



# Managing Access in Newtown Square: PA 3 and PA 252 in Newtown Township, Delaware County, Pennsylvania

August 2010



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# Executive Summary

This access management case study addresses congested segments of both Newtown Street Road (PA 252) and West Chester Pike (PA 3) – intersecting arterial highways in Newtown Township, Delaware County.

Highway access management techniques were assembled into a conceptual plan for the corridor to improve safety and mobility and to prolong highway serviceability in light of ongoing regional growth and development. The work was performed by DVRPC staff in support of Pennsylvania Department of Transportation's (PennDOT's) effort to promote wider planning for and application of access management procedures within the Commonwealth. The procedures are applicable to both state and local highways, and the strategies are most effectively delivered through municipal ordinances that govern the land development design, application, review, and approval process. As such, principal guidance for developing the plan work was obtained from PennDOT's publication *Access Management Model Ordinances for Pennsylvania Municipalities Handbook*.

The foundation of the conceptual access management plan for PA 3 and PA 252 lies within their classification as principal arterial highways. Principal arterials should emphasize and provide for mobility for longer distance trips and through-travel, versus direct access to abutting property and local trips. Accordingly, to support their purpose and functional integrity for the foreseeable future, changes to property access were integrated into the plan. Opportunities for improving access management in the study area were supplied for scenarios involving the major transportation improvements associated with the Ellis Preserve Town Square development and as outlined in the Master Plan Traffic Study, and for PA 252 assuming that the improvements are not realized. Being that much of the study area is heavily developed, the most effective implementation of access management would be through major redevelopment efforts, though by working within the bounds of existing development, progress may still be made.

Improvement recommendations were developed with municipal, county, and PennDOT staff participation. In summary, the conceptual plan recommends:

- ◆ Assuming redevelopment of the commercial properties in the northwest quadrant of the PA 3 and PA 252 intersection – reconfigured access
- ◆ Consolidating and closing driveways along PA 252
- ◆ Achieving greater separation between driveways and intersecting roadways
- ◆ Providing internal circulation and on-site storage
- ◆ Defining driveway openings with curbing
- ◆ Building a grid of local roads along the east side of PA 252 to remove direct parcel access from the principal arterial highway
- ◆ Improving pedestrian circulation

In addition to providing conceptual access management plans, the study provides an assessment of the existing access management-related regulations (zoning and subdivision and land development ordinances), and makes recommendations to fill in regulatory gaps.



# Introduction

Highway access management is one of many strategies available to prolong and/or improve the function of a state or local roadway. The methods employed in access management seek to identify corridor needs, optimize the existing transportation infrastructure, and accommodate eventual change. Access management strategies generally work toward eliminating turning movements at driveways, reducing through travel interruptions, and making vehicle entrances and exits to/from driveways and roadways more predictable.

Because access management is so closely related to land development, and land use and development are municipal responsibilities, implementation can most effectively be achieved through the practices, plans, and ordinances that guide and support the municipality's land development design, application, review, and approval processes (e.g., the Official Map, the Comprehensive Plan, the Zoning Ordinance, and the Subdivision and Land Development Ordinance). In turn, formal placement and design of new intersecting streets and driveways along important state and municipal highways within its jurisdiction can be regulated by the municipality. Where state highways are involved, formalized access management plans can also be supported by PennDOT's highway occupancy permitting process. The plan's successful outcome, for both highway systems, is very often hinged upon early and frequent communication, coordination, and cooperation between the developer, the municipality, and PennDOT (where state highways are involved).

Access management can be a relatively low cost means of reducing congestion and increasing both the efficiency and safety of a roadway if implemented through the land development design and approval process. Access management techniques can be introduced on a case-by-case basis by retrofitting access at individual parcels along developed highway corridors or incrementally along growing corridors. The key to each is to have a defined plan of approach and the legal basis for requiring compliance.

According to the Transportation Research Board the goals of access management are accomplished by applying the following principles:

1. Provide a specialized roadway system – design and manage roadways according to the transportation function they are expected to serve;
2. Limit direct access to major roadways – limiting points of interruption favors travel mobility;
3. Promote intersection hierarchy – transitions between differing highway classes should be logical and efficient;

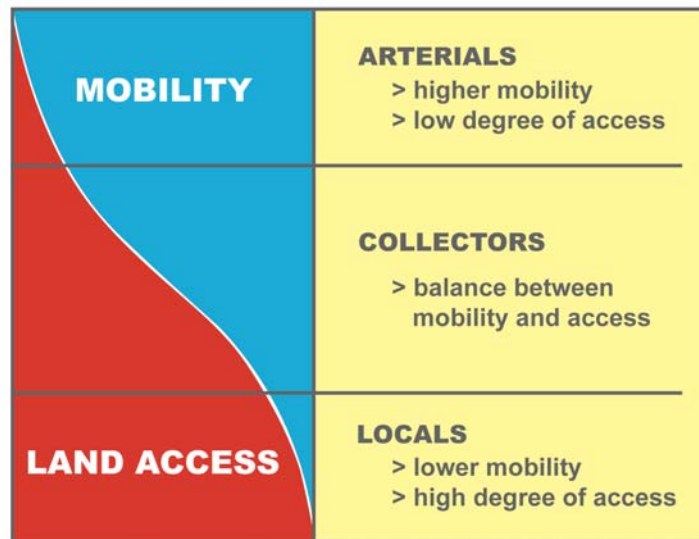


4. Locate traffic signals to favor through movement – long, uniform spacing between signalized intersections is more amenable to coordinated traffic control systems that provide for continuous traffic movement at desired speeds;
5. Preserve the functional areas of intersections and interchanges – areas within an intersection where deceleration and maneuvering decisions are made, as a result of the intersection’s design/control, should remain free of external, extraneous influences;
6. Limit the number of conflict points (places where the paths of vehicles intersect) – to simplify the driving experience, and reduce decision-making and the chances for making mistakes that can lead to collisions;
7. Separate conflict areas – provide sufficient distance and time for decision-making;
8. Remove turning vehicles from through-traffic lanes – separate/protect turning vehicles with lanes that accommodate deceleration and storage to reduce stopping interruptions and conflicts along the main thoroughfare;
9. Use nontraversable medians to manage turning movements – effective for improving roadway safety; and
10. Provide a supporting street and circulation system – networks of local and collector streets that accommodate development, and unify property access and circulation systems which are highly desirable for dispersing traffic demand and eliminating local travel from higher order highways. Interconnected streets, sidewalks, and trails also provide alternate routes for bicyclists and pedestrians.

National studies indicate that where access management techniques are consistently implemented along a highway corridor, collisions can be reduced by as much as 50 percent; capacities increased between 23 and 45 percent; and travel times and delays reduced as much as 40 to 60 percent versus highway segments with un- or under-regulated access management practices (NCHRP Report 420). Another study concluded that increasing driveway interferences (e.g., conflict points) from 10 to 20 per mile can result in a 30 to 40 percent increase in crashes along a highway (Levinson, H.S., in TRB Access Management Manual).

*Highway functional classification* is a term that implies the hierarchy and interconnectivity of a highway network. Typically, freeways, expressways, and arterial highways provide for through-travel and mobility over longer distances. Local travel, composed of shorter trips, is served by collector roads and local streets. More often than not, trips include both local and longer-distance elements, hence the importance of interconnectivity and continuity of the system to serve all highway trips. Functional classification is an important parameter in determining the extent to which access management strategies should be applied. Besides defining a network of highways that are most important locally, regionally, and nationally, highways designated in the system may also be eligible for federal funding assistance when transportation improvement projects are contemplated.

The relationship between mobility and land access represented by a highway's functional classification is conceptualized in the mobility curve graphic below. With the exception of limited access highways (e.g., expressways, where movements to and from the highway occur only at interchanges) and some principal arterial highways, properties abutting highways are legally entitled to access. Proper emphasis of the highway's main purpose can be achieved through recognition and definition—to carry traffic or serve abutting property—and design. Access management plans/designs supported by ordinances reinforce the desired purpose of the highway.



**Mobility Curve**

*FHWA, 1992*

A foundation for understanding the hierarchy of roads is represented by the federal aid highway classification system. Typically, functional classification maps and highway designations are also found in municipal comprehensive plans. Highway design standards, contained in PennDOT manuals and municipal ordinances, reinforce the intended function of a highway. PennDOT's Access Management Model Ordinances Handbook also arranges its guidelines in relation to a highway's functional classification.

DVRPC's access management work program was created to promote and support PennDOT's Access Management Model Ordinance project with the participation of the membership and the municipalities. DVRPC's access management planning methodology draws from the region's federally mandated Congestion Management Process (CMP), which aims to minimize congestion and enhance the mobility of both people and goods along a defined network of highways. The CMP acts as a connection between the region's Long Range Plan and the region's Transportation Improvement Program (TIP) to ensure that appropriate strategies are applied to improve regional transportation facilities. An initial step in the CMP was to define congested corridors throughout the Delaware Valley. The process then considered characteristics within each corridor and preliminarily identified strategies—including access management techniques—to mitigate congestion. Consequently, with the direct participation of the local municipality in the case study evaluation, DVRPC's access management corridor approach provides a more

detailed evaluation than the CMP's general recommendation and a sounding board for its acceptance.

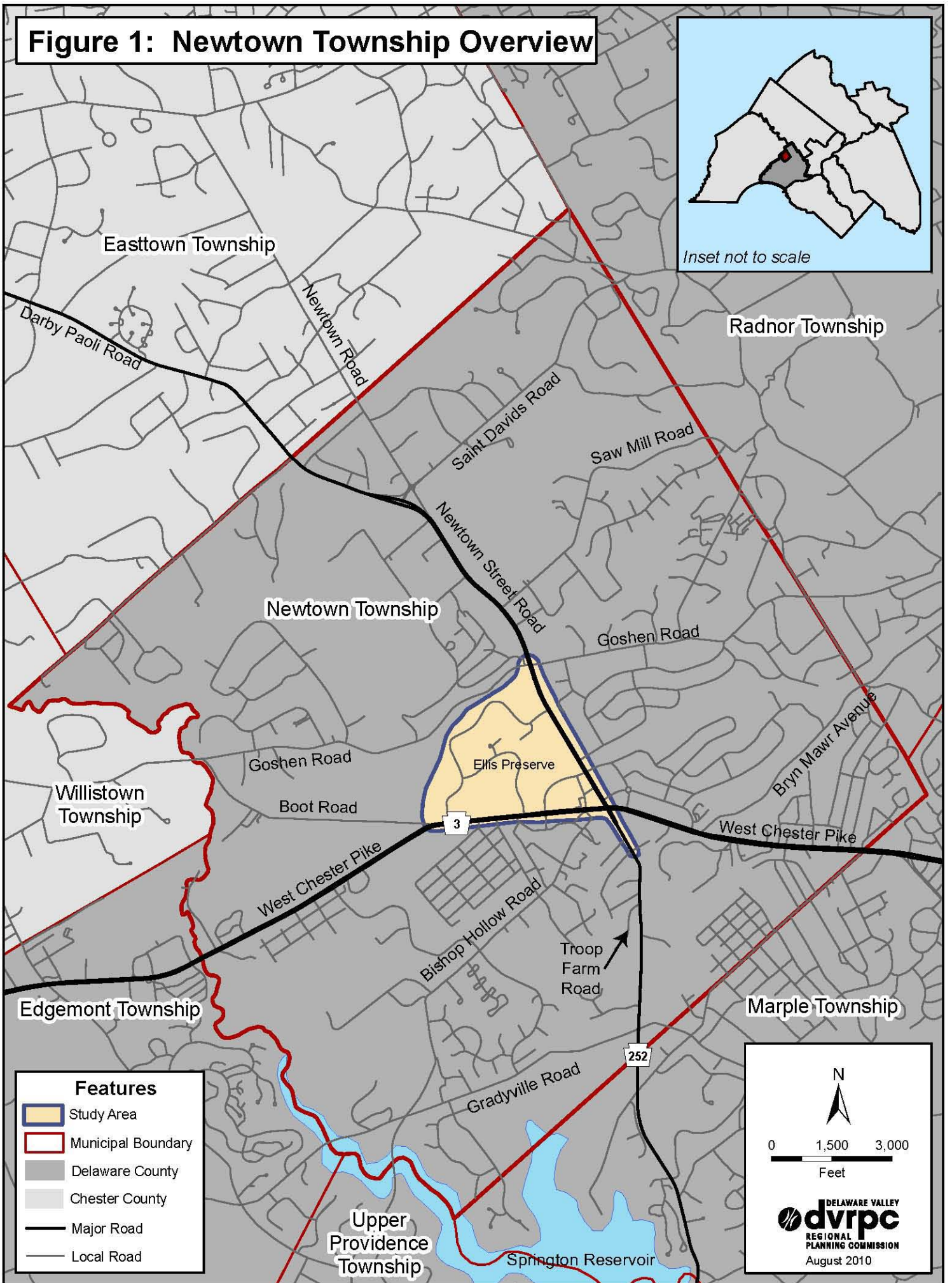
In January 2009 an Access Management Task Force meeting was held at DVRPC to select corridors for access management case studies. Representatives of each Pennsylvania county in the DVRPC region, and staff from PennDOT Engineering District 6-0 and SEPTA were on hand for the selection process. Through nomination and discussion a long list of candidate corridors, drawn from the region's CMP, were winnowed to an action list for detailed study. The Newtown Square project was nominated by Delaware County due to the proposed Ellis Preserve Town Square development.

Subsequently, the "host" steering committee member (Delaware County for this study) and Newtown Township representatives participated in working meetings with DVRPC staff to more clearly define the study area and its problems, and consider potential improvements. Municipal representatives that participated in the planning exercises were also given the opportunity to review and make comments on the draft report.

The congested area subject to this case study evaluation is the Newtown Street Road (PA 252) and West Chester Pike (PA 3) intersection area. Major changes in this area are on the horizon with the proposed Ellis Preserve Town Square and associated highway improvements; providing a good opportunity to analyze the township's access management policies and practices. The Ellis Preserve Town Square development is slated to occupy 218 acres in the northwest quadrant of the PA 252/PA 3 intersection. The proposed interior circulation system of the Ellis Preserve Town Square development is reviewed for access management best practices due to the potential for the roadways being dedicated to the township. The study area and township are shown in a regional setting on **Figure 1**.

The access management assessment conducted in this study is comprised of two facets: the geographic specific assessment of PA 252 and PA 3 in the vicinity of the Ellis Preserve Town Square development and a review of the township's enabling ordinances. The primary goal of this study, and of the access management program as a whole is to educate the municipality to the benefits of access management and for access management to be included in future municipal transportation-related decision-making.

**Figure 1: Newtown Township Overview**





# Study Area Transportation Facilities

## Study Area

The study area for this study is defined as being PA 252 – Newtown Street Road between Goshen Road and PA 3 – West Chester Pike, and PA 3 between PA 252 and Boot Road, including the functional area of the end point intersections on all approaches. Additionally, Newtown Township requested an analysis of business accesses on PA 252 south of PA 3. **Figure 2** illustrates the study area and roadway network.

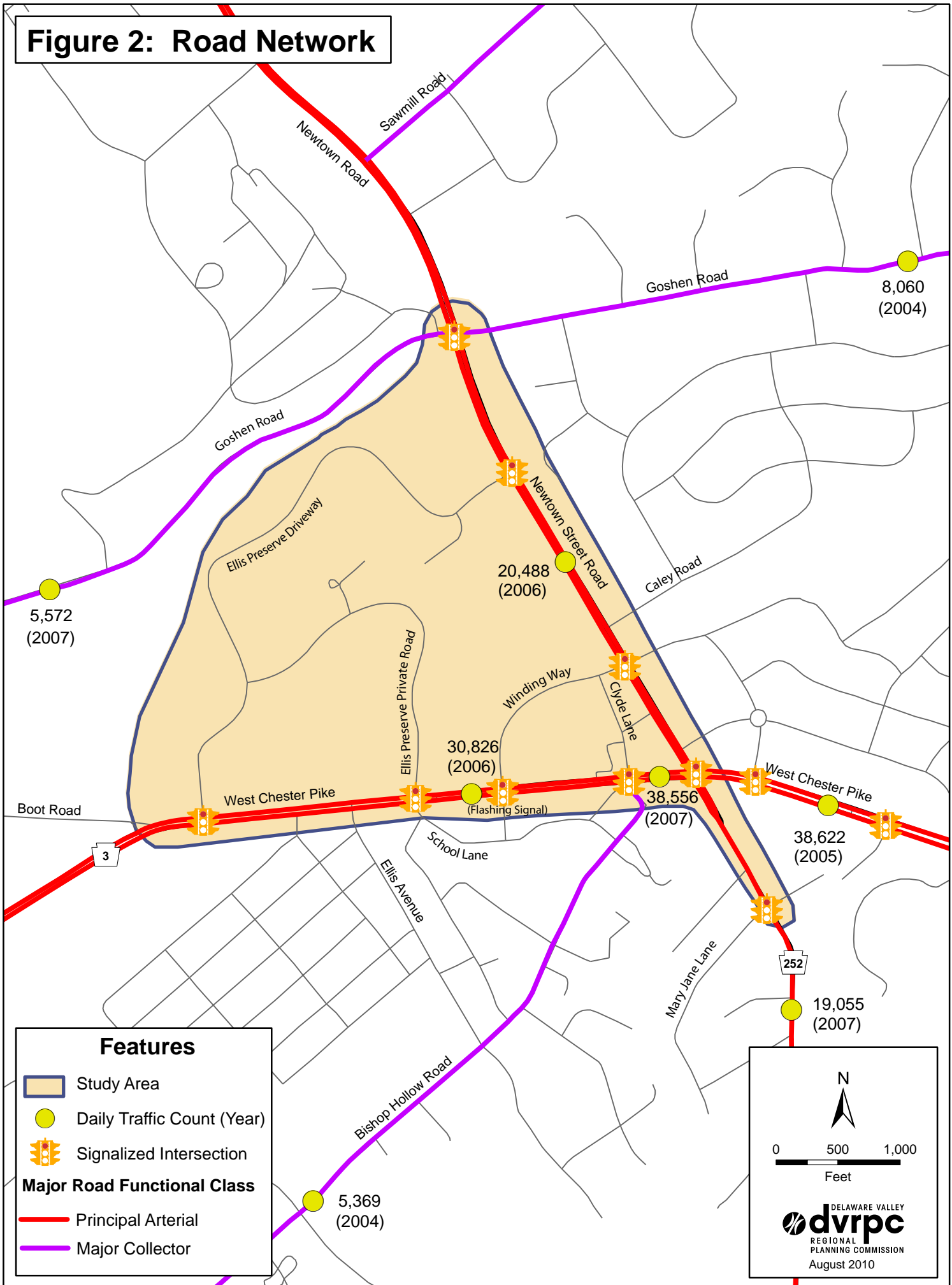
## Existing Conditions

This study is greatly benefited by a proactive municipality that recognizes current and future transportation challenges. McMahon Transportation Engineers and Planners completed the *Newtown Square Master Plan Traffic Study* in 2007 and recommended numerous roadway improvements to accommodate current (2007) and future (2017) transportation needs. The study's findings have been adopted by the township. The master plan stresses that no single improvement will solve all problems, rather many, and often invasive, improvements are necessary to avoid perpetual poor levels of service in the growing municipality and along the intersecting principal arterial highways. This study seeks to supplement the master plan's recommendations with sound access management principles.

The catalyst for this study was the proposed Ellis Preserve Town Square development on the land in the northwest quadrant of the West Chester Pike/Newtown Street Road intersection. The 218-acre parcel is currently known as the Ellis Preserve and contains a large corporate campus. The new development is slated to occur on 210 acres and in two phases: Phase 1 being the area outside of Winding Way and Phase 2 being the area inside Winding Way – nearer the PA 3 and PA 252 intersection. Housing, retail, office, and hotel are all included in the development. As a response to legal challenges of the approved plans, the developer may alter initial plans to an “as of right” design which is not as heavily commercial. In either scenario, the level of traffic generated is nearly equal in the order of 24,000 trips per weekday.



**Figure 2: Road Network**



**Features**

- Study Area
- Daily Traffic Count (Year)
- Signalized Intersection

**Major Road Functional Class**

- Principal Arterial
- Major Collector

N

0 500 1,000  
Feet

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## Roadway Characteristics

**Newtown Street Road** (PA 252) is a four-lane roadway north of PA 3 and a two-lane roadway south of PA 3. The length between southern Delaware County and US 202, including through Newtown Township, is functionally classified as a principal arterial highway. The PA 3 intersection area is flared and includes dedicated left-turning lanes for both directions, and the northbound approach gains a travel lane to match the two-lane configuration north of the intersection. Southbound PA 252 has dedicated left-turn lanes for the intersections with Goshen Road, Caley Road, and Winding Way. Where left-turn lanes are not present, PA 252 has a center median; grass north of Caley Road and concrete south. PA 252 is undivided south of PA 3. The posted speed limit is 40 miles per hour south of the Ellis Preserve Driveway and 55 miles per hour north of the driveway. Signalized intersections include Goshen Road, Ellis Preserve Driveway, Winding Way, and PA 3.

**West Chester Pike** (PA 3) is a four-lane roadway throughout the study area separated by a grass median. Several intersections have dedicated turning lanes in addition to the two through travel lanes: eastbound – Boot Road, Ellis Preserve Driveway (two left-turn lanes), Ellis Preserve Private Road, Winding Way, Clyde Lane, and PA 252; westbound – PA 252, Bishop Hollow Road, Ellis Avenue, and a private business driveway (opposite Ellis Preserve Driveway). Signalized intersections include the Ellis Preserve Driveway, Ellis Preserve Private Road/School Lane, Winding Way, Saint Albans Avenue, Newtown Square Shopping Center Driveway, Bishop Hollow Road/Clyde Lane, and PA 252. The posted speed limit is 40 miles per hour.

### Other Important Roadways:

- **Goshen Road** – a two-lane major collector between PA 3 near West Chester and where it joins Darby Paoli Road near the Sproul Road (PA 320) and Bryn Mawr Avenue intersection. Traffic volumes range from approximately 8,000 vehicles per day east of, and 5,500 vehicles per day west of PA 252. The intersection of Goshen Road and PA 252 defines the northern extent of the study area.
- **Ellis Preserve Driveway** – a private roadway that intersects both PA 3 and PA 252 with signalized intersections. The driveway currently serves the SAP office campus.
- **Winding Way (west of PA 252)** – also known as the Winding Way Extension, is a three-lane local road (two northbound, one southbound) with a grass center median that intersects both PA 3 and PA 252. The intersection with PA 252 is signalized and the PA 3 intersection is signalized with a flashing signal, with movement restricted to right turns only. The road was constructed to provide relief to the PA 3 and PA 252 intersection.
- **Bishop Hollow Road** – a two-lane major collector that bisects the southwest quadrant of Newtown Township in a southwest to northeast direction. The road was reconfigured near the PA 3 and PA 252 intersection to provide greater separation between the PA 3 intersections. Approximately 5,500 vehicles per day travel on Bishop Hollow Road. Bishop Hollow Road intersects PA 3 opposite Clyde Lane with a signalized intersection.



## Public Transit Service

Public transit service in the study area is provided by the Southeastern Pennsylvania Transportation Authority (SEPTA). There are three bus routes that operate on PA 3, PA 252, or both in the study area:

- **Route 104** – provides 7-day service between 69<sup>th</sup> Street Terminal in Upper Darby and West Chester University. The route has 10-minute peak-hour headways and 30-minute off-peak headways on weekdays, and 30-minute headways on Saturdays and Sundays. On weekdays, the route circles through the Newtown Square Corporate Campus.
- **Route 118** – operates between the City of Chester and Newtown Square. In the study area, the route operates primarily on PA 252 south of PA 3. With a route terminus in Newtown Square, the route reverses direction by using Chapel Avenue, Saint Albans Avenue, and PA 3 – each for a short distance. Route 118 provides hourly headways on weekdays and Saturdays. There is no Sunday service.
- **Route 120** – provides service between 69<sup>th</sup> Street Terminal in Upper Darby and Cheyney University. The route operates entirely on PA 3 in Newtown Township. Route 120 provides 1-hour weekday and 2-hour weekend headways.

## Land Use, Human, and Natural Environments

The relationship between land use and transportation facilities is central to any traffic study. The use of the land—where people live, work, and play—and its intensity is responsible for trip generation and its magnitude. The geographic distribution of the uses and the transportation facilities connecting or serving the uses are responsible for how trips are made (e.g., by highway, transit, walking, etc.).

Natural and cultural resources sustain environmental functions, provide recreational opportunities, and enhance the quality of life for local residents.

### Land Use

**Figure 3** displays the categories and spread of land coverage in 2005 for Newtown Township. **Table 1** further breaks down land use cover by type, area, and percentage.

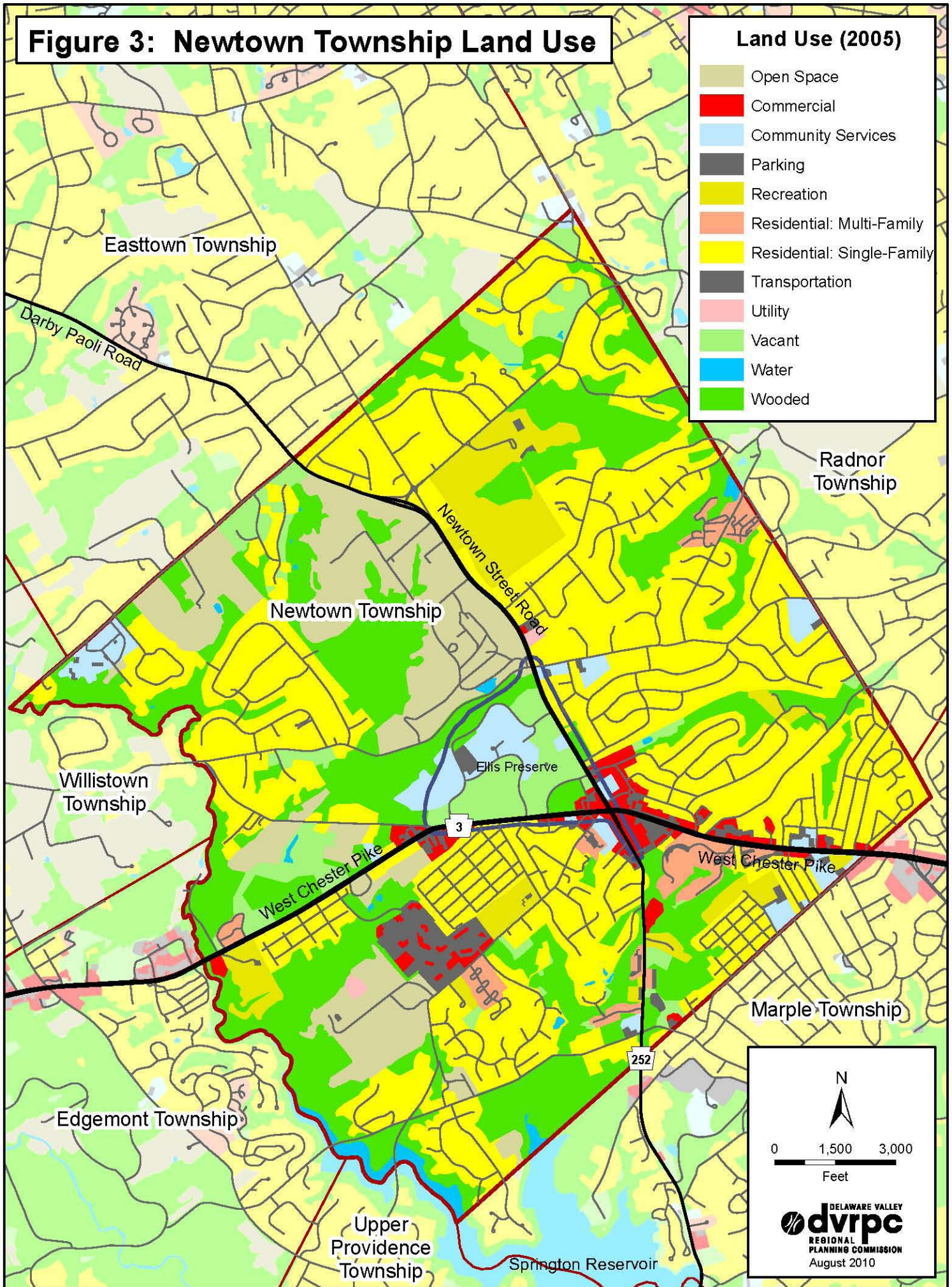
**Table 1: Newtown Township Land Use (2005)**

Newtown Land Use	Acres	Percent
Open Space	713	11.1%
Commercial	136	2.1%
Community Services	193	3.0%
Parking	129	2.0%
Recreation	300	4.7%
Residential: Multi-family	130	2.0%
Residential: Single-family	2,854	44.4%
Transportation	37	0.6%
Utility	10	0.2%
Vacant	337	5.2%
Water	66	1.0%
Wooded	1,530	23.8%
<b>Total</b>	<b>6,433</b>	<b>100.0%</b>

*DVRPC, 2009*



**Figure 3: Newtown Township Land Use**





Housing, primarily single-family, occupies roughly 46 percent of the township. Open space and wooded areas combined cover another 35 percent of the township. Commercial land uses occupy a mere two percent of the township and are focused almost entirely along PA 3, and along PA 252 in the PA 3 intersection area. The study area includes the Ellis Preserve which is a combination of commercial, community services, and vacant. The remainder of the study area is primarily commercial with areas where residential neighborhoods abut either PA 3 or PA 252.

DVRPC 2005 population and employment estimates for Newtown Township are: 11,842 residents and 8,160 jobs.

Typical of many suburban communities, Newtown Township lacks a walkable, mixed-use core. BPG Development, Inc. has proposed and received permission to build a 218-acre mixed-use development northwest of the PA 3/PA 252 intersection. The area, Ellis Preserve, currently contains a corporate campus, office buildings, and open space (vacant land).

Land use is dynamic and growth is assured. Newtown Township is likely to see significant development in the near future—the catalyst for this study:

- **The Ellis Preserve Town Square Development**
  - 465,000 square feet of new retail, 400,000 square feet of new office space, two hotels, and 410 mixed residential housing units
- **DVRPC 2035 Population and Employment Forecasts**
  - 12,099 residents and 8,912 jobs – two percent and nine percent increases, respectively

## Human and Natural Environments

To the degree that federal funding might be involved in any aspect of developing or implementing recommendations from this study, it deserves mentioning that some advance inventorying work was performed in identifying human and natural environments in the study area. As projects are developed, the information may be helpful in engaging selected, targeted residents; helping identify avoidance steps; and/or preparing for the eventuality of compliance with the requirements of federal mandates.

Federal law states that no person or group shall be excluded from participation in, or denied the benefits of any program or activity utilizing federal funds. Each federal agency is required to identify any disproportionately high and adverse health or environmental effects of its programs on minority and low-income populations. In turn, Metropolitan Planning Organizations (MPO), as part of the U.S. Department of Transportation's certification requirements, are charged with evaluating their plans and programs for environmental justice sensitivity, including expanding their outreach efforts to low-income, minority, or other disadvantaged population groups.

As the MPO for the Philadelphia metropolitan region, DVRPC's "Degrees of Disadvantage" process was applied to the township using data from the 2000 Census. The finding of that process indicated that there is one segment of the population that surpasses the regional

threshold. Two of the township's three census tracts have concentrations of elderly (75 years of age or older) surpassing the regional threshold of seven percent:

- **Tract 4099.02** – all portions of the township south of PA 3
- **Tract 4099.03** – the tract located north of PA 3, east of PA 252, and south of Goshen Road

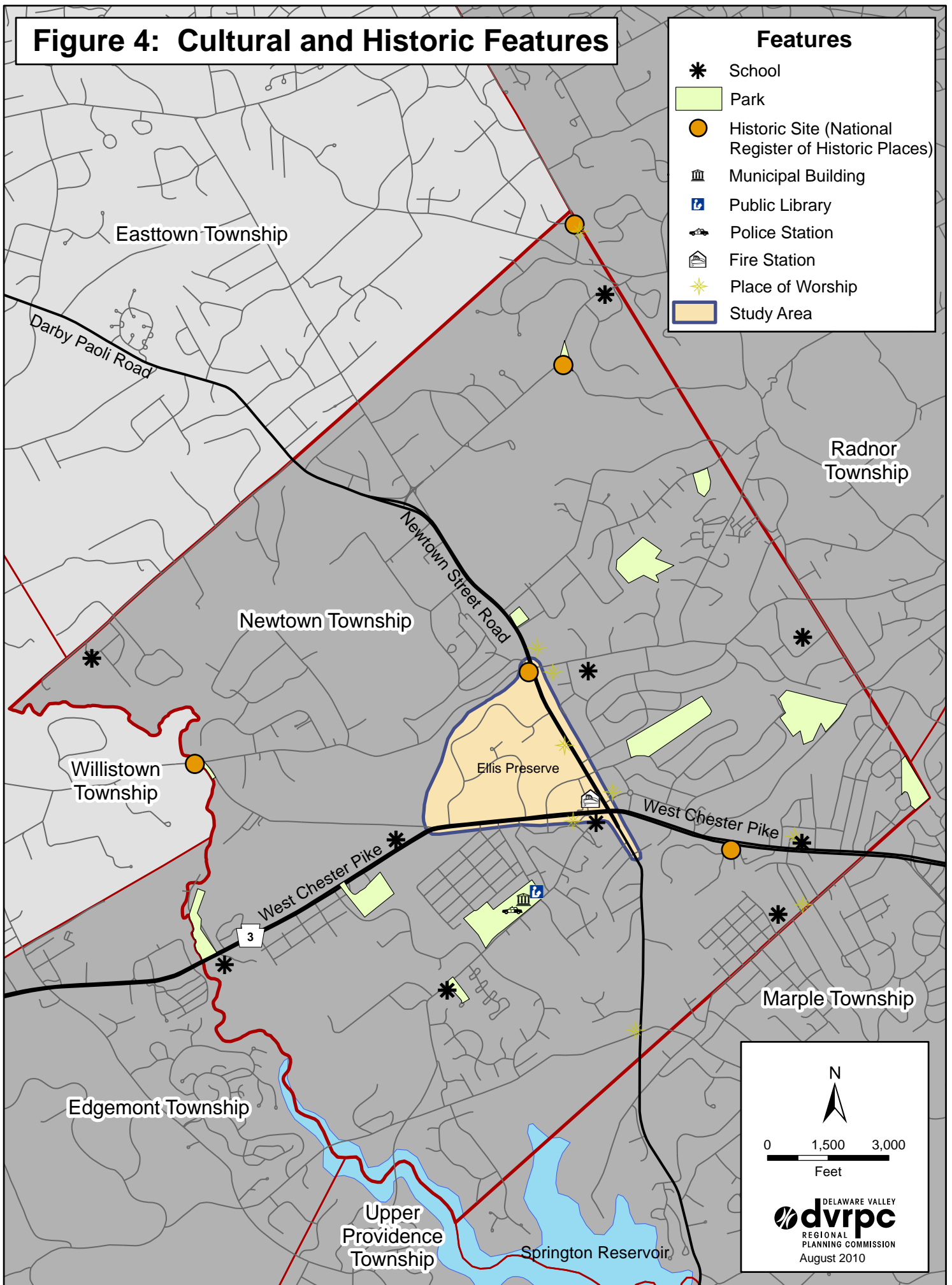
Outreach efforts should be made to actively engage this population group and respond to their needs, particularly when planning processes that may require federal government involvement are conducted in these areas. Environmental justice does not give veto power to the disadvantaged population(s); rather it seeks to ensure that they are welcome in the planning process and that their concerns are heard and considered. The Ellis Preserve is located in a census tract without disadvantaged populations exceeding the regional thresholds.

Cultural landmarks and historic resources in Newtown Township include schools, parks, historic sites, municipal services buildings, and places of worship. Those identified within the township are shown on **Figure 4**. The Square Tavern, township firehouse, and several places of worship abut either PA 3 or PA 252 in the study area. Impacts to these sites may require special review and advanced clearance from local interest groups or the Pennsylvania Historical and Museum Commission.

Natural features in the township include floodplains, wetlands, and protected lands, etc., and are illustrated in **Figure 5**. None of the natural features impact the study area.

**Figure 4: Cultural and Historic Features**

Features	
* (black asterisk)	School
■ (light green square)	Park
● (orange circle)	Historic Site (National Register of Historic Places)
■ (grey building icon)	Municipal Building
■ (blue building icon)	Public Library
■ (black car icon)	Police Station
■ (grey house icon)	Fire Station
★ (yellow star)	Place of Worship
■ (orange rectangle)	Study Area



N

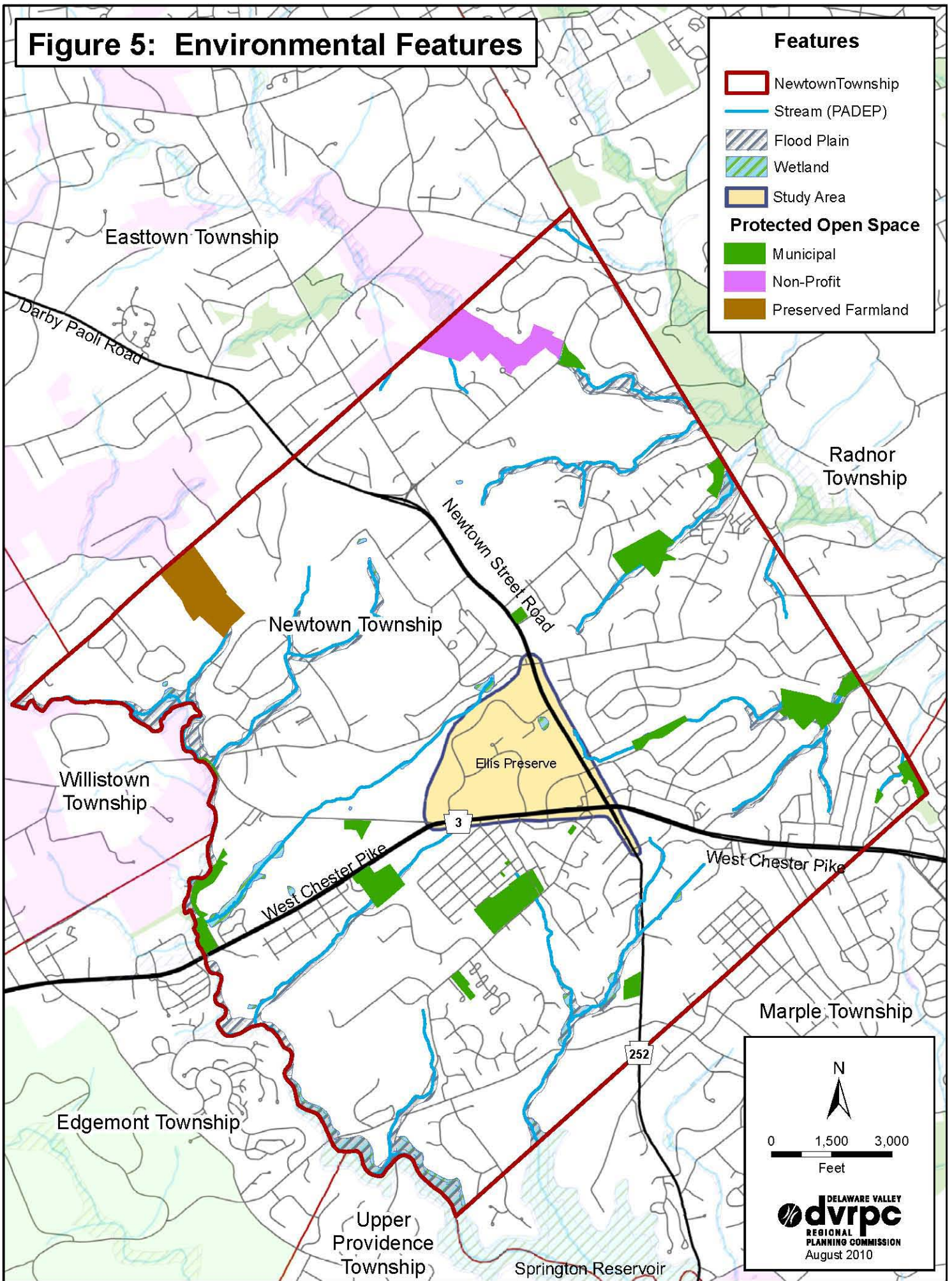
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Feet

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**Figure 5: Environmental Features**



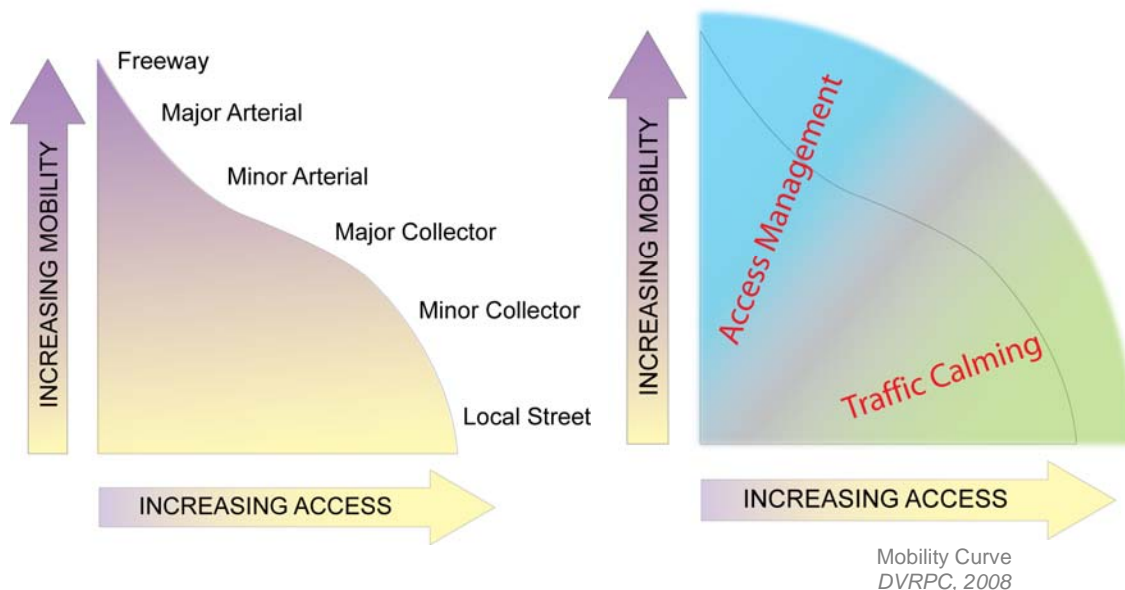
# Access Management: Principles, Practices, and Observations

## Access Management: Principles and Practices

Access Management is the lesser known and understood big brother of traffic calming. They are related due to their application to roadways – traffic calming to lower order roadways; access management to higher order roadways. There is, however, one big difference: **traffic calming** is often **reactive**; **access management** works best when **proactive**.

Roadways are commonly classified according to their respective function. In Pennsylvania, PennDOT classifies roadways in accordance with the American Association of State Highway Transportation Officials (AASHTO) *A Policy on the Geometric Design of Highways and Streets (Green Book)*. These classifications range from Principal Arterial to Local Road (PA 3 and PA 252 are both classified as Principal Arterials). Newtown Township builds on this functional classification system with a classification system contained in the comprehensive plan. Limited-access freeways would be classified above principal arterials and they assist in the understanding of access management. A limited-access freeway has severely restricted access, the only access being at interchanges. No driveways are found on these facilities. This roadway design is used to provide the greatest levels of mobility possible. Conversely, local roads may be laden with driveways. Mobility on local roads is of secondary importance to providing access to abutting commercial and residential properties. In fact, if mobility on local roads is too good, traffic calming measures may be requested/employed to decrease mobility. Access management works the other way. If access is hampering mobility, highway access management techniques may be appropriate. It is also appropriate to preserve mobility before undue access creates an actual problem. The graphic on the next page provides a visual representation of the access/mobility relationship.





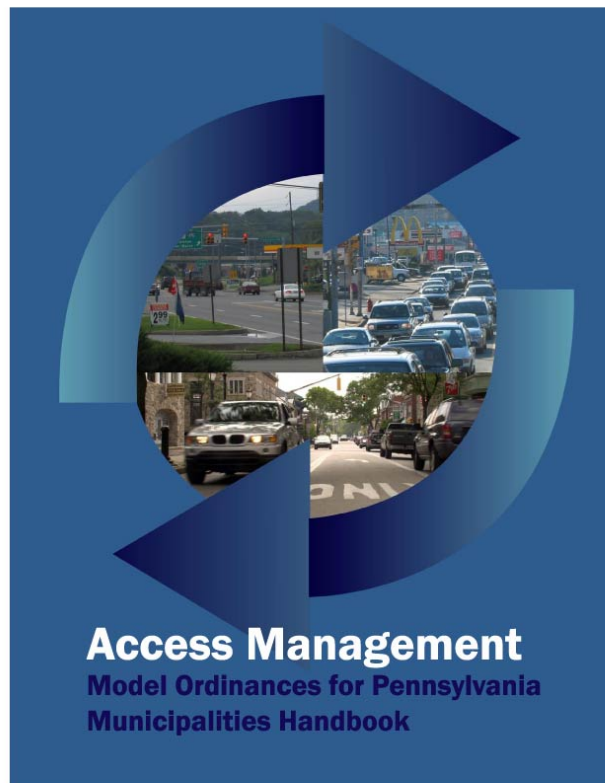
The graphic shows the role that access and mobility play in relation to the various functions of roadways. Access management and traffic calming become appropriate when roadways begin to stray from their intended function, a skewing of the curve so to speak. When the skewing occurs the purple portions of the curve may require access management and the yellow portions may require traffic calming. Again, both access management and traffic calming may be used to prevent the curve from becoming skewed in the first place.

In March 2008, the *Smart Transportation Guidebook: Planning and Designing Highways and Streets that Support Sustainable and Livable Communities* was published. The document was a collaborative effort between the Pennsylvania and New Jersey DOTs, and its concepts have since been adopted by PennDOT. According to the guidelines in the *Smart Growth Guidebook*, PA 3 is considered a regional arterial and PA 252 is a community arterial. By distinguishing classifications beyond *Principal Arterial Highway*, roadway treatments more in-line with the surrounding land-use context may be utilized.

Safety is also compromised by a skewed mobility curve. Access points create turbulence on the roadway. When poor access management is in place too many conflict points (turbulences) are present, and are disorderly in nature, resulting in less predictable driver behavior and ultimately increased crashes.

With safety and mobility in mind, the Transportation Research Board (TRB) states that “The purpose of access management is to provide vehicular access to land development in a manner that preserves the safety and efficiency of the transportation system.” Access management is not about putting undue requirements on developers and businesses; rather it is concerned with preserving mobility and improving safety on regional roads.

Access management in Pennsylvania has historically been the responsibility of PennDOT; a court case in 1997, however, established legal precedence for municipal-level access management ordinances. The case, *Ice v. Cross Roads Borough* (York County), found that property developers are required to satisfy the access requirements of both the local municipality and PennDOT, even if the local municipality's requirements are more thorough than those of PennDOT. PennDOT fully supports municipal access management regulations. *Pennsylvania Code, Title 67, Chapter 441* defines the access management regulations employed by PennDOT. The regulations were developed as a generic set of regulations that may be applied to the state as a whole, and by no means reflect the context of any particular municipality. Enacting local access management ordinances is a means to tailor regulations to be more fitting to the unique situations of a municipality, and to provide access management planning coverage to non state-owned roads. *Chapter 441* explicitly states that municipalities may enact ordinances that are more stringent than the Pennsylvania Code regulations. Essentially, the access management regulations identified in *Chapter 441* act as a default – municipalities are free to enact their own so long as they are more thorough.



The PennDOT Access Management Handbook was developed to assist municipalities adopt access management ordinances and was a key resource for this study.

Just as there are numerous traffic calming techniques, there are various methods used to accomplish access management. Municipal ordinances only establish the legal basis for employing the methods. *PennDOT Planning Series, Work Order #7, Task #4* provides a comprehensive list of access management techniques categorized by purpose:

- ◆ Highway Access Management techniques to limit conflict points:
  - Installing a median barrier with no left turns at the median openings
  - Installing raised median dividers with a left-turn deceleration lane
  - Installing one-way operations
  - Installing traffic signals at high volume driveways
  - Channelizing median openings to restrict left-turn ingress or left-turn egress
  - Median closure to eliminate left-turn ingress and egress
  - Installing a division island to control entry into a left-turn bay
  - Installing a physical barrier to prevent uncontrolled access along property frontage
  - Installing median channelization to control merger or left-turn egress vehicles
  - Offsetting opposing driveways
  
- ◆ Highway Access Management techniques to separate basic conflict areas:
  - Regulate the minimum spacing of driveways
  - Regulate the distance between a crossroad intersection and the nearest driveway
  - Regulate the minimum property clearance
  - Regulate the maximum number of driveways per property frontage
  - Consolidate access for adjacent properties
  - Buying properties that abut highway improvements
  - Denying access to small frontages
  - Consolidating existing access
  - Designating the number of driveways to each existing property and denying additional driveways regardless of future subdivision of that property
  - Requiring access on a collector street in lieu of driveways on a major highway
  
- ◆ Highway Access Management techniques to limit deceleration requirements:
  - Restricting parking on the roadway next to driveways to increase driveway turning speeds
  - Installing visual cues of the driveway
  - Improving sight distance
  - Regulating minimum sight distance
  - Optimizing driveway location in the permit authorization stage
  - Increasing the effective approach width of the driveway
  - Improving the profile of the driveway
  - Installing a right-turn acceleration lane
  
- ◆ Highway Access Management techniques to remove turning vehicles from through lanes:
  - Installing continuous two-way, left-turn lanes
  - Installing alternating left-turn lanes
  - Installing an isolated median and deceleration lane to shadow and store left-turn vehicles
  - Installing left-turn deceleration lanes to remove turning vehicles from the through lane
  - Installing medial storage for left-turn egress vehicles
  - Increasing the storage capacity of existing left-turn deceleration lanes
  - Constructing a local service road
  - Constructing a bypass road

## The Good, the Bad, and the Ugly

Providing local examples of actual practices in highway access management is helpful in illustrating the benefits of access management. A few examples follow.

### The Good

The PA 3 Center Median – The median and the space it provides for auxiliary lanes is an enormous access management benefit for Newtown Township. If unrestricted left turns were available on PA 3 or onto PA 3 from driveways, the existing congestion issues would seem petty.

Winding Way – Winding Way provides much needed relief to the PA 3/PA 252 intersection. Additionally, the Ellis Preserve Town Square plans indicate that direct access along Winding Way will be controlled through access management practices.

Bishop Hollow Road intersection with PA 3 – Realigning Bishop Hollow Road accomplished two major access management ideals; it created a right-angle intersection, and it aligned the road opposite Clyde Lane.

### The Bad

Mattress Giant Strip Center – The strip shopping center has very wide driveway curb cuts, and insufficient maneuvering and storage space for accommodating entering and exiting traffic.

Streets and driveways intersecting near the PA 3/PA 252 intersection – Several streets (Clyde Lane, Bishop Hollow Road, Saint Albans Avenue, Chapel Road) intersect too near the arterial intersection.

### The Ugly

Northbound PA 252 south of PA 3 – Nearly all businesses along this roadway segment have open frontages. Very little curb is provided to properly define driveway access points and focus/limit turning movements.

Access management, if implemented can have a profound positive effect on the safety and mobility of roadways. Implementation along developed corridors is a slow process that takes place during change of use and redevelopment, yet benefits may still be realized.



PA 252 – approaching PA 3 from the south.  
DVRPC, 2009



## Conceptual Plans

PennDOT's publication *Access Management Model Ordinances for Pennsylvania Municipalities Handbook* was the prime resource used in generating recommendations in the study corridor. Access management strategies and applications within the model ordinances are structured in three tiers in which differing techniques are applied over different physical limits or geographic areas. The first tier focuses on applications suitable for individual parcels (i.e., number, placement, and design of driveways serving a parcel). The second tier addresses techniques for roadways (i.e., provisions for separate turning lanes along, and driveway placement within a given roadway segment; traffic signal spacing). The third tier applies more comprehensive considerations of traffic and land use planning practices, including zoning overlay districts, official maps, continuous two-way, left-turn lanes, nontraversable medians, etc.

DVRPC staff drew from all three tiers and took the proposed development siteplan, and other traffic-related improvements identified in the township's traffic master plan traffic study into consideration, to develop preliminary improvement schemes related to this project. Two concepts (**Figures 6 and 7**) were developed for PA 252 south of PA 3 – one which assumes the master plan traffic study projects are constructed along with the wholesale redevelopment of the properties east of PA 252 that does not. Two additional concepts (**Figures 8 and 9**) build from the assumed transportation improvements identified by Traffic Planning and Design, Inc. (TPD) prepared on behalf of the BPG development (as depicted on their 1/14/09 conceptual design).

General design guidelines underlying the conceptual plans were taken from the *Handbook*. The conceptual access management plans assume that direct land access is preferable along secondary roadways than on a principal arterial highway (PA 3 or PA 252). Other guidelines were:

- ◆ Providing right angle driveway and street intersections when possible
- ◆ Achieving the greatest separation possible between driveways and intersecting roadways
- ◆ Limiting land access to shared driveways, single driveways (i.e., one per property), or restricted movement driveways
- ◆ Providing internal circulation and on-site storage
- ◆ Defining driveway openings with curbing

**Figures 6, 7, 8, and 9** provide enlargements of selected areas which are described in the following sections.

## PA 252, South of PA 3

This segment of road, PA 252 between PA 3 and Mary Jane Lane, was noted as having an excessive number of driveways. Much of the northbound side of this segment is without definition and essentially one large open driveway. The southbound side has better driveway definition though improvements can still be made.

The *Newtown Square Master Plan Traffic Study* calls for widening this segment from two lanes to four lanes with left-turn lanes at Reese Avenue for both directions. Also, a new “Loop Road,” between Bryn Mawr Avenue and PA 252 at Troop Farm Road, is planned. The Loop Road essentially continues Bryn Mawr Avenue south to connect with PA 252 south of PA 3 at the existing PA 252/Troop Farm Road intersection. The Loop Road will reduce traffic volumes on the segment of PA 252 between PA 3 and Troop Farm Road, and at the PA 3/PA252 intersection by functioning as a bypass for the congested area. Both Bryn Mawr Avenue and Troop Farm Road are beyond the extent of **Figures 6** and **7**, though both are shown in **Figure 1** on **Page 7**. Two concepts for this area were developed – one assumed the master plan projects were built, including a wholesale redevelopment of the properties along the northbound side of PA 252, and the other assumed the existing road and driveway configurations as the base condition.

**Figure 6** assumes the master plan projects are not built and portrays possibilities as may be achievable through the highway occupancy review and approval process in association with the redevelopment of individual properties, changes of use, or the request for new driveway permits. On the local level, these possibilities may best be enabled through ordinance regulations and a zoning overlay district, particularly when a statement of nonconformity is included in the ordinance regulations. Along with the roadway configuration remaining static, so too is the built environment abutting the highway. The primary goal in this scenario is to reduce curb cuts and provide a more predictable driving environment. Restricted movement driveways and shared driveways are both shown and recommended in this concept. Since the land use is static, large-scale access management projects (i.e., frontage roads, center turn lanes, etc.) are not reasonable.

**Figure 7** displays the same geographic area as **Figure 6** but assumes the master plan widening is built. The improvements associated with this master plan scenario will require the wholesale redevelopment of the land east of PA 252. While this is a very invasive scenario, it allows for access management principles to be included in the redevelopment design. The southbound side of PA 252 is shown exactly as it is in **Figure 6** – only the northbound side changes. With the redevelopment, only limited direct access to or from PA 252 are necessary. A new reverse frontage road, called “Service Road” on the illustration, can handle the bulk of the needed access.



Figure 6: Newtown Street Road - Conceptual Access Management Plan  
Existing Land-Use Scenario

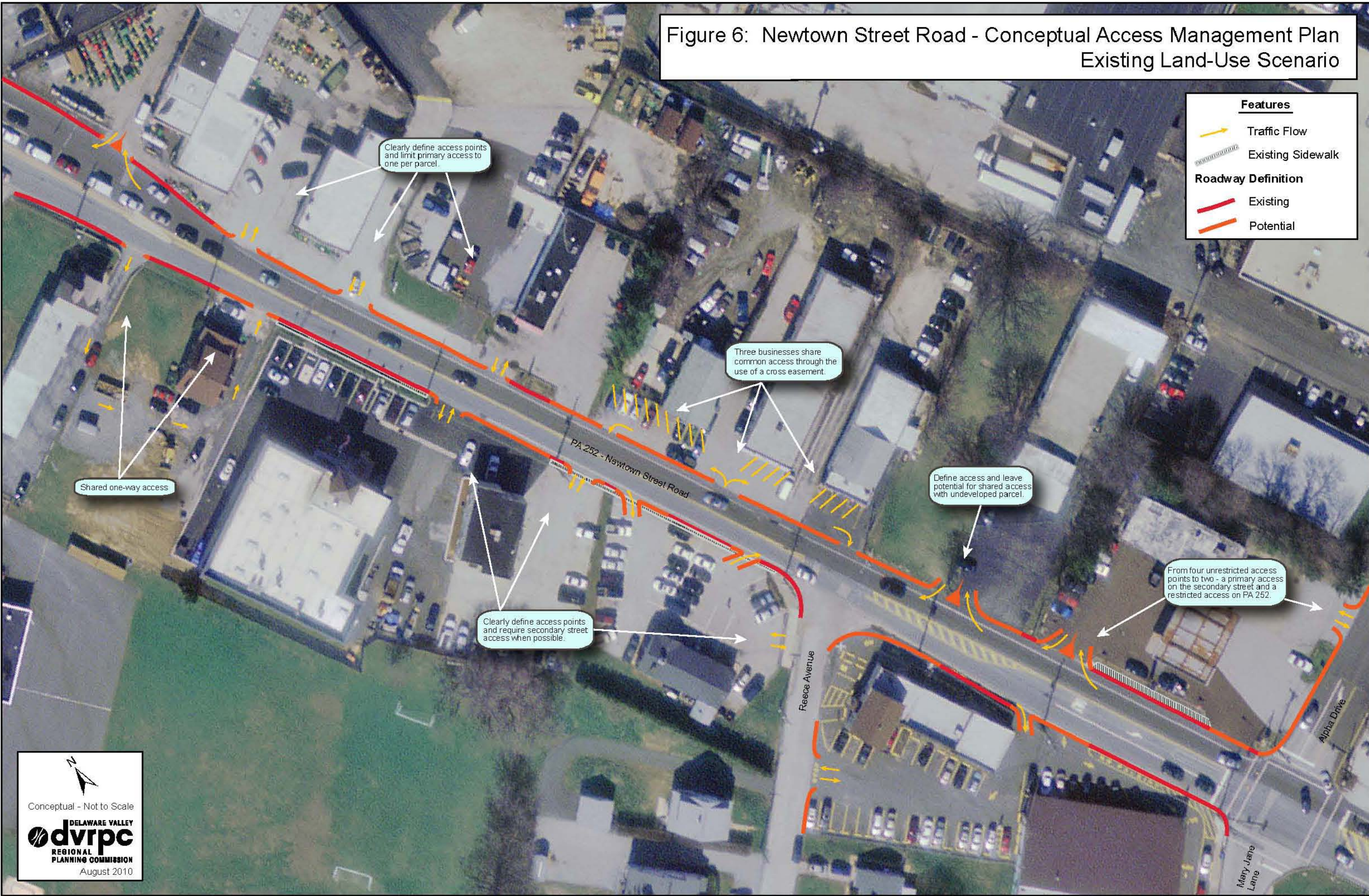
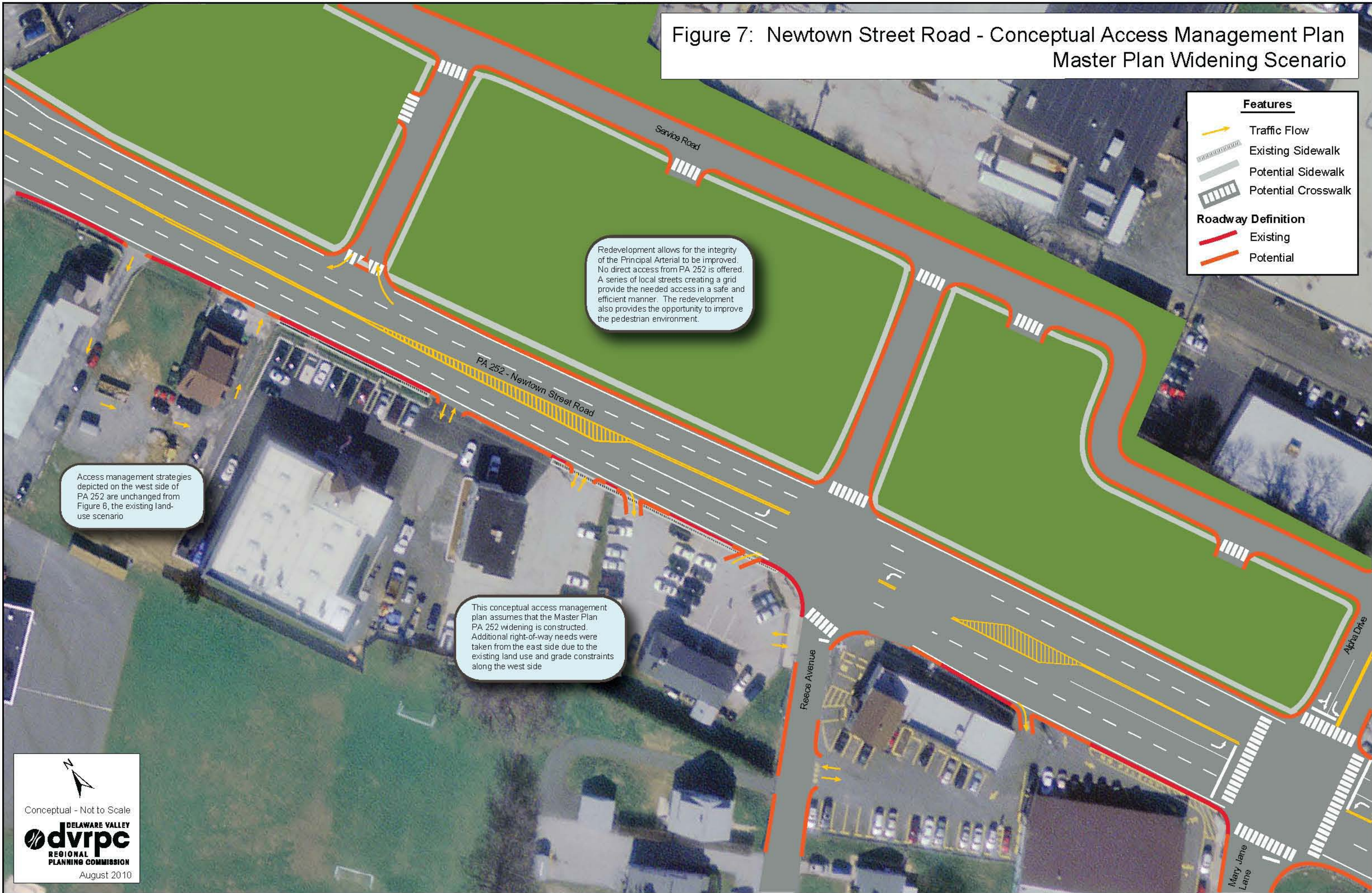




Figure 7: Newtown Street Road - Conceptual Access Management Plan  
Master Plan Widening Scenario



Features	
	Traffic Flow
	Existing Sidewalk
	Potential Sidewalk
	Potential Crosswalk
Roadway Definition	
	Existing
	Potential

Redevelopment allows for the integrity of the Principal Arterial to be improved. No direct access from PA 252 is offered. A series of local streets creating a grid provide the needed access in a safe and efficient manner. The redevelopment also provides the opportunity to improve the pedestrian environment.

Access management strategies depicted on the west side of PA 252 are unchanged from Figure 6, the existing land-use scenario

This conceptual access management plan assumes that the Master Plan PA 252 widening is constructed. Additional right-of-way needs were taken from the east side due to the existing land use and grade constraints along the west side



## PA 3/PA 252 Intersection Area

Transportation improvements associated with the Ellis Preserve Town Square development were supplied on an illustration by Traffic Planning and Design, Inc. These improvements were assumed to be constructed in both concepts, as they are associated with the development of the township approved Ellis Preserve Town Square. The improvements include widening PA 3 from two to three lanes in each direction. The primary concern is with the strip shopping center in the northwest quadrant of the PA 3/PA 252 intersection. For reference, the strip shopping center contains the Mattress Giant store. Widening PA 3 will require PennDOT to use the land within the PA 3 right-of-way which includes nearly all space in front of this strip shopping center, including customer parking areas. A review of the site was conducted and no obvious means of preserving the commercial viability of these businesses appears. The widening will not allow for any on-street parking in front of the businesses, and the buildings are not suited to be reconfigured as reverse frontage, nor will the township's fire marshal permit parking beyond what is currently defined in the rear of these buildings. A parking lot north of these businesses (behind the fire station) is owned by the same owner, though the lot location is not ideal for preserving commercial viability of the businesses. The two concepts for this area both assume that it will be redeveloped. The three businesses nearest PA 252 in this strip center have a greater set back from PA 3 than the other businesses and may potentially be preserved. However, preservation of any of these commercial properties, while widening PA 3, appears difficult at best.



The angle parking in front of these businesses will be lost to PA 3 widening.  
*DVRPC, 2009*

**Figure 8** conceptually redevelops the area into commercial and/or residential use. Access management plays into this concept by removing access from PA 3 frontage, locating new access in the least invasive location, and ensuring sufficient driveway throat length. Any redevelopment of this area should allow no more than a single right-in and right-out driveway along either PA 3 or PA 252.

**Figure 9** is similar to **Figure 8**, but removes commercial use from the land. **Figure 9** proposes a parking lot that may serve as a park-n-ride lot, and a park. Installing a park in the center of Newtown Square may create a unique identification for the township and improve the quality of life of its residents. A park-n-ride lot is a travel demand management strategy that has been identified as appropriate for this corridor in the regional Congestion Management Process (DVRPC, 2009).

The conceptual illustrations for the PA 3/PA 252 intersection area, **Figures 8 and 9**, are meant to highlight how access management can alter the transportation/land use relationship. By no means do they promote or condone any specific type of land use.

Figure 8: PA 3 / PA 252 Intersection Area  
Conceptual Access Management Plan - Alt. A

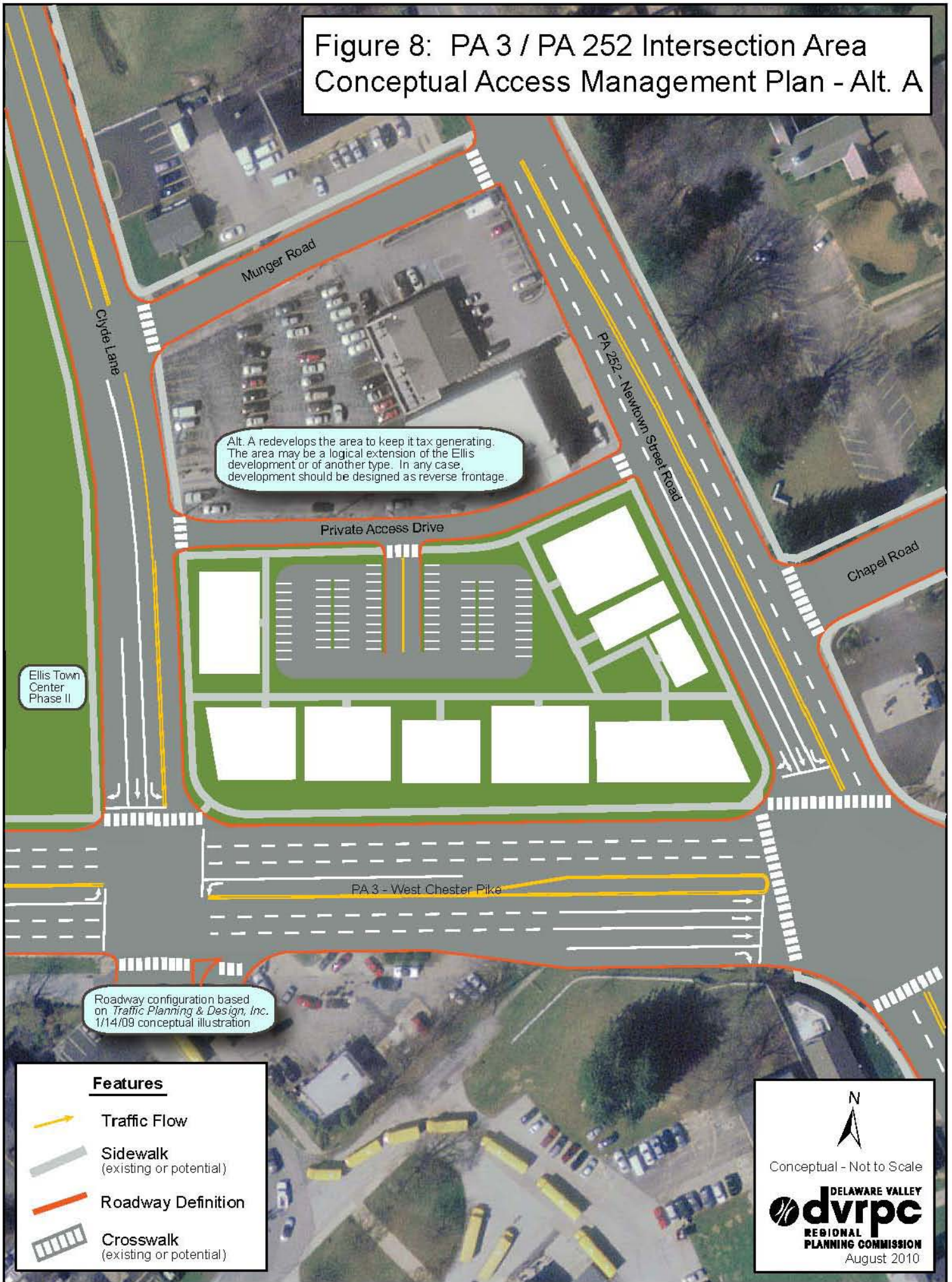
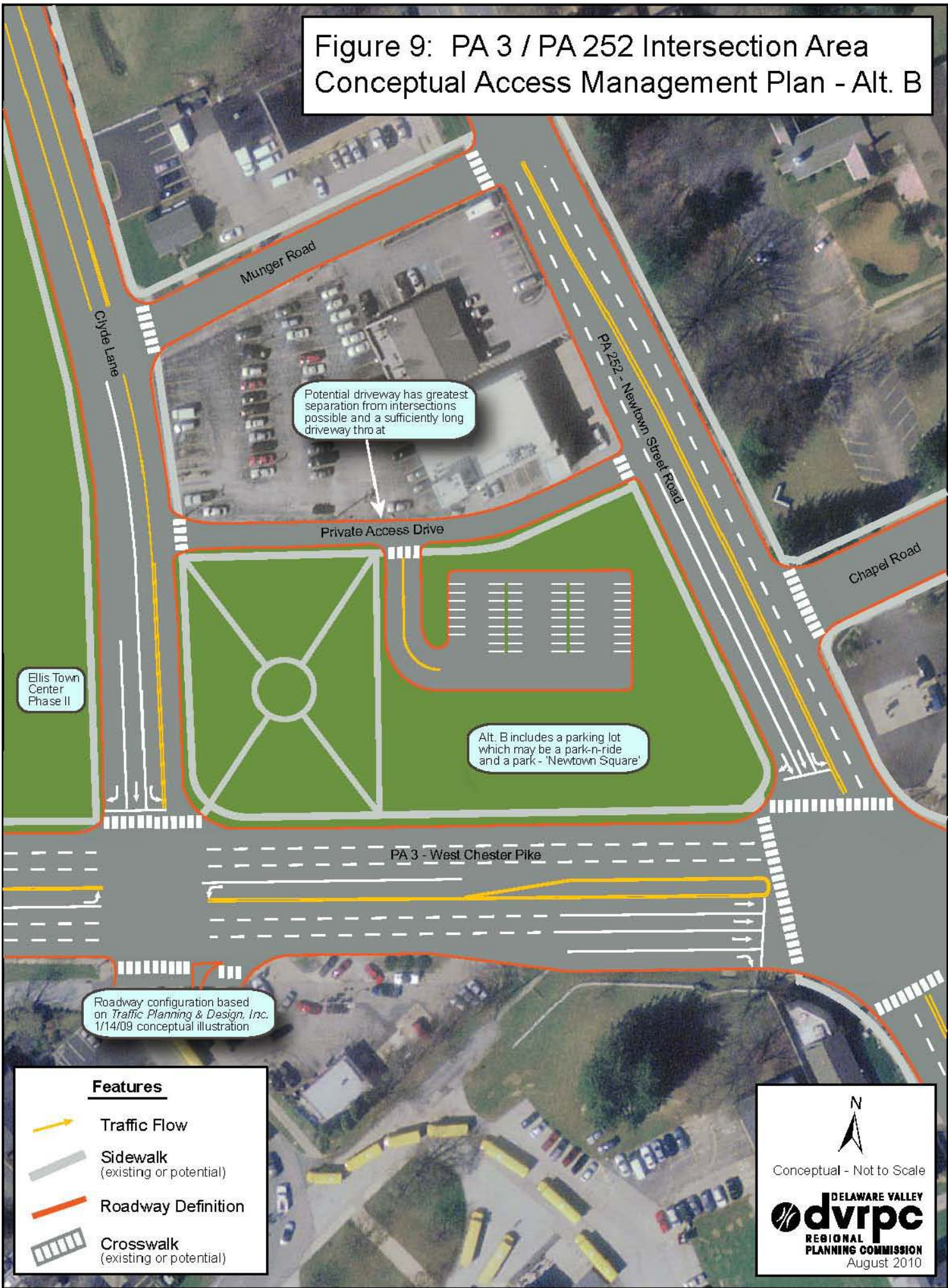





Figure 9: PA 3 / PA 252 Intersection Area  
 Conceptual Access Management Plan - Alt. B



**Features**

-  Traffic Flow
-  Sidewalk (existing or potential)
-  Roadway Definition
-  Crosswalk (existing or potential)

N  


Conceptual - Not to Scale

**dvrpc**  
 DELAWARE VALLEY  
 REGIONAL  
 PLANNING COMMISSION  
 August 2010

## Internal Circulation: Ellis Preserve Town Square Development

The conceptual plan for the Ellis Preserve Town Square was completed for the BPG Development Company (**Figure 10**). The township requested a review of the internal circulation of the proposed development as related to access management in order to assist decision-making in the event the internal roads are offered for dedication.

**Figure 11** is the conceptual transportation improvement design associated with the development prepared by Traffic Planning and Design, Inc.

As was proposed in the development plans (**Figure 10**), a new traffic signal has recently been installed at the PA 3/School Lane intersection. Another traffic signal exists at the Ellis Preserve Driveway intersection with PA 3. The signal at the PA 3/School Lane intersection is approximately 1,700 feet from the nearest traffic signal in each direction – Ellis Preserve Driveway west and Bishop Hollow Road east, not considering the flashing signal at PA3/Winding Way. The distance is well beyond both the existing and proposed ordinance regulations regarding minimum distance between signalized intersections.

According to the illustrations (**Figures 10 and 11**), Winding Way will have two driveways connected to it and a bridge built over it. The driveways, one per direction, are shown on **Figure 10** to be right-in, right-out only. The bridge connects the two phases of the town square development. Ideally, no additional driveways should be located along Winding Way. Winding Way was constructed to, and serves the purpose of a reliever for the PA 3/PA 252 intersection. This road will grow in importance if left turns from two approaches are prohibited at the PA 3/PA 252 intersection as is indicated on **Figure 11**:

1. PA 3 east to PA 252 north
2. PA 252 north to PA 3 west

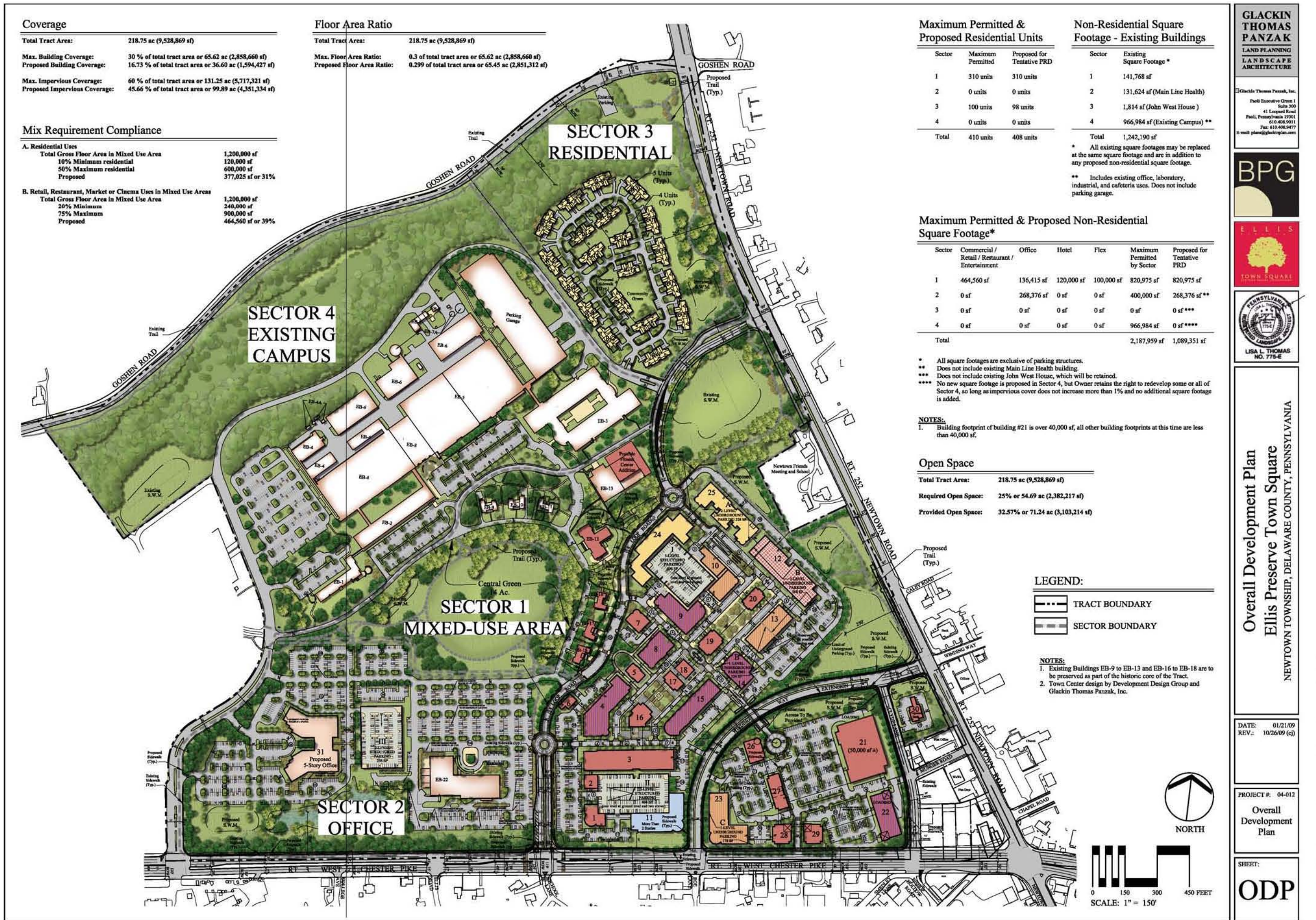
Removing the two left-turn movements at the PA 3 and PA 252 intersection may require dedicating the Winding Way Extension to the state, or some type of agreement with the state to be reached due to the fact that current PennDOT policy does not permit the bypassing of state-owned road using non state-owned roads. Under current policy, no signs may be placed directing traffic to use the Winding Way Extension to avoid the PA 3 and PA 252 intersection. According to *PennDOT Publication 212*, alternate routes are used when certain vehicle types cannot use the primary route.

In regards to accepting the dedication of Ellis Preserve Town Square roads, it is recommended that only the road shown in **Figure 11**, traversing between PA 252 and PA 3 across from School Lane be accepted if offered. A road dedicated to the township cannot be closed to the travelling public at the discretion of the developer. In accepting this dedication the township should consider an access covenant to prohibit additional full-movement accesses to the Ellis property from PA 3, PA 252, Winding Way, and the new road, except at proposed roundabout locations.





Figure 10



**Coverage**

Total Tract Area:	218.75 ac (9,528,869 sf)
Max. Building Coverage:	30 % of total tract area or 65.62 ac (2,858,660 sf)
Proposed Building Coverage:	16.73 % of total tract area or 36.60 ac (1,594,427 sf)
Max. Impervious Coverage:	60 % of total tract area or 131.25 ac (5,717,321 sf)
Proposed Impervious Coverage:	45.66 % of total tract area or 99.89 ac (4,351,334 sf)

**Floor Area Ratio**

Total Tract Area:	218.75 ac (9,528,869 sf)
Max. Floor Area Ratio:	0.3 of total tract area or 65.62 ac (2,858,660 sf)
Proposed Floor Area Ratio:	0.299 of total tract area or 65.45 ac (2,851,312 sf)

**Mix Requirement Compliance**

**A. Residential Uses**

Total Gross Floor Area in Mixed Use Area	1,200,000 sf
10% Minimum residential	120,000 sf
50% Maximum residential Proposed	600,000 sf
	377,025 sf or 31%

**B. Retail, Restaurant, Market or Cinema Uses in Mixed Use Areas**

Total Gross Floor Area in Mixed Use Area	1,200,000 sf
20% Minimum	240,000 sf
75% Maximum Proposed	900,000 sf
	464,560 sf or 39%

**Maximum Permitted & Proposed Residential Units**

Sector	Maximum Permitted	Proposed for Tentative PRD
1	310 units	310 units
2	0 units	0 units
3	100 units	98 units
4	0 units	0 units
<b>Total</b>	<b>410 units</b>	<b>408 units</b>

**Non-Residential Square Footage - Existing Buildings**

Sector	Existing Square Footage *
1	141,768 sf
2	131,624 sf (Main Line Health)
3	1,814 sf (John West House)
4	966,984 sf (Existing Campus) **
<b>Total</b>	<b>1,242,190 sf</b>

\* All existing square footages may be replaced at the same square footage and are in addition to any proposed non-residential square footage.  
 \*\* Includes existing office, laboratory, industrial, and cafeteria uses. Does not include parking garage.

**Maximum Permitted & Proposed Non-Residential Square Footage\***

Sector	Commercial / Retail / Restaurant / Entertainment	Office	Hotel	Flex	Maximum Permitted by Sector	Proposed for Tentative PRD
1	464,560 sf	136,415 sf	120,000 sf	100,000 sf	820,975 sf	820,975 sf
2	0 sf	268,376 sf	0 sf	0 sf	400,000 sf	268,376 sf **
3	0 sf	0 sf	0 sf	0 sf	0 sf	0 sf ***
4	0 sf	0 sf	0 sf	0 sf	966,984 sf	0 sf ****
<b>Total</b>					<b>2,187,959 sf</b>	<b>1,089,351 sf</b>

\* All square footages are exclusive of parking structures.  
 \*\* Does not include existing Main Line Health building.  
 \*\*\* Does not include existing John West House, which will be retained.  
 \*\*\*\* No new square footage is proposed in Sector 4, but Owner retains the right to redevelop some or all of Sector 4, so long as impervious cover does not increase more than 1% and no additional square footage is added.

**NOTES:**  
 I. Building footprint of building #21 is over 40,000 sf, all other building footprints at this time are less than 40,000 sf.

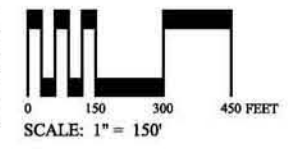
**Open Space**

Total Tract Area:	218.75 ac (9,528,869 sf)
Required Open Space:	25% or 54.69 ac (2,382,217 sf)
Provided Open Space:	32.57% or 71.24 ac (3,103,214 sf)

**LEGEND:**

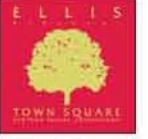
- TRACT BOUNDARY
- SECTOR BOUNDARY

**NOTES:**  
 1. Existing Buildings EB-9 to EB-13 and EB-16 to EB-18 are to be preserved as part of the historic core of the Tract.  
 2. Town Center design by Development Design Group and Glackin Thomas Panzak, Inc.



**GLACKIN THOMAS PANZAK**  
 LAND PLANNING  
 LANDSCAPE ARCHITECTURE

Glackin Thomas Panzak, Inc.  
 Paul Executive Center I  
 Suite 300  
 41 Locust Road  
 Paoli, Pennsylvania 19301  
 610-408-9011  
 Fax: 610-408-9477  
 E-mail: glackin@glackin.com



Overall Development Plan  
 Ellis Preserve Town Square  
 NEWTOWN TOWNSHIP, DELAWARE COUNTY, PENNSYLVANIA

DATE: 01/21/09  
 REV.: 10/26/09 (c)

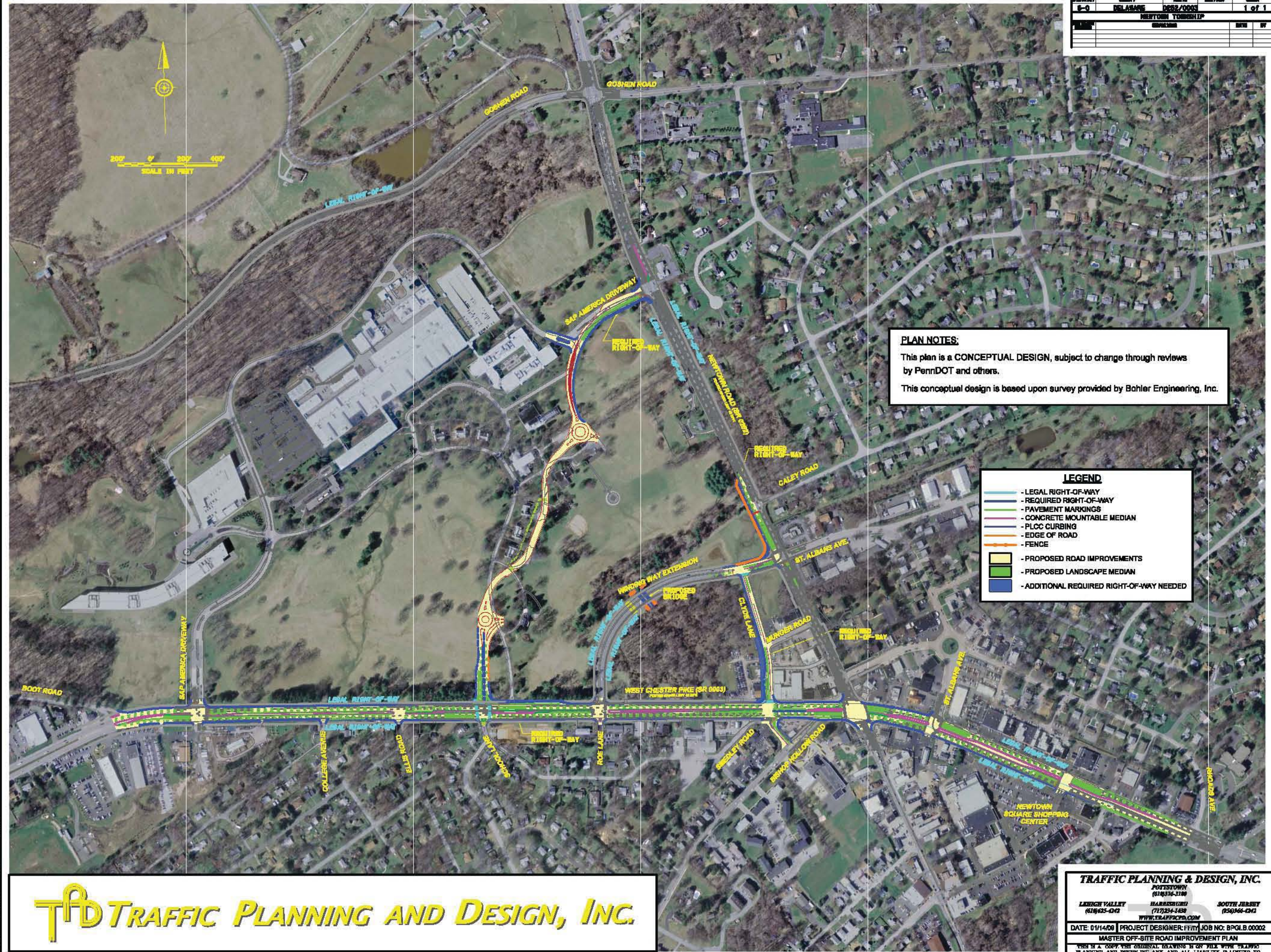
PROJECT #: 04-012  
 Overall Development Plan

SHEET:  
**ODP**



Figure 11

DATE	PROJECT	DATE	BY	NO.
0-0	RELEASE	02/22/0003		1 of 1
NEWTOWN TOWNSHIP				
PROJECT				
DATE				
BY				



**PLAN NOTES:**  
 This plan is a CONCEPTUAL DESIGN, subject to change through reviews by PennDOT and others.  
 This conceptual design is based upon survey provided by Bahler Engineering, Inc.

- LEGEND**
- LEGAL RIGHT-OF-WAY
  - REQUIRED RIGHT-OF-WAY
  - PAVEMENT MARKINGS
  - CONCRETE MOUNTABLE MEDIAN
  - PLCC CURBING
  - EDGE OF ROAD
  - FENCE
  - PROPOSED ROAD IMPROVEMENTS
  - PROPOSED LANDSCAPE MEDIAN
  - ADDITIONAL REQUIRED RIGHT-OF-WAY NEEDED

**TPD TRAFFIC PLANNING AND DESIGN, INC.**

**TRAFFIC PLANNING & DESIGN, INC.**  
 POTTSVILLE  
 (610) 836-3100

LEHIGH VALLEY      HARRISBURG      SOUTH JERSEY  
 (610) 625-0242      (717) 234-1430      (950) 664-0242

WWW.TPAFCPA.COM

DATE: 01/14/06    PROJECT DESIGNER: FFM    JOB NO: BPGLB 00002  
 MASTER OFF-SITE ROAD IMPROVEMENT PLAN

THIS IS A COPY OF THE ORIGINAL DRAWING IS ON FILE WITH TRAFFIC PLANNING AND DESIGN, INC. ANY AND ALL LIABILITY IS LIMITED TO THE ORIGINAL UP TO AND INCLUDING THE LAST REVISION.

V:\PROJECTS\2005\05-01-14 Full Buildout\Rev\05-01-14 Master off-site Road Improvements Plan w/11 Air File.dwg  
 11.04.06  
 FFM



## Access Management Policy Framework

Implementing access management regulations is necessary to achieve access management goals and benefits. For access management regulations to be legally sound, they must be supported by the township's comprehensive plan.

Newtown Township's current comprehensive plan, zoning ordinance, and subdivision and land development ordinance were reviewed and PennDOT's model ordinances were compared to the existing regulations of the township. A recommendation is proposed for each subject and the corresponding Pennsylvania Code Chapter 441 regulation is given. Comments are offered for several subjects. Sources for this work were a hard copy of the township's comprehensive plan (dated 2001), and its zoning ordinance (dated 1976) and subdivision and land development ordinance (dated 1986) via the subscription-based website – Ordinance.com. All sources are current.

### Comprehensive Plan Review

The current comprehensive plan makes no mention of access management. *Chapter 3, Section 4 – Circulation*, mentions that traffic congestion is a township concern, the easy improvements have been completed and major improvements lack funding. Larger improvements mentioned for the study area include: widening PA 3 through the PA 252 intersection, and widening PA 252 to four lanes plus auxiliary lanes south of PA 3. This creates a void for access management to fill since access management is a low-cost means of improving mobility and safety.

In keeping with the existing comprehensive plan's style, the following paragraph, or another which supports access management is recommended to be included in *Chapter 3, Section 4* during the next comprehensive plan update:

Considering that funding for major transportation improvements is slow to materialize, the township promotes the practice and principles of access management. Access management is a low-cost means of preserving existing infrastructure while improving traffic mobility and safety. More often than not, the improvement is implemented through land development activities – not public financing. Common access management techniques include: limiting the number of driveway curb cuts, designing driveways to fit their respective uses, using shared driveways and internal access where appropriate, locating driveways away from intersections and other driveways, and providing auxiliary turning lanes when needed. Absent large-scale roadway improvements, access management is promoted to provide a safe, efficient, and predictable driving environment.

## Ordinance Review

The existing zoning and subdivision and land use ordinances for the township were reviewed to identify existing access-related regulations. Each access-related regulation is listed below in the “Existing” field. Also included for each proposed regulation is a brief description, the recommended regulation, the PennDOT Chapter 441 corresponding regulation, and a comment in several instances.

Newtown Township currently has minimal access management regulations. The benefit of having minimal regulations existing is that the recommended regulations may be added in their entirety as a new chapter. If the township does adopt the recommended regulations, three additional steps must be completed:

- Update the comprehensive plan
- Delete the regulations that are in the “Existing” field on the coming pages
- Provide references where applicable throughout the zoning and subdivision and land development ordinances pointing to the new chapter (i.e., see *Chapter X – Access Management* for additional regulations).

Access management regulations can become part of either the township’s zoning ordinance or subdivision and land development ordinance. If access management is included in the zoning ordinance the regulations are difficult to waive, compared to the subdivision and land development ordinance where the regulations could be negotiated. Ultimately, municipal officials must decide the appropriate place to house access management regulations. In either scenario, the regulation regarding nonconforming driveways should be included in the zoning ordinance.

The ordinance review and resulting recommendations are concerned primarily with the most common aspects of access management. The township might also consider such regulations as: safe sight distance, driveway channelization, driveway throat length and width, driveway radius, driveway profile, signalized intersection spacing, and frontage and service roads. Many of these regulations, however, are covered through the PennDOT Highway Occupancy Permitting process for state-owned roads.

### **PURPOSE**

The purpose states a very broad overview of the regulations that follow. It should be a brief summary of the supporting language in the comprehensive plan.

#### **Existing:**

No existing statement of purpose related to highway access management.

#### **Recommendation:**

This ordinance is intended to promote safe and efficient travel within Newtown Township by limiting the number of conflict points, providing safe spacing standards between driveways, encouraging shared access between abutting properties, and ensuring safe access by emergency vehicles.

**Chapter 441:**

It is in the public interest to regulate the location, design, construction, maintenance, and drainage of access driveways, local roads, and other property within state highway right-of-way for the purpose of security, economy of maintenance, preservation of proper drainage, and safe and reasonable access.

**APPLICABILITY**

The applicability statement addresses the circumstances under which the regulations shall apply. In most cases the regulations shall apply in all circumstances except those specifically excluded.

**Existing:**

No existing statement of applicability related to access.

**Recommendations:**

This ordinance shall pertain to all applications for subdivision and land development approval, or building permits, for lots with frontage along roadways within Newtown Township.

The township may grant a modification of the requirements of this ordinance if the township concludes that the literal enforcement will exact undue hardship because of peculiar conditions pertaining to the land in question, provided that such modifications will not be contrary to the public interest and that the purpose and intent of this ordinance is observed.

Except for those criteria found within this ordinance, PennDOT criteria as found in Pennsylvania Code 441 shall govern the design of intersections of arterial and major collector roadways with private driveways and other public roadways.

**Comment:**

If the ordinance is adopted as a stand-alone chapter, the recommendation, or a recommendation by the township’s legal representative, is preferred.

**NONCONFORMING DRIVEWAYS**

Specific mention of nonconforming driveways enables poor access management design of the past to be corrected in the future at the expense of the land owner.

**Existing:**

No existing statement for nonconforming driveways related to highway access management.

**Recommendations:**

Driveways that do not conform to the regulations in this ordinance, and were constructed before the adoption of this ordinance, shall be considered legal nonconforming driveways. However, nonconforming driveway(s) shall be reconstructed to comply with this ordinance under all of the following conditions:

- 1. New driveway permits are requested,
- 2. Modifications to an existing driveway permit are requested,



3. The property owner or applicant applies for a change in property use and will generate more vehicle trips than the existing use, or
4. An expansion of the existing use will result in an increase in trip generation.

**Chapter 441:**

Although driveway openings on state highways were established prior to promulgation of these regulations, this regulation could be applied retroactively to reasonably limit ingress and egress since the property is held subject to valid police power regulations “made, and to be made, for the health and comfort of the people.” *Department of Transportation v. Longo (1986)*.

**RELATIONSHIP TO PENNDOT HIGHWAY OCCUPANCY PERMIT**

This provision includes what has been found to be legal by the courts of Pennsylvania. Though not necessary to include, its inclusion may prevent frivolous challenges to aspects of this ordinance.

**Existing:**

No existing related statement.

**Recommendation:**

Issuance of a PennDOT Highway Occupancy Permit (HOP) does not guarantee site plan approval by Newtown Township nor does it deem the plan in conformance with this ordinance. The HOP submittal to PennDOT should not occur before approval to do so by the township. However, upon request of the applicant or request of the township, PennDOT may be brought into the review process to reconcile site design and access issues.

**Chapter 441:**

Issuance of a permit (Highway Occupancy Permit) under these regulations does not relieve the permittee from any additional responsibility to secure other federal, state, or local approvals or permits as may be required by law.

**NUMBER OF DRIVEWAYS**

Limiting the number of driveways is the first step in managing access. Intersecting driveways create turbulence on a roadway. Their number and design have a direct impact on safety and mobility.

**Existing:**

172-21-B-3 (Conditional Uses in Residential Areas). Where possible, as determined by the township, vehicle access shall be provided by two (2) or more driveways or streets and, where such access points are from one (1) street, they will be located at least five hundred (500) feet apart. These standards are intended to facilitate efficient and safe traffic movement and provide for more than one (1) point of ingress and egress during times of emergencies. All parking requirements of the proposed use must be met by off-street parking areas. No on-street parking shall be permitted.

**Recommendations:**

1. One driveway shall be permitted per property. Additional driveways shall be permitted if the applicant demonstrates that:
  - a. For land uses other than single residences, the design is in the best interest of efficient traffic operations on the site, including but not limited to reducing delays at a single access point that would otherwise operate at worse than a Level of Service 'C' in rural areas and Level of Service 'D' in urban areas, and can improve safety.
  - b. The frontage of the property is sufficient width to permit multiple driveways in accordance with the spacing requirements of Section X (Driveway Spacing).
  - c. For land uses other than single residences, all driveways on the property will be interconnected with an internal circulation network. For single residences, multiple driveways shall not be interconnected.
  - d. The township may restrict additional access to right-turn ingress and/or egress only.
2. If the township anticipates that a property may be subdivided and that subdivision may result in an unacceptable number or arrangement of driveways, or both, the township shall require the property owner to enter into an access covenant to restrict future access.

**Chapter 441:**

Normally, only one driveway will be permitted for a residential property and not more than two driveways will be permitted for a nonresidential property.

If the property frontage exceeds 600 feet, the permit may authorize an additional driveway.

Regardless of frontage, a development may be restricted to a single entrance/exit driveway, served by an internal collector road separated from the traveled way.

PennDOT has language similar to #2 in the recommendation.

**Comment:**

Land uses that need multiple driveways will be able to justify such need; all others should be defaulted to one.

**DRIVEWAY ALIGNMENT**

Proper driveway alignment allows for safe and predictable turning movements.

**Existing:**

148-31-D. Driveways to single-family residences shall intersect street at angles of no less than sixty (60') degrees. All other driveways shall intersect streets at right angles, where practicable, and in no case less than seventy-five degrees (75'). The angle of intersection is the acute angle made by the intersection of the center line of the driveway with the center line of the road.

**Recommendations:**

Access driveway approaches used for two-way operation shall be positioned at right angles, that is, 90 degrees, to the roadway or as near thereto as site conditions permit.

When two access driveways are constructed on the same property frontage and used for one-way operation, each of these driveways may be placed at an angle less than a right angle, but not less than 45 degrees to the roadway.

**Comment:**

This is a word-for-word copy of the PennDOT Chapter 441 regulation. The purpose of duplicating the regulation is to provide coverage to non state-owned roadways.

**DRIVEWAY SPACING**

Every driveway is a potential turbulence point along a roadway and increases the potential for crashes. To preserve safety and mobility, driveways should be spaced uniformly, as far from one another as possible, and with greater distances on higher speed roads.

**Existing:**

No existing regulation related to driveway spacing.

**Recommendations:**

1. Driveway spacing is measured from the end of one driveway radius to the beginning of the next driveway radius.
2. The spacing standards are desirable for unsignalized, full-movement driveways along arterial highways and major collector roads:
  - a. Principal arterial: 600 feet
  - b. Minor arterial: 400 feet
  - c. Major collector: 200 feet
3. Driveways shall be aligned with other driveways and roadways on the opposite side of the intersecting roadway on arterials and major collector roads in order to meet spacing requirements. If alignment is not possible, the intersections shall be offset at least 200 feet measured from the centerline for major collector street and 300 feet for arterials. This regulation shall not apply where a center median is present on West Chester Pike.
4. In no case shall left turns into the driveway be made across a left-turn lane serving another driveway or street on the opposite side of the roadway.
5. If these driveway spacing standards cannot be met, a system of joint or cross access driveways, frontage roads, or service roads may be required.

**Chapter 441:**

The Department may require the permittee to locate an access driveway directly across from a highway, local road, or access driveway on the opposite side of the roadway, if it is judged that offset driveways will not permit left turns to be made safely or that access across the roadway from one access to the other will create a safety hazard.

Multiple driveways serving the same property must be separated by a minimum distance of 15 feet measured along the right-of-way line and 20 feet measured along the shoulder, ditch line, or curb. When the distance between multiple driveways is 50 feet or less measured along the shoulder or ditch line, the area between shall be clearly defined by permanent curbing.

**Comment:**

This regulation goes beyond simple driveway spacing and addresses offsets and left turns.

**CORNER CLEARANCE**

Corner clearance refers to the distance between an intersecting street and the first driveway. The distance should be sufficient enough to ensure that there is no confusion as to where a motorist intends to turn, or where a traffic signal queue regularly blocks a driveway, or vice versa. Where auxiliary lanes support travel through an intersection, driveways that permit left turns should not be located within the area where such auxiliary lanes are present.

**Existing:**

148-31-F. The intersection of any driveway with a street shall be at least forty (40) feet from the nearest end of the paving radius of that street's intersection with other streets.

**Recommendations:**

1. Corner clearance shall meet the following driveway spacing standards that are desirable for arterial and major collector roads:
  - a. Principal arterial: 600 feet
  - b. Minor arterial: 400 feet
  - c. Major collector: 200 feet
2. Access shall be provided to the roadway where corner clearance requirements can be achieved.
3. If the minimum driveway spacing standards cannot be achieved due to constraints, the following shall apply in all cases:
  - a. There shall be a minimum 10-foot tangent distance between the end of the intersecting roadway radius and the beginning radius of a permitted driveway.
  - b. The distance from the nearest edge of cartway of an intersecting roadway the beginning radius of a permitted driveway shall be a minimum of 30 feet.
  - c. Access shall be taken from the intersecting roadway with the lesser functional classification.
4. If no other reasonable access to the property is available, and no reasonable alternative is identified, the driveway shall be located the farthest possible distance from the intersecting roadway. In such cases, directional connections (i.e., right-in/right-out only, right-in only, or right-out only) may be required.
5. The township shall require restrictions at the driveway if the municipal engineer determines that the location of the driveway and particular ingress or egress movements will create safety or operation problems.

**Chapter 441:**

The location of a driveway near a signalized intersection may include a requirement that the permittee provide, in cooperation with the municipality new or relocated detectors, signal head, controller, and the like, for the control of traffic movements from the driveways.

Access to a property, which abuts two or more intersecting streets or highways, may be restricted to only that roadway that can more safely accommodate its traffic.



There shall be a minimum 10 foot tangent distance between the intersecting highway radius and the radius of the first permitted driveway.

Except for joint-use driveways, no portion of any access shall be located outside of the property frontage boundary line.

### **JOINT AND CROSS ACCESS**

Joint access is essentially a shared driveway and cross access is a frontage connection between adjacent properties. A good example of joint and cross access is a strip shopping center where few access points serve multiple adjacent properties.

#### **Existing:**

148-31-J. A common driveway shall serve no more than two (2) lots.

#### **Recommendations:**

1. The township may require a joint driveway in order to achieve the following driveway spacing standards that are desirable for arterial and major collector roads:
  - a. Principal arterial: 600 feet
  - b. Minor arterial: 400 feet
  - c. Major collector: 200 feet
2. Adjacent nonresidential properties shall provide a joint or cross-access driveway to allow circulation between sites wherever feasible along roadways classified as major collectors or arterials in accordance with the functional classification contained in the municipal comprehensive plan. The following shall apply to joint and cross-access driveways:
  - a. The driveway shall have a design speed of 10 miles per hour and have sufficient width to accommodate two-way traffic including the largest vehicle expected to frequently access the properties.
  - b. A circulation plan that may include coordinated or shared parking shall be required.
  - c. Features shall be included in the design to make it visually obvious that abutting properties shall be tied in to provide cross access.
3. The property owners along a joint or cross-access driveway shall:
  - a. Record an easement with the deed allowing cross access to and from other properties served by the driveway.
  - b. Record an agreement with the municipality so that future access rights along the driveway shall be granted at the discretion of the municipality and the design shall be approved by the municipal engineer.
  - c. Record a joint agreement with the deed defining the maintenance responsibilities of each of the property owners located along the driveway.

### **INTERNAL ACCESS TO OUTPARCELS**

This is similar to joint and cross access though it pertains to developments under common ownership at the time of application. A good example of this is the Citizen's Bank on West Chester Pike. Despite having frontage on West Chester Pike, the bank is accessed by the internal circulation of the Newtown Square Shopping Center.

**Existing:**

172-76-B (C-2 District Only). Internal site circulation shall be provided for vehicle access to all buildings and facilities shall be part of a closed circuit system enabling continuous flow of traffic and shall be of sufficient width and turning radii to allow access without entrapment of emergency vehicles.

**Recommendation:**

For commercial and office developments comprised of more than one building site and under the same ownership at the time of application and consolidated for the purposes of development, the township shall require that the development, including all outparcels, be served by an internal drive that is separated from the main roadway. Outparcel access shall demonstrate safe, efficient ingress and egress and avoid queuing across other driveways and parking aisles.

**PEDESTRIAN CONNECTIONS**

Providing pedestrian connectivity between adjacent commercial properties assists in reducing vehicle trips on major roadways. For example, if a convenience store and a bank were adjacent, one should not need to drive between the two.

**Existing:**

Several existing regulations regarding sidewalks border on this topic.

**Recommendation:**

Land uses generating more than 250 vehicular trips per day shall provide pedestrian connections from their side or rear yards to adjoining land uses when possible. The intent of this section is to reduce vehicular trips between adjoining properties on arterials and major collectors.

**PUBLIC TRANSPORTATION ACCOMMODATION**

Providing bus turnouts allows for safe and efficient traffic flow on higher speed roads. Public transit is often not considered in suburban areas. However, employers in large commercial developments often attract transit-dependent populations to fill lower-wage jobs, and many seniors rely on public transit to accomplish daily tasks.

**Existing:**

No existing regulation related to accommodating public transportation.

**Recommendation:**

For commercial and office developments, and residential developments with greater than 50 residential units along existing public transportation routes on arterial and collector roadways, the township may require the installation of bus turnouts to separate stopped buses from travel lanes. Bus turnouts shall be designed in accordance with the American Association of State Highway Transportation Officials (AASHTO) Publication, *A Policy on Geometric Design of Highways and Streets*.

## **SIGNALIZED INTERSECTION SPACING**

Proper distance between signalized intersections allows for the efficient flow of traffic. The existing and recommended regulations are similar.

### **Existing:**

148-27-G-3. To the fullest extent possible, intersections with arterial streets shall be located not less than one thousand (1,000) feet apart, measured from center line to center line. Exceptions may be granted for those cases deemed by the Board to require closer spacing.

### **Recommendations:**

1. Uncoordinated traffic signals shall be located at a minimum of 1,000 feet from adjacent signalized intersections.
2. Optimal spacing for coordinated systems may be determined by the following equations:  
For simultaneous coordinated signal systems:  $S = VC / 0.681$ .  
For alternating coordinated signal systems:  $S = VC / 1.362$ .  
S = signal spacing in feet  
C = cycle length in seconds  
V = progression speed in miles per hour
3. The progression speed shall be determined by the municipal engineer and PennDOT.
4. Warrants for the signalization of an intersection must be met and may be found in the *Manual on Uniform Traffic Control Devices (MUTCD)*.
5. If a driveway or local road requires signalization and will be located within an existing coordinated traffic signal system, the traffic signal must be incorporated in the system or restrict turning movements.

## **RIGHT-TURN/DECELERATION LANES**

Auxiliary lanes remove slowing, stopped, and queuing traffic from travel lanes, thereby improving mobility and safety.

### **Existing:**

148-27-H. 1. Deceleration or turning lanes may be required by the township along existing and proposed streets whenever the Board feels such lanes are required to meet reasonable safety needs, as determined by a traffic impact study or otherwise by the Board.

2. Deceleration lanes shall be designed to the following standards:

- a. The lane shall have a minimum width of twelve (12) feet or, in the case of intersections with state-owned highways, such width as is required by the applicable regulations and standards of PennDOT.
- b. The lane shall provide the full required lane width for the entire length, which shall be measured from the center line of the intersecting road. In addition, there shall be a seventy five (75) foot taper provided at the beginning of the lane so that traffic can leave the main traveled lane smoothly.
- c. The minimum lane length shall be as follows:



Speed (mph)	Minimum Deceleration Lane Length (feet)
30	100
40	175
50	225

3. Acceleration lanes are required only when the need is indicated by a traffic impact study. The design shall be as per the recommendation of the township engineer. As necessary, a paved taper shall be provided for right-hand turns.

**Recommendation:**

Keep existing regulation for non state-owned roads; rely on PennDOT HOP process for state-owned roads.

**Chapter 441:**

1. The combination of highway speed, volumes, location, and arrangement of driveways and intersections may require the installation of an acceleration or deceleration lane, or both, to serve a proposed low, medium, or high volume driveway. When required by the permit, a speed change lane of sufficient length and width shall be constructed to allow vehicles to safely decelerate or accelerate when entering or leaving the property.
2. The permit may require the installation of a left-turn, stand-by lane to separate and protect left-turning vehicles from through traffic if failure to do so would result in an undue hazard to the traveling public.
3. Where the width of the highway right-of-way is insufficient to permit the construction of a needed auxiliary lane, the permittee shall provide any necessary additional right-of-way.
4. When required, auxiliary lanes shall be constructed, at no cost to the Department, in accordance with the Roadway Construction Standards and Form 408.

**LEFT-TURN LANES**

Like other auxiliary lanes, left-turn lanes remove slowing, stopped, and queuing traffic from travel lanes.

**Existing:**

See Right-Turn/Deceleration Lanes

**Recommendation:**

Left-turn lanes shall be constructed at all existing or proposed signalized intersections when required to obtain a PennDOT Highway Occupancy Permit.

**Chapter 441:**

See Right-Turn/Deceleration Lanes



## Conclusion and Implementation

This access management case study addresses a congested intersection area in Newtown Township, Delaware County. The intersection of PA 3 – West Chester Pike and PA 252 – Newtown Street Road, both principal arterial highways, is located in the heart of Newtown Township. The Ellis Preserve located in the northwest quadrant of the intersection is slated to experience a significant level of development with Ellis Preserve Town Square.

Highway access management techniques were assembled into a conceptual plan for the area to improve safety and mobility and to prolong highway serviceability in light of ongoing regional growth and development. The work was performed by DVRPC staff in support of PennDOT's effort to promote wider planning for, and application of, access management procedures within the Commonwealth. The procedures are applicable to both state and local highways, and the strategies are most effectively delivered through municipal ordinances that govern the land development design, application, review, and approval process. As such, principal guidance for developing the plan work was obtained from PennDOT's publication *Access Management Model Ordinances for Pennsylvania Municipalities Handbook*.

The foundation of the conceptual access management plan for Newtown Township lies within the classification of the intersecting principal arterial highways. Principal arterials should emphasize and provide for mobility for longer distance trips and through-travel versus direct access to abutting property and local trips. Accordingly, to support its purpose and functional integrity for the foreseeable future, changes to property access and recommendations for geometric improvements and traffic control, as shown in the master plan, were integrated into the plan.

Nearly all frontage along PA 3 and PA 252 in Newtown Township is developed, or in-line to be developed. Opportunities to correct access management deficiencies are present during redevelopment and changes of use. Three of the four concepts provided in this study assume that redevelopment of particular parcels will be required due to major transportation improvements. The other concept focuses on defining access, shared access, and restricted movement access (i.e., right-in, right-out only). These concepts can be implemented if at any point the affected properties are redeveloped or undergo a change of use.

Appropriately designed access for new development is a simpler task to accomplish, but both developed and developing parcels need to be recognized and addressed in the vision – to effect a comprehensive improvement for the intersecting arterials. Before any physical access management improvements can be made or implemented, access management regulations need to be adopted by the township.

The ultimate access management plans and municipal access management regulations should be communicated and coordinated with the county and PennDOT. Acknowledgment and consideration by these experts will further empower the vision of the municipality and improve the chances for implementation (e.g., as add-ons to transportation projects being constructed by others and/or to garner support where significant cost-sharing assistance would be sought through the regional Transportation Improvement Program).





# Acknowledgments and References

## Acknowledgments

The following individuals contributed to this study:

**James Sheldrake**

Township Manager – Newtown Township

**Michael Schneider, P.E.**

Newtown Township Consulting Engineer – Pennoni Associates Inc.

**Louis Hufnagle**

Transportation Planner – Delaware County Planning Department

**Francis Hanney**

Traffic Services Manager – PennDOT District 6-0 Engineering

**Dennis Glackin, AICP, PP**

Planning Consultant – Glackin Thomas Panzak, Inc.

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Abstract: The evaluations summarized in this report were performed in support of PennDOT's statewide effort to promote the establishment of formal access management ordinances for state and local highways. A case study of Newtown Street Road (PA 252) and West Chester Pike (PA 3) in the vicinity of the proposed Ellis Preserve Town Square development was conducted and a conceptual plan prepared for the study area as a tangible illustration of the benefits of planning and implementing access management strategies, and as a means of combating congestion and enhancing traffic safety.

In addition to providing a conceptual plan for the study area, the study also analyzed the existing access management regulations in the township's zoning and subdivision and land development ordinances. Where regulatory gaps were found, recommendations with sample ordinance language were provided.

Staff Contact:

Michael Becker  
Transportation Planner  
☎ (215) 238-2834  
✉ mbecker@dvrpc.org

Delaware Valley Regional Planning Commission  
190 N. Independence Mall West, 8th Floor  
Philadelphia PA 19106  
Phone: (215) 592-1800  
Fax: (215) 592-9125  
Internet: [www.dvrpc.org](http://www.dvrpc.org)

