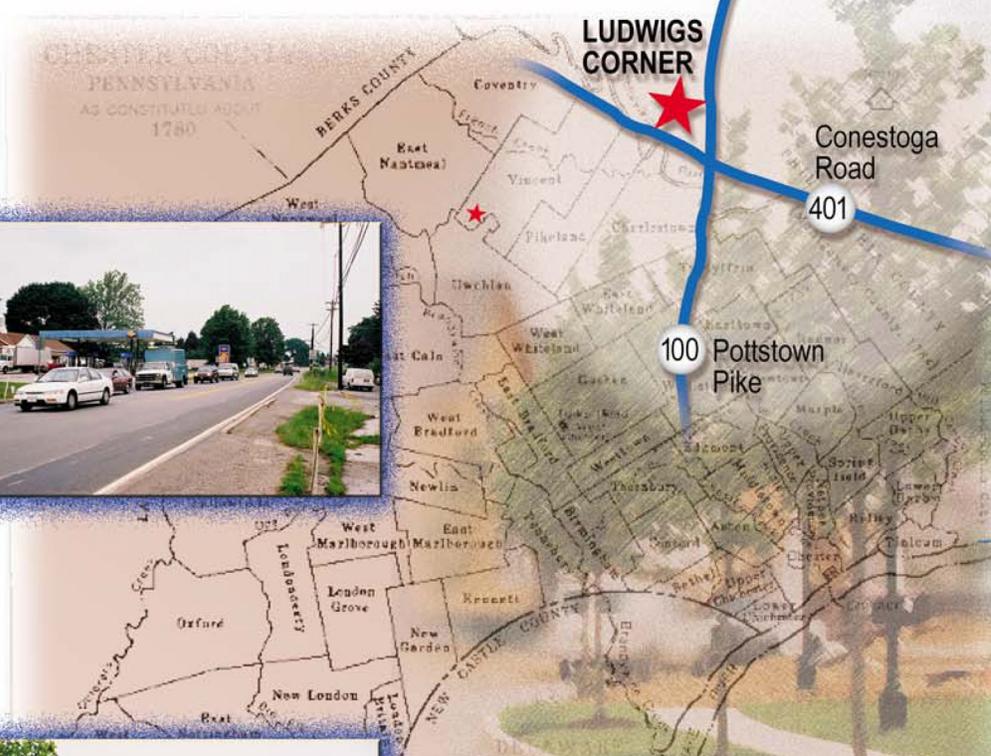


Ludwigs Corner Strategic Vision and Community Design Plan



Submitted to:
West Vincent Township

Submitted by:
Kise Straw & Kolodner

Architects Planners Historians Archaeologists

With:
Brown & Keener
Cahill Associates
Urban Partners

April 2005

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CHAPTER 1: PURPOSE AND GOALS

A historic focus for development, Ludwigs Corner, located at the intersection of two state routes and in the path of exurban development, represents an opportunity for the emergence of a compact, walkable, rural village center for West Vincent Township. The Township has taken a number of steps toward achieving this goal, including encouraging development in Ludwigs Corner by creating Village Commercial and Residential Zoning Districts, and through transfer of development rights (TDR). Due to the increased development pace, the Township Board of Supervisors and Planning Commission facilitated this "Ludwigs Corner Strategic Vision and Community Design Plan" to analyze future development potential and its impacts and to envision the potential for a mixed-use pedestrian-oriented village. This concept plan recommends the creation of a walkable village shopping center focused on Ludwigs Corner that is within walking distance of compact residential neighborhoods.

In 1996, the Township completed a study of the Route 100/401 intersection, the "Route 100 Corridor Study." To reduce current congestion problems at the Route 100/401 intersection, the study proposed a "bypass", now known as Lexington Road that would function as a local access road and involve the construction of two additional lanes for Route 100 east of its present location. The location of "Lexington Road" was incorporated into the Official Map of the Township in 1998 and the 1998 Zoning Ordinance. The middle portion of "Lexington Road" is being constructed as part of the mixed-use Weatherstone project, which was approved for 240,000 square feet of commercial, including retail, offices, library, and YMCA, as well as 197 single-family homes and 76 townhomes.

The purpose of this study is to build on these prior initiatives as well as investments by the development community, such as Weatherstone, by developing more specific, "place-making" land use, zoning, and community design recommendations. This study highlights the critical issues for existing land uses, transportation network, natural resources, and community infrastructure as it relates to the potential impact of future development. In addition, this study incorporates stakeholder and public feedback on conceptual design alternatives and recommendations. Ultimately, West Vincent Township will use this study to guide future development in a pattern that will be more environmentally and fiscally sustainable, promote the preservation of significant natural resources, and reinforce community identity.

Community Goals

The Township's twin goals of saving their rural heritage and of transferring permitted development into a compact and walkable "village" are the foundation of this Plan. To achieve those qualities of compactness and walkability, two limits must be acknowledged:

- *Walking from shop to shop*: studies have shown this activity to have a maximum distance of approximately 1/4 mile, or 1,200 feet. This is the length of typical downtown shopping streets, and of typical shopping malls. With larger distances people do not walk, but drive.
- *Walking from home to shop*: this activity has a maximum distance of approximately 1/2 mile, or 2,600 feet. Distances larger than this are driven, rather than walked.

Therefore, the area of study, the village and its environs, should have three fundamental characteristics: all shopping and commerce must fit within a 1/8 mile-walking radius; all compact and *walkable* housing must fit within 1/2 mile-walking radius; and, all lands beyond the 1/2 mile-walking radius should generally be a combination of preserved open space and farmland.

The Village Center must take advantage of the historic crossroads of Ludwigs Corner. Ludwigs Corner must therefore be the focal point of walking and shopping in the new rural village center. The village, in order to be a rural and walkable place, must have these characteristics:

- It must be a pedestrian-friendly, mixed-use place that is based on the rural walkable distances.
- Buildings must be designed at a small size and scale that is compatible with the historic buildings that make Ludwigs Corner and West Vincent Township special.
- The Weatherstone residential neighborhood must be linked, by walking, into the village.
- The proposed Weatherstone commercial site must be part of the walkable village, and therefore must create the link between its own neighborhood, the Library, and the historic crossroads of Ludwigs Corner.
- All new developments in the village must be coordinated with the existing developments, regarding open space, auto access, parking, and streetscape elements.
- The movement of traffic, both through and local, must be provided for, but also planned to support walkability: it must be pleasant to walk along the roadways and safe to cross them, including both Pottstown Pike and Conestoga Road.
- The new Lexington Road also should be a pedestrian-friendly road that serves its traffic objectives but is compatible with the adjacent walkable residential neighborhoods.
- The village and its surrounding environs must respect the natural environment of the study area.

Based on these design characteristics and the Township's aspirations, the following community goals are articulated to enhance existing development and guide future development.

Community Goals:

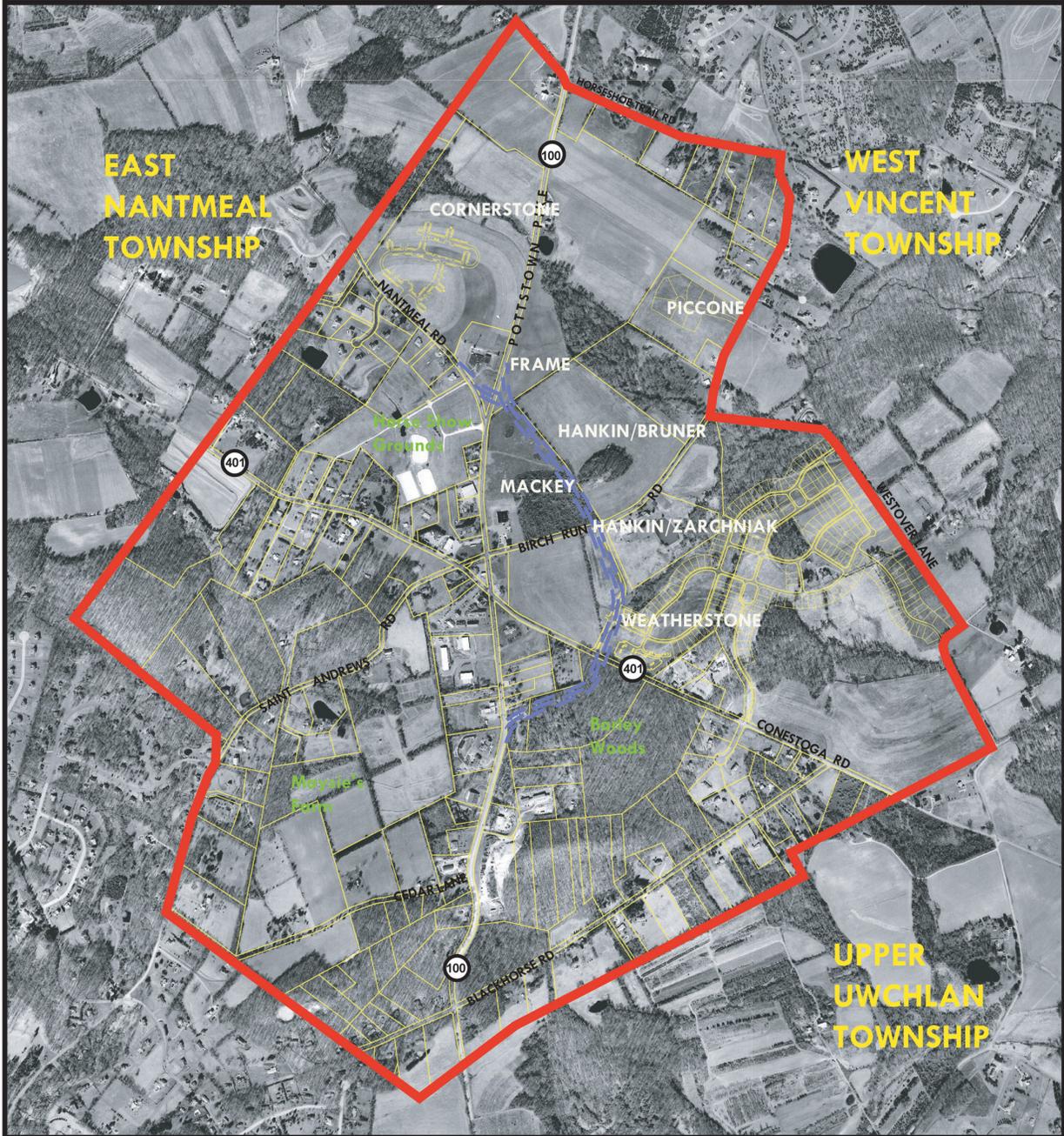
1. Create a pedestrian-friendly, mixed-use rural center with a core retail area and nearby residences that respects the natural environment
2. Maintain the historic crossroads of Pottstown Pike and Conestoga Road as the focal point of the rural center
3. Facilitate development of Weatherstone's commercial site in order to create a mixed-use center linked to the historic crossroads
4. Coordinate new development with existing development in terms of open space, parking, ingress/egress, and streetscape elements
5. Design Lexington Road as a pedestrian-friendly road that is compatible with adjacent residential land uses
6. Preserve the Ludwigs Corner Horseshow Grounds as an integral open space component of Ludwigs Corner's development

CHAPTER 2: EXISTING LAND USES

Historically, Ludwigs Corner was a crossroads-farming village located at the intersection of Pottstown Pike and Conestoga Road, now designated as PA Route 100 and Route 401, respectively. The 18th-century Ludwigs Inn is located at this intersection, and is operating today as a popular restaurant and bar. Many farm properties are located in the immediate vicinity that are either operating farms or protected open space, particularly east of Route 100. These include Maysie's Farm, southwest of Ludwigs Corner, between Route 100 and Saint Andrews Road. Large open spaces or woodlands, such as the Horseshow Grounds and Barley Woods, also characterize the rural landscape. The Ludwigs Corner Horseshow grounds located between Route 100 and Route 401 northwest of the Ludwigs Corner intersection are regarded as a major recreation amenity by the community. Although the character of Ludwigs Corner has changed along Route 100 due to roadway widening and highway-oriented businesses, the overall character of the study area beyond Route 100 remains very rural and scenic. However, development pressures in the immediate vicinity have increased over the last 10 years, and new projects are slated to change the rural crossroads of Ludwigs Corner.

The Ludwigs Corner study area comprises the area of West Vincent Township bounded by Upper Uwchlan Township and East Nantmeal Township on the south and west; Horseshoe Trail Road on the north; and Birch Run Road, Westover Lane and Fellowship Road on the east. The intersection of Route 100 and 401 serves as the focal point of the area (see existing properties map). Currently, several subdivision and land development projects are proposed or under construction that will change the character of Ludwigs Corner. Weatherstone, a 307-acre development project located near the Route 100/401 intersection, is approved for 197 single-family homes, 76 townhomes, and 240,000 square feet of retail and office. Half of the homes are now constructed, as well as a public library. The commercial portion of Weatherstone has an approved plan, but is not built. Located near the edge of the study area, Cornerstone is a 125-acre development project for 216 apartments (see existing land uses map).

Ludwigs Corner Strategic Vision & Community Design Plan



LEGEND: Existing Properties

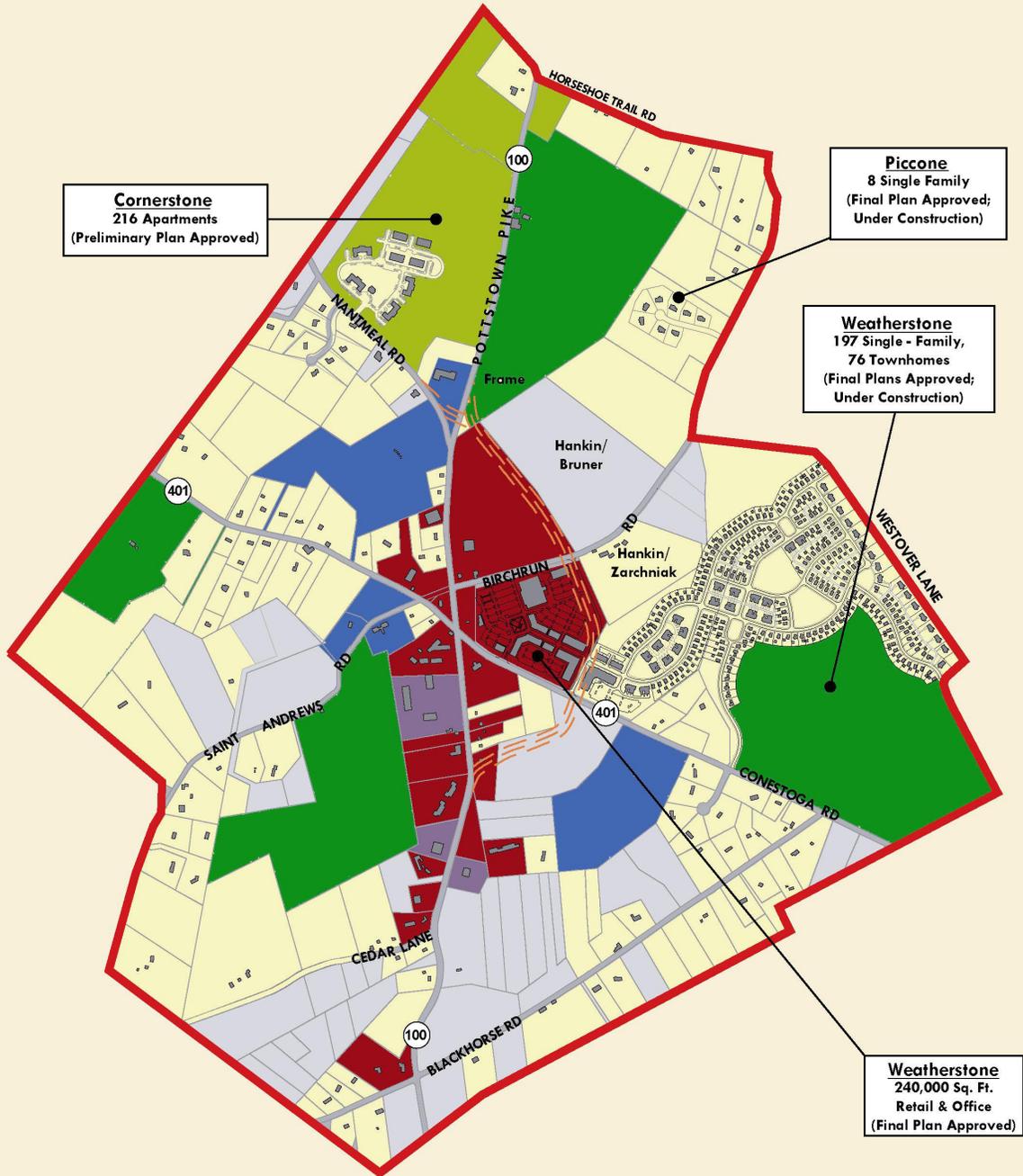
- Study Area
- Property Lines
- By-Pass

Note: Parcel data provided by Chester County Planning Commission



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LEGEND : Existing Land Uses

- Study Area
- Residential
- Commercial
- Institutional
- Industrial
- Open Space
- Agriculture
- Vacant Land



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CHAPTER 3: EXISTING ZONING AND BUILD-OUT ANALYSIS

The Township's 2003 Zoning Ordinance designates the Ludwigs Corner area with a variety of zoning districts (see existing zoning map). There are three zoning districts within the study area: VCC (Village Center Commercial), PC/LI (Planned Commercial/Light Industry), and R2 Residential. There are also three overlay districts, which affect the underlying zoning in various ways: VCR (Village Center Residential), Route 100 (affecting properties that abut Route 100 and the future Lexington Road), and MHP (Mobile Home Park). It is important to note that the land along Route 100 between Nantmeal Road and Cedar Lane, including the Ludwigs Corner Horseshow Grounds, are located within the Township's transfer-of-development (TDR) receiving zone.

A mathematical analysis of the basic zoning categories suggests that the commercial districts have development capacities that exceed the possibilities in the marketplace cannot be accommodated by reasonable traffic and roadway planning, and exceed what can truly be called a "village." In addition, development bonuses are given in the VCC area for contributing to the construction of the "Route 100 bypass," now known as Lexington Road.

The basic residential district (R2), while not permitting a large amount of development, does permit large-lot, non-pedestrian, types of residential uses. These kinds of uses, if applied to all of the remaining developable lands, do not support the idea of a pedestrian community. The VCR overlay, however, does encourage walkability and could be considered a model for living within a true rural village.

These calculations assume the total capacity if all properties were clear with no buildings on them. This is the situation with some properties, but is not the situation on others, where the buildings will remain. Therefore, in reality, the total build-out would be somewhat less than indicated, but the exact amount cannot be predicted. The numbers below, while simply the arithmetic created by the existing zoning regulations, are nevertheless a simple and dramatic portrait of the development capacity that does, indeed, exist.

3.1 VCC District

Although the Impervious Coverage limitation regulation, at 50%, is the most constraining criteria, analysis of actual possible development suggests that the total building area on any site, after providing for parking (at 4+ cars per 1,000 sq.ft.) and assuming two story buildings, will not exceed 27% of the total area of the site. For example, a 100,000 sq.ft. site could accommodate a maximum of 27,000 sq.ft. of building (13,500 sq.ft. per floor on two floors, plus about 110 – 115 cars in a parking lot). The following analyses are based on this 27% ratio.

VCC Build-Out Capacity:

75.5 acres are included in the VCC zone

75.5 acres = 3,284,200 sq.ft.

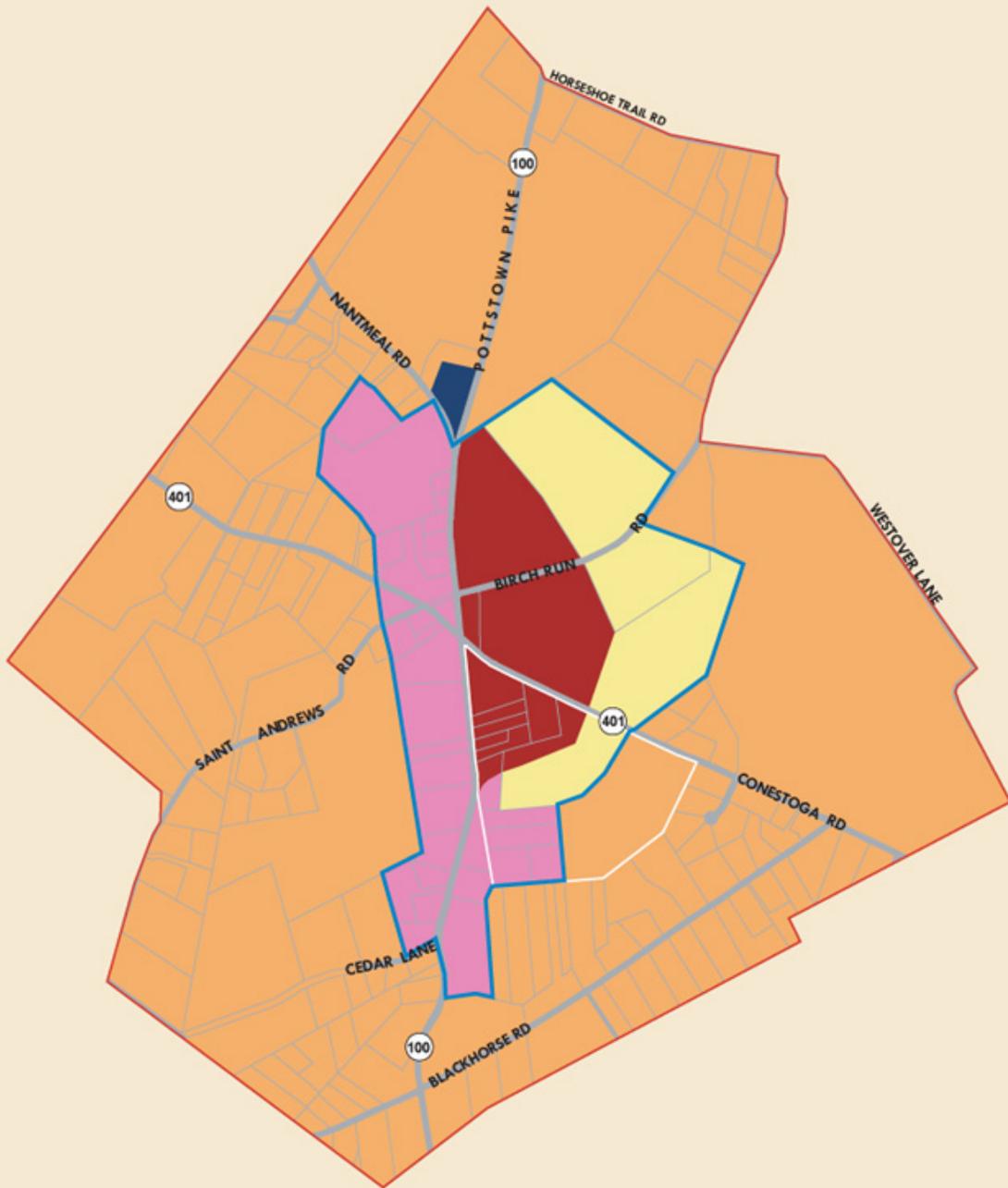
27.5% of 3,284,200 sq.ft. = 886,734 sq.ft. of total possible building area

The portions of VCC that fall within the Route 100 Overlay are permitted to add to the total impervious coverage, but this analysis reveals that the combination of building, parking and required open space establishes an upper level limit, beyond which bonuses cannot add any more development. Thus, it appears that this Overlay may have no practical effect. (Note: Total capacity analysis is based on the developable acreage calculations in Appendix A.)

3.2 PC/LI District

The 50% Impervious Coverage is the most controlling criteria. As in the VCC district, the maximum amount of building that can be built on any site equals approximately 27% of the total area of the site. As a result, the Route 100 Overlay appears to have no practical impact on the total possible development.

Ludwigs Corner Strategic Vision & Community Design Plan



LEGEND: Existing Zoning

- | | | | |
|--|---|--|--|
|  Study Area |  VC Commercial |  Municipal |  VC Residential Overlay |
|  R2 |  PC/LI |  TDR Receiving Zone |  MHP Overlay |



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PC/LI Build-Out Capacity:

69.3 acres are included in the various PC/LI zones

69.3 acres = 3,014,550 sq.ft.

27.5% of 3,014,550 = 813,928 sq.ft. total possible building area

Total Possible Commercial Development:

VCC: 886,700 sq.ft.

PC/LI: 813,900

1,700,600 sq.ft. total building area (Including all permitted uses: retail, office, industrial, etc. in the two zones.)

To put this amount of commercial space into context, King of Prussia Mall, which draws customers internationally, has just under 3 million square feet of retail space in its 8 major department store anchors and 400 specialty retailers and restaurants. Exton Square, including its 5 anchor department stores and supportive specialty shops, is approximately 1 million square feet in size and the entire Phoenixville area has approximately 430,000 square feet of retail space, of which approximately 100,000 square feet is located within the Bridge, Church and Main Street downtown commercial district.

Given the projected population base of the Ludwigs Corner area and surrounding communities, and the competition posed by existing and planned retail centers that are more conveniently located for a large portion of this potential market, it is difficult to imagine the study area attracting retailing of the scale currently zoned, even if the retailing is positioned to attract a larger regional customer base. Using generalized parameters to estimate individuals' retail spending by square foot of store space, and giving no consideration to the actual store size requirements of individual store types, it is possible to estimate the magnitude of customer base that would be required to support various scales of retailing at Ludwigs Corner.

Under this method of estimation, the approximately 3,200 West Vincent Township current residents would, collectively, need to make at least 30% of their total retail purchases at Ludwigs Corners in order to support 80,000 square feet of retail space at this location. If East Nantmeal's approximately 1,800 residents also made 30% of their retail sales at Ludwigs Corner, a total of approximately 100,000-120,000 square feet of retail space could be supported. If the site was developed to attract a more regional customer base and also attracted 30% of all current Upper Uwchlan residents' retail expenditures, an additional 6,850 people, Ludwigs Corners could conceivably support 550,000 square feet of retail space. As housing development in the region continues, Ludwigs Corner's potential retail customer base will also grow. Approved and proposed developments in West Vincent will conservatively bring the township population to about 5,600 in the next 2-3 years.

Of course, retail purchasing does not occur in such a prescribed manner. People routinely purchase certain convenience goods, such as groceries and prescription drugs, at locations close to their homes and make more occasional, larger ticket purchases across a much broader geography. Given current population and income characteristics, the Ludwigs Corner site could support a full-size 15,000 square foot drug store if it drew 80% of all current West Vincent residents' drug store expenditures. Similarly, up to 7,500 SQ.FT. of restaurant space could be supported at Ludwigs Corner if the restaurants located there could attract 50% of all West Vincent residents' restaurant expenditures. However, given the location of the site in proximity to this population and the location of other more conveniently-located retail centers, it is not clear that these uses could be supported at this site given current population densities. A more detailed supply and demand analysis, including consideration of the magnitude and location of the area's expected population growth and a complete inventory of existing and planned competitive retailing

centers is required to provide any specific recommendations regarding Ludwigs Corner’s potential retail market.

In developing a pedestrian-oriented village at Ludwigs Corner, it will be important to balance the scale of retailing offered to the desired physical characteristics of such an environment, while also acknowledging the market reach required for stores to operate in a financially viable manner.

3.3 R2 District

Total developable area in this district is 546 acres. Five Tiers of development are offered as options to developers, with the approval of the Planning Commission. The required green spaces in each Tier can be included within the individual house properties, so each maximum development in each Tier is calculated based on the developable land minus the area required for rights-of-way, streets, etc. If Transfer-of-Development Rights (TDR) is used throughout the entire 546 developable acres, the number of dwellings can be increased by 25% in each Tier.

R2 Build-Out Capacity:

Tier 1:	(49 d.u. @1 per 10 acres minus streets, etc.+ TDR bonus):	61 d.u.
Tier 2:	(98 d.u. @1 per 5 acres minus streets, etc. + TDR bonus):	123 d.u.
Tier 3:	(252 d.u. @1 per 1.84 acres minus streets, etc. + TDR bonus):	315 d.u.
Tier 4:	(336 d.u. @1 per 1.38 acres minus streets, etc. + TDR bonus):	420 d.u.
Tier 5:	??	

(Note: Total capacity analysis is based on the developable acreage calculations in Appendix A.)

3.4 Overlay Districts

VCR Overlay:

Base Density =	0.5 d.u./acre
Bonus for Village design =	additional 0.5 d.u./acre
Bonus for elderly/affordable housing =	additional 0.5 d.u./acre

The VCR overlay applies to the R2 district.

Route 100 Overlay:

Bonuses are offered for contributing to the planning and construction of new Lexington Road (called a “bypass” in the regulations). The bonuses are: in VCC, the addition of 2,500 sq.ft. of impervious coverage per acre; in VCR, the addition of 0.25 d.u. per acre; in R2, the addition of 0.25 d.u. per acre

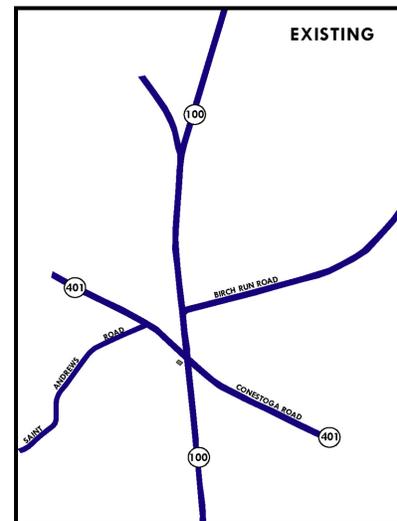
CHAPTER 4: TRANSPORTATION NETWORK EVALUATION

Traffic congestion in Ludwigs Corner primarily manifests itself at the intersection of Routes 100 and 401. There are varying opinions within the community as to how best to solve this issue. This chapter documents several options and anticipates their probable longer-term effects (see Appendix B for detailed traffic analysis). Studies have indicated that a large percentage of traffic through West Vincent Township on Route 100 is regional through-traffic.

The most recent available set of counts and projections for this intersection are provided in the 2001 Traffic Signal Report for the Hankin Tract Development by McMahon Associates. The Hankin Tract Development is approved and called "Weatherstone." The figures and conclusions in this analysis assume full build-out of the Hankin tract and accept as given its traffic generation numbers as presented in the 2001 report.

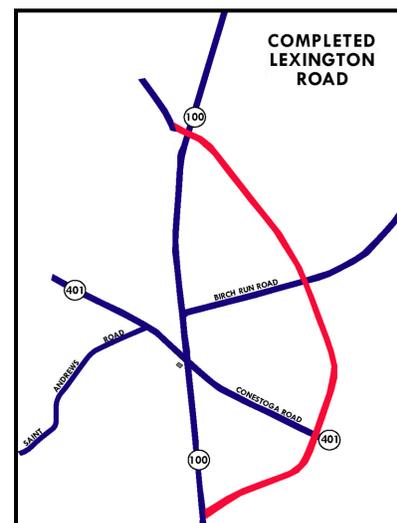
1. Existing Network

Given the present street network with no further upgrades, the completion of the Hankin Tract would contribute to volumes at the Route 100/401 intersection that would be 50% higher than that which could be carried at Level-of-Service D (which represents an acceptable level for peak periods in suburban locations).



2. Existing Network Plus Completed Lexington Road

A new two-way connector to the east of the existing Route 100 (Lexington Road) would serve as a local distributor and divert local traffic around the constrained Route 100/401 intersection. Nantmeal Road at Route 100 would be realigned to match the traffic-controlled intersection of Route 100 and Lexington Road. Given completion of the Hankin Tract, this configuration would lighten the load on Route 100/401 intersection such that it would be only 20% above LOS D levels.

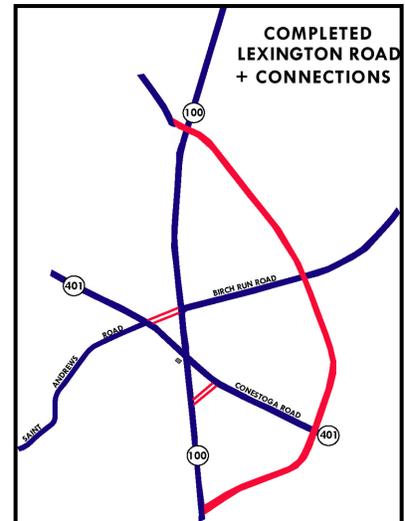


3. Existing Network Plus Completed Lexington Road Plus Supplemental Links

In addition to the completed boulevard, two further links for both southbound and northbound traffic could be added to eliminate Route 100 right turns from the Route 401 intersection. These links would serve as channelized right turn lanes to accommodate the remainder of right-turning traffic not diverted to the completed Lexington Road. In addition to lower total volumes through the intersection, the separation of right turns would also allow the Route 100 through-lanes to operate at a more efficient level by eliminating the slow-down friction of right-turn movements.

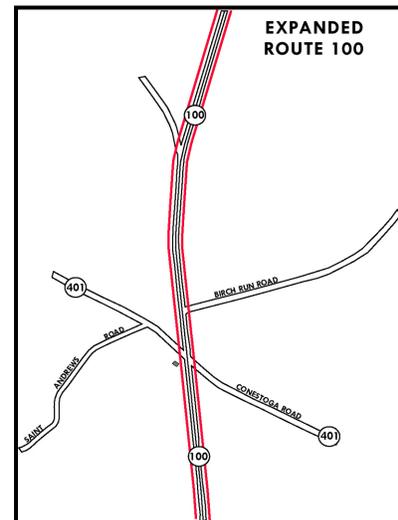
With each of these factors considered, the critical intersection would operate at a LOS D during the PM peak period, and would be only about 10% over during the AM peak.

However, given the nature of traffic flow, some of the regional traffic flow would respond to constrained levels by using the excess capacity of the new completed Lexington Road. Travel times on each would “equalize” at about 25% diversion of regional traffic to the connector, which would bring the critical Route 100/401 intersection to 5% to 10% UNDER the target LOS D level. This implies that the completed Lexington Road would also perform comfortably at LOS C or better.



4. Expanded Route 100

Expansion of Route 100 to four lanes—with a five-lane section at the Route 401 intersection—would not solve all the traffic challenges in and of itself. Projections with Hankin would still be 15% over LOS D levels even with an expanded Route 100.



5. Expanded Route 100 Plus Completed Lexington Road

Expanding Route 100 and adding the connector, though very expensive in terms of total cost, would provide the most overall capacity through the community vis-à-vis the other options, with the critical Route 100/401 intersection running at 20% below LOS D levels.



6. Recommendation

This study recommends maintaining Route 100 at two lanes (with a third lane at intersections for left-turn movements) and completing Lexington Road and suggested supplemental links. These links will include completion of the link connecting Saint Andrews Road and Birch Run Road, between Route 401 and Route 100, and completion of the link between Conestoga Road and Route 100 south of the Ludwigs Corner intersection. Given the predicted regional diversion, this leaves room for 5% to 10% traffic growth while maintaining very acceptable LOS D levels. The 5% to 10% growth could accommodate various combinations of residential, retail, and office development.

An example of such a program would be the following: 200 homes; 100,000 square feet of office; and, 50,000 square feet of retail. Another example could include 400 homes, 50,000 square feet of retail, and no office uses. The preceding examples are for illustrative purposes and could be altered to reflect the specific needs of the community and the results of a detailed market analysis. Nevertheless, the new connections would allow the vast majority of local residents to completely avoid the Route 100/401 intersection.

Although the Expanded Route 100 Plus Completed Lexington Road option offers greater overall capacity, this would be in excess of the community's local needs (given reasonable allowances for development) and instead would cater mostly to regional through-traffic. It is presently being expressed in many communities throughout the country that, given adequate alternate connections for local residents, regional routes that are two lanes and occasionally congested are preferable to four-lane highways with high-speed regional through-traffic.

By focusing on the addition of new local connections, Ludwigs Corner can vastly decrease the community's reliance on Route 100 (enhancing local mobility) while avoiding the creation of a widened high-speed barrier through the center of the community.

CHAPTER 5: NATURAL RESOURCES EVALUATION

West Vincent Township revised its Zoning Ordinance in 2003, with a significant objective of "the preservation, protection, management, and enhancement of the natural resources and environmental qualities of West Vincent Township." Using the Natural Lands Trust and Growing Greener Conservation Oriented Design techniques, West Vincent Township is striving to achieve their development objectives along with preservation of important natural and open space resources. The zoning ordinance includes primary and secondary conservation areas.

5.0 Primary Conservation Areas

Primary Conservation Areas (Figure 1) comprise only the most severely constrained lands – submerged lands (streams and lakes), floodplains, wetlands, and slopes greater than 25 percent – where development is restricted under current West Vincent Township zoning ordinances. The Township requires mapping of conservation features in the Design Standards found in Article XIX of the Zoning Ordinance, as well as in procedures found in various sections of the Subdivision and Land Development Ordinance. The Design Standards have been established to support the natural resource conservation objectives of the Township Comprehensive Plan and the Open Space, Recreation, and Natural Resources Plan.

5.1 Secondary Conservation Areas

Secondary Conservation Areas, defined in the Zoning Ordinance, are those areas that "...do not create severe limitations for development but which designations as greenway areas, along with the preservation of primary conservation areas, is desirable for purposes of providing an interconnected system of open space and recreation." These areas include precautionary slopes (15% - 25%), areas with seasonal high water table soils, woodlands, and visual resources, which together are crucial to create a healthy, inclusive network of open space throughout the Township. These features, mapped for the study area in Figure 2, provide important building blocks— environmental, recreational, and agricultural – for open space, recreation, and natural resource protection and should continue to be maintained via the conservation oriented design standards in the Township's Zoning Ordinance and Subdivision and Land Development Ordinance.

Water Source Protection Overlay District

West Vincent Township's Zoning Ordinance also offers water resource protection through the use of a *Water Resource Protection Overlay District*. This area coincides with local and regional recharge areas and areas susceptible to ground and surface water contamination. This overlay district requires a greater degree of hydrogeologic impact analyses for any well development. In the Ludwigs Corner study area, this district affects very few parcels, as few as ten in the southwest portion of the study area

Figure 1 – Primary Conservation Areas

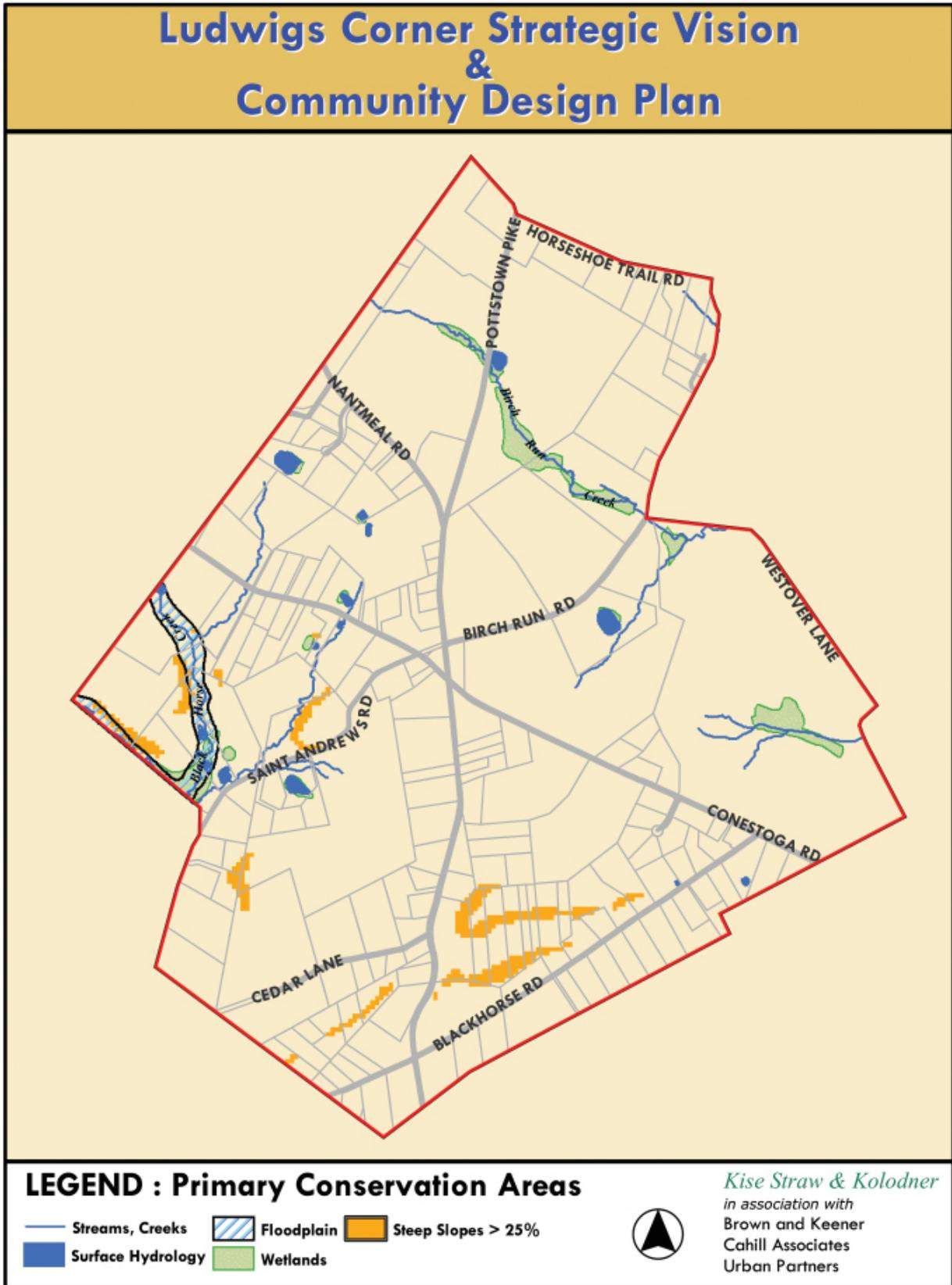
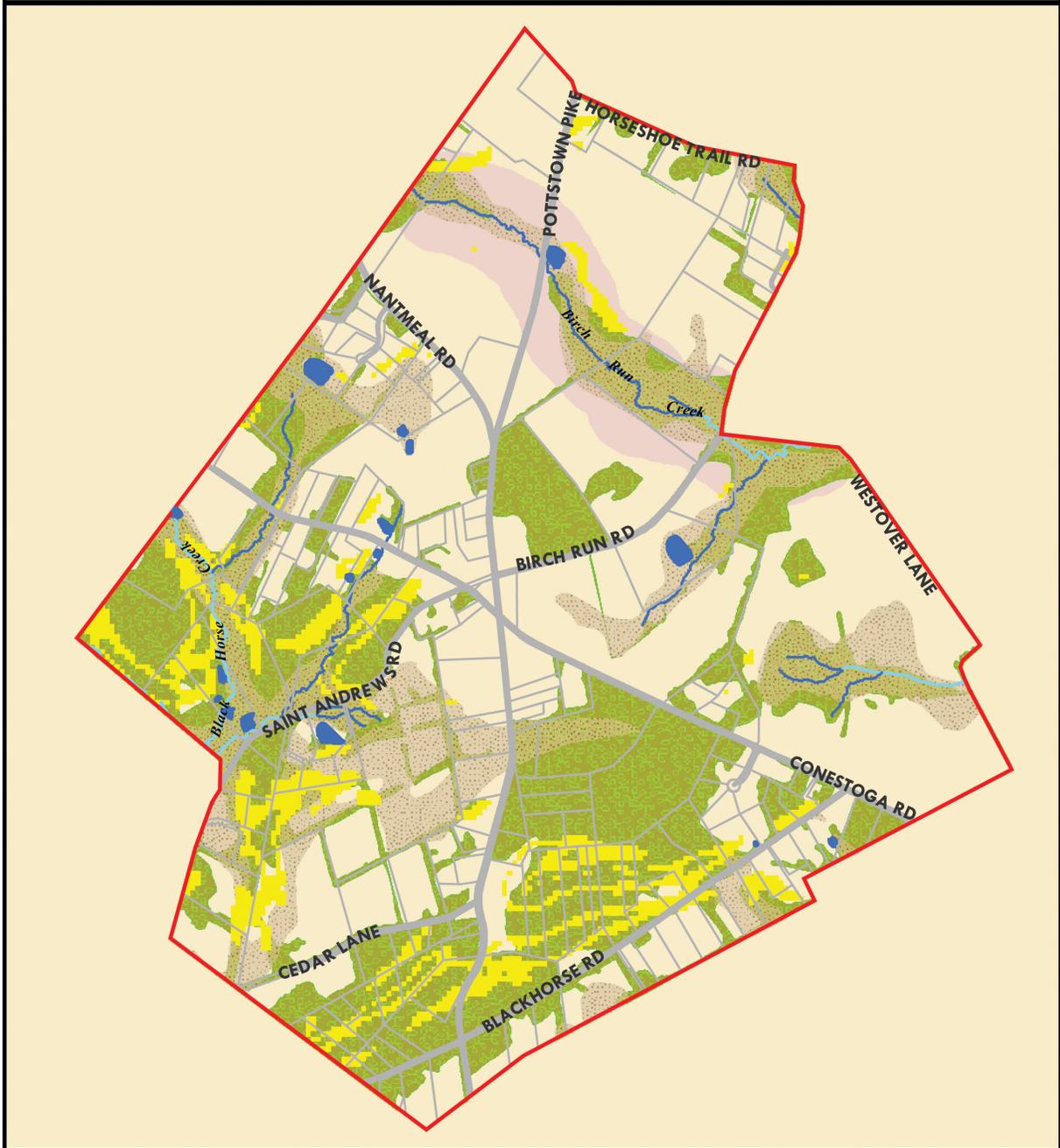


Figure 2 – Secondary Conservation Areas

Ludwigs Corner Strategic Vision & Community Design Plan



LEGEND : Secondary Conservation Areas

- 1st Order Streams
- Scenic River Designation
- Precautionary Slopes, 15-25%
- Seasonal High Water Table Soils
- Woodlands



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5.3 Issues & Recommendations

Natural woodlands, at least in this eco-region, are key to optimizing quality and quantity of water resources. As such, the highest priority should be placed on limiting the disturbance of those very limited existing woodlands within the study area. Other important “undeveloped” open space properties, though lacking woodlands, include Maysie’s Farm and the Ludwigs Corner Horseshow Grounds. All of these properties are vulnerable to development and, when taken together, constitute large and dispersed open space opportunities within the study area, which could serve to contain and buffer a higher density Ludwigs Corner village from the remainder of rural West Vincent Township. All of these properties, furthermore, could provide future land application sites for treated wastewater effluent, if such were to be needed. All of these properties could provide a myriad of open space functions, from conservation of habitat to replenishment of air quality to protection of scenic and visual values, which are so important to the study area and the region at large.

Issues:

- The study area is blessed with a confluence of special values (headwaters, Special Protection Waters, Pennsylvania Scenic Rivers designation, and others), all of which argue for less, rather than more development, all else being equal.
- At the same time, there are relatively few wetlands, floodplains, steep slopes, woodlands, and little in the way of geologic and soils constraints.
- If development is to occur in the study area, special care should be taken to balance the impacts of new development with these natural resource values. For example, special effort should be made to maximize conservation of all remaining open spaces, especially those with significant stands of woodlands remaining.

Recommendations:

- To further buffer proposed uses, work to protect, conserve, and link through public and private means those limited wooded areas which exist within the study area; work to promote reforestation of open space areas, publicly and privately, where practicable.
- To further buffer proposed uses, work to protect, conserve, and link through public and private means those additional open space properties as identified in the Vision and Community Design Plan.
- Investigate fine-tuning of the transfer of development rights program in conjunction with the above recommendations, so that priority open space parcels could be conserved at least in part through “sending” of development rights to more focused and concentrated “receiving zones” within Ludwigs Corner village areas.

CHAPTER 6: COMMUNITY INFRASTRUCTURE EVALUATION

One of the goals of this Ludwigs Corner Strategic Vision and Community Design Plan is to create a community focus for growth in West Vincent Township where growth can be accommodated in the most effective and efficient manner, while other areas of the Township where development makes less sense are conserved. The overall goal of redirecting development from portions of the Township less suited for growth to more centralized areas where community services and facilities can be provided more effectively and efficiently makes environmental and economic sense.

6.0 Existing Water Supply Service

The majority of existing land uses currently within the study area rely on small on-site wells for water supply. Philadelphia Suburban Water Company (now Aqua America), has recently expanded its large public water supply system into West Vincent Township and the Ludwigs Corner study area, as the result of water needs related to Weatherstone, Cornerstone, and other anticipated developments. Water supply lines originate to the south in the Brandywine Creek watershed, tapping into a previously existing water supply system in Upper Uwchlan Township, which is largely based on nearby municipal wells. West Vincent Township agreed to the granting of a water service franchise area to Aqua America to provide water supply in the general study area. Technically and institutionally, this system should be able to provide additional water supply for Ludwigs Corner land uses (for example, the new Weatherstone subdivision is served by this public water supply as are few existing land uses at Ludwigs Corner). Any new land uses related to this master planning effort should be able to be served by this public water source. It should be noted, however, that this water supply system involves an interbasin transfer of water from the Brandywine to the French Creek; such transfers should be avoided whenever possible. Water is pumped from wells located at the “top” of the Brandywine watershed and imported into the French Creek basin. In terms of the water balance objectives of the Northern Federation’s Sustainable Watershed Management program, this importing of water for water supply coupled with land application of wastewater effluent (see discussion below) results in an effective benefit to the water resources of the French Creek – though this transfer occurs at the expense of the Brandywine Creek.

6.1 Wastewater Service

Historically, wastewater treatment in the Ludwigs Corner study area has been provided primarily by on-site septic systems (a few scattered cess pools may also exist). According to the Township Engineer, there is no record of significant malfunctioning of these on-site systems. There also exists a small community on-site disposal system at Ludwigs Village, which provides 6,000-8,000 gpd sub-surface treatment for these shops and eateries. The Township continues to use its adopted 537 sewage facilities plan to guide new wastewater treatment planning which calls for non-stream-discharge and land-based treatment facilities in the study area, consistent with the Exceptional Value stream designation.

A new wastewater treatment facility consisting of lagoon treatment ponds, storage ponds for the treated effluent, and spray irrigation fields for the wastewater effluent has recently been completed by the Hankin Group, as part of the Weatherstone land development. This facility is designed to accommodate all projected wastewater treatment needs for Weatherstone at build-out (110,000 gpd, based on the assumption of 262.5 gpd per household or EDU), as well as additional wastewater flows; this new system avoids water quality problems associated with stream discharge facilities and, as a land-based system, replenishes the groundwater as well. There are currently about 110 residential units connected to this new system which is flowing at about 6,000-7,000 gpd. In other words, wastewater generation per household is proving to be closer to 120 gpd. Assuming that this wastewater generation factor maintains itself at this very low rate, this new system will experience substantial excess capacity (not to mention the substantial amount of non-residential flows which have been included in the design of the plant, are

finally approved by the Township, but which appear to have a questionable future due to lack of market demand). Furthermore, according to the Township Engineer, the treatment lagoon system capacity for this 110,000 gpd facility can be increased with the addition of more aerators in the treatment lagoon.

Additionally, the recently approved Cornerstone development also includes a mechanical treatment plan and drip irrigation wastewater treatment facility, sized at approximately 40,000 gpd. This system is proceeding through the PADEP permit approval process, although the Cornerstone developer has discussed the option of making a connection between Cornerstone and Weatherstone and utilizing the excess capacity in the Weatherstone wastewater treatment system. These discussions have been unsuccessful due to an inability to reach agreement on costs of providing this wastewater treatment. In any case, Cornerstone is planned and designed to accommodate its additional wastewater treatment capacity, a storage lagoon, plus additional area for drip irrigation of the treated wastewater effluent.

In summary, with the addition of both the Weatherstone and Cornerstone wastewater treatment facilities, substantial treatment capacity appears to exist within the study area, which is technically expandable to accommodate a reasonable amount of future growth and development. Additional area for land application of wastewater effluent treated at either Weatherstone or Cornerstone may be needed in the future. It should be noted here that although the technical solution for wastewater treatment is reasonably straightforward, the institutional arrangements required for implementation have become more difficult. It has been the intent of the Township to make satisfactory arrangement with Weatherstone developer Hankin so that future Ludwigs Corner wastewater flows could be treated at the new Weatherstone treatment facility (Hankin has committed to turning this system over to the Township at Weatherstone project completion; the Township owns and maintains several other wastewater and water treatment systems elsewhere in the township). Thus far, dedication of the system has not been able to be negotiated, however. Such a connection could require some additional collection system construction and possibly some modest pumping. Negotiations between Hankin and Cornerstone have also not been successful.

6.2 A Green Infrastructure: Wastewater and Stormwater

Conventional engineering approaches to water and sewer and stormwater have too often failed to understand natural systems and the balance that is so important in these natural systems. Smart engineering strives to understand how these systems function and use this understanding to enhance and build onto natural functions – to achieve a kind of green infrastructure. West Vincent is already using “*smart engineering*” practices in its approach to wastewater, as well as stormwater. This Ludwigs Corner Strategic Vision and Community Design Plan proposes to expand these “*green infrastructure*” concepts, achieving the highest degree of environmental performance.

Wastewater Issues and Recommendations

West Vincent Township has embraced comprehensive environmental planning principles throughout its comprehensive planning program. This commitment is reflected in West Vincent’s 537 Sewage Facilities Plan, which has specifically recommended that centralized treatment facilities be constructed, but only those which avoid stream discharge of wastewater effluent and opt for land application of treated wastewater effluent. Both the Weatherstone and Cornerstone wastewater treatment systems are consistent with this concept. In terms of water resource impacts, such an approach recycles the water being used; this water is infiltrated back into the ground and either taken up by vegetation and evapotranspired or recharged into the groundwater. In terms of water quality, discharge of any wastewater-related pollutants into these Exceptional Value streams is avoided.

Issues:

- How will proposed uses be watered and sewerred?
- What will be the environmental impacts of this wastewater and water supply infrastructure?

Recommendations:

- Technically utilize and connect to the land-based wastewater treatment systems, which have been constructed and are being planned at both Weatherstone and Cornerstone. Ownership/institutional questions will have to be resolved.
- Expand these systems as technically feasible (i.e., enhanced aeration, etc.); expand land application sites as necessary, with priority placed on existing woodland sites, other priority open space properties.
- Existing public water supply is more than adequate to satisfy future uses within the study area.

Stormwater Issues and Recommendations

Stormwater management means not only control of peak rates of runoff site by site, but also control of total runoff volumes, with better management of groundwater (and aquifer) recharge as well. In many cases, conventional stormwater management achieved through peak rate control detention basin systems, focused on control of larger storm events, has imbalanced the water cycle and increased runoff volumes and downstream flooding in developing watersheds.

Closely linked to this water cycle imbalance issue is the stream impact issue. Increased erosive forces produce bank erosion, bank undercutting, scouring of the substrate, deposition from eroded material and smothering of aquatic biota.

Closely linked to the water quantity management issue is water quality, best served by preventive approaches as well as mitigative practices. Often these comprehensive objectives of groundwater recharge and water quality are not being achieved. Systems malfunction, which in turn create eyesores such as clogged outlets, reduced infiltration, and standing water that quickly degenerates into potential mosquito breeding pools. Unsightly chain-linked fences are often installed around basin perimeters, making them even more foreboding.

Stormwater management typically takes the form of some sort of highly centralized basin squeezed into whatever site area is leftover after the building program has been fully planned out and accommodated on the site. As such, locations of the conventional stormwater basins are often less than ideal, emerging in visually prominent positions such as major entrances or open space. Rarely are the stormwater systems carefully integrated into overall site design, reflective of optimal locations from either a functional or aesthetic perspective. Maintenance requirements, whether imposed by homeowners, homeowners associations, or the municipalities themselves, mount. Even under the best of conditions, the natural tendency is to cut maintenance short. As various malfunctions increase, maintenance requirements increase rapidly.

The use of Best Management Practices (BMP) has grown significantly in recent years and offers exciting possibilities for application in the Ludwigs Corner Strategic Vision and Community Design Plan. BMP techniques focus on special opportunity areas where the comprehensive stormwater management objectives of volume control, peak rate control, and water quality control can be achieved.

Streetscape Systems

A major theme of the Plan focuses on creation of village streetscapes, providing vehicular, bicycle, and pedestrian access. Lineal systems of vegetation which separate the roadway from pedestrian sidewalk areas and adjacent buildings should be provided; sub-surface infiltration systems can be integrated into this overall design, providing volume control as well as partial peak rate control and water quality control (see Figures 1 through 4) for roadways, sidewalks, and buildings. Some portion of adjacent rooftop structural runoff should be able to be accommodated, with additional runoff management provided by Parking Area Systems as described below. These infiltration systems will support and reinforce the attractive landscaped streetscape, further enhancing village businesses and overall community quality. Although rooftop and sidewalk runoff can be expected to be free of nonpoint source pollutants, runoff from busier roadways should be filtered prior to entering infiltration systems.



Figure 1. Sheetflow from adjacent sidewalks infiltrates within this streetscape stormwater system (Seattle Public Utilities)

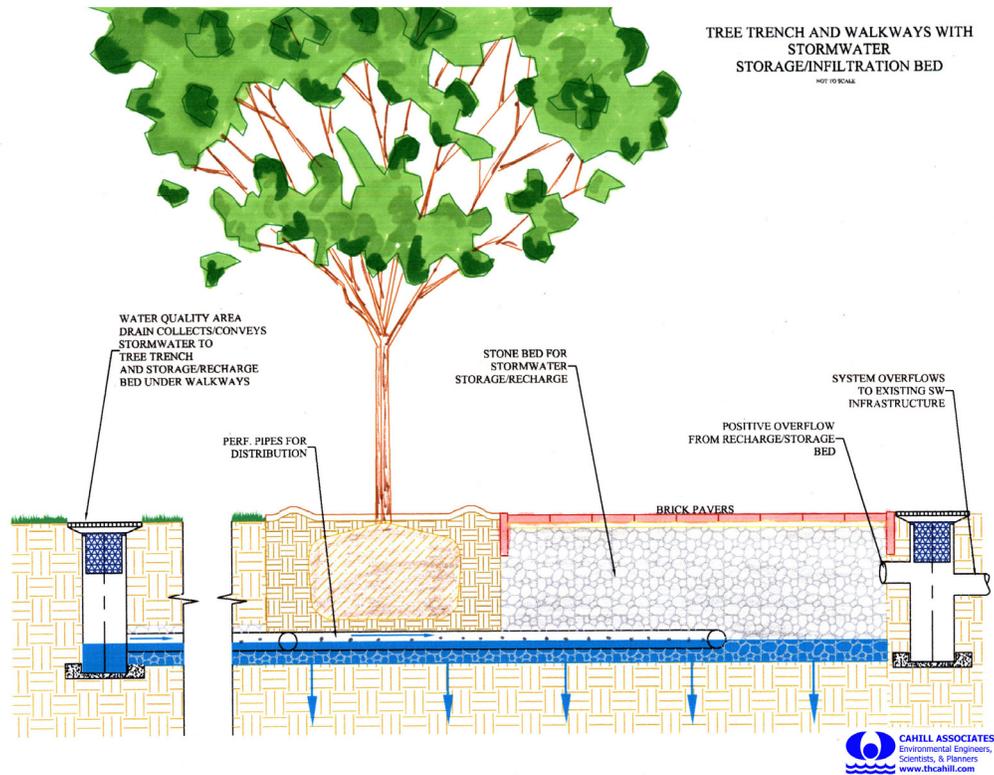
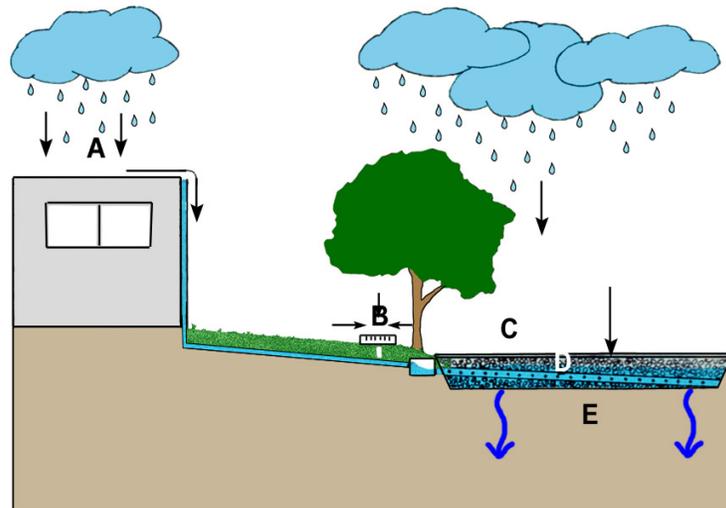


Figure 2. Conceptual design showing infiltration underneath a porous



- A. Precipitation is carried from roof by roof leaders to storage beds.
- B. Stormwater runoff from impervious areas and lawn areas is carried to storage beds.
- C. Precipitation that falls on pervious paving enters storage beds directly.
- D. Stone beds with 40% void space store water. Continuously perforated pipes distribute stormwater from impervious surfaces evenly throughout the bed.
- E. Stormwater exfiltrates from storage beds and into soil, recharging groundwater.

Figure 3. Roofleaders connected to an infiltration bed beneath porous asphalt parking area



Figure 4. Roof leaders for the adjacent buildings connect to an infiltration trench under this walkway

Grouped Parking Area Systems

Additional grouped parking areas for village commercial uses are to be provided, typically off of the direct streetscape and to the rear of uses; these areas will provide ideal locations for porous pavement underlaid with underground infiltration/recharge beds (see Figures 5). Substantial volume control can be provided by such systems, above and beyond that being provided by Streetscape Systems.

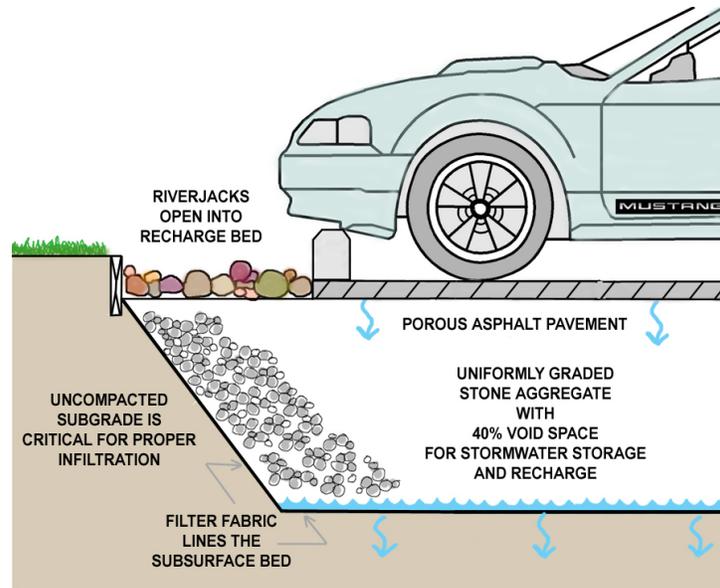


Figure 5. Conceptual design elements for porous pavement parking areas with subsurface infiltration

Issues:

- Given the special values of this study area plus the importance of special programs such as the Sustainable Watershed Management program and concern for water quality and water quantity impacts, how should stormwater be handled within the study area?
- What special stormwater techniques are appropriate for neo-traditional/village development?

Recommendations:

- All developments within the study area should be required to provide stormwater management, which does not increase runoff volume, pre- to post-development for up to the 2-year storm. Assuming this provision is satisfied, no additional water quality provision is imposed.
- All developments within the study area must provide peak rate control for larger storms, up to the 100-year storm; where feasible, the peak rate management should be combined and integrated with volume control management.
- Preventive non-structural management techniques should be applied where feasible; vegetative and soil-based systems should be used to mitigate unavoidable stormwater impacts as part of the green infrastructure of the Plan.
- Use of lineal Streetscape Systems, as described in our report, should be maximized, as well as dual use of Grouped Parking Area systems including porous pavement with underground infiltration/recharge beds.

CHAPTER 7: COMMUNITY DESIGN PLAN RECOMMENDATIONS

The future of Ludwigs Corner as a rural village depends on creating a community gathering spot that unites the historic crossroads, existing historic buildings, new commercial development, and nearby residential development in a pedestrian-friendly manner. Based on feedback received from the Township's Supervisors and Planning Commission, property owners and other stakeholder groups, and the general public, a Preferred Design Plan was identified for Ludwigs Corner that creates two retail villages (see plan on next page). The main thrust of the Preferred Design Plan is to site principal retail uses adjacent to the historic crossroads of Ludwigs Corner, Pottstown Pike and Conestoga Road, as well as Ludwigs Inn. A secondary retail village is proposed at the intersection of Route 100 and Lexington Road. It is imperative that the Township works with adjacent property owners adjacent to make the concept a reality and create a "sense of place" for Ludwigs Corner. The overall goal of the Preferred Design Plan is to create a higher-density village center surrounded by residences, and open spaces such as the Ludwigs Corner Horseshow Grounds and Maysie's farm.

7.0 Recommended Overall Plan for Ludwigs Corner

The recommended development plan for Ludwigs Corner includes the following principal elements:

- Creation of a compact walkable Village shopping Center, focused on Ludwigs Corner that will provide a sense of "center" for the township. Retail uses would be located within an 1/8 mile radius of the historic intersection of Route 100 and Route 401 would front both Route 100 and Route 141.
- Creation of a gateway village green on the east side of Route 100 between Conestoga Road and Birch Run Road.
- Extending from the village core, Weatherstone Main Street would create a pedestrian-friendly connection between new offices, live/work units, and the library at Lexington Road, to the Weatherstone neighborhood. From St. Andrews Road, north along Pottstown Pike, new live/work units are also proposed beyond the retail core that could contain ground-floor office or other non-retail workspace and apartments above. From the Ludwigs Road south along Pottstown Pike, additional new live/work units are proposed.
- Creation of a small secondary neighborhood mixed use center, Lexington Corner, at the intersection of Lexington/Nantmeal Road and Route 100 that would serve adjacent residential areas.
- Route 100 would remain as a 2-lane highway, with a turning lane at intersections. Lexington Road will also be completed as a 2-lane 2-way road. The road link connecting Saint Andrews Road and Birch Run Road between Route 401 and Route 100 would also be completed. A new inner loop road, Ludwigs Road, would link Route 100 south of Ludwigs Corner, Route 141, Birch Run Road, and Route 100 north of Ludwigs Corner. All roads will have wide tree-lined sidewalks.
- Compact residential development is proposed for parcels with a 1/2 mile radius of Ludwigs Corner, in order to generate more foot traffic and activity in the village center and accommodate the township transfer of development rights program.
- The Ludwigs Corner Horseshow grounds and Maysie's farm would be preserved and protected as open space.

Ludwigs Corner Strategic Vision & Community Design Plan



LEGEND: Preferred Design Plan

- | | | | | |
|---|---|---|--|---|
| ■ Commercial | ■ Mixed Use | ■ Existing | ■ Wooded Area | Walk Distance |
| ■ Office | ■ Residential | ■ Institutional | ■ Shared Parking | |



Kise Straw & Kolodner
in association with
Brown and Keener
Cahill Associates
Urban Partners

7.1 Planning and Design Principles

Two questions must be answered in order to complete this Plan: (1) where is the “village” at Ludwigs Corner; and, (2) what are the characteristics of that “village”? The following Plan Recommendations answer those two questions.

Because the intention in planning for a village at Ludwigs Corner is to create a compact and walkable place that enables the preservation of open space elsewhere in the Township, the characteristics of walking in rural Chester County must be acknowledged. The following principles have provided guidance for this Plan:

- Many studies of shopping behavior have shown that in this region, people will generally not walk further than 1/4-mile between any two shops. This is true in both small town shopping districts such as Chestnut Hill in Philadelphia and Haddonfield in New Jersey as well as in large malls. Therefore all commercial uses, retail as well as offices (since office workers will be shoppers), must be located within 1/8-mile of the center of Ludwigs Village.
- People will generally not walk further than 1/2-mile from home to shop. In order to encourage nearby residents to shop in the village, and not drive to some remote shopping mall, residential development that is planned in a compact walkable form must be located within that 1/2-mile distance from the center of the village.
- Because people who live further than 1/2-mile from the center will drive to shop, and therefore can easily be tempted to drive to other places, land beyond the 1/2-mile walkable distance should be either preserved as farmland or open space, or developed at very low residential densities.
- The location of primary uses retail is determined by roadway access, and a maximum shopper walking distance of 1/8 mile from the center of the retail development. Principal retail uses should lie within a 1/8 mile radius circle, defined by the intersection of Route 100 and Route 401.
- The design of the shopping area should permit shoppers to park once, within shared parking areas, and walk to multiple retail destinations.
- The design of retail developments should reflect the character of a real rural village, and not have the appearance of a typical strip retail development.
- Existing zoning should be modified to reflect the proposed plan.
- Retail uses face public streets, with parking to the rear.

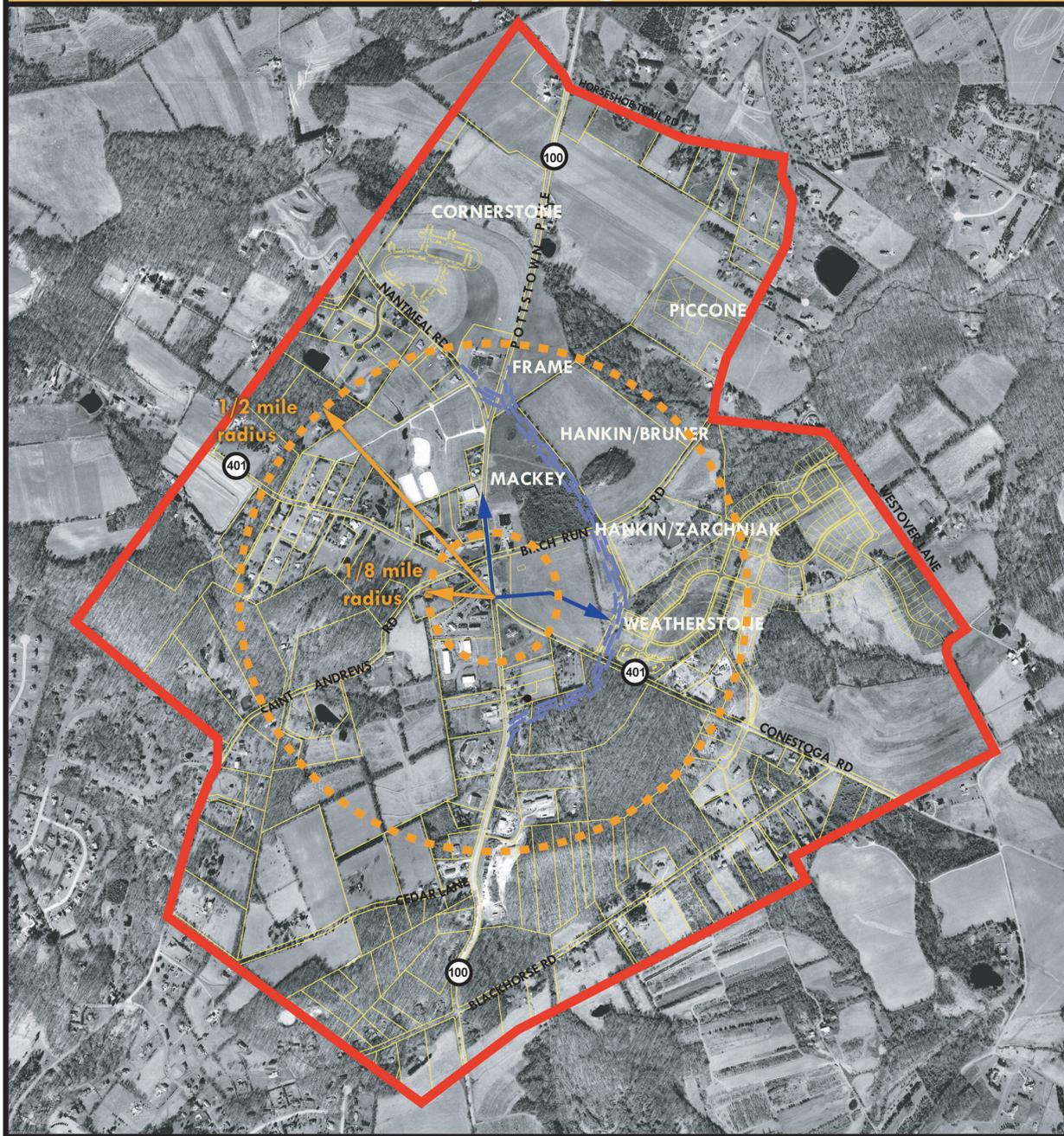
7.2 The Plan

The walkable commercial area at the heart of the larger village should be thought of as the “Center” – the new small-scale downtown of West Vincent Township. The center of the Center must, because of the long history of this place, be Ludwigs Corner – Ludwigs Inn and the Pottstown Pike/Conestoga Road intersection. Thus, the 1/8- and 1/2-mile radii are drawn on the accompanying map with their centers at that intersection (see Walkability Limits map).

Two distinct retail villages are proposed:

- Ludwigs Corner Village Center, at the intersection of Route 100 and Route 401 that will be the central shopping place for West Vincent Township.
- Lexington Corner, a smaller supporting mixed use center with dining and shopping located at the intersection of Lexington Road and Route 100.

Ludwigs Corner Strategic Vision & Community Design Plan



LEGEND: WALKABILITY LIMITS

- Study Area
- Property Lines
- ➔ Primary Walking Destinations

Note: Parcel data provided by Chester County Planning Commission



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Ludwigs Corner Village Center

The Ludwigs Corner Village Shopping Center, which is the core of the Village Center, is located within a 1/8-mile radius of the intersection of Route 100 and Route 401. It will provide approximately 125,000 sq.ft. of new retail area, which reflects the likely retail capacity of the market area. All the retail development is designed to face directly onto public streets or the village green, with parking to the rear. Some retail development fronts Route 100 and Route 401, while some other retail uses will be located along the Main Street access route from the Weatherstone development.

The area between Birch Run Road and Conestoga Road along the east side of Route 100 is illustrated as a “village green”. It is designed to be a community gathering place at the focal point of the village shopping center with retail uses surrounding it. The village green would become an identifying landmark for the community, full of pedestrian activity because of the orientation of retail uses around it. The area on the west side of Route 100 across from the village green, where there is currently an active gas station, will become a triangle space between the extension of Birch Run Road and Route 401. This area could complement the village green and serve as a green gateway for the community with a casual restaurant use. If the gas station were to continue in operation, it could improve landscaping and provide an outdoor seating area for customers.

The economic assessment of the potential for a new Village at Ludwigs Corner, which was outlined in Chapter 2, Existing Zoning and Build-Out Analysis, suggests that only a small amount of retail can be successfully developed here under current Township population conditions. Therefore, there will be a limit on the total size of the shopping area within the new Village Center, even after more potential shoppers are added by new nearby residential developments.

Locating walkable shopping along Route 100 requires a special attention to the details of the landscape along the roadway. Green setbacks, shade trees, and a continuous shopping walkway in front of all retail buildings are required. These details are discussed with more specificity in “*Details Matter*” below.

Originally the Village Commercial zoning district area was only located on the east side of Route 100. It is the recommendation of this Plan to include both sides of Route 100 in the VCC, however it should not extend as far north and south as it does now. By changing the shape of the VCC area, it will allow development to form a walkable downtown Village Center. The total VCC area will be slightly larger than the 1/8-mile radius of the shopping area. The total development possibility of the reconfigured VCC zoning area will be reduced from 706,000 sq.ft. to no more than 275,000 sq.ft. The lower number provides for a great mix of uses, including:

- Retail
- Offices
- 2nd floor apartments

An important result of this plan is that the total amount of space devoted to shopping is more in keeping with the realities of the marketplace, and with the small scale, rural development expectations of the community.

Lexington Corner Mixed Use Center

This small-scale mixed use center of shops, restaurants, apartments, and offices is focused on the south side of the intersection of Route 100 and Lexington Road and will serve residential areas to the north and east. Since the Lexington corner center will be much smaller than Ludwigs Corner Village Center, the development should be more compact. All retail uses should be located within 200 yards of the intersection, and face Route 100 and Lexington Road. All retail and other uses should face the roadways,

with parking behind. A total retail and office area of 58,000 sq.ft. is proposed and the potential for 58,000 sq. ft. of residential could be located on the second floor of the commercial space.

Mixed-Use Development between the Villages

A mix of commercial uses, apartments, and mixed use office/residential buildings are proposed for parcels along Route 100 between Ludwigs Corner and Lexington Corner retail districts. Buildings will face Route 100, with tree-lined sidewalks, and parking and vehicular access from the rear.

The areas along Route 100 that will remain outside the new VCC/Village Center, are now zoned PC/LI, an area which was designed to accommodate a wide range of commercial uses. The analysis of the developments that are mathematically possible under the planning criteria for PC/LI, suggests that approximately 830,000 sq.ft. of building area is currently possible if it were all built out at two stories average. If this amount of development were to take place (and the total of 706,000 sq.ft. in the VCC/Village Center zone), the rural character that is cherished would be lost, and the traffic on surrounding roads would be untenable.

Note, however, since the recommendation of this Plan is to make two small and compact Retail Villages on both sides of Route 100 the total development within the PC/LI zone is also reduced significantly, to 435,000 sq.ft. Given the fact that some of the PC/LI zone is already developed at densities lower the maximum calculations, and is not expected to expand a great deal, the total development numbers become part of a sensible balance of all the competing objectives.

This reduced total development is especially viable if a variety of uses are developed along Route 100, all of which can and should add to the walkability of the larger Village area:

- All of the uses now permitted in the existing PC/LI zoning area should remain, with the significant exception of certain categories of retail, which must be located within Ludwigs Corner Village Center or at Lexington Corner. Thus the recommended uses are, for example, personal services, lumber yards, offices, banks, bed-and-breakfasts, car dealerships, nurseries, equipment sales, and residential as an accessory use.
- In addition, live/work units will add the opportunity for small investors to work here, live here, and perhaps own a rental residence.
- This place, along the busy Route 100, can also be a desirable place to live, as a primary use; town houses and apartments, when properly located and designed, will add pedestrian activity and potential shoppers to the Village Center.
- Living and working along Route 100 have the same site plan design requirements as shopping. In all of the uses recommended for this portion of the Village, design for walkability is essential. This must not become a drive-and-leave place for business or living. The details of green setbacks, continuous front walkways, and shared parking in the rear are essential to the success of the Village. The specific recommendations of these conditions are listed in “*Details Matter*”.

Access and Circulation

Route 100 will continue as a 2-lane road with turning lane. A lawn setback with shade trees is proposed to separate wide sidewalks adjacent the new building faces from traffic. Lexington Road will be completed as a parkway type road with tree-lined sidewalks. A new inner loop road, Ludwig Road, is proposed and will provide access to neighborhoods, as well as remove turning traffic from the major intersection on Route 100. It extends the existing bank drive, off Route 100 south of Ludwigs corner, across Conestoga Road, thorough a new traffic circle at the intersection with the Weatherstone development Main Street, across Birch Run Road, into the Mackey property, and finally connecting back

to Route 100 north of Ludwigs Corner. Ludwig Road will also be developed with wide, tree-lined sidewalks.

Mixed use development parcels will be laid out with a connecting street grid pattern, with tree-lined sidewalks, to increase options for walking.

Parking

There are two topics that must be addressed to create a viable parking system for a new walkable Ludwigs Corner:

- Amount of parking to be provided

Ludwigs Corner is not to be developed as a typical, drive-only and drive among stores, suburban place. The compact nature of the recommended plan will result in two characteristics:

- Many of the Corner's future residents will live within a reasonable walking distance of the shopping, a fact which will reduce the need for parking spaces.
- The compact nature of the shopping will result in a "park once and shop twice" behavior of the shoppers – unlike suburban strip developments where the car is moved in the parking lot from one store to another.

The typical suburban strip center has customarily required 5 to 7 parking spaces for each 1,000 sq.ft. of retail space. These numbers account for the "park once, shop once" situation, and for the fact that no one ever walks from home to shop. In contrast, typical small shopping places (e.g., Chestnut Hill, Bryn Mawr, Haddonfield, Doylestown) in older historic communities generally provide no more than 3 cars per 1,000 sq.ft. These work very well because they have to; they have no more space to provide for parking, and they manage their parking system very well.

Given these conditions and expectations, this Plan recommends a parking ratio of about 4 cars per 1,000 sq.ft. of retail space. This number is less than the suburban models, and more than the old town models. It seems right for an emerging town/suburban place in rural Chester County. The recommended site plan shows just that amount of parking; note that, if more parking were provided, there would not be enough space for adequate shopping.

- Methods of providing the required parking

Two rules must govern the parking arrangement:

- Parking spaces must be behind the shops; the shops must face comforting walkable sidewalks along the streets.
- All spaces should be managed so that the "park once, shop twice" intention can be implemented. There cannot be any "Parking for this business only, or your car will be towed" signs. Every space must be available to every shopper and every shop.

The recommended site plan shows how those two rules can be followed in all areas of the new development, both at Ludwigs Corner and at Lexington Corner, and in those non-retail spaces between shops. Parking lots are linked together by driveways, and linked to the shop fronts by pedestrian walkways. None are isolated behind individual retail buildings.

Finally, the management of these parking lots must include all lots. A system of shared operations, costs, and maintenance must be created among the developers, property owners, business and shop owners, and the Township. It is not the charge of this Plan to recommend the specifics of such a system, but precedents do exist in many other communities.

Details Matter

Route 100, Lexington Road, and all other new road links in the Village must be designed to make a place that encourages walking. The typical suburban pattern of individual buildings and parking lots on separate sites and with separate driveways and no sidewalks is easily regulated without concern for design. Witness the character of so many American highways and shopping centers; unattractive large parking lots along the road, enormous signs unsuccessfully competing for our attention, no landscaping, and ugly buildings with lights that block out the night sky. This is what is *not* desired for Ludwigs Corner.

To make Ludwigs Corner realize the goals of the community, these design details are essential (see the Section 7.6 for recommendations zoning revisions):

1. Ludwig Road (the inner loop road) and new Main Street linking the Ludwigs Village corner to Weatherstone must both have wide sidewalks (about 20') that permit a green planting strip along the curb and enough room for outdoor dining activity. A row of retail-friendly street trees – e.g., Honey Locusts - about 30' – 40' on center - must be included. The roadway itself must have two moving lanes at 11', and two parking lanes at 8'. On street parking is essential. (See the attached sketch for these details.)
2. Route 100, the shopping and the office/residential areas, must have 40' lawn setbacks, large shade trees, and a continuous 10' – 15' sidewalk/walkway at the fronts of the retail buildings. In areas where there are no retail uses, the buildings can be set even further back from the walkway to create small front yards. The following sketches and photos of a very similar condition - a busy road at the heart of a handsome village in England - illustrate this essential recommendation. It is, indeed, possible to transform Route 100, and to make it walkable and livable.
3. Lexington Road must be designed to permit through traffic, but to keep it slow and make it possible to walk across from the pedestrian-oriented residential areas into the shops at the Village Center. This road must therefore have similar dimensions to the new Main Street and Ludwig Road: two moving lanes at 11', two parking lanes at 8' (on street parking is essential), a 5' wide edge at the curb for grass and wide shade trees, and a sidewalk at least 10' wide.
4. Conestoga Road should also have landscaped edges and continuous walkways on both sides of the roadway, similar to that recommended for Route 100. This will make the planned parking lots for the Village Center attractive and Conestoga Rd. will be made a walking link from the Library and the recommended new adjacent neighborhoods.
5. The potential Village Green, and the gateway to the Ludwigs Corner Village Center, must be landscaped to not only be a handsome “gateway” setting, but must be designed to accommodate public gatherings. This open space could be the center of the Township, so the grass, paving, and plantings allow for the entire community to discover activities that will serve both civic and commercial needs: picnics, fairs, flea markets, outdoor shopping, outdoor games, and even just quiet sitting.

Ludwigs Corner Strategic Vision & Community Design Plan

Village Center Prototypes:



Ludwigs Corner Strategic Vision & Community Design Plan

Recommended Cross Sections:



Ludwig Road and Weatherstone "Main Street"



Route 100

(Some Portions will be Three Traffic Lanes)

6. All of the buildings in the Village Center, no matter their uses, must aspire to be part of the rural quality that makes West Vincent Township so beautiful and special. These buildings are not to be strip shopping centers or town house developments. They must, instead, have these basic design characteristics:
- All buildings must have front doors facing the street, and doors facing rear parking lots. Entrances must not open onto front parking lots, since this is a walking place, first – and not merely a driving place.
 - The individual buildings should be small structures; they should be similar in size to the large homes and barns seen in the surrounding countryside. Thus, they should not be taller than two stories, and should not be longer along their fronts than about 75'. The upper floors can include a number of uses: added retail, office, or apartments, all of which will add liveliness to the sidewalks below.
 - The spaces between buildings should be garden-like. In the retail areas they can be both walkways from parking lots and outdoor dining areas. In other places they are the walking routes from the shared rear parking. Although these gardens can be quite pleasant in the shopping areas, they should not be wider than 25', so that all the shops feel near each other and the shopping experience for the pedestrian is continuous.
 - They should be made with sloped roofs and local materials (painted and unpainted wood, stone, and natural finish stucco).
 - The windows, even the large windows of the storefronts, should be set into the masonry and wood walls; these are not glass buildings, and the walls are essential parts of the overall design. Awnings that are not plastic or back-lit and with words limited to the valance area are encouraged to complement the window and shade the sidewalk.
 - The roofs should be made of shingles or metal – and not flat built up materials.
 - All signs should be sized to attract the pedestrian shopper, and not merely the passing motorist. In keeping with a general intention to keep lighting levels low, all signs should be externally illuminated (no plastic signs with lights inside) from above, to avoid glare and reductions in the night sky.
 - Parking lots must be planned so that all adjacent businesses can share the spaces and the entrance drives. Curb cuts must be minimized, especially on Route 100. The lots within the Village Center must also be located at the rear of the buildings, with no parking adjacent to the front sidewalks and walkways.
 - While it is preferable to leave lights on in shop windows, for safety, all public lighting must be very carefully designed to minimize sky glare. Street lights, lights on signs and buildings, and the lights in gas stations and parking lots must all shine down and not sideways.

Flexibility to Evolve in the Future

The general assessment of the potential retail market that will take place as the entire Village grows has suggested that all shopping should be focused on the historic crossroads at Ludwigs Corner. This area

includes the existing Inn, the Ludwigs Village Shops, and the Downingtown Bank, as well as the various recommended locations for small new retail buildings.

Although this Plan recommends other uses - offices, live/work/ residential – outside the two retail and mixed use cores, the arrangement of buildings along Ludwig Road, the Main Street and Route 100 permits flexibility for the retail business to grow if future markets justify this use. The current fix on the extent of retail is the result of understanding the market forces, and of acknowledging the need to keep shops close together to maintain a comfortable pedestrian environment.

Residential is always a positive part of an active shopping downtown. Whether the homes are in adjacent areas, or in apartments over the shops, they will all add life and potential shoppers to the new Village Center.

7.3 Walkable Residential Areas Near Village Center

Developments outside the 1/8-mile walking radius, but within the 1/2-mile walking radius should be developed as pedestrian-oriented residential neighborhoods. The existing Weatherstone neighborhood is an excellent model of design, variety, and density, for these future developments. The residents of this neighborhood already are walking within their community, to the Library, and even (with difficulty) to the Inn and shops at the Ludwigs Corner.

Weatherstone has been built at about 4.0 dwelling units (d.u.) per acre, including streets and sidewalks, but not including remote preserved properties. Apartments developed by the Hankin Group in Eagleview have 12.0 d.u./acre. An argument could be made that some portions of this area could be developed at slightly higher densities than Weatherstone, such as 6 – 8 d.u./acre, which would add more shoppers to the new downtown of the Village without adding many school age children, and yet be designed to have a “village” feel. Homes for seniors, some townhouses, some twins, a few apartments, and the single houses like Weatherstone would have a variety of family unit types, and would be compact enough to be truly walkable. Parcels appropriate for compact residential development include the Mackey Tract.

The total amount of new residential development that will support the activity of the Center is also limited by future traffic conditions. If too many houses are built, the primary roadway intersections will have traffic capacities that cause movement “failure.” This condition is described in greater detail in Chapter 4, Transportation Network Evaluation, and Appendix B. Therefore the ability of the retail activity at the Center is further constrained by the ability of Route 100 to handle the traffic generated by the necessary nearby residences, as well as the regional through-traffic that represents the majority of traffic on Route 100.

The capacities of the various intersections along Route 100, Conestoga Rd., and Lexington Road will establish the full limits of residential development. The actual capacities of the various development parcels may well be less than that permitted by the VCR zoning regulations. The total number of dwellings that can be accommodated by the roadways and intersections is described in Chapter 2, Transportation Network Evaluation, and in Appendix B.

Details Matter

The details of the driving and walking environment are essential to encourage walking into the Center. Narrow roadways, with on-street parking, and tree-shaded sidewalks that lead into the shopping area must be included in every portion of any development. Crosswalks across the main streets must be provided in convenient locations. Each residential community must also be linked to its neighboring communities –

these are not to be isolated “developments” in the normal suburban sense, but to be real rural neighborhoods that are part of the fabric of the entire Ludwigs Corner Village.

As is evident in Weatherstone, and in the historic villages in the Township, two important design rules lie at the heart of these walkable neighborhoods:

- Front doors must face the streets. Porches are good and small front yards add visual interest.
- Parking must be in the back. No parking lots in front of apartments or townhouses, and no rows of large garage doors.

7.4 Open Space Adjacent the Village Center

The recommended development plan includes the preservation of the Ludwigs Corner Horseshow grounds as permanent open space and the village center park for West Vincent Township. Maysies Farm, west of Route 100, and south of Saint Andrews Road is also preserved as permanent open space.

The village green will create a special identity for Ludwigs Corner Village Center. It will serve as a gathering place and center for activity in the community. Across Route 100 from the village green, the triangular parcel formed by the intersection of Route 401, Route 100, and the proposed new Birch Run Road/Saint Andrews Road connector is presently occupied by a gas station. This high visibility parcel could become an attractive village gateway with landscaping and an outdoor seating area for customers. park that will. Even within the village center, a green rural village ambience will be enhanced by tree-lined and lawn-lined roadways.

7.5 The Village Environs

Most residential development will be found within the overall village development area, with a half-mile radius of the Ludwigs Corner intersection. Outside the half mile walking radius, every attempt should be made to preserve open lands and maintain a rural character. Residential development should be limited clustered developments that preserve most of the land as open space and minimize the number of units built.

Beyond the 1/2-mile walking limit, the development should be at significantly lower densities. The objective is to encourage walking to the Center, and discourage driving: once someone is in the car it is just as easy to go to a shopping center as it is to remain in Ludwigs Corner. Therefore the planning strategies that will support both open space preservation and the viability of a Village Center should include the following:

- An active farm preservation effort.
- The preservation of the forests and fields, and of the headwaters of the three creeks.
- Any new developments after the farms and open spaces are preserved, should be at low densities to maintain the sense of openness that now exists. The regulations for Tier III and Tier IV of R2 zoning call for (approximately) 1.5 and 2.0-acre average densities, which can be effective if the resulting developments are set within preserved open spaces. The site planning of all roadways should include simple access to the Ludwigs Corner Village. Public Trails, for both walkers and horses, should be included, which will connect to the Center.

Every plan, every development, should lead to the creation of a real, vital, walkable rural village, that in turn has led to the preservation of great areas of this beautiful Township.

7.6 Recommended Land Use Plan and Zoning Code Revisions

Land Use Plan Recommendations

The Land Use Plan element of the Township's Comprehensive Plan should be amended to reflect the recommendations of the Preferred Design Plan. However, since the Comprehensive Plan was last updated in 1985, the Land Use Plan element could be revised during the next update of the Comprehensive Plan. West Vincent Township is currently participating in an effort to create the Phoenixville Area Regional Comprehensive Plan, which is scheduled for completion and adoption in 2005. Based on the recommendations of the Regional Comprehensive Plan, the Township will likely need to update its individual Comprehensive Plan.

Revisions to VCC:

- Change the boundary, to create a Village Center that has development on both sides of Route 100; consequently reducing the total development area.
- Transfer some of the required open space out to the R2 districts. The current zoning regulations require a minimum of 50% open space, which is so large an area that it contradicts the planning intention to create a compact shopping district. While some open space will be provided within the VCC developments (small gardens, landscaping in parking lots, the Village Green) it will not equal the 50% required. Therefore the balance of the required open space should be required to be located in area outside of the VCC, in the existing R2 zone beyond the 1/2 mile walking limit – essentially as part of a TDR process. This act will create a small scale and pedestrian friendly place to shop and work at the center, and will help preserve the open space around it.
- Require that buildings along shopping streets be located close together. The distance now required between any two buildings is 40'. This is too great to create an effective compact shopping area, so the minimum dimension should be reduced to that of a well-landscaped walkway (that would lead, for example, from the shopping sidewalk to the rear parking), or 15'; in addition, a maximum distance could be established, at 25', which would permit small gardens and outdoor dining, but would not separate adjacent stores by a too-large dimension.
- Require all parking to be shared by the adjacent buildings and businesses.
- Require parking to be setback at least 50' from the store front facades. The objective in this regulation is to locate the parking behind the shops and other uses.
- Require a minimum 40' landscaped setback along Route 100, to include grass, tall spreading shade trees, and a continuous walkway located at the fronts of the set back shops.

Ludwigs Corner Village Center Shopping Area

If these regulations are followed, the total development that will take place is as follows:

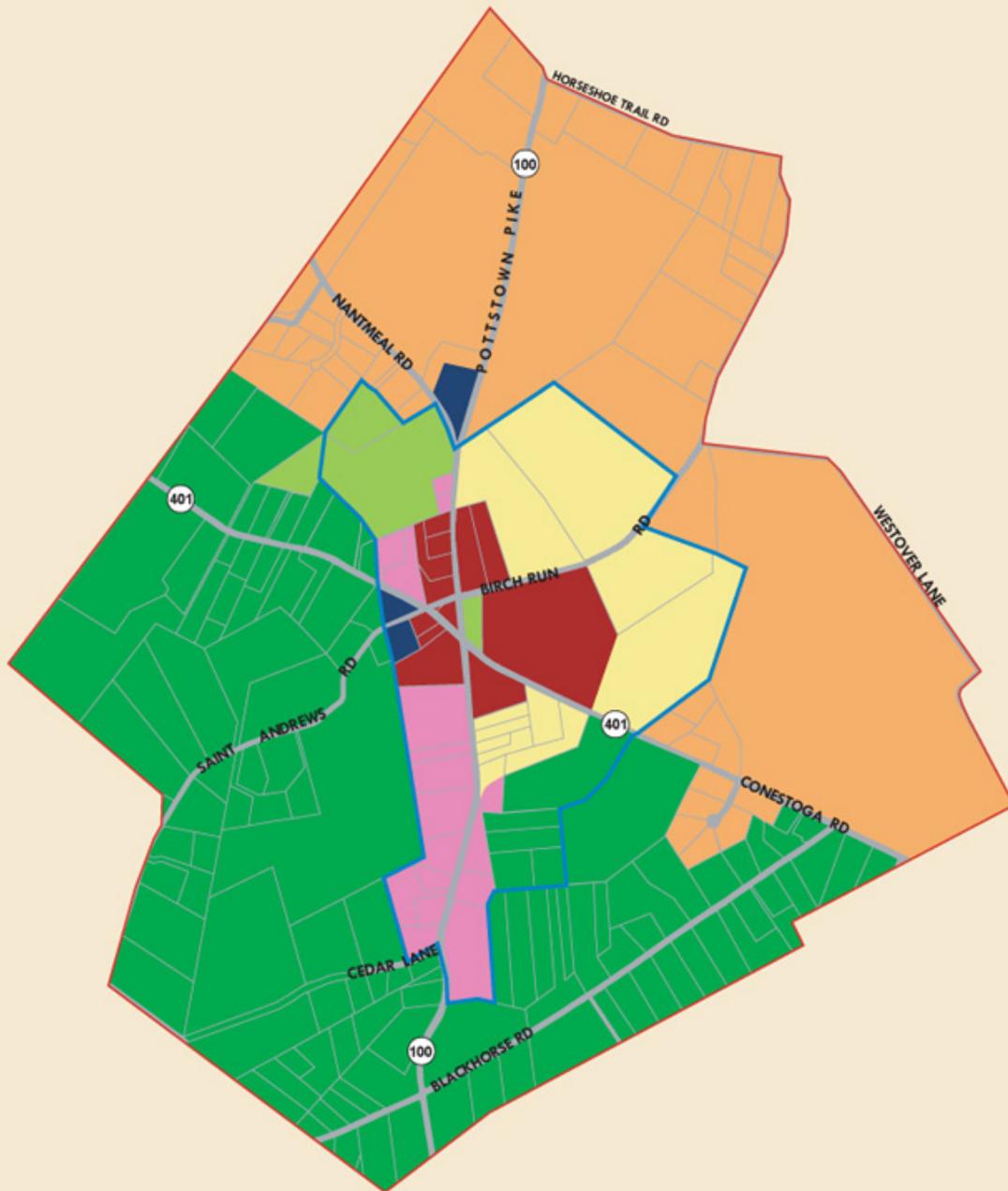
Total VCC area: 47 acres (including the Ludwigs Inn and the Ludwigs Village shops sites)

Total *new* building area in the proposed VCC: 275,000 sq.ft. with the possibility for additional second floor commercial or residential uses. This area is based on the arrangement shown in the preferred design plan, which includes parking at the ratio of 4 cars/1,000 sq.ft. It is also based on the assumption that the maximum building height equals 2 stories and that some buildings are one story only. The approved Hankin plan for the central VCC site shows 240,000 sq.ft. of building area, including a supermarket and a YMCA. The preferred design site plan accommodates a similar amount of square footage as the Hankin's site plan, but arranges it differently. The Village Center will also include 35,000 sq.ft. of new retail is located along Route 100 in the VCC, for a total of about 275,000 sq.ft. of building area.

A possible mix of uses for the new VCC development:

- 1st floor retail: 165,000 sq.ft.

Ludwigs Corner Strategic Vision & Community Design Plan



LEGEND: Proposed Zoning

- | | | | | |
|--|---|--|--|--|
|  Study Area |  VC Commercial |  Municipal |  VC Residential Overlay |  (RC) Rural Conservation |
|  R2 |  PC/LI |  TDR Receiving Zone |  Recreation | |



Kise Straw & Kolodner
in association with
Brown and Keener
Cahill Associates
Urban Partners

- 1st floor YMCA: 54,000 sq.ft.
- 1st floor offices: 61,200 sq.ft.
- 2nd floor offices: 49,200 sq.ft.
- 2nd floor apartments: 28,500 sq.ft. (about 28 d.u.)

Total *existing* building area = 35,000 sq.ft. (approx.)
(Ludwigs Inn and the Ludwigs Village shops)

Total *all* building areas (not including 2nd floor) in the recommended VCC district = 315,000 sq.ft.

Lexington Corner Mixed Use Center

A possible mix of uses for Lexington Corner mixed use area is as follows:

- First floor retail 58,000 sq. ft.
- Second floor offices/apartments 58,000 sq. ft.

Revisions to PC/LI:

- Reduce the total boundary, by these changes:
 - Change the noted parcels on the west side of Route 100 to VCC.
 - Change the Ludwigs Corner Horseshow Grounds to public recreation.
 - Change the few parcels on the east side of Route 100 to VCR, as an overlay on R3.
- Remove most categories of retail as a permitted uses; shops must be concentrated within the Village Center.
- Add residential as a primary (not only as a secondary) use.
- Add live/work as a primary use.
- Require the same green setback and walkway along Route 100 that is required in the VCC parcels facing this roadway.

If these regulations are implemented, the development that results will be as follows:

Total PC/LI area: 31 acres

Total possible development: 370,800 sq.ft.

(2 floors; average, based on the current zoning regulation of 50% maximum impervious site coverage, and the 27.5 % probable relationship between total building area and total site area)

(Note: if all of these regulations are implemented, the maximum total development that could take place in the VCC and PC/LI zones equals 725,000 sq.ft. (in contrast to the 1,732,000 sq.ft. that is possible with the existing zoning.)

Revisions to R2:

No changes to the zoning regulations are recommended. The only recommendation is to make every effort to preserve as much open space as possible. Take full advantage of the use of TDRs, easement gifts and purchases, and of the transfer of required open space in the Village Center to the community open spaces in the study area.

Revisions to the Three Overlay Districts:

- VCR

The design criteria established for developments in the VCR Overlay regulations are well-tailored for the creation of pedestrian friendly neighborhoods. Therefore they should be applied to those areas of the Village that are within the 1/2 mile walking distance noted in the Development Plan Recommendations. Weatherstone, which fundamentally follows the criteria of the VCR regulations, has a net density (including streets, but not preserved open space) of about 4 d.u. per acre. If some apartments are added (e.g., for over 55 and elderly residences), this density increases to 6 – 8 d.u. per acre.

7.7 Recommended Funding Sources

The Township already has created regulations that provide developers with incentives, such as density bonuses, to create public goods, such as roads or preserved open space. Key examples include Lexington Road as part of the Weatherstone development and the preserved farm open space as part of the Cornerstone development. Therefore, the Township should work proactively with area property owners to accommodate the public improvements presented in the Preferred Design Plan, such as new roads, sidewalks, and open space.

The Township also could investigate amending their official map in order to create the appropriate right-of-way for key streets, such as the St. Andrews Road link, the Downington Bank link, and Ludwig Road site. This action would preserve the option for the Township to purchase the right-of-way or to work with a developer to make the necessary roadway improvements through incentives.

In order to preserve or create additional open space, the Township should investigate outright purchase of development rights. For instance, the Township may wish to purchase a site for open space, and then work with developers to transfer their open space requirements to the purchased site by accepting payment in lieu of on-site open space. This option would be particularly applicable to the village center within the 1/8-mile radius that currently contains very high open space standards (fifty percent). The Township also should investigate open space grant funds through Pennsylvania's Department of Conservation and Natural Resources (DCRN), which would require a local funding match.

The other major improvements presented in the Preferred Design Plan relate to Pottstown Pike or Route 100, which is a state highway. The Township should work with the Pennsylvania Department of Transportation (PENNDOT) through the appropriate transportation planner at the Chester County Planning Commission. Both the County and the State agencies should be aware of the Township's desire to preserve the current roadway capacity of Route 100 and to upgrade the roadway with pedestrian amenities. Ultimately, state and federal funding should be available for roadway improvements if the Township agrees to fund the necessary engineering documentation.

APPENDIX A : DEVELOPABLE ACREAGE CALCULATIONS*

PARCEL ID	LOCATOR ID	ACRES	ZONING	PRIMARY NATURAL RESOURCES	SECONDARY NATURAL RESOURCES	DEVELOPABLE ACREAGE
2507 00040000	156	32.81	VCR/RT100	0.00	0.53	32.28
2507 00050100	158	15.20	VCR/RT100	0.93	3.50	10.77
2506 00600000	120	24.93	VCC/RT100			24.93
2506 00670000	127	3.10	VCC/MHP/RT100			3.1
2506 00660000	126	1.54	VCC/MHP/RT100		0.26	1.28
2506 00620000	122	4.52	VCC/MHP			4.52
2506 00630000	123	1.42	VCC/MHP			1.42
2506 00640000	124	1.29	VCC/MHP			1.29
2506 00650000	125	0.81	VCC/MHP		0.00	0.81
2506 00610000	121	1.80	VCC			1.8
2506 00590000	119	65.90	R2/RT100	3.90	2.69	59.31
2506 00010000	11	58.35	R2/RT100	1.19	4.28	0
2507 00080100	165	16.33	R2/MHP/RT100		2.51	13.82
2507 00080000	164	23.04	R2/MHP			23.04
2506 00310000	73	54.17	R2	0.58	17.81	35.78
2502 0004010E	2	22.06	R2			22.06
2506 00400000	89	24.80	R2	0.41	3.87	20.52
2506 00140000	46	20.77	R2	3.23	0.94	16.6
2506 00150000	47	20.36	R2	4.04	0.52	15.8
2506 00230100	60	12.12	R2	0.17	0.83	11.12
2506 00430000	96	10.52	R2		0.04	10.48
2507 00030000	155	19.93	R2	2.88	6.79	10.26
2506 00810000	140	10.70	R2	0.49		10.21
2507 00020200	154	9.53	R2			9.53

* **Note** : Parcel data provided by Chester County Planning Commission

APPENDIX A : DEVELOPABLE ACREAGE CALCULATIONS*

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2506 00130000	45	9.21	R2		0.84	8.37
2506 00120000	43	10.89	R2		2.81	8.08
2506 00410000	90	8.99	R2		1.11	7.88
2506 00390000	88	7.88	R2			7.88
2506 00420000	95	8.49	R2		1.05	7.44
2506 00240000	63	10.72	R2	1.38	1.98	7.36
2506 00230000	59	11.60	R2	2.15	2.23	7.22
2506 00380000	87	7.01	R2		0.03	6.98
2506 00830000	144	8.38	R2		1.54	6.84
2503 00870000	6	6.13	R2			6.13
2506 00230300	62	10.40	R2	3.76	0.55	6.09
2507 000802A0	167	6.54	R2	0.78		5.76
2502 00050100	4	6.74	R2		0.98	5.76
2506 00220000	58	6.38	R2	0.04	0.85	5.49
2506 00230200	61	9.32	R2	3.26	0.69	5.37
2506 00560000	111	5.36	R2			5.36
2507 00080200	166	5.49	R2	0.24	0.07	5.18
2502 00040000	1	5.05	R2			5.05
2506 00820000	141	4.95	R2			4.95
2506 00550000	110	4.92	R2			4.92
2506 00580100	117	4.76	R2			4.76
2507 00140000	183	5.46	R2	0.87		4.59
2506 00580000	116	4.53	R2			4.53
2506 00800000	138	4.78	R2	0.42		4.36
2506 00090000	38	4.66	R2	0.30		4.36

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2507 00010300	151	5.30	R2		1.02	4.28
2503 008801A0	8	5.22	R2		0.95	4.27
2503 00880000	7	4.08	R2		0.13	3.95
2506 00770000	136	5.30	R2	1.39		3.91
2506 01360000	147	4.33	R2		0.50	3.83
2506 00120100	44	4.58	R2		0.89	3.69
2507 00070100	161	3.68	R2			3.68
2507 00180300	193	3.89	R2	0.08	0.16	3.65
2507 00190000	196	3.59	R2			3.59
2506 00160000	48	5.28	R2	0.01	1.77	3.5
2506 00210100	57	3.64	R2	0.29		3.35
2506 00820100	142	3.23	R2			3.23
2507 001801A0	189	3.22	R2			3.22
2507 00170000	186	3.21	R2			3.21
2507 001801C0	191	4.12	R2		0.92	3.2
2507 001801B0	190	3.36	R2		0.17	3.19
2506 00470000	101	3.43	R2	0.24		3.19
2506 00480000	102	3.17	R2			3.17
2506 00780000	137	4.13	R2	0.98		3.15
2507 00160000	185	3.14	R2			3.14
2503 00860000	5	3.11	R2			3.11
2506 00820200	143	3.26	R2		0.17	3.09
2507 000803B0	169	3.28	R2	0.02	0.18	3.08
2506 00200000	55	2.99	R2			2.99

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2503 00880200	9	2.98	R2		0.14	2.84
2506 00030700	22	4.47	R2		1.64	2.83
2506 00450000	98	2.74	R2	0.01		2.73
2506 00030600	21	5.11	R2	0.93	1.46	2.72
2506 00760000	135	4.09	R2	1.49		2.6
2506 00170000	49	3.17	R2	0.20	0.39	2.58
2506 00440000	97	2.73	R2	0.16		2.57
2506 00090100	39	2.52	R2			2.52
2507 00180000	187	2.51	R2			2.51
2506 00490000	104	3.14	R2	0.65		2.49
2507 00070300	163	2.44	R2			2.44
2507 00120000	180	2.49	R2	0.11		2.38
2503 008802A0	10	2.36	R2			2.36
2506 00250100	65	2.32	R2			2.32
2507 00180200	192	2.29	R2		0.00	2.29
2507 00070200	162	2.23	R2			2.23
2507 00180400	194	2.15	R2			2.15
2507 000803D0	171	2.13	R2			2.13
2506 00580200	118	2.12	R2			2.12
2507 00010200	150	2.45	R2		0.34	2.11
2507 000803C0	170	2.10	R2			2.1
2507 00180100	188	3.96	R2		1.88	2.08
2506 01350000	146	2.06	R2		0.00	2.06
2506 00180200	53	2.04	R2			2.04
2506 00020100	14	2.04	R2			2.04

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2506 00460000	99	2.27	R2	0.28		1.99
2506 00310100	74	3.91	R2	0.73	1.19	1.99
2507 00110000	178	1.96	R2			1.96
2506 00040400	28	2.20	R2		0.24	1.96
2507 000803F0	173	1.95	R2			1.95
2506 00210000	56	2.03	R2	0.07	0.02	1.94
2506 00110100	42	1.94	R2			1.94
2507 000803A0	168	1.92	R2			1.92
2507 000803H0	175	1.90	R2			1.9
2507 000803G0	174	1.87	R2			1.87
2507 00010100	149	1.86	R2			1.86
2506 00100000	40	1.86	R2			1.86
2507 00180500	195	1.82	R2			1.82
2507 000803E0	172	1.82	R2			1.82
2507 00010000	148	1.82	R2			1.82
2506 00540000	109	1.81	R2			1.81
2506 004102C0	94	2.84	R2	0.43	0.61	1.8
2507 00130000	182	1.90	R2	0.11		1.79
2507 00120100	181	1.83	R2	0.05		1.78
2507 00070000	160	1.78	R2			1.78
2507 00150000	184	1.77	R2			1.77
2506 00190000	54	1.75	R2			1.75
2507 00110100	179	1.72	R2		0.03	1.69
2506 00110000	41	1.85	R2		0.25	1.6
2506 003101C0	77	2.79	R2		1.22	1.57

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2506 00180000	51	1.53	R2			1.53
2506 00570300	115	1.52	R2			1.52
2506 004102B0	93	1.78	R2	0.26		1.52
2506 004102A0	92	2.41	R2		0.89	1.52
2506 00030000	15	1.51	R2			1.51
2506 00030400	19	1.50	R2		0.00	1.5
2506 00800100	139	1.83	R2	0.36		1.47
2506 003101A0	75	2.13	R2		0.66	1.47
2506 00030900	24	1.60	R2		0.14	1.46
2507 00190100	197	1.65	R2		0.22	1.43
2506 00570000	112	1.43	R2			1.43
2506 00030200	17	1.42	R2			1.42
2502 00050000	3	1.42	R2			1.42
2507 00020100	153	1.51	R2		0.11	1.4
2506 00480100	103	1.38	R2			1.38
2506 00030300	18	1.29	R2			1.29
2506 00040100	26	1.27	R2			1.27
2506 00030100	16	1.27	R2			1.27
2506 00570200	114	1.26	R2			1.26
2506 00410200	91	2.51	R2		1.25	1.26
2506 00030800	23	1.46	R2		0.22	1.24
2506 003101D0	78	2.36	R2	0.03	1.11	1.22
2506 00460100	100	1.20	R2			1.2
2506 00030500	20	1.58	R2		0.47	1.11
2507 00100000	177	1.09	R2			1.09

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2506 00180100	52	1.08	R2			1.08
2506 003101B0	76	1.84	R2		0.79	1.05
2506 00080400	36	1.05	R2			1.05
2506 00520000	107	0.99	R2			0.99
2506 00500000	105	0.99	R2			0.99
2506 00510000	106	0.98	R2			0.98
2506 00570100	113	0.94	R2			0.94
2506 00040300	27	1.26	R2		0.34	0.92
2507 00090000	176	0.88	R2			0.88
2506 00170100	50	0.93	R2		0.23	0.7
2506 00530000	108	0.60	R2			0.6
2506 00020000	13	0.31	R2			0.31
2507 00020000	152	16.10	R2		1.17	0
2506 00690000	131	2.33	PC/LI /RT100			2.33
2506 00680100	129	3.07	PC/LI /MHP		0.00	3.07
2506 00680000	128	3.07	PC/LI /MHP	0.19		2.88
2506 00700000	132	2.77	PC/LI /MHP			2.77
2506 00680200	130	2.42	PC/LI /MHP			2.42
2506 00300000	71	8.04	PC/LI		0.47	7.57
2506 00720000	134	8.40	PC/LI	1.44		6.96
2506 00300100	72	5.45	PC/LI			5.45
2506 00080000	32	4.51	PC/LI			4.51
2506 00040000	25	6.20	PC/LI	0.17	2.63	3.4
2506 00370100	86	3.49	PC/LI		0.18	3.31
2506 00340000	81	4.72	PC/LI		1.86	2.86

* **Note** : Parcel data provided by Chester County Planning Commission

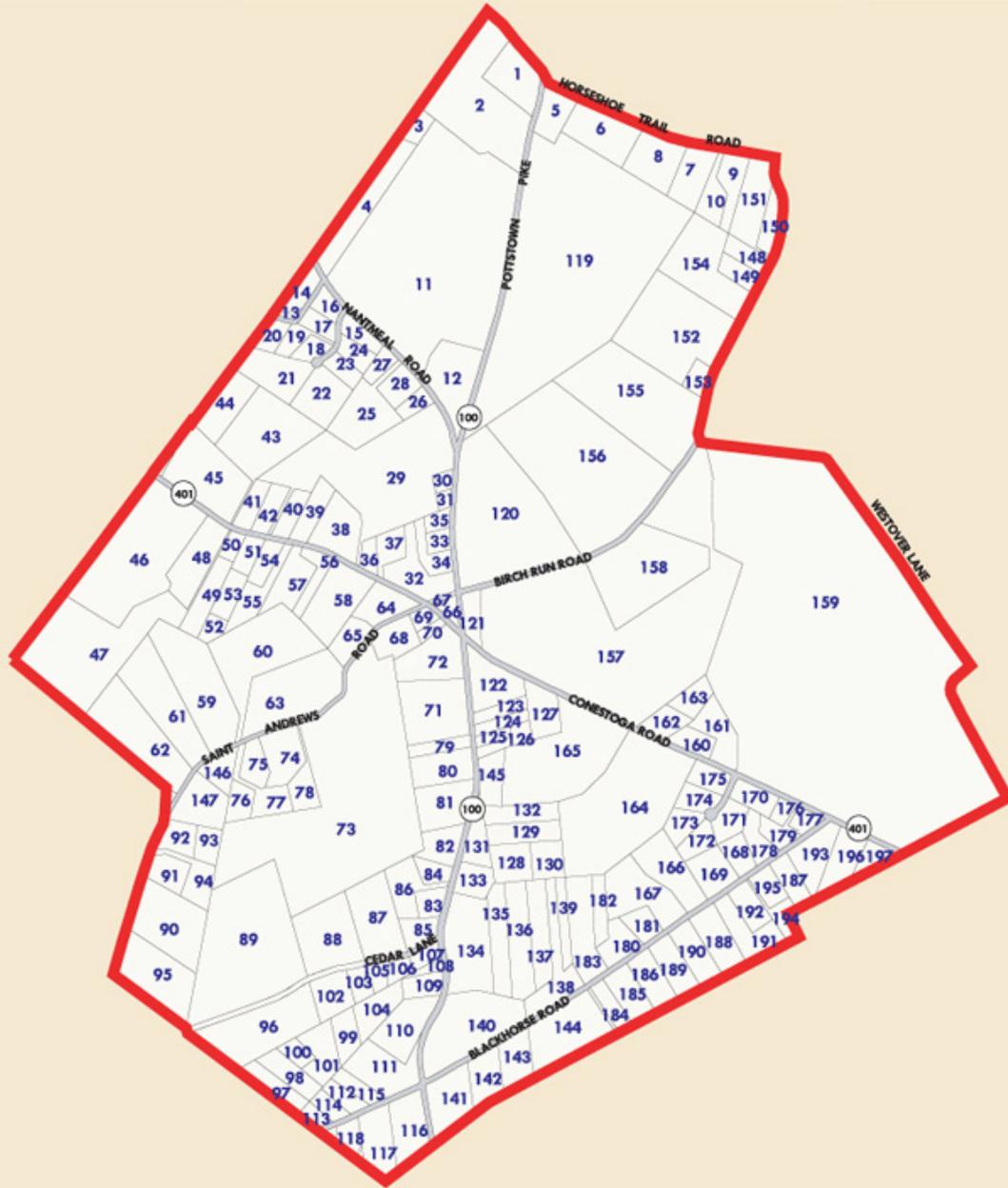
APPENDIX A : DEVELOPABLE ACREAGE CALCULATIONS*

PARCEL ID	LOCATOR ID	ACRES	ZONING	PRIMARY NATURAL RESOURCES	SECONDARY NATURAL RESOURCES	DEVELOPABLE ACREAGE
2506 00350000	82	2.68	PC/LI		0.06	2.62
2506 00710000	133	2.28	PC/LI	0.07		2.21
2506 00330000	80	3.96	PC/LI		1.91	2.05
2506 00080200	34	2.04	PC/LI			2.04
2506 00080500	37	2.00	PC/LI			2
2506 00370000	85	1.88	PC/LI			1.88
2506 00360000	83	1.57	PC/LI			1.57
2506 00360100	84	1.40	PC/LI			1.4
2506 00320000	79	1.58	PC/LI		0.47	1.11
2506 00080100	33	1.02	PC/LI			1.02
2506 00080300	35	0.96	PC/LI			0.96
2506 00280000	69	0.88	PC/LI			0.88
2506 00260000	66	0.74	PC/LI			0.74
2506 00060000	30	0.71	PC/LI			0.71
2506 00290000	70	0.61	PC/LI			0.61
2506 00070000	31	0.51	PC/LI			0.51
2506 00260100	67	0.05	PC/LI			0.05
2506 0001010E	12	6.42	M/RT100			6.42
2506 0027000E	68	2.93	80% +PC/LI 20% R2			2.93
2507 00060000	159	154.58	75% VCR + 25% VCC	4.67	18.14	0
2506 00050000	29	26.21	75% PC/LI 25% R2	0.11	0.29	25.81
2506 0025000E	64	3.20	75% PC/LI 25% R2			3.2
2507 00050000	157	60.59	50% VCR + 50% VCC /RT100		5.33	0
2506 00840000	145	2.49	50% VCC + 50%PC/LI /MHP		0.86	1.63

* **Note** : Parcel data provided by Chester County Planning Commission

■

Ludwigs Corner Strategic Vision & Community Design Plan



LEGEND : Parcel Identification



Study Area



Parcel ID



Kise Straw & Kolodner
in association with
Brown and Keener
Cahill Associates
Urban Partners

APPENDIX B: DETAILED TRANSPORTATION NETWORK EVALUATION

Ludwigs Corner in the target of internal and external traffic pressures, manifested in congestion at the intersection of Routes 100 and 401. Several options for improvements and anticipate their probable longer-term effects have been developed.

1.0 METHODOLOGY

The constraints and demands of the existing Route 100/401 intersection is observed during the morning and afternoon peak periods. The most recent available counts and projections for this intersection are provided in the 2001 Traffic Signal Report for the Hankin Tract Development by McMahon Associates. The projections (for 2008) represent the most current assessment of anticipated traffic growth, and have been used as the base figures for the subsequent analysis (see **Figures 1a and 1b**).

The methodology employed in this evaluation is a modified critical lane method, which, in short, examines every traffic movement at the intersection for the fraction of overall green time required for it to carry an acceptable level of service (LOS D). If the required green time fractions for each movement add up to 1.00 or less, then the intersection is performing at an acceptable level. If the required green times add up to a number greater than 1.00, then the intersection is over capacity.

2.0 EXISTING SITUATION

Assuming the present street network, the critical lane method for 2008 (including the Hankin Tract) yields the following results for the Route 100/401 intersection (see Appendix for full calculations):

AM Peak: 1.48
PM Peak: 1.67

According to the critical lane analysis method, this intersection is over capacity, mostly as the result of growing local and through commuter traffic over the last ten years.

3.0 IMPROVEMENT SCENARIOS

3.1 Existing Network with Connector

The current manifestation of the “bypass” proposal includes a new two-way connector to the east of the existing Route 100. Although no longer intended as a pure regional bypass but rather a local distributor boulevard, its value lies in its ability to divert traffic around the constrained Route 100/401 intersection.

The greatest potential for such trip diversion concerns local trips destined for the areas east of Route 100. For example, traffic from the south destined for Weatherstone or other locations off Route 401 east could be accommodated by the boulevard and would no longer have to go through (turning right at) the Route 100/401 intersection. The implications for the Route 100/401 intersection are clear: There would be fewer vehicles making the following moves:

Figure 1A

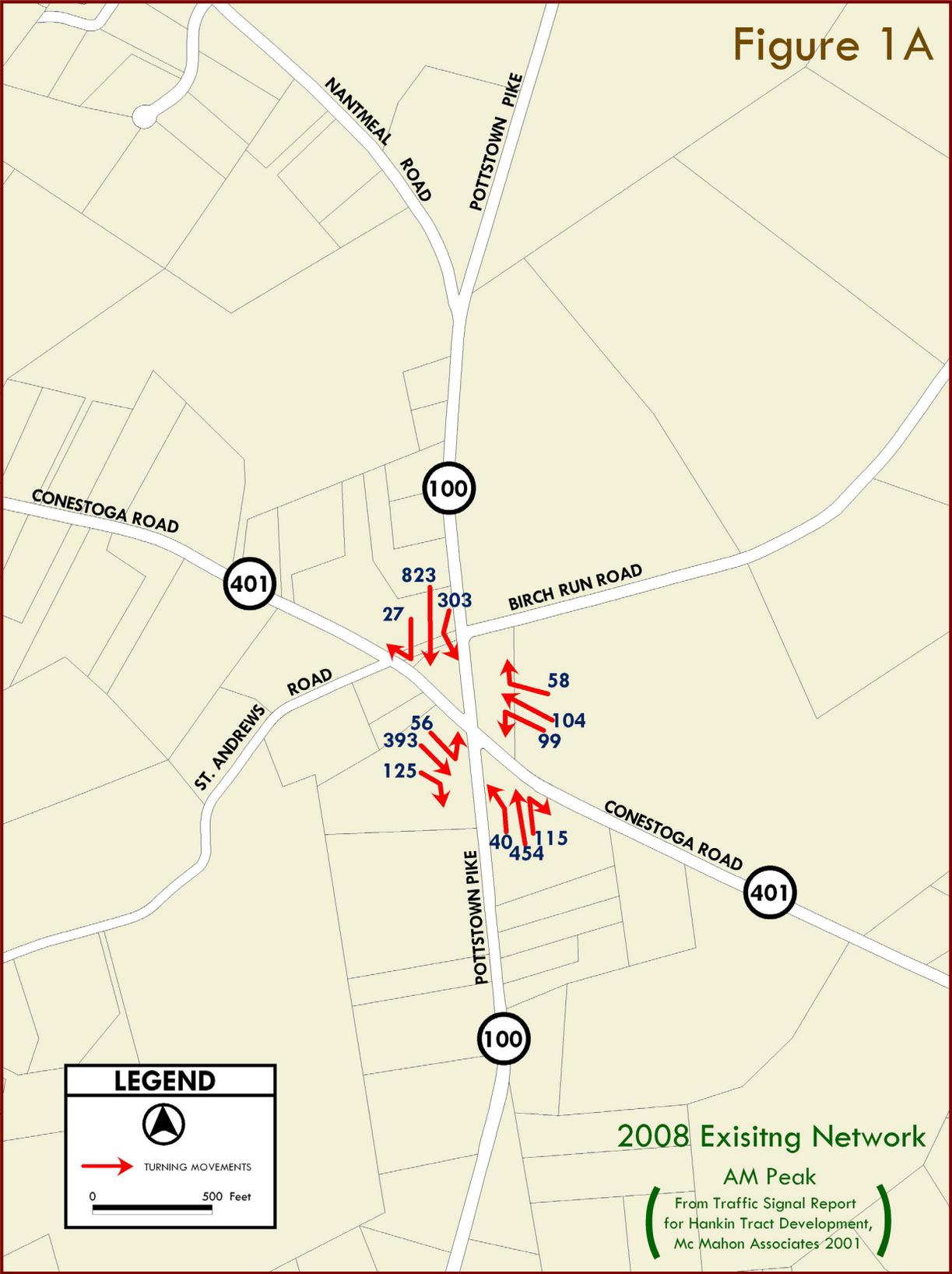
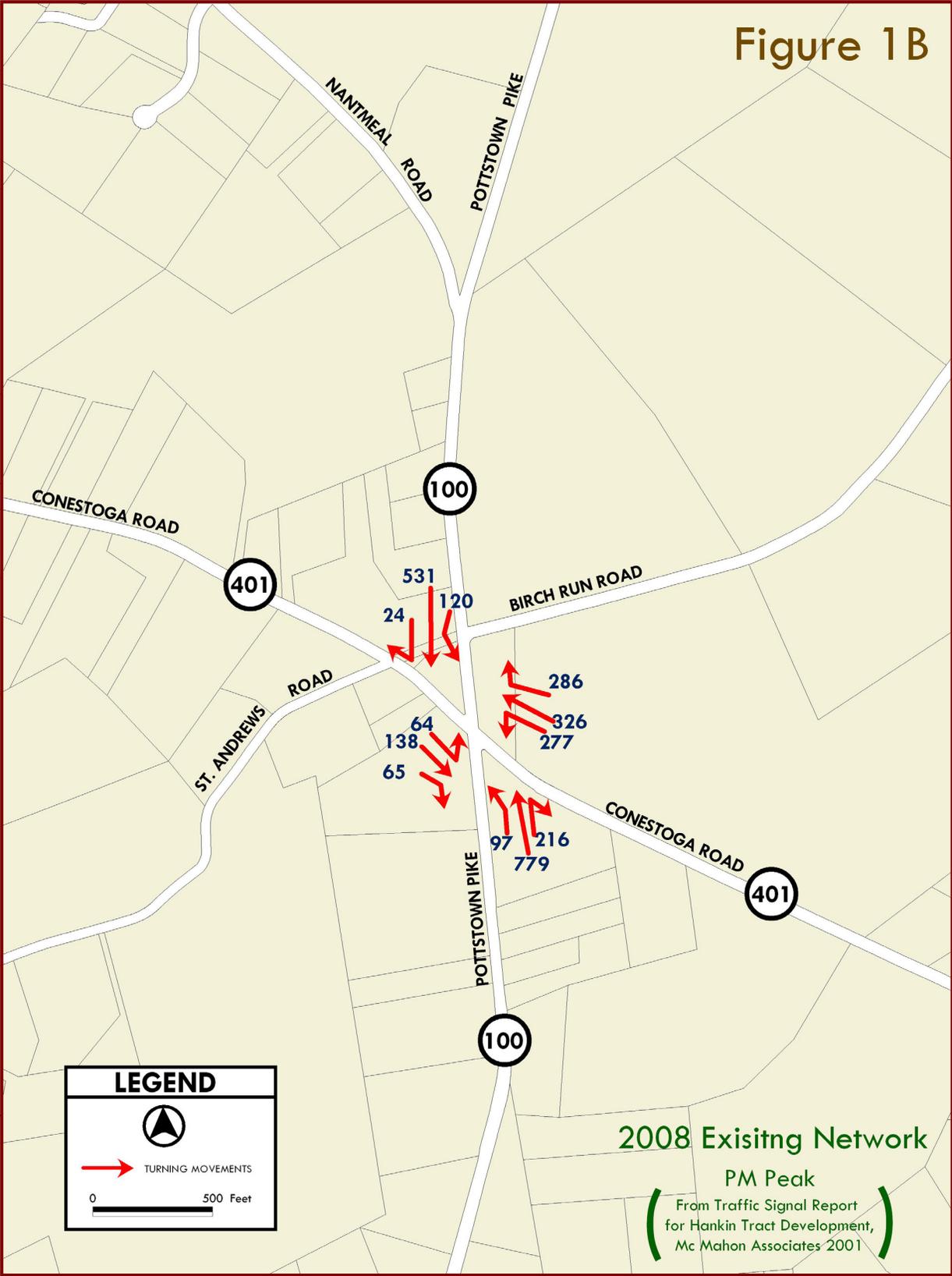


Figure 1B



Northbound 100 to Eastbound 401
Westbound 401 to Southbound 100
Southbound 100 to Eastbound 401
Westbound 401 to Northbound 100

Figures 2a and 2b show the revised trip numbers assuming reductions for the moves listed above. The connector reduces the critical lane results to the following:

AM: 1.23
PM: 1.15

3.2 Enhanced Network with All Connections

In addition to the connector, two further links could be added to eliminate Route 100 right turns from the target intersection, as shown in **Figures 3a and 3b**. These links would serve as (appropriately designed) channelized right turn lanes to accommodate the remainder of right-turning traffic not diverted to the connector. In addition to lower total volumes through the intersection, the separation of right turns would also allow the Route 100 through-lanes to operate at a more efficient level by eliminating the slow-down friction of right-turn movements.

With each of these factors considered, the critical lane results at the Route 100/401 intersection are further reduced to the following:

AM: 1.11
PM: 1.01

In order to get this scenario to “work” according to the critical lane analysis, a certain amount of diversion of regional through-trips to the connector would have to take place to provide further relief for the target intersection. Assuming 25% diversion (see **Figures 4a and 4b**), the critical lane results are as follows:

AM: 0.96
PM: 0.87

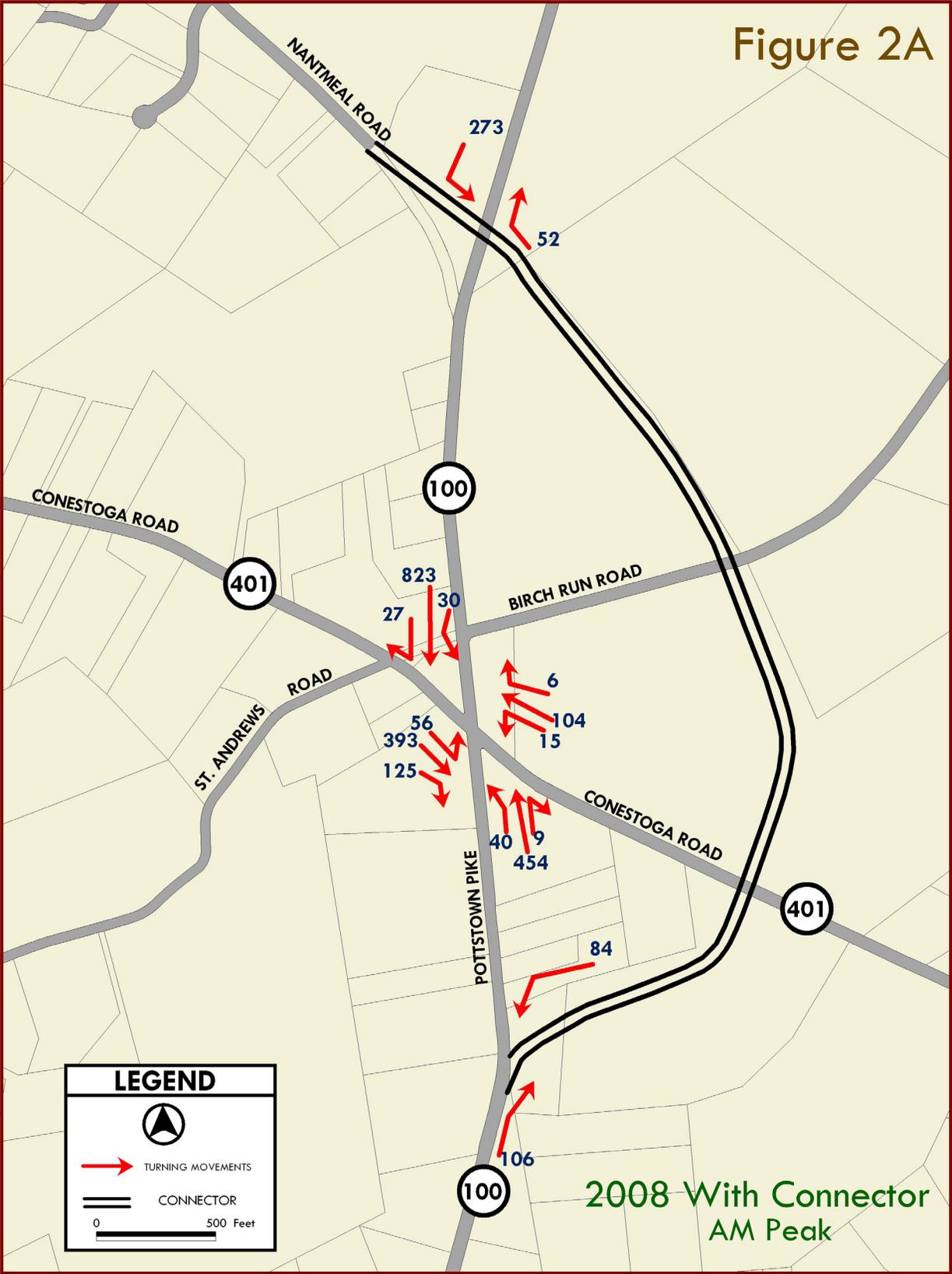
Much of this diversion would occur naturally to “balance” the overall network, as commuters would recognize the Route 100/401 intersection as a constraint and seek to avoid it. Adjusting the signal phases at the connector’s endpoints could further help to achieve a desired balance. This scenario would shift a high volume of turning movements to the connector endpoints, which would be better able (vis-à-vis the Route 100/401 intersection) to absorb them for the following reasons:

- The two critical movements at each of the endpoints (i.e., those shown in **Figures 4a and 4b**) could take place at the same time, as they do not conflict with one another.
- The southbound morning left-turn movement to the connector would vie for green time with only a moderate amount of opposing traffic (especially given a 25% northbound diversion as well) and very low intersecting through-volumes.

3.3 Expanded Route 100

Expansion of Route 100 to four lanes—with a five-lane section at the Route 401 intersection—could achieve the following critical lane results:

Figure 2A



2008 With Connector
AM Peak

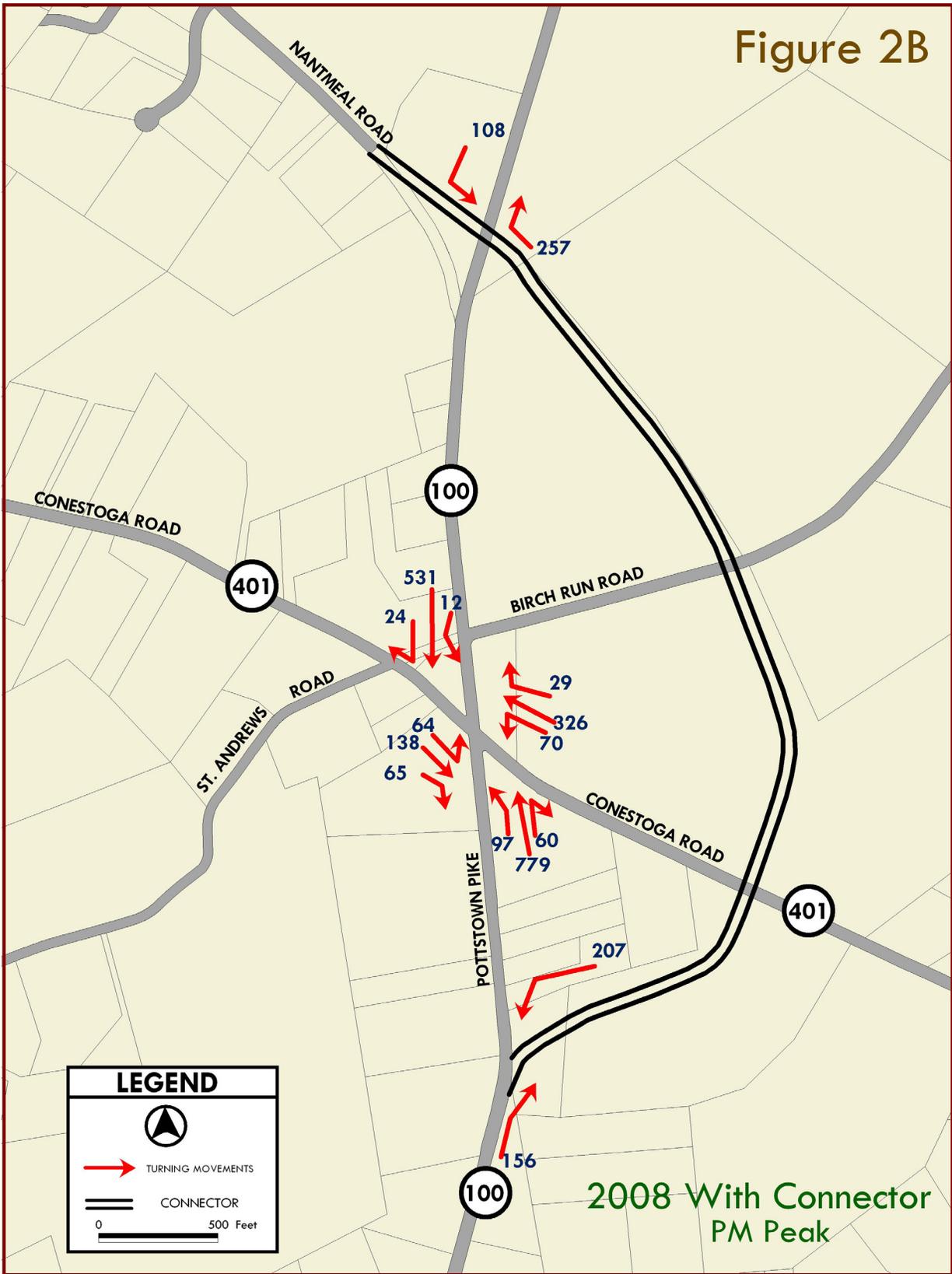


Figure 3A

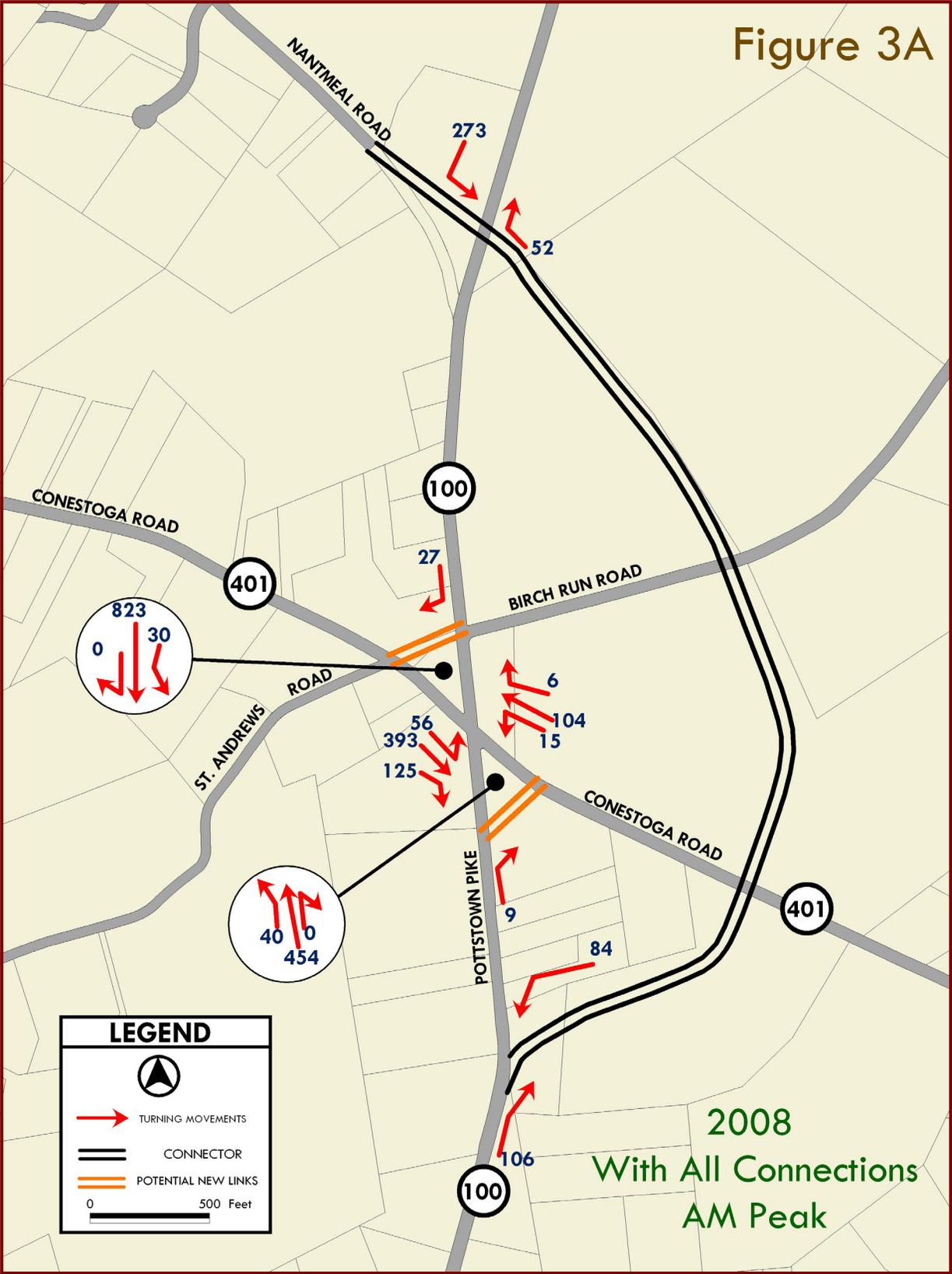


Figure 3B

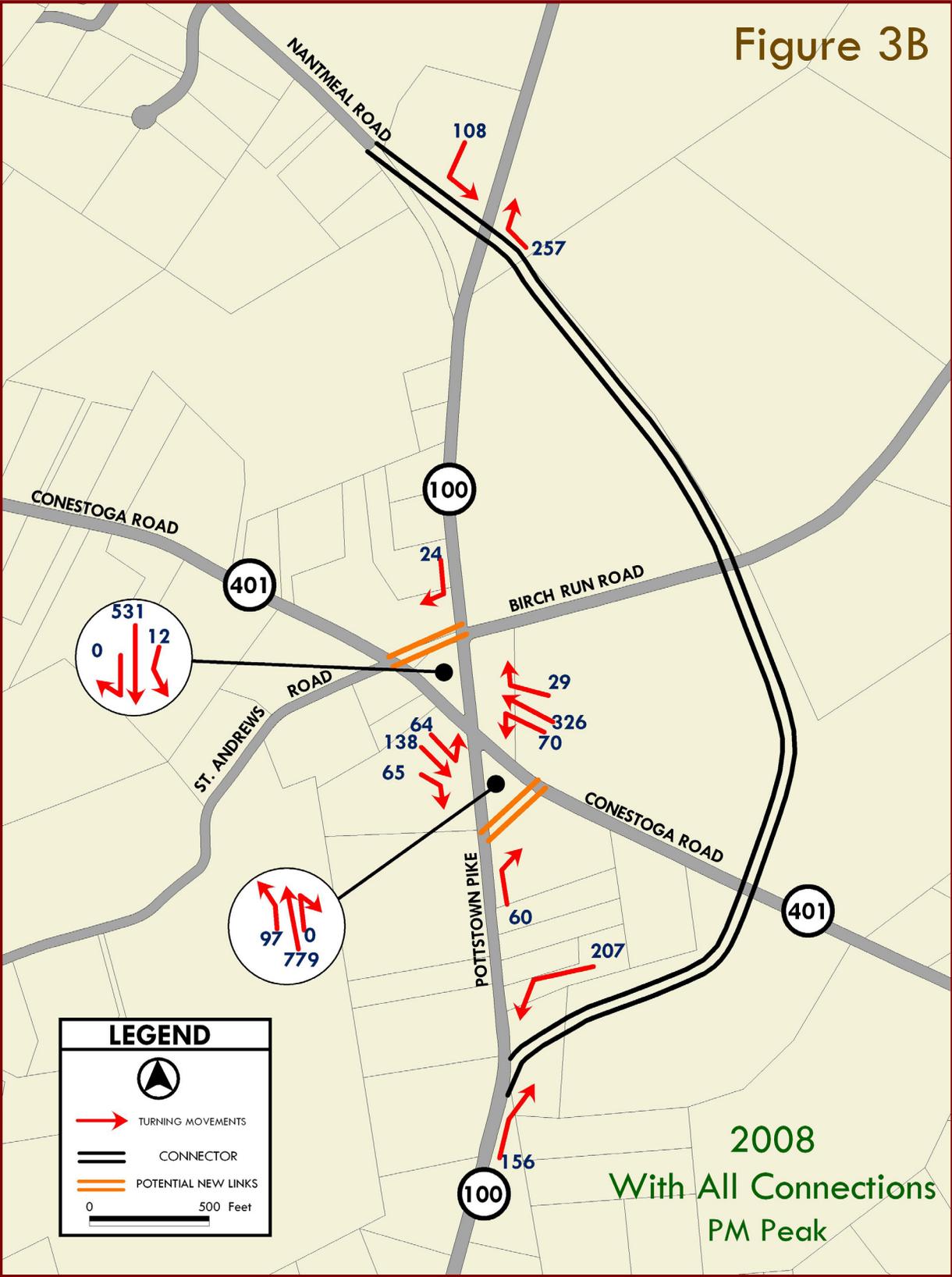
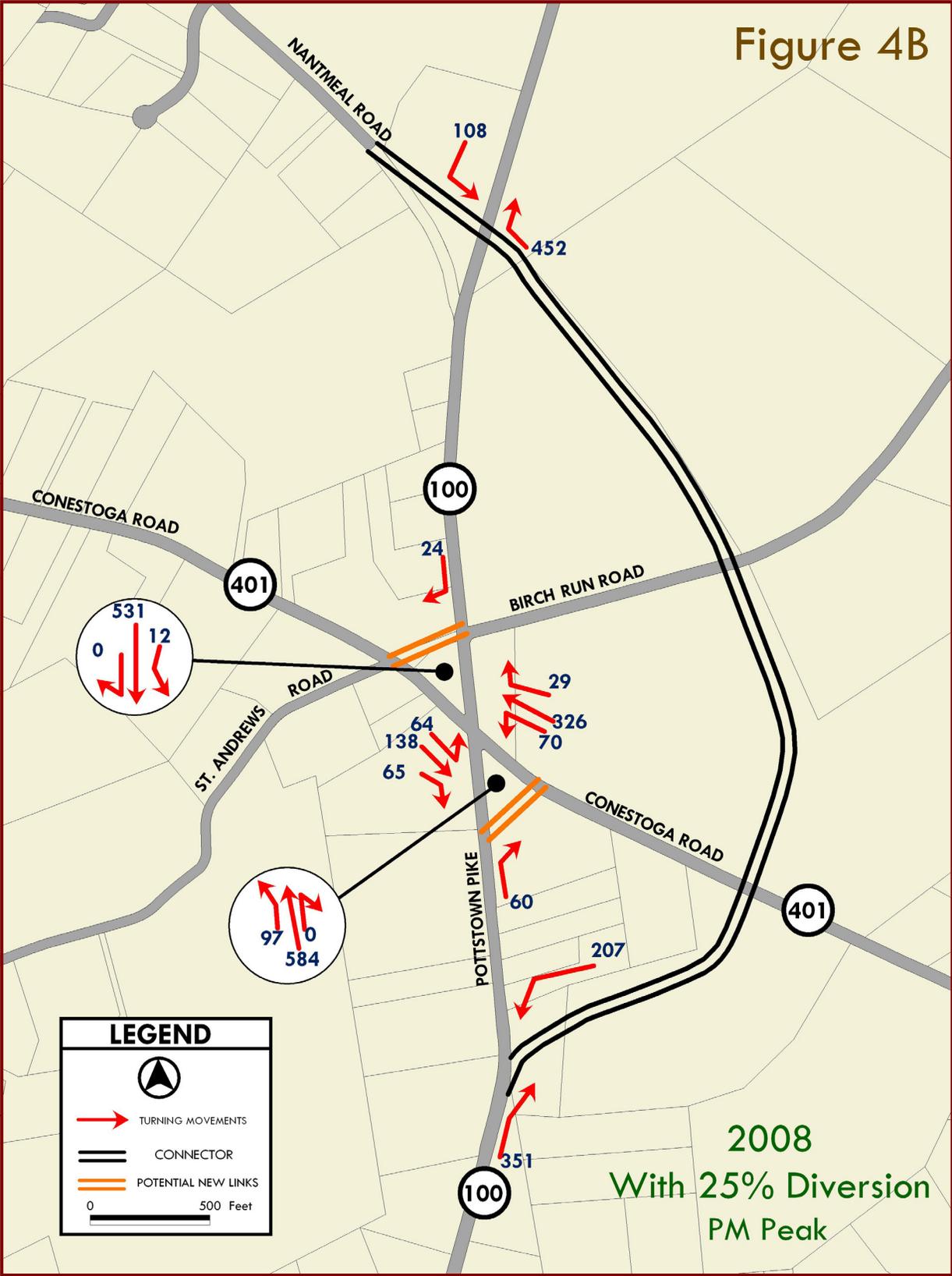


Figure 4B



AM: 1.09
PM: 1.22

Assuming that the expansion would be accompanied by construction of the new connector, the critical lane results would be (applying the same distribution of trips shown in **Figures 2a and 2b**):

AM: 0.84
PM: 0.77

It is important to note that this actual degree of traffic flow improvement could be difficult to achieve for the following reasons:

- The effects of the connector alone may make it difficult to justify the further expense of a Route 100 expansion, as congestion levels would have been lowered to a tolerable range. If it were indeed a question of either/or, both projects would have comparable effects on traffic congestion levels, meaning that other factors (such as development goals or community character) would require consideration.
- IF both projects were implemented, then the improvement to traffic flow would be likely eroded by regional and local “induced” traffic within five to ten years, as the excess capacity would help shape regional commuter and development patterns.

4.0 FUTURE IMPLICATIONS

Assuming the “All Connections” (i.e., without expansion) scenario with successful 25% regional through-trip diversion, the Route 100/401 intersection would be able to absorb approximately 5% more AM trips and 15% more PM trips “across the board” (i.e., maintaining current proportions of traffic to/from all directions). This translates to 88 AM trips and 287 PM trips. This leads to the following conclusions about future development:

- There is more overall availability of traffic capacity in the PM peak. Since retail development has far less impact on the AM peak than do office and residential uses, the traffic figures would argue that the development program in the direct vicinity of Route 100 should consist of a higher proportion of retail vis-à-vis these other uses.
- New office and residential uses should be focused to the east of Route 100 so that they could be effectively served by the connector rather than relying on the Route 100/401 intersection.

In terms of overall development potential of the All Connections scenario, and assuming that this planning process can allocate development in a manner that relies on the Route 100/401 intersection for 20% or less of its AM traffic, then it would be reasonable to accommodate a level of new development that generates a sum-total of 440 new AM trips. An example of such a program would be the following:

Use	Amount	AM Peak Trips	PM Peak Trips
Residential	200 dwelling units	101	200
Office	100,000 square feet	191	186
Retail	50,000 square feet	106	397
Totals		398	783

For the PM peak, assuming that the office and residential uses are located such that 20% of their traffic (77 trips) use the Route 100/401 intersection, approximately one-half of the PM retail trips could be absorbed by the critical intersection. In terms of planning implications, this means that a fair share of late-opening (post AM-peak) retail uses, as well as those that simply cater to pass-by traffic, could be concentrated near or to the west of Route 100 with traffic impacts within an acceptable range.

The preceding example is for illustrative purposes and could be altered to reflect the specific needs of the community and the results of the market analysis.

If Route 100 were expanded (and the connector built), more growth could be supported. However, the following points should be considered:

- The true value of a Route 100 expansion for the township—in terms of potential for new development—would depend very strongly on timing. In short, if development lags behind the expansion project by more than a few years, then most of the excess capacity would be taken up by induced regional through-traffic. Conversely, approval of too much development prior to the expansion project (in anticipation of its eventual implementation) would aggravate near-term traffic problems, compounded further during the construction period.
- A widened Route 100 would, through its physical characteristics and development attraction potential, alter the character of Ludwigs Corner.

5.0 CONCLUSION

This analysis has shown that Ludwigs Corner has several options for addressing its traffic issues and advancing into the future. In all scenarios, the completion of the proposed connector is a critical element due to its ability to divert local traffic around the Route 100/401 intersection.

In the Expanded Route 100 scenario, the connector would be preserved purely for local use, as Route 100 itself would be configured to more swiftly carry regional traffic through the area. The duration of improved traffic flow conditions over time and the physical impact of such a corridor would warrant careful discussion. In the All Connections scenario, which retains a two-lane Route 100 but enhances the street network with new links wherever possible, the connector would share some of the burden of regional through traffic during peak periods.

In terms of overall balance, the All Connections scenario represents the most efficient transportation investment option, in that it addresses current problems, spreads the traffic evenly throughout the network, and minimizes the potential for induced regional traffic.

APPENDIX C: CRITICAL LANE ANALYSIS

General Notes

Assumed Saturation Flows:	straight	1500 vph
	straight plus right turn	1300 vph
	left turn	1400 vph

C/(C-L) estimated at 1.1 for 10% lost time.

2008 Existing Network	phase	period	type	volume	lanes	sat flow	X
Route 100 NB	1a	AM	left	40	1	1400	0.03
	1b	AM	str/right	569	1	1300	0.48
	1a	PM	left	97	1	1400	0.08
	1b	PM	str/right	995	1	1300	0.84
Route 100 SB	1a	AM	left	303	1	1400	0.24
	1b	AM	str/right	850	1	1300	0.72
	1a	PM	left	120	1	1400	0.09
	1b	PM	str/right	555	1	1300	0.47
Route 401 EB	2a	AM	left	56	1	1400	0.04
	2b	AM	str/right	518	1	1300	0.44
	2a	PM	left	64	1	1400	0.05
	2b	PM	str/right	203	1	1300	0.17
Route 401 WB	2a	AM	left	99	1	1400	0.08
	2b	AM	str/right	162	1	1300	0.14
	2a	PM	left	277	1	1400	0.22
	2b	PM	str/right	612	1	1300	0.52
Analysis	AM	0.24+0.72+0.08+0.44				1.48	
	PM	0.09+0.84+0.22+0.52				1.67	

2008 with Connector	phase	period	type	volume	lanes	sat flow	X
Route 100 NB	1a	AM	left	40	1	1400	0.03
	1b	AM	str/right	463	1	1300	0.39
	1a	PM	left	97	1	1400	0.08
	1b	PM	str/right	839	1	1300	0.71
Route 100 SB	1a	AM	left	30	1	1400	0.02
	1b	AM	str/right	850	1	1300	0.72
	1a	PM	left	12	1	1400	0.01
	1b	PM	str/right	555	1	1300	0.47
Route 401 EB	2a	AM	left	56	1	1400	0.04
	2b	AM	str/right	518	1	1300	0.44
	2a	PM	left	64	1	1400	0.05
	2b	PM	str/right	203	1	1300	0.17
Route 401 WB	2a	AM	left	15	1	1400	0.01
	2b	AM	str/right	110	1	1300	0.09
	2a	PM	left	70	1	1400	0.06
	2b	PM	str/right	355	1	1300	0.30
Analysis	AM	0.03+0.72+0.04+0.44			1.23		
	PM	0.08+0.71+0.06+0.30			1.15		

2008 with All Connections	phase	period	type	volume	lanes	sat flow	X
Route 100 NB	1a	AM	left	40	1	1400	0.03
	1b	AM	str/right	454	1	1500	0.33
	1a	PM	left	97	1	1400	0.08
	1b	PM	str/right	779	1	1500	0.57
Route 100 SB	1a	AM	left	30	1	1400	0.02
	1b	AM	str/right	823	1	1500	0.60
	1a	PM	left	12	1	1400	0.01
	1b	PM	str/right	531	1	1500	0.39
Route 401 EB	2a	AM	left	56	1	1400	0.04
	2b	AM	str/right	518	1	1300	0.44

	2a	PM	left	64	1	1400	0.05
	2b	PM	str/right	203	1	1300	0.17
Route 401 WB	2a	AM	left	15	1	1400	0.01
	2b	AM	str/right	110	1	1300	0.09
	2a	PM	left	70	1	1400	0.06
	2b	PM	str/right	355	1	1300	0.30
Analysis	AM	0.03+0.60+0.04+0.44			1.11		
	PM	0.08+0.57+0.06+0.30			1.01		
2008 with 25% Diversion	phase	period	type	volume	lanes	sat flow	X
Route 100 NB	1a	AM	left	40	1	1400	0.03
	1b	AM	str/right	341	1	1500	0.25
	1a	PM	left	97	1	1400	0.08
	1b	PM	str/right	584	1	1500	0.43
Route 100 SB	1a	AM	left	30	1	1400	0.02
	1b	AM	str/right	617	1	1500	0.45
	1a	PM	left	12	1	1400	0.01
	1b	PM	str/right	531	1	1500	0.39
Route 401 EB	2a	AM	left	56	1	1400	0.04
	2b	AM	str/right	518	1	1300	0.44
	2a	PM	left	64	1	1400	0.05
	2b	PM	str/right	203	1	1300	0.17
Route 401 WB	2a	AM	left	15	1	1400	0.01
	2b	AM	str/right	110	1	1300	0.09
	2a	PM	left	70	1	1400	0.06
	2b	PM	str/right	355	1	1300	0.30
Analysis	AM	0.03+0.45+0.04+0.44			0.96		
	PM	0.08+0.43+0.06+0.30			0.87		

2008 Expanded Route 100	phase	period	type	volume	lanes	sat flow	X
Route 100 NB	1a	AM	left	40	1	1400	0.03
	1b	AM	str/right	569	2	2800	0.22
	1a	PM	left	97	1	1400	0.08
	1b	PM	str/right	995	2	2800	0.39
Route 100 SB	1a	AM	left	303	1	1400	0.24
	1b	AM	str/right	850	2	2800	0.33
	1a	PM	left	120	1	1400	0.09
	1b	PM	str/right	555	2	2800	0.22
Route 401 EB	2a	AM	left	56	1	1400	0.04
	2b	AM	str/right	518	1	1300	0.44
	2a	PM	left	64	1	1400	0.05
	2b	PM	str/right	203	1	1300	0.17
Route 401 WB	2a	AM	left	99	1	1400	0.08
	2b	AM	str/right	162	1	1300	0.14
	2a	PM	left	277	1	1400	0.22
	2b	PM	str/right	612	1	1300	0.52
Analysis	AM	0.24+0.33+0.08+0.44			1.09		
	PM	0.09+0.39+0.22+0.52			1.22		

2008 Exp. 100 + Connector

	phase	period	type	volume	lanes	sat flow	X
Route 100 NB	1a	AM	left	40	1	1400	0.03
	1b	AM	str/right	463	2	2800	0.18
	1a	PM	left	97	1	1400	0.08
	1b	PM	str/right	839	2	2800	0.33
Route 100 SB	1a	AM	left	30	1	1400	0.02
	1b	AM	str/right	850	2	2800	0.33
	1a	PM	left	12	1	1400	0.01
	1b	PM	str/right	555	2	2800	0.22
Route 401 EB	2a	AM	left	56	1	1400	0.04
	2b	AM	str/right	518	1	1300	0.44

	2a	PM	left	64	1	1400	0.05
	2b	PM	str/right	203	1	1300	0.17
Route 401 WB	2a	AM	left	15	1	1400	0.01
	2b	AM	str/right	110	1	1300	0.09
	2a	PM	left	70	1	1400	0.06
	2b	PM	str/right	355	1	1300	0.30
Analysis	AM	0.03+0.33+0.04+0.44			0.84		
	PM	0.08+0.33+0.06+0.30			0.77		
Growth (AM 5%, PM 15%)	phase	period	type	volume	lanes	sat flow	X
Route 100 NB	1a	AM	left	42	1	1400	0.03
	1b	AM	str/right	358	1	1500	0.26
	1a	PM	left	112	1	1400	0.09
	1b	PM	str/right	672	1	1500	0.49
Route 100 SB	1a	AM	left	32	1	1400	0.02
	1b	AM	str/right	648	1	1500	0.48
	1a	PM	left	14	1	1400	0.01
	1b	PM	str/right	611	1	1500	0.45
Route 401 EB	2a	AM	left	59	1	1400	0.05
	2b	AM	str/right	544	1	1300	0.46
	2a	PM	left	74	1	1400	0.06
	2b	PM	str/right	233	1	1300	0.20
Route 401 WB	2a	AM	left	16	1	1400	0.01
	2b	AM	str/right	116	1	1300	0.10
	2a	PM	left	81	1	1400	0.06
	2b	PM	str/right	408	1	1300	0.35
Analysis	AM	0.03+0.48+0.05+0.46			1.02		
	PM	0.09+0.49+0.06+0.35			0.99		

APPENDIX D: DETAILED NATURAL RESOURCE EVALUATION

West Vincent Township revised its Zoning Ordinance in 2003, with a significant objective of "...the preservation, protection, management, and enhancement of the natural resources and environmental qualities of West Vincent Township...", (Zoning Ordinance, 2003). Using the Natural Lands Trust and Growing Greener Conservation Oriented Design techniques, West Vincent Township is striving to achieve their development objectives along with preservation of important natural and open space resources. The discussion that follows below primarily focuses on the methodology used to prioritize natural resources into Primary Conservation Areas and Secondary Conservation Areas. This technique, while certainly valuable and unquestionably important, does not take into account every important natural resource feature. Discussion at the end of this section focuses on other important conservation and natural resource protection issues for the Ludwigs Corner study area.

West Vincent Township's Zoning Ordinance offers water resource protection through the use of a *Water Resource Protection Overlay District*. This area coincides with local and regional recharge areas and areas susceptible to ground and surface water contamination. Significant alteration and development in this district may be hazardous with respect to the contamination of ground and surface waters, and thus wetlands, high groundwater areas, and riparian buffers are afforded a greater degree of attention if development is proposed. In addition, this overlay district requires a greater degree of hydrogeologic impact analyses for any well development (See Ordinance No. 78-1997). In the Ludwigs Corner study area, this district affects very few parcels, as few as ten in the southwest portion of the study area.

1.0 Primary Conservation Areas

Primary Conservation Areas (Figure 1) comprise only the most severely constrained lands – submerged lands (streams and lakes), floodplains, wetlands, and slopes greater than 25 percent – where development is restricted under current West Vincent Township zoning ordinances. The Township requires mapping of conservation features in the Design Standards found in Article XIX of the Zoning Ordinance, as well as in procedures found in various sections of the Subdivision and Land Development Ordinance, SDLO (Step 1- Delineation of Greenway Lands for Residential Subdivision applications, and Existing Resources and Site Analysis Plan requirement of the Preliminary Plan). The Design Standards have been established to support the natural resource conservation objectives of the Township Comprehensive Plan and the Open Space, Recreation, and Natural Resources Plan.

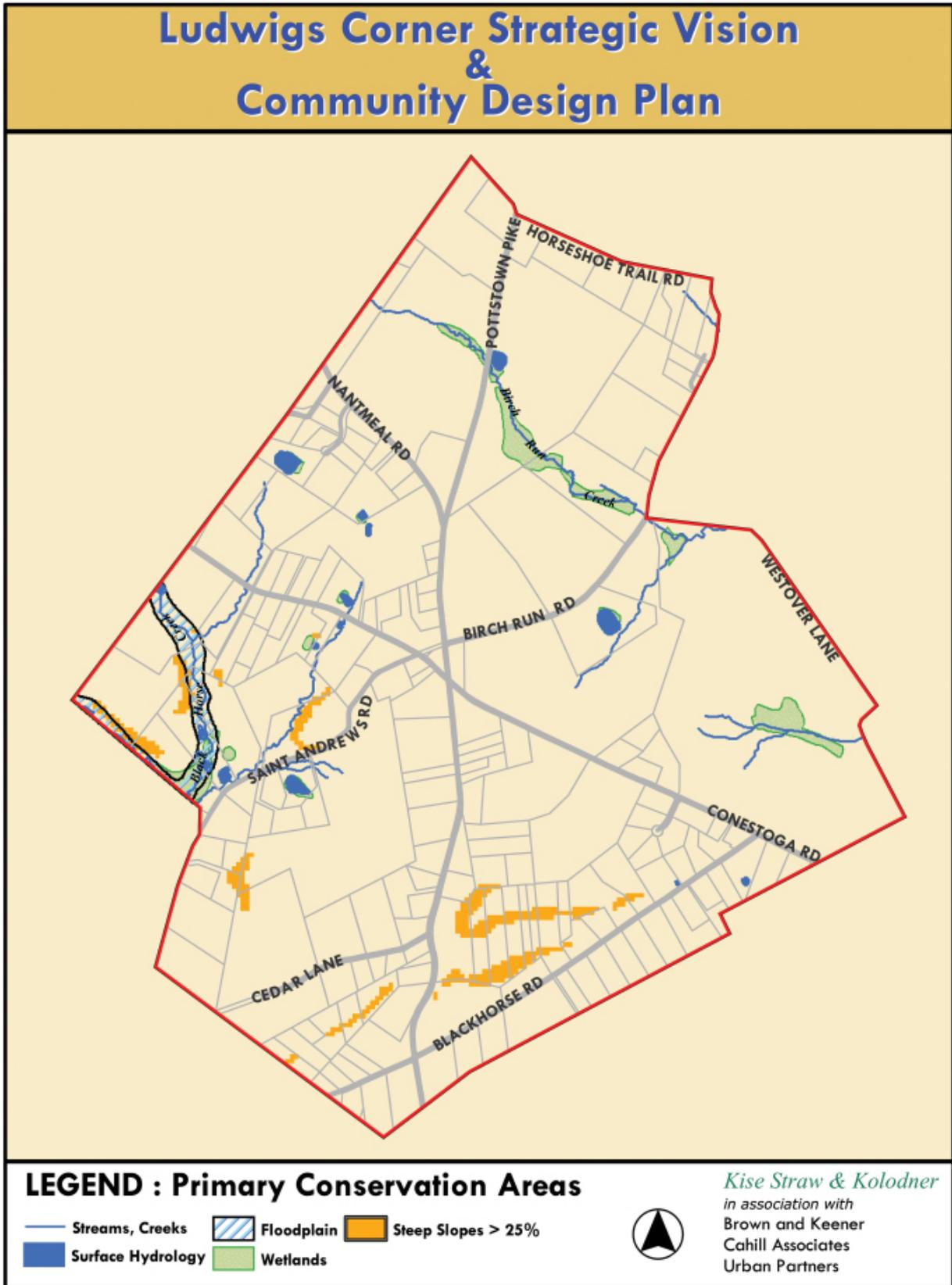
1.1 Submerged Lands (Surface Hydrology)

Ludwigs Corner is situated at the "top" of a hydrologic system that drains to three distinct watersheds. The PA Department of Environmental Protection (PADEP) has recognized the importance of these watershed systems and provided protection from degradation through the Exceptional Value and High Quality streams classification (see Chapter 93-Water Quality Standards below). Protection notwithstanding, all surface streams and lakes are subject to impairment pressures from surrounding land uses and development activities. Ludwigs Corner is also under significant suburbanization pressures from the region and it is this combination of local and regional forces that increase the potential for degradation and/or elimination of important natural surface water features. First Order Streams, which are not protected under existing Township zoning, are discussed in greater detail under "Other Conservation Features."

1.2 Floodplain (Floodway)

Floodplains and the riparian areas buffering streams, lakes, and other surface water features are especially sensitive zones that provide multiple critical ecological benefits. In their naturally vegetated and

Figure 1 – Primary Conservation Areas



undisturbed state, floodplains and riparian areas provide crucial stormwater management and flood control functions, aiding in both water quantity and water quality control. These areas intercept stormwater runoff and actually “store” (absorb) out-of-bank-flows that occur as storm intensity increases. Nonpoint pollutants are filtered through the vegetation while chemical and biological interactions take place both on the surface and subsurface, reducing pollutant loadings.

The naturally vegetated floodplain and riparian zone also provide stream shading via tree and shrub canopy. This important function regulates water temperature and reduces overheating of waters in the summer. Also, the vegetation provides detrital matter (leaves and twigs) that serves as an important food source for aquatic biota. Floodplain and riparian zone vegetation anchors the streambank and inhibits scouring, undercutting, and overall erosion, important to maintain the stream’s morphology, its system of meanders and riffles, and resulting aquatic habitat. Floodplains and riparian areas, when conserved, provide an effective system of greenways linking larger open space masses to support habitat for humans and non-human species. In short, undisturbed floodplains and riparian areas are absolutely essential watershed elements.

A relatively small portion of the Ludwigs Corner study area contains Federal Emergency Management Agency (FEMA)-identified 100-year floodplains. Shown in Figure 1, floodplains have only been identified west of Saint Andrews Road near the border of the Township. It must be noted that FEMA-standards focus primarily on protection of “life, limb, and property” and are not intended statutorily to be a program of watershed management or floodplain protection. The FEMA standards themselves offer minimum protection standards, which are inadequate and allow for additional floodplain and riparian zone impacts to occur. Filling and even structural construction may occur, provided that impacts are not substantial and the lowest habitable floor areas are properly flood-proofed. Furthermore, massive vegetative clearing, soil disturbance, paving, and so forth may occur in the floodplain under the FEMA program.

The Township’s *Flood Plain Conservation (FPC) Overlay District* provides protection for land identified by FEMA as being within an area subject to the one hundred year flood. Given that a relatively small portion of floodplain is within the study area, this overlay district does not protect the sensitive first order, or headwater, streams. Further discussion is provided on this topic in Headwaters/First Order Streams section below.

1.3 Wetlands

Wetlands are transitional lands between terrestrial and aquatic environments and include swamps, marshes, and bogs. Wetlands can also include areas that may not always have standing water – hydric or alluvial soils are a strong indicator of wetland areas. Wetlands are unique environments that provide critical ecological and environmental functions including water storage, flood water abatement, water quality improvement, provision of vital plant and wildlife habitat, groundwater recharge in some cases, and in most cases groundwater discharge. The Township defines wetlands in the Zoning Ordinance as “...those areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support... ...a prevalence of vegetation typically adapted for life in saturated soil conditions.”

Wetlands within West Vincent Township (see Figure 1) have been identified and mapped according to National Wetland Inventory (NWI) program. The U.S. Fish and Wildlife Service administer the NWI Program, and classify wetlands according to a hierarchical system. All wetlands found within Ludwigs Corner are classified Palustrine, which includes all nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens. One important point to stress concerning the NWI Program is the data only provides an approximate mapping of wetlands based on interpretation of high altitude aerial

photography. Though NWI-classified wetlands are often used for regulatory purposes, they are rarely a complete data source for wetlands and should be supplemented with ground “truthing” and field delineation, especially of hydric soils, which are used as an indicator of wetlands. The Board of Supervisors may recommend further wetland delineation to supplement the NWI mapped wetlands.

1.4 Prohibitive Slope District

A very small portion of Ludwigs Corner is situated in the Prohibitive Slope District, defined as areas with slopes greater than 25 percent (see Figure 1). These steep slope areas are found either along the streams edge or ridge tops. Excessively steep slopes, while rare in the Piedmont rolling topography, should be highly protected for the important functions of reducing erosion and sediment and protecting downstream properties from flooding by slowing stormwater runoff. Buildings and structures are prohibited in this Slope District, which is currently protected by the *Steep Slope Conservation Overlay District* of the Zoning Ordinance.

2.0 Secondary Conservation Areas

Secondary Conservation Areas, defined in the Zoning Ordinance, are those areas that “...do not create severe limitations for development but which designations as greenway areas, along with the preservation of primary conservation areas, is desirable for purposes of providing an interconnected system of open space and recreation.” These areas include precautionary slopes (15% - 25%), areas with seasonal high water table soils, woodlands, and visual resources, which together are crucial to create a healthy, inclusive network of open space throughout the Township. These features, mapped for the study area in Figure 2, provide important building blocks— environmental, recreational, and agricultural – for open space, recreation, and natural resource protection and should continue to be maintained via the conservation oriented design standards in the Township’s Zoning Ordinance and Subdivision and Land Development Ordinance.

2.1 Precautionary Slope District

The Precautionary Slope District includes those areas with a range of percent slope from 15 % up to 25% and occurs at a greater frequency in the study area (Figure 2). Though not prohibited from development, it is recommended that these areas be preserved through conservation design options in the Zoning Ordinance. The *Township’s Steep Slope Conservation Overlay District* protects steep and very steep slopes from excessive and inappropriate development in order to protect downstream properties from flooding, to maintain the ecological integrity and habitat value, and to encourage the use of these areas for open space and conservation uses.

Permitted uses stated in Article XVII include public parks and recreation uses, agricultural uses, single-family detached dwellings, accessory buildings or structures, and impervious surfaces as a function of the Base Zoning District and Maximum Total Impervious Surface as a Percentage of Total Tract Area in the Slope District.

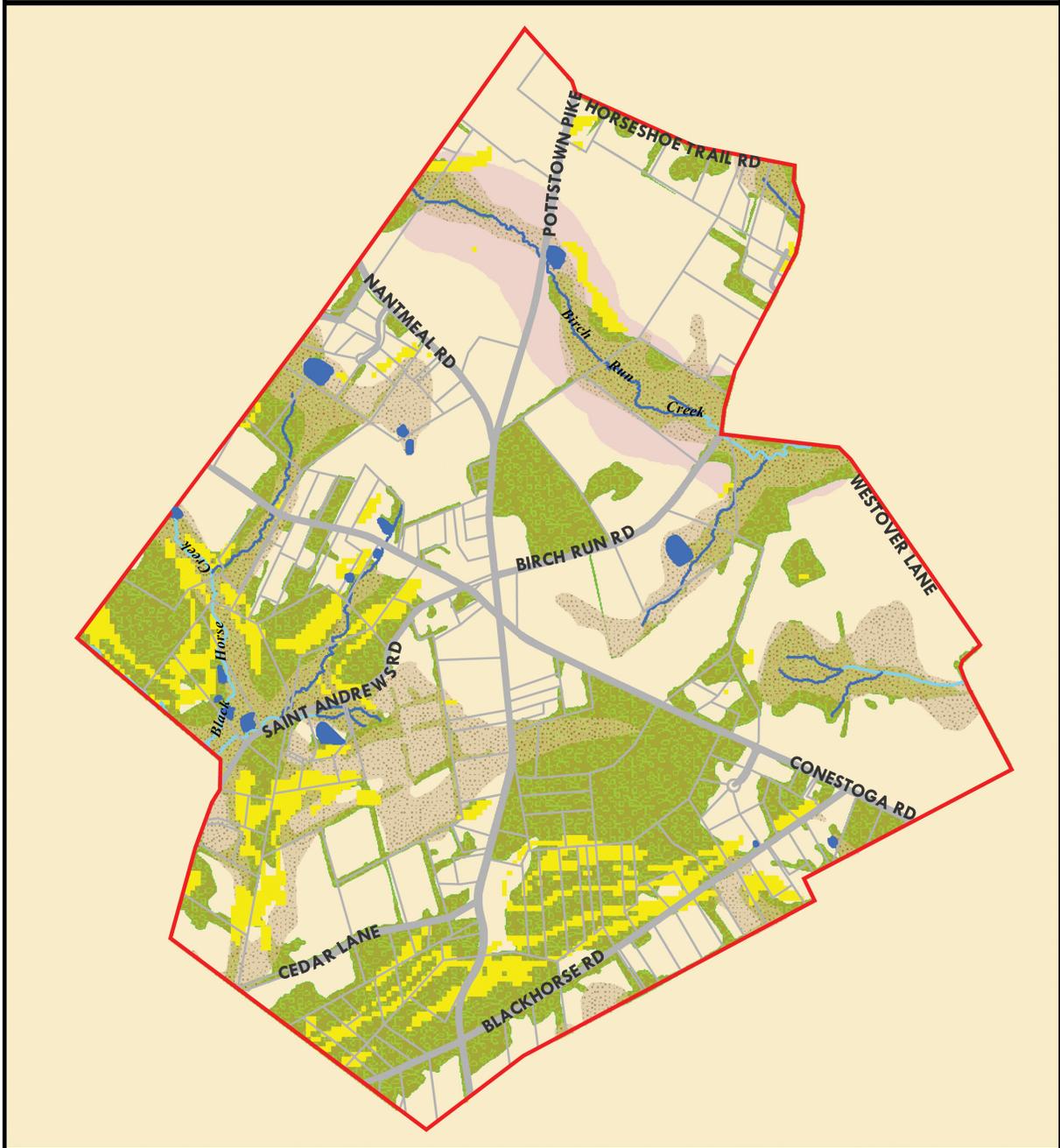
2.2 Seasonal High Water Table Soils

Seasonal high water table soils, shown in Figure 2, are those soils described as having a minimum depth of 1.5 feet or less to the seasonal high water table (defined in the Chester County Soil Survey). These alluvial or “wet” soils are often found adjacent to streams and creeks, and frequently include wetland areas. These soils are poorly drained usually on a seasonal basis, and typically do not allow for economically beneficial development activities or agriculture uses.

All soil types in Pennsylvania have been assigned an Hydrologic Soils Group (HSG) rating, A through D, which describe the physical drainage and textural properties of each soil type (usually defined as a range of permeability), as well as certain physical constraints such as depth to bedrock and seasonal high water

Figure 2 – Secondary Conservation Areas

Ludwigs Corner Strategic Vision & Community Design Plan



LEGEND : Secondary Conservation Areas

- 1st Order Streams
- Scenic River Designation
- Precautionary Slopes, 15-25%
- Seasonal High Water Table Soils
- Woodlands



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table. Soil types assigned an HSG Group A classification are very well drained and highly permeable, while Group D soils are poorly drained, with B and C soils with good to fair drainage characteristics. Figure 3 shows the HSG soils mapping. The majority of the study area is classified in Group B, indicating very permeable, well draining soils. This information is critical when considering land based stormwater and wastewater management systems. Seasonal high water table soils correspond to soils with HSG classification of “C” or “D”. Seasonal high water table soils often indicate areas of groundwater discharge and are critical for environmental functions as described and desirable for an interconnected system of open space and recreation.

2.3 Woodlands

A large amount of study area contains naturally wooded, forested areas (Figure 2) with the majority found south of Conestoga Road. These wooded areas are critical ecological elements that contribute significant environmental and scenic values for the Township and region as a whole. Forested areas are connectors for open space, provide migration corridors for bird and other wildlife species, and when buffering the stream these areas provide critical water quality and quantity benefits. Contiguous areas have a higher ecological value than isolated forested islands, though every wooded stand provides some degree of ecological functions, which are of great value for protection.

Without delving into the science in great detail, the dilemma confronting developing regions is to minimize the loss of species diversity by minimizing the loss of habitat. An important objective is to minimize the impacts of habitat fragmentation and negative edge effects, which occur so frequently in developing suburban areas where small, isolated, unconnected and unplanned patches of natural habitat may be preserved, but with minimal habitat benefit if habitat is interrupted with frequent intrusions and interruptions. In order to maximize the important natural ecological functions (or “services”), the science of landscape ecology has demonstrated that the most beneficial or efficient way to optimize ecological functions provided by landscape is through a system of interconnected networks, linking core reserve areas with natural corridors. Such a system if properly planned can provide critical mating variety, food supply, shelter opportunities, and overall support to foster greater species diversity.

West Vincent Township’s conservation design standards in the Zoning Ordinance offer incentives to developers in order to protect forested areas to the greatest extent possible. Though not a specific overlay district, applicants proposing development on tracts with large amounts of wooded land are given incentives if their design attempts to protect these wooded areas, especially in locations where wooded areas coincide with other secondary conservation features. In the Ludwigs Corner study area, the wooded layer covers more acreage of land than any one other secondary conservation feature, and should be preserved in combination with other secondary features in order to offer maximum interconnected open space and natural resource protection.

2.4 Visual Resources

The landscape of Ludwigs Corner is a rich assortment of wooded hillsides, stream valleys, field and pastures, with historic elements scattered throughout, and Township officials deemed these resources worthy of inclusion in the interconnected fabric of open space. Two important studies have been prepared which are useful to this Secondary Conservation Area category:

West Vincent Township Open Space and Recreation Plan, 1992: A Visual Landscape Quality analysis was prepared for this report and delineated areas of both visual “accents” and “intrusions” located within the “public viewshed”. The results of the analysis are summarized in map form at a scale of 1” = 800’ on display at the Township offices (a portion of which is included in Figure 4). Within Ludwigs Corner, nine visual accents, two visual intrusions, and 3 vista points on public roads were identified. The

majority of land was classified “Visually Significant Landscapes–Upland”, with portions of the Township south of Conestoga Road classified as “Non Scenic or Not Visible from Public Roads within the Township”. While the Township has no section in the Zoning Ordinance that specifically regulates scenic resources, as with other Secondary Conservation Features, incentives are provided to applicants who propose development which attempt to maintain and conserve these resources.

French Creek Scenic River Corridor, 1982

The Federation of Northern Chester County Communities of which West Vincent is a member obtained Pennsylvania Scenic Rivers Designation in 1982 for the French Creek. Rivers included in the Scenic Rivers System Scenic are defined as “free-flowing and capable of, or under restoration, to support water-cased recreation, fish and aquatic life. The view from the river or its banks shall be predominately wild, but may reveal some pastoral countryside. The segment may be intermittently accessible by road.” The Corridor surrounds Birch Run, a tributary to the French Creek, which begins in East Nantmeal Township and flows through the northern portion of Ludwigs Corner (Figure 2).

Figure 3 – Hydrologic Soil Groups

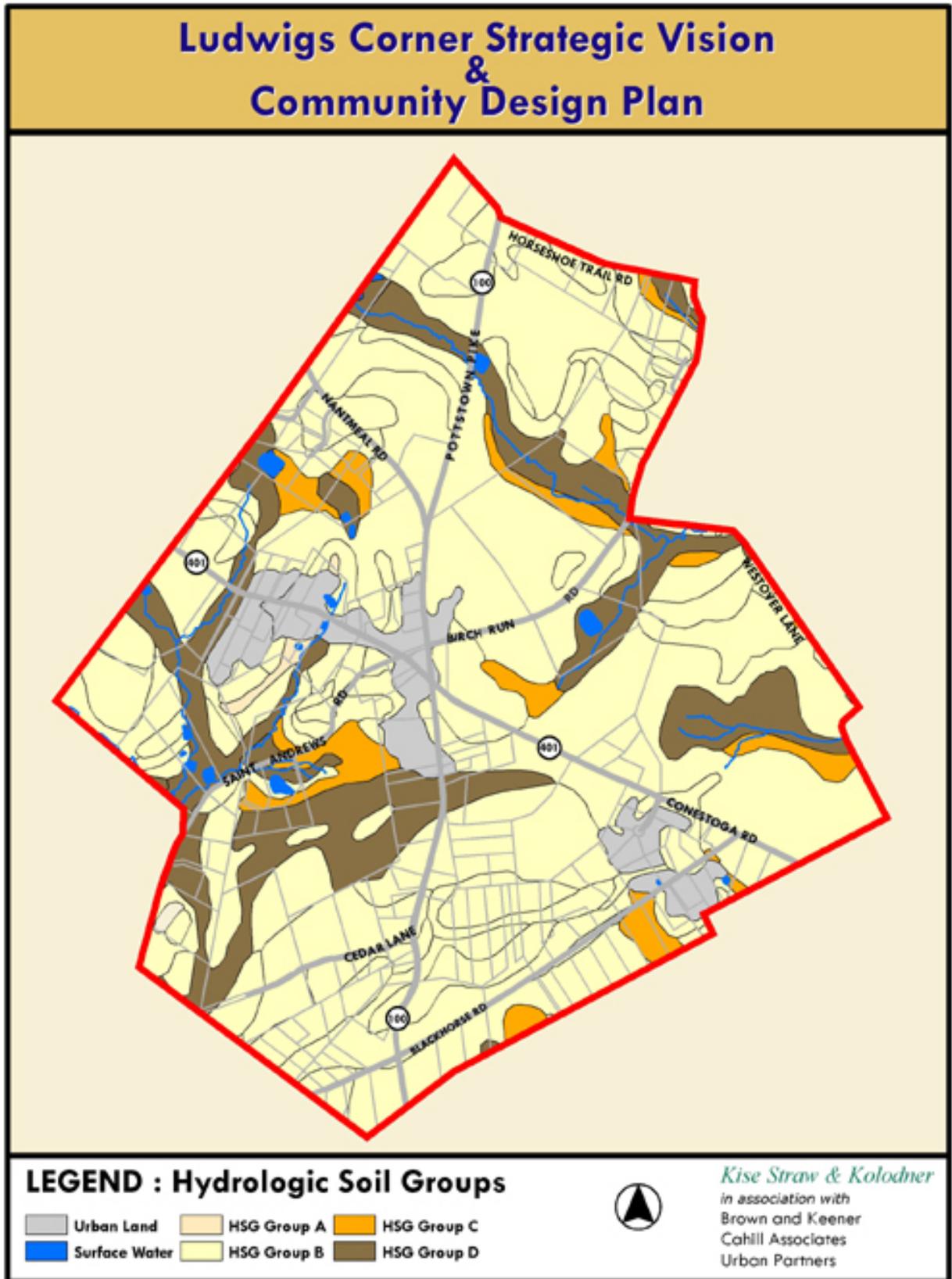
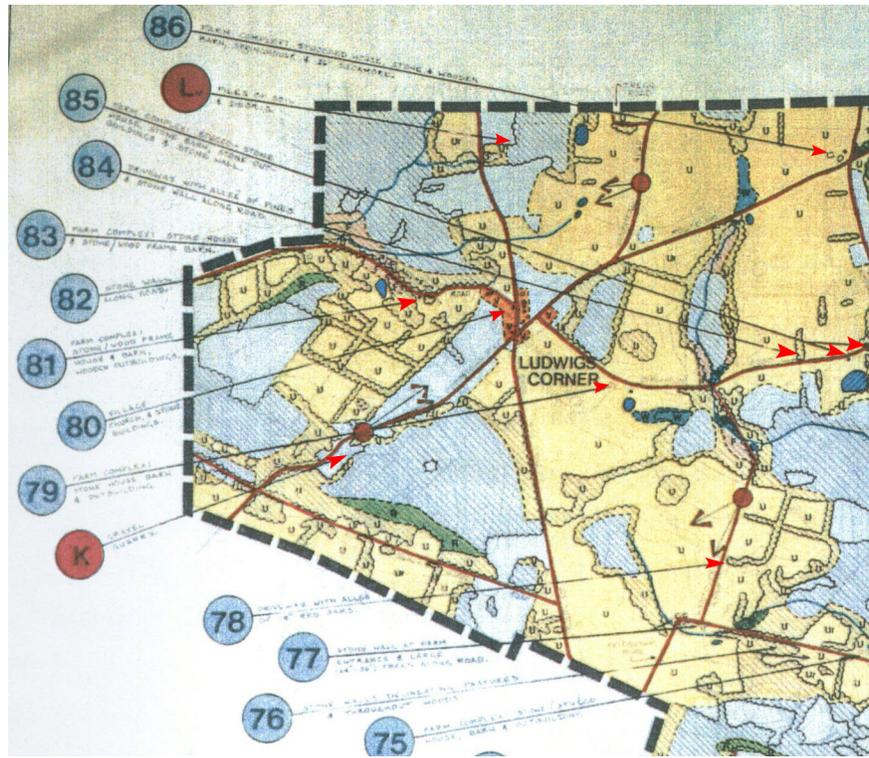


Figure 4 – Visual Resource Analysis



3.0 Other Conservation Features

3.1 Sustainable Watershed Management Program

Sustainable Watershed Management (SWM) was developed by the Green Valleys Association to manage the special land and water systems that comprise the watersheds of Northern Chester County, which corresponds to more than half of the land in the Ludwigs Corner area. Land in the western portion of Ludwigs Corner drains to the Black Horse Creek Sub Basin prior to confluence with the Brandywine Creek Watershed. Land in the south drains to the Pickering Creek Watershed prior to confluence with the Schuylkill River. The remaining land in the north portion of the study area drains to the French Creek Watershed. The French Creek and the Pickering Creek watersheds are two important headwater systems in the SWM program.

The premise of the SWM program is that through the use of science and innovative techniques, we can achieve effective land management patterns that reduce impact to the water resources in the exceptional value sub-basins. Major goals of the SWM include water quality and water quantity conservation. In terms of water quantity, conservation practices include onsite water supply and recycling/reuse measures. Onsite wastewater conservation techniques are also recommended. Fortunately, West Vincent Township is implementing SWM water quantity goals through spray irrigation and onsite septic systems. Additionally, land based stormwater management is critical to achieve both water quantity and water quality objectives.

Headwaters/First Order Streams

An important characteristic of the stream structure and the SWM program relates to the ordering of streams. First order streams are especially important to watershed life because they comprise the largest percentage of the total stream system on a lineal percentage basis. Headwaters are the locations of critical ecological operations, where exchange of energy from land to water occurs directly and is most ecologically vital. Flows in these small headwaters are generally small – provided by discharge from the ground through springs and seeps – and these first order streams are extremely sensitive. When water levels decline in periods of drought, headwaters are the first streams to dry up. The maintenance of base flow during drought periods is most critical in those small, individual streams.

Figure 5 shows the first order streams found within the study area. A majority of surface streams are headwaters, further illustrating the importance of sustainability in this area.

Pennsylvania Code, Chapter 93: Water Quality Standards/Special Protection Waters

As part of the water quality standards program, PADEP conducts stream use designation evaluations on an ongoing basis, pursuant to Chapter 93 of the Department's Rules and Regulations. All Commonwealth waters are protected for a designated aquatic life use as well as a number of water supply and recreational uses. The use designation shown in the water quality standards is the aquatic life use. Streams with excellent water quality may be designated High Quality Waters (HQ) or Exceptional Value Waters (EV). Aquatic life uses are Warm Water Fishes (WWF), Trout Stocking (TSF), Cold Water Fishes (CWF), and Migratory Fishes (MF).

The entire study area resides within Special Protection Waters, shown in Figure 5.

3.2 Prime Agricultural Soils

The Capability classification for soils is a grouping that shows the suitability of that soil for farming uses. Class I soils have few limitations that restrict their use, while Class VIII soils are too rough, shallow, or otherwise limited for agricultural use. The Pennsylvania Municipalities Planning Code defines Prime Agricultural Soils as Class I, II, or, III soils (Figure 6). These soils are important natural resources for the preservation of agricultural activities in the Township.

3.3 Chester County Natural Areas Inventory / PNDI

Pennsylvania Natural Diversity Inventory (PNDI) is a statewide cooperative project between the PA DCNR Bureau of Forestry, The Nature Conservancy and Western Pennsylvania Conservancy. PNDI is the natural heritage program of Pennsylvania and uses a site-specific information system that describes significant natural resources within the Commonwealth for environmental review and data requests. This system includes data descriptive of plant and animal species of special concern, exemplary natural communities and unique geological features. Findings are summarized by County and reported in a Natural Areas Inventory, with the recommendation that each Township consider these areas for preservation.

Chester County's Natural Areas Inventory (2000) was examined to determine whether species of concern or important natural habitats occur in the Ludwigs Corner study area. According to the report, though many sites and species are found throughout the Township, none occur within Ludwigs Corner. PNDI records were queried and indicate no occurrences of plant species of special concern within the project area.

Figure 5 – Hydrologic Resources



Figure 6. Prime Agricultural Soils

