- **Route 24** travels throughout the study area including River Road, Lore Avenue, Governor Printz Boulevard, Rysing Drive, Brandywine Boulevard and Edgemoor Road before continuing into Wilmington.

Adjacent to the Northeast Corridor rail line, Septa and Amtrak trains run through the area but no longer stop. SEPTA served the area during the 1960s and 1970s but service was ceased in 1982 for financial reasons. A preliminary evaluation of a possible train station in Edgemoor was complete in April 2002 by Zeta-Tech. This report identified issues that would need to be addressed through further station planning.



Septa currently has a station in Claymont, about 4 miles north of the study area. Parking here is often filled, and Claymont serves both residents of PA and DE. Edgemoor would serve Delaware residents and reverse commuters going to a redeveloped Merchant's Square and corporate centers on Carr and Bellevue roads.

## Demographics

	NUMBER	PERCENT
<b>POPULATION</b>	<b>5,992</b>	
Under 20 years	1,804	30.1
20 to 64 years	3,534	59.0
65 years and over	654	10.9
Average household size	2.38	

	NUMBER	PERCENT
<b>HOUSING</b>	<b>2,851</b>	
Occupied housing units	2,507	87.9
Vacant housing units	344	12.1
For seasonal, recreational, or occasional use	42	1.5
Homeowner vacancy rate (percent)	4.8	
Rental vacancy rate (percent)	14.6	
Owner-occupied housing units	1,486	59.3
Renter-occupied housing units	1,021	40.7
Units in Structure		
1-unit, detached	1,131	39.6
1-unit, attached	506	17.7
2 to 9 units	348	12.2
10 or more units	858	30.1
Mobile home	12	0.4
Year Structure Built		
1990 to March 2000	192	6.7
1960 to 1989	1120	39.3
1959 or earlier	1543	54.0

	NUMBER	PERCENT
<b>TRANSPORTATION</b>		
Vehicles Available		
None	274	10.9
1	1,188	47.4
2	870	34.7
3 or more	172	6.9
Means on Transport to Work		
Drove alone	2,070	73.5
Carpooled	325	11.5
Public transportation	241	8.6
Walked	68	2.4
Worked at home	114	4.0

Source: Census 2000

Note: Census numbers are for entire area of Edgemoor and include areas beyond study area

## ASSUMPTIONS

Delaware Economic Development Office (DEDO) is currently working with residents, elected officials, owners of Merchant's Square, DNREC, DelDOT and New Castle County to explore strategies for the economic revitalization of the Merchant's Square Shopping Center and overall economic development along the Delaware River. While the DEDO study is developing the eventual redevelopment plan for the area, for this TOD study we made some assumptions based on the mix of uses and density of TODs in other areas.

For transportation, we assumed that enhancements are made to improve conditions for walking, bicycle and bus transit, i.e. adding sidewalks to one side where none currently exist and completing missing pedestrian links. As the Fox Point area is revitalized, we recommend working with community members to identify the specific transportation improvements desired.

We assumed that existing land uses predominantly remain the same for the study area, except for Merchant's Square and using vacant parcels. We assumed that the 12 acre abandoned commercial parcel between Colony North and the Paladin Club would be rezoned for townhouses. For Merchant's Square, we made the following assumptions:

- Mix of uses:
  - 40 percent retail and services – desirable uses allow residents and employees convenient access to needed retail and services, include day care, dry cleaner, convenience store or small super market, coffee shop, video rental, news stand, gym, etc.
  - 40 percent other employment
  - 20 percent civic (parks, transit facilities, plazas, recreation, government, etc.)
- Contains internal streets and pedestrian connections. Block sizes should be within 3 to 7 acres.
- Employment density of 50 employees per acre or 1,250 employees at the site. (Note: New Jersey guidelines state the minimum commercial development needed to support rail or other high capacity service is 150 employees per acre.)
- 667,689 square feet commercial and office space (current first floor square feet x 3 floors).
- Maximize available parking while minimizing adverse impacts of parking. This can be accomplished with shared parking between land uses, on-street parking, multistory parking garages with retail on ground floor, parking behind buildings, and parking fees.

## SMART GROWTH INDEX MODEL

The Smart Growth Index is a tool developed by the Environmental Protection Agency (EPA) to evaluate effect of different land use and transportation scenarios based on land use, housing, employment, transportation and environmental indicators. It was developed to illustrate the impact that our transportation and land use decisions have on our communities and the environment. By comparing land use and transportation scenarios, and evaluating their outcomes, we analyze regional plans, local land use, transportation and neighborhood plans, land development proposals, and other special projects, e.g. brownfield redevelopment and annexation. Two levels of analysis can be done; a “forecast” analysis is forward-looking approach to plan for an entire community or region while a “snapshot” analysis, as used

for this study, can look at how local changes would impact a community at a single point in time. Appendix A details the indicators analyzed and the results.

## SCENARIOS TESTED

Using the Smart Growth Index we tested three land use and transportation “snapshot” scenarios to compare with current conditions.

- ***Scenario 1: Merchant’s Square Redevelopment and Local Transportation***  
This scenario includes the redevelopment of Merchant’s Square to include 1,250 jobs (250 retail, 250 service and 750 office employment). It also includes the redevelopment of smaller vacant commercial sites along Route 13. Transportation improvements are limited to completion of the sidewalk network and a road network in Merchant’s Square.
- ***Scenario 2: Enhanced Land Use and Redevelopment***  
This includes all redevelopment shown in Scenario 1. In addition, it includes the renovation of 85 apartments adjacent to the Colony North Apartments and the construction of 58 townhouses on a vacant commercial parcel owned by Paladin Club. Scenario 2 includes no transportation changes.
- ***Scenario 3: Transit Station Community***  
Scenario 3 includes all land use and transportation changes from Scenario 1 and 2. This scenario also includes the Fox Point Train Station adjacent to Merchant’s Square and three new bus stops to serve the train station and shopping center.

## RESULTS

The Smart Growth Index showed that the current conditions and the scenarios tested all have areas with population densities, mixes of residential types, and housing proximity to transit to support some transit services. All three of the scenarios tested significantly improve the balance between jobs and housing (463 percent increase), thus allowing more trips by means other than driving. Also, the completion of the pedestrian network in Scenarios 1 and 3 improve the walkability index by 21 percent.

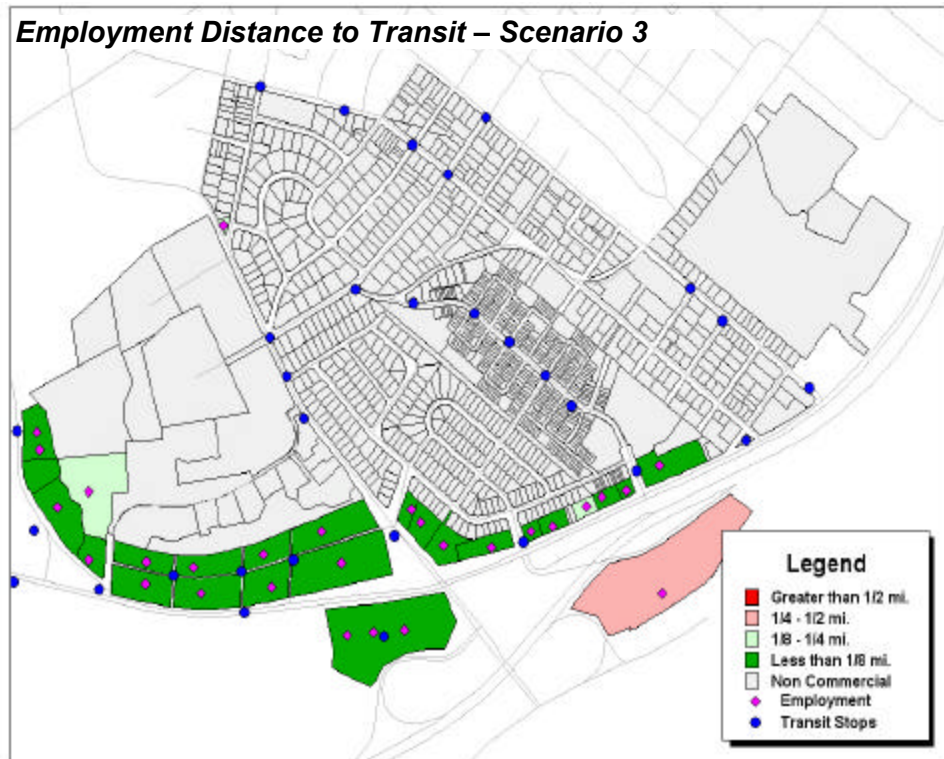
Scenario 3 showed a 20 percent decrease in the number of vehicle trips, an 18.5 percent decrease in the vehicle miles traveled, and less air pollution. However, because our analysis looked at local impacts rather than regional ones, the addition of the train station in Scenario 3 shows less change than would be expected. To assess the regional impacts of an Edgemoor Train Station, more analysis should be done to examine trip destinations and the potential for reverse commute trips to the redeveloped Merchant’s Square.

The following table shows results from the most relevant indicators for all scenarios tested. Appendix A includes details about the remaining indicators and how the results are tabulated.

Key Indicators	Base	Scenario 1	Scenario 2	Scenario 3	Base vs. Scenario 3
Population density (population/sq. mi.)	7056.58	8632.71	8952.26	8952.26	26.9%
Jobs/housed workers ratio	0.08	0.48	0.45	0.45	462.7%
Land-use diversity	0.15	0.65	0.63	0.63	317.4%
Residential density (dwellings/acre)	9.64	9.64	9.66	9.66	0.1%
Multi-family housing share	58.90	58.90	58.52	58.52	-0.6%
Housing proximity to transit (avg. ft.)	581.16	568.35	585.43	568.31	-2.2%
Employment density (employees/acre)	4.74	24.14	24.71	24.71	421.6%
Employment proximity to transit (avg. ft.)	549.27	877.72	911.40	334.17	-39.2%
Sidewalk completeness (percent)	22.12	68.65	22.12	68.65	210.3%
Walkability index	2.78	3.37	2.79	3.37	21.0%
Vehicle miles travel (per capita)	30.00	24.31	24.77	24.45	-18.5%
Vehicle trips (per capita)	3.20	2.54	2.57	2.56	-20.0%
Carbon monoxide (CO) (lbs/yr/capita)	617.12	500.32	509.90	503.31	-18.4%
Hydrocarbon (HC) (lbs/yr/capita)	79.74	64.62	65.86	65.01	-18.5%
Oxides of nitrogen (NOX) (lbs/yr/capita)	50.49	43.21	43.80	43.38	-14.1%
Carbon dioxide (CO2) (lbs/yr/capita)	8.58	7.54	7.63	7.57	-11.8%

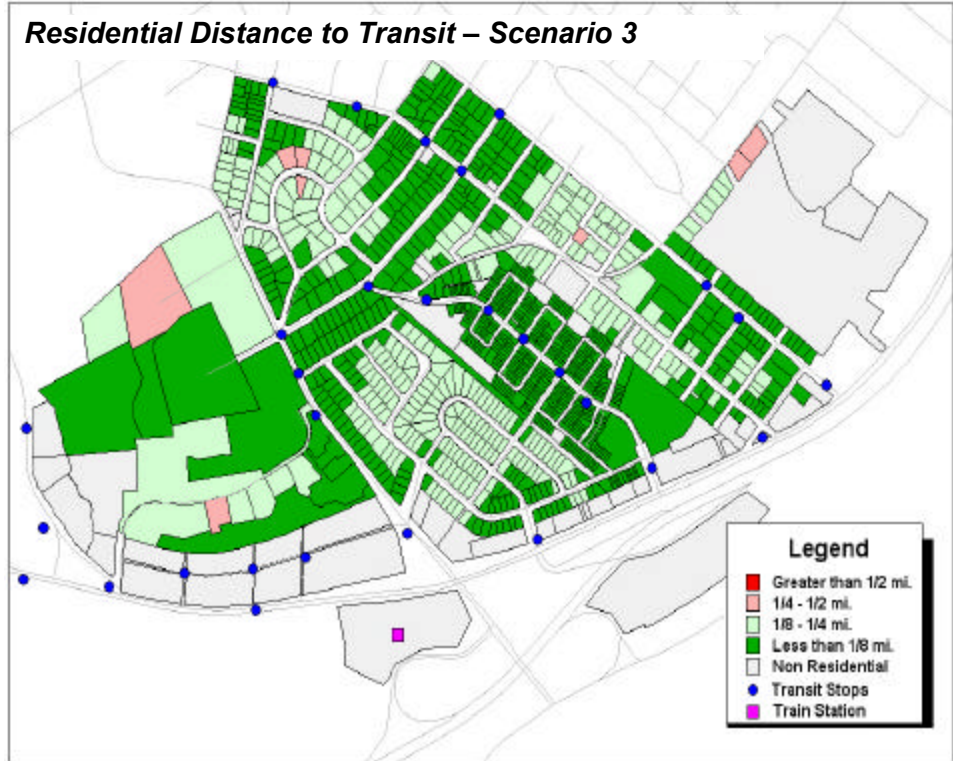
The following maps show the effectiveness of Scenario 3 as a TOD.

The Transit Station Community scenario (#3) locates most jobs within 1/8 mile of a transit stop, less than a 5-minute walk. When combined with transit-friendly design and convenient services, shopping and restaurants, employees can easily commute by transit. On average, sites are 334 feet from the nearest transit stop. Scenario 3 is closer to transit than existing conditions and Scenarios 1 and 2 because of the new train station and additional bus stops at Merchant's Square.

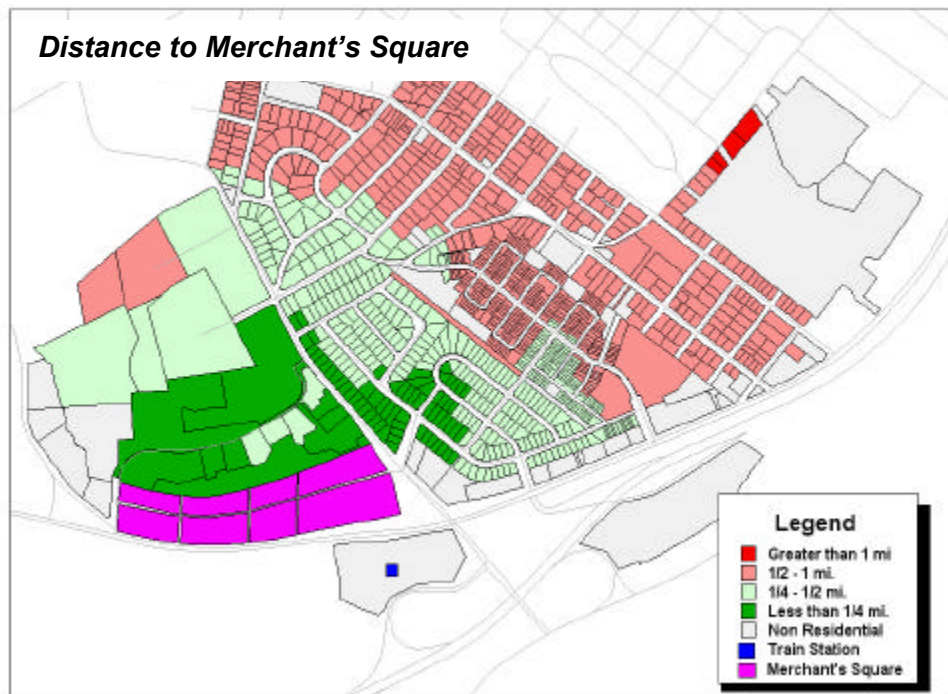




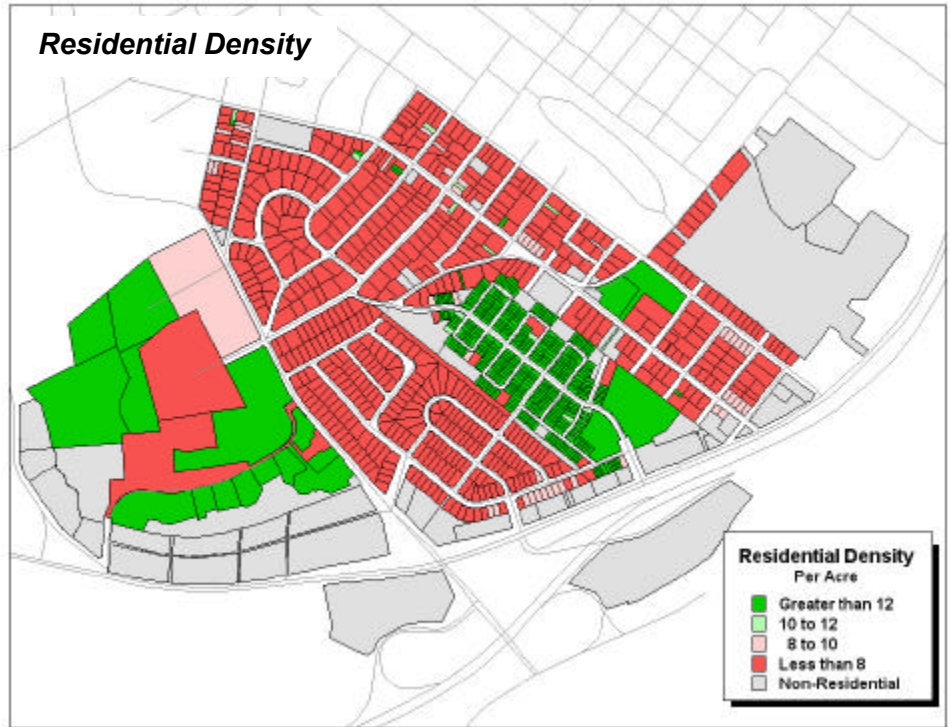
Housing too is a short walk from transit under both existing conditions and all scenarios. Almost 60 percent of the existing housing are apartments and condominiums, allowing transit to effectively serve the population. For Scenario 3, the average walk to the nearest transit stop is only 568 feet.



Most residents are also within easy walking distance of Merchant's Square, the proposed community commercial center adjacent to the train station site. However, since Merchant's Square is on the southern edge of the community, some have a longer than desired walk. For those further than 1/2 mile from Merchant's Square, the bus routes may be modified to bring residents there.



A residential density of 8 dwelling units (DU) per acre is generally considered desirable to support public transit. Sections of the study area have sufficient density to support transit, however, others do not. For rapid transit, 12 DU per acre is preferred, with 20,736 people within a square mile area. Therefore, unless commercial redevelopment is done in coordination with the train station, the area may not have sufficient population to support a train station.



## CONCLUSION

Results from TODs in other areas combined with the preliminary analysis done using the Smart Growth Index, supports the community's efforts to revitalize the area with the redevelopment of Merchant's Square and transit improvements. Even today, the Edgemoor has a desirable mix of multifamily and single family homes, with some areas having a density to support transit effectively. The DEDO led study to redevelop Merchant's Square can bring the necessary jobs and services to the area to encourage local trips by walking and bicycling. While more study is needed to assess the true ridership potential of a train station here, many areas have successfully turned greyfield malls into vibrant, transit-oriented community centers.

# APPENDIX A: ABOUT THE SMART GROWTH INDEX MODEL

WILMAPCO was selected by the EPA as one of 20 pilot areas to test the Smart Growth Index Model. The Smart Growth Index is a Geographic Information System (GIS) sketch model for comparing land-use and transportation scenarios, and evaluating their outcomes using indicators of environmental performance. This tool can be used to analyze regional plans, local and-use, transportation and neighborhood plans, land development proposals, and other special projects, e.g. brownfield redevelopment and annexation. To use the Smart Growth Index, we defined the study area and compared three scenarios with the existing conditions. The model outputs include a variety of land use, housing, employment, transportation and environmental indicators discussed below.

## Snapshot Indicators

### *Land-Use*

#### Population density

Definition and Units: Persons per sq. mi. in total sketch area, including residents and employees. Typical scores vary widely by type of community and sketch area characteristics, e.g. 3,000-100,000 persons per sq. mi.

Results:	Base	7056.6
	Scenario 1: Merchant’s Square Redevelopment	8632.7
	Scenario 2: Enhanced Land Use	8952.3
	Scenario 3: Transit Station Community	8952.3

#### Use mix

Definition and Units: Proportion of dissimilar land-uses among a grid of one-acre cells, expressed on a scale of 0 to 1 (1 is high). Scores of 0.3 to 0.4 indicate moderately diverse areas and 0.6 to 0.7 indicate highly diverse areas.

Results:	Base	0.27
	Scenario 1: Merchant’s Square Redevelopment	0.27
	Scenario 2: Enhanced Land Use	0.25
	Scenario 3: Transit Station Community	0.25

#### Jobs/workers balance

Definition and Units: Ratio of total jobs to total employed residents assuming a constant 1.4 workers per household. A score of 0.2 would represent a predominantly residential area; 1.0 would represent a perfect balance of jobs and workers; 2.0 would represent a predominantly non-residential area.

Results:	Base	0.08
	Scenario 1: Merchant’s Square Redevelopment	0.48
	Scenario 2: Enhanced Land Use	0.45
	Scenario 3: Transit Station Community	0.45

## **Land-use diversity**

Definition and Units: 0-1 index of sketch area population/employment mix compared to regional population/employment mix. Scores near 1 represent sketch area mixes that are similar to regional mixes; lower scores reflect less similarity between sketch area and region.

Results:	Base	0.15
	Scenario 1: Merchant's Square Redevelopment	0.65
	Scenario 2: Enhanced Land Use	0.63
	Scenario 3: Transit Station Community	0.63

## **Housing**

### **Residential density**

Definition and Units: Dwelling units per net acre of all land designated for all residential uses. Scores range from 4 to 5 DU/acre or less for low-density areas to 50 to 60 DUs/acre for high-density areas.

Results:	Base	9.64
	Scenario 1: Merchant's Square Redevelopment	9.64
	Scenario 2: Enhanced Land Use	9.66
	Scenario 3: Transit Station Community	9.66

### **Single-family housing share**

Definition and Units: Single-family percent of total dwellings. Scores vary widely depending on community and sketch area, e.g. 40-80%.

Results:	Base	41.10
	Scenario 1: Merchant's Square Redevelopment	41.10
	Scenario 2: Enhanced Land Use	41.48
	Scenario 3: Transit Station Community	41.48

### **Multi-family housing share**

Definition and Units: Multi-family percent of total dwellings. Scores vary widely by community type and sketch area, e.g.10-40%.

Results:	Base	58.90
	Scenario 1: Merchant's Square Redevelopment	58.90
	Scenario 2: Enhanced Land Use	58.52
	Scenario 3: Transit Station Community	58.52

### **Housing transit proximity**

Definition and Units: Average distance (feet) to nearest transit stop. Distances of 1320 and shorter are desirable.

Results:	Base	581.16
	Scenario 1: Merchant's Square Redevelopment	568.35
	Scenario 2: Enhanced Land Use	585.43
	Scenario 3: Transit Station Community	568.31

### **Housing recreation proximity**

Definition and Units: Average distance (feet) to nearest park. Distances of 1320 and shorter are desirable.

Results:	Base	540.30
	Scenario 1: Merchant's Square Redevelopment	539.29
	Scenario 2: Enhanced Land Use	516.15
	Scenario 3: Transit Station Community	515.19

## ***Employment***

### **Employment density**

Definition and Units: Number of employees per net acre of land designated for employment uses. Typical scores are 5 to 10 employees/acre for low-density employment areas; 50 to 60 employees/acre for high-density employment areas.

Results:	Base	4.74
	Scenario 1: Merchant's Square Redevelopment	24.14
	Scenario 2: Enhanced Land Use	24.71
	Scenario 3: Transit Station Community	24.71

### **Employment transit proximity**

Definition and Units: Average distance (feet) to transit stop. Distances of 1320 and shorter are desirable.

Results:	Base	549.27
	Scenario 1: Merchant's Square Redevelopment	877.72
	Scenario 2: Enhanced Land Use	911.40
	Scenario 3: Transit Station Community	334.17



## **Travel**

### **Sidewalk completeness**

Definition and Units: Percent of total street frontage with improved sidewalks on both sides. Scores range from 10-90%.

Results:	Base	22.12
	Scenario 1: Merchant's Square Redevelopment	68.65
	Scenario 2: Enhanced Land Use	22.12
	Scenario 3: Transit Station Community	68.65

### **Pedestrian route directness**

Definition and Units: Ratio of shortest walkable route distance from outlying origin points to central node destination versus straight line distance between the same points. Scores from 1.20-1.50 are relatively favorable; scores above 1.5 are unfavorable.

Results:	Base	1.81
	Scenario 1: Merchant's Square Redevelopment	1.79
	Scenario 2: Enhanced Land Use	1.80
	Scenario 3: Transit Station Community	1.79

### **Pedestrian design index**

Definition and Units: Composite index of sidewalk completeness, street network density, and pedestrian route directness indicator scores. Scores of 0.7 or higher are favorable.

Results:	Base	2.78
	Scenario 1: Merchant's Square Redevelopment	3.37
	Scenario 2: Enhanced Land Use	2.79
	Scenario 3: Transit Station Community	3.37

### **Street network density**

Definition and Units: Density of streets in centerline miles per sq. mi. Typical scores are 5-20 mi. per sq. mi.

Results:	Base	26.66
	Scenario 1: Merchant's Square Redevelopment	27.36
	Scenario 2: Enhanced Land Use	26.66
	Scenario 3: Transit Station Community	27.36

### **Street connectivity**

Definition and Units: Ratio of street intersections versus intersections and cul-de-sacs, expressed on a scale of 0 to 1 (1 is high). Scores of 0.6 or less are unfavorable; 0.8 or higher is very favorable.

Results:	Base	0.98
	Scenario 1: Merchant's Square Redevelopment	0.98
	Scenario 2: Enhanced Land Use	0.98
	Scenario 3: Transit Station Community	0.98

### **Vehicle miles traveled**

Definition and Units: Average total vehicle miles traveled daily per capita. Typical scores are 15 VMT/day/capita in dense multi-modal areas; 25 VMT/day/capita in low-density auto-dependent areas.

Results:	Base	30.00
	Scenario 1: Merchant's Square Redevelopment	24.31
	Scenario 2: Enhanced Land Use	24.77
	Scenario 3: Transit Station Community	24.45

### **Vehicle trips**

Definition and Units: Average total vehicle trips daily per capita. 4-5 VT/day/capita.

Results:	Base	3.20
	Scenario 1: Merchant's Square Redevelopment	2.54
	Scenario 2: Enhanced Land Use	2.57
	Scenario 3: Transit Station Community	2.56

### **Auto travel costs**

Definition and Units: Annual average household cost for auto travel in \$/year based on American Automobile Association cost per mile data and VMT estimate. \$5,000 -10,000 year.

Results:	Base	5147
	Scenario 1: Merchant's Square Redevelopment	4170
	Scenario 2: Enhanced Land Use	4250
	Scenario 3: Transit Station Community	4195

## **Environment**

### **Open space**

Definition and Units: Percent of total sketch area in user-defined open space land-use classes. Scores depend on general vicinity (urban, suburban), and user definition of open space.

Results:	Base	6.56
	Scenario 1: Merchant's Square Redevelopment	6.56
	Scenario 2: Enhanced Land Use	6.56
	Scenario 3: Transit Station Community	6.56

### **Park space availability**

Definition and Units: Acres of park and schoolyards per 1,000 residents, typically 2 to 3 acres per 1,000 residents.

Results:	Base	0.46
	Scenario 1: Merchant's Square Redevelopment	0.46
	Scenario 2: Enhanced Land Use	0.46
	Scenario 3: Transit Station Community	0.46

### **Carbon monoxide (CO) emissions**

Definition and Units: CO emitted from light vehicles in lbs/year/capita. 200-300 lbs/year/capita.

Results:	Base	617.12
	Scenario 1: Merchant's Square Redevelopment	500.32
	Scenario 2: Enhanced Land Use	509.90
	Scenario 3: Transit Station Community	503.31

### **Hydrocarbon (HC) emissions**

Definition and Units: HC emitted from light vehicles in lbs/yr/capita. 15-25 lbs/yr/capita.

Results:	Base	79.74
	Scenario 1: Merchant's Square Redevelopment	64.62
	Scenario 2: Enhanced Land Use	65.86
	Scenario 3: Transit Station Community	65.01

### **Oxides of Sulfur (SOX) emissions**

Definition and Units: SOX vehicle emissions in lbs/yr/capita. 10-15 lbs/yr/capita.

Results:	Base	11.64
	Scenario 1: Merchant's Square Redevelopment	11.64
	Scenario 2: Enhanced Land Use	11.63
	Scenario 3: Transit Station Community	11.63

### **Oxides of nitrogen (NOX) emissions**

Definition and Units: NOX emitted from light vehicles in lbs/year/capita. 15-25 lbs/year/capita.

Results:	Base	50.49
	Scenario 1: Merchant's Square Redevelopment	43.21
	Scenario 2: Enhanced Land Use	43.80
	Scenario 3: Transit Station Community	43.38

### **Carbon dioxide (CO2)**

Definition and Units: Carbon dioxide emitted from light vehicles in lbs/year/capita. 7,000-10,000 lbs/year/capita.

Results:	Base	8.58
	Scenario 1: Merchant's Square Redevelopment	7.54
	Scenario 2: Enhanced Land Use	7.63
	Scenario 3: Transit Station Community	7.57

## APPENDIX B: RESOURCES

### Transit Oriented Development Resources

*An Overview of Transit-Oriented Development (TOD)*, University UNITED, [www.universityunited.com/TOD.doc](http://www.universityunited.com/TOD.doc)

*Best Development Practices: A Primer for Smart Growth*, International City/County Management Association and Smart Growth Network, [www.epa.gov/smartgrowth/pdf/BestDevprimer.pdf](http://www.epa.gov/smartgrowth/pdf/BestDevprimer.pdf)

*Building Livable Communities with Transit*, US Department of Transportation, [www.fta.dot.gov](http://www.fta.dot.gov)

*Envisioning Neighborhoods with Transit-Oriented Development Potential*, Mineta Transportation Institute, May 2002, [transweb.sjsu.edu](http://transweb.sjsu.edu)

*Keys to Successful Transit Oriented Developments*, Steve Coyle, ULI Place-Making Conference, [www.uli.org](http://www.uli.org)

*Pedestrian and Transit-Friendly Design: A Primer for Smart Growth*, 1999, Ewing, Reid. International City/County Management Association and Smart Growth Network, [www.epa.gov/smartgrowth/pdf/ptfd\\_primer.pdf](http://www.epa.gov/smartgrowth/pdf/ptfd_primer.pdf)

*Transit Oriented Development Fact Sheet*, Capitol Region Council of Governments, [www.crcog.org](http://www.crcog.org)

*Transit Oriented Development: Moving from Rhetoric to Reality*, The Brookings Institution Center on Urban and Metropolitan Policy and The Great American Station Foundation, June 2002, [www.brookings.edu/dybdocroot/es/urban/publications/belzertod.pdf](http://www.brookings.edu/dybdocroot/es/urban/publications/belzertod.pdf)

*Transit-Oriented Development: A Popular Planning Paradigm*, Mineta Transportation Institute July 2001, [transweb.sjsu.edu](http://transweb.sjsu.edu)

[www.todcommunities.org](http://www.todcommunities.org), explores basics of planning transit station communities

### Greyfield Mall Redevelopment Resources

*Dead Malls Competition*, Los Angeles Forum for Architecture and Urban Design, [www.laforum.org/deadmalls](http://www.laforum.org/deadmalls)

[Deadmalls.com](http://Deadmalls.com), historical background and ideas for mall redevelopment

*Greyfield Regional Mall Study*, Congress for New Urbanism January 2001 [www.cnu.org](http://www.cnu.org)

*Greyfields into Goldfields*, Congress for New Urbanism February 2001 [www.cnu.org](http://www.cnu.org)

*Growth Tool Kit: Convert Dead Suburban Malls into Town Centers*, National Governors Association, [www.nga.org](http://www.nga.org)

*Mizner Park photos*, [www.frontierhome.com/Mizner.htm](http://www.frontierhome.com/Mizner.htm)

[www.federalrealty.com](http://www.federalrealty.com), examples of mall redevelopment