

6.0 Choices for our Future

A plan is only as strong as its related action or implementation component. As a matter of good public policy and economic common sense, “getting it done” needs to be paired with “doing it right.” The development of an action plan constitutes a proactive, strategic approach to moving from the planning and design stages to implementation and construction (as applicable).

As important challenges and decisions are faced in the months and years ahead, the action plan should be the frame of reference to which the Borough, Townships and County’s elected officials and transportation planning officials can refer in implementing new policies and programming transportation projects. The purpose of the action plan is to provide the framework for many of the decisions that will need to be made along the way.

Transportation plays a significant role in determining how communities grow and function, and should be considered as an essential part of land use management initiatives. This study recognizes the dynamic that exists between transportation and land use management and offers a menu of recommendations geared towards improving safety, roadway capacity, intermodalism, community design, and the coordination of transportation and land use planning.

Land Use & Development Recommendations

Waterford Borough Main Street Character

Waterford Borough and Waterford Township should coordinate on the preparation of a town master plan as part of a strategy for “in-fill” development from the center of the borough to the “Y” intersections on both the northern and southern ends of the borough. The recommendation is intended to extend the traditional Main Street character of the borough out to US 19’s intersections with PA 97 North and South.

The Borough currently uses a Transitional Zone, which provides for commercial and apartment development in the borough through the redevelopment of existing structures and land. Waterford Township currently has the area along US 19 south of the Borough to the “Y” zoned as B-1 (Business). Permitted uses for this district include retail, food services, banks, hospitals and clinics, clubs, auto sales and repair, residential and many other similar uses.

1. New development should reflect the overall village development pattern (which is a considerable community asset), rather than develop inconsistently or in conflict with the existing use. New construction should be compatible with surrounding properties.
2. Provisions should be made for bicycles and pedestrians.

- a. Waterford Borough and Waterford Township should consider establishing a joint bicycle-pedestrian greenway committee to serve as an advisory group to their planning commission and the Erie MPO. This Committee would oversee the implementation of the bicycle, pedestrian and greenway elements of this study, establish short and long term priorities, and administer future public involvement and outreach. The Committee would also provide technical guidance on matters related to bicycle and pedestrian planning, and provide assistance on any plan updates to the Waterford Borough, Waterford Township and Erie County's Comprehensive Plan.
 - b. Waterford Borough and Waterford Township should consider adopting a Landscaping Ordinance that would require the construction of sidewalks (minimum width of 4 to 5 feet) for all new non-residential land developments. For pre-existing development along the US 19 corridor, the borough and township could consider several approaches for installing sidewalks:
 - PennDOT's Transportation Enhancement Funding
 - Pennsylvania Department of Community and Economic Development (DCED)
 - Private donations
 - General funds
 - Redevelopment of properties
 - County matching funds to encourage landowner buy-in.
 - c. Waterford Borough should consider adopting a "toolbox" of traffic calming devices aimed at improving pedestrian safety in the downtown area. A valid concern of residents is the volume and speed of through traffic. Traffic calming techniques such as bulb-outs and chokers can slow motorists while improving safety for pedestrians. In the case of chokers, the effect of narrowing the street slows traffic and reduces pedestrian crossing times, thus improving the downtown area's "walkability" and safety.
3. Waterford Borough and Waterford Township should consider amending their zoning ordinances to encourage the following off-street parking principles along the US 19 Corridor:
 - Encourage parking in the rear yard and side yard as opposed to the front yard of commercial and institutional development to support a pedestrian oriented environment.
 - Develop incentives for developers that are willing to provide side and/or rear parking instead of front parking such as density bonuses to allow for

a higher floor area ratio and higher maximum lot coverage percentage to accommodate the increased driveway lengths.

- Encourage the development of shared parking lots for adjacent properties to be consistent with the recommendations in the Access Management Section of this study.
4. Maximum front yard setbacks should be maintained. (This is important in the case of pre-zoning communities, where the buildings have a close relationship with the street. Continuing this development pattern serves to retain the borough's character.)
 5. The recommendation is consistent with and supportive of the transportation recommendation to convert US 19's intersections with PA 97 into a pair of roundabouts (see transportation recommendations) which would better function as "borough gateways" than do the current intersection designs.

Open Space / Rural Character Areas

Public preferences expressed at project meetings indicate that the most desired uses of land in the study area are residential (37 percent), followed closely by "no development at all" (35 percent). Maintaining the area's rural character, agricultural lands and open space are also public priorities. The public additionally indicated a desire for limiting commercial development to the area immediately adjacent to the I-90 interchange and in downtown Waterford Borough. The following recommendations were developed to be consistent with public preferences.

In addition to more traditional zoning regulations, the protection of the corridor's desired open space and rural character areas (and resultant safety and capacity of the adjoining roadway) can be accomplished through other strategies, such as implementing provisions for Conservation Design principles, conservation easements, and strategic location of public utilities.

1. Summit and Waterford Townships should consider implementing Conservation Design principles for proposed developments along the rural portions of the corridor between Waterford and I-90. While preserving the rural character of the corridor is a priority, the townships must also accommodate future residential growth and development. The Summit and Waterford Township Zoning Ordinances should be amended to include a new Residential Conservation Development District that incorporates the conservation design principles developed by Randall G. Arndt of the Natural Lands Trust.
2. Figure 19 demonstrates the effect of applying conservation design principles to a typical agricultural area in Pennsylvania.

Figure 19: Conservation Design

Typical Pennsylvania agricultural area – undeveloped state:



Application of conventional residential development:



Application of conservation development principles:



2. Summit and Waterford Townships and Waterford Borough may want to encourage conservation easements with landowners who have property along the US 19 corridor. Conservation easements are a land-saving tool that preserves open space. Easements keep land on the municipal tax rolls, can be tailored to the specific needs of the municipality and landowner, and are completely voluntary on the part of the landowner. They can be used to protect forests, wetlands, endangered species habitat, beaches, scenic areas, save farmland, and preserve and buffer streams.

3. A conservation easement is a voluntary agreement that allows a landowner to limit the type or amount of development on his property while retaining private ownership of the land. The agreement is a written legal document that is between the landowner and a government entity or land trust (a private, non-profit conservation organization) that permanently restricts a property's uses to protect its conservation values.
4. When a landowner donates or sells an easement to a land trust or municipality, the easement holder continues to own the eased property and pay taxes on it, but he or she agrees to permanently give up certain rights. (For example, if someone owns 80 acres, of which 35 acres are wetlands, the landowner may decide to restrict development only on these 35 acres. The remaining 45 acres would not be covered or affected by the easement.)

Future owners would be bound by the terms of the easement, which is recorded at the county courthouse. The holder of the easement takes on the legal responsibility and right to enforce the easement.

Many landowners receive a federal income tax deduction for the gift of a conservation easement. The Internal Revenue Service (IRS) allows a deduction if the easement is perpetual (lasts forever) and donated "exclusively for conservation purposes." The amount of the tax deduction is determined by the value of the conservation easement. In addition, the donor may have estate and property tax relief.

5. Strategically locating the extension of water and sewer service areas can serve to focus higher densities of development into more efficient, clustered service areas, preserving desired rural character areas and helping to prevent unchecked "highway strip" commercial development from occurring throughout the entire length of the corridor between I-90 and Waterford Borough. Encouraging denser (in-fill) development in the existing service areas is the most cost effective strategy for public utility infrastructure construction and maintenance, and locating future service areas that can also be developed into high-density nodes in specific locations along the rural portions of the corridor will also result in cost efficiencies.

Economic Development / Growth Areas

Another important strategy aimed at managing the impacts of the rapid growth being experienced in the study area includes the identification and development of growth areas in order to direct development growth to areas that have (or are planned to have) the infrastructure to accommodate it. This can be done in tandem with existing land use control ordinances and can be viewed as a constructive way of encouraging development in desired locations, rather than a punitive approach of downzoning or other potentially unpopular methods of managing municipal land use.

1. **Provide convenient access to public utilities and municipal services.**
The provision of "gray" infrastructure (e.g., water and sewer) should be provided (and extended) into areas that are appropriately zoned to accommodate more intense forms of development. Providing such infrastructure in high-density zoning districts can complement the original intent of the zoning district, while the introduction of such service in low-density districts can yield the opposite effect with unintended results.
2. **Provide development incentives for designated areas.** As the study area continues to experience an influx of both residential and commercial development, the study area municipalities can provide development incentives to encourage development in certain areas in harmony with existing land use management ordinances. As a means of focusing economic development, the municipalities can offer the following types of development incentives:
 - Property tax abatement
 - Discounted utility rates
 - Fee waivers (such as land development review), and
 - Sales tax refunds.
3. **Utilize standardized land development process/approval guidelines that expedite decision-making.** Pre-application meetings between the developer and the municipality can serve to identify municipal concerns up front and mitigate costly and time consuming re-submissions. Costs are also lowered for the municipality, since the review and approval process should be reasonably shortened as a result of holding an informal plan review with the land developer.

Ordinance and Policy Recommendations

Study area municipalities should consider updating or adopting various land use planning and management tools to be consistent with the outcomes of the US 19 Land Use and Transportation study process.

There are several planning tools municipalities can employ in shaping land use and its resultant impacts on the transportation system. Considerations surrounding the municipal comprehensive plan, zoning ordinance, and subdivision ordinance are discussed under this set of recommendations, as well as related ordinances that complement the study findings.

➤ Comprehensive Planning

The comprehensive plan establishes the big picture for the future of the community. The plan analyzes existing conditions and establishes a direction for the municipality. Transportation and land use are, of course, just two elements of the plan, but ones that must be considered within the context of other aspects of community planning, particularly future land use and designated growth areas. Within the plan, existing

transportation trends and issues are examined, and a range of goals, objectives and strategies are developed to help the community attain its vision for the future. The plan should also give the municipality an idea of expected future demands, based on future land use designations.

While comprehensive planning typically should drive the development of other planning tools and studies (such as this one), the plans can be updated based on the public desires and preferences expressed during the course of the US 19 Land Use and Transportation Study.

➤ **Zoning Ordinance**

The zoning ordinance is the most powerful tool a municipality can use in shaping the community's character. While a comprehensive plan provides a community with a strategic direction, it is the zoning ordinance that gives a local decision-maker an important tool in actually implementing the broad directions outlined in the comprehensive plan. Where the comprehensive plan provides a framework for a community, the zoning ordinance manages the type and magnitude of development that can occur. From a transportation standpoint, this is a critical power that is often not used to its desired effect. An effective zoning ordinance should be sensitive not only to existing land use patterns, but on the performance of the surrounding transportation system, particularly its roadways.

As a function of the planning commission, study area planners should take care in evaluating the current zoning of the municipality as it relates to the roadway network. This can be accomplished by determining future traffic volumes and trip generation by looking at what activities are presently permitted and the expected rate (and intensity) of development. From this analysis, planners can estimate the roadway's future performance and identify its expected level of service (LOS). Performing routine analyses such as these can give planners and decision-makers an idea of potential needed adjustments to the zoning ordinance in advance of costly roadway widenings or worsening traffic congestion.

When considering zoning's effect on the area roadway network, there are several points to be considered:

1. **Uses:** (1) Allowing for mixed uses within a particular zone, or zoning districts in general that are developed on a pedestrian (as opposed to automotive) scale can encourage fewer vehicular trips by lessening dependence on the private automobile. (2) Commercial uses that are significant traffic generators could be considered as a conditional use, as opposed to one that's allowable by right. This gives decision-makers greater flexibility in reviewing and approving new commercial land development as it relates to the capacity and safety of the roadway network. (3) A third but less popular way is to re-zone the area in question to a less-intensive use. This re-zoning can be done in conjunction with the establishment of Transfer of Development Rights (TDR) which involves the establishment of sending and receiving zones. (4) Municipalities may

also consider the creation of new zoning districts, such as the Transitional zoning district as currently administered by Summit Township, or a Residential Conservation Development District. These new districts could be introduced in areas where the study area's rural character must be preserved.

2. **Building Coverage:** In addition to use, trip generation is also based in part on building size. By controlling the intensity of land use, municipalities can control the total number of trips generated by various zoning districts. For example, ordinances that allow for excessive (e.g., 60 percent plus) building coverage in commercial districts can unnecessarily generate significant amounts of additional traffic. Ordinances that allow for high densities of commercial development may have the potential to overwhelm an existing adjacent highway network. An example from the TRB Highway Capacity Manual states that a single pump at a fuel service station can generate as many as 537 trips daily.

For commercial and industrial uses, trip generation is calculated by building size. For residential uses, planners may use other metrics, such as dwelling units per acre and required minimum lot size. Even the type of dwelling unit can have an impact on trip generation, as larger homes tend to have more people per unit, resulting in a higher rate of trip generation.

3. **Set-back requirements:** A basic component of any zoning ordinance is the set-back requirements it imposes on new development. Closely related to the previous item, large set-backs can allow for smaller building sizes and thus result in fewer trips being generated. From a vehicular safety standpoint, large set-backs can allow for improved sight distance and should take into account the possibility of future need for roadway widening in the future.
4. **Design standards:** Sidewalks are important considerations in ensuring that new residential and commercial developments are connected by an adequate network of sidewalks and off-road trails. Sidewalks should ideally be 6 feet in width and set back from the roadway a minimum of 5 feet for improved safety. If these dimensions cannot be met, the construction of any sidewalk is preferable as opposed to having none at all. Wide shoulders are also important, not only because they can extend the life of the roadway, but they can provide a safe place for bicyclists to travel.

➤ **Subdivision and Land Development Ordinance**

While the comprehensive plan looks at the community from 30,000 feet, and the zoning ordinance regulates uses and development density, the subdivision ordinance can shape transportation in very tangible ways, as described in the following points:

1. **Creation, design and placement:** As noted above, the subdivision ordinance's greatest impact on land use relates to its ability to manage the creation of new roadways, including their design and placement. Within the subdivision ordinance, the municipality can establish the required cartway and right-of-way widths, curb and sidewalk requirements, and various engineering criteria.
2. **Accessibility and Functional Class:** Roadways serve different functions, from providing accessibility to individual properties, to broader mobility from one region to another. Roadways must be planned for in a way that recognizes each roadway's unique function.

Once a municipality has defined a roadway hierarchy within the transportation element of its comprehensive plan, the subdivision ordinance can be used for classifying roadways according to their hierarchy and setting standards for new streets and roadways based on their classification.

Many roadways over time have evolved to serve more than one primary function, which makes planning more challenging.

As development occurs on a roadway frontage, its character and resulting function can begin to change. For example, in numerous examples across Pennsylvania, roadways that once served as rural or suburban throughways for inter-regional movement such as US 19 have since evolved into regional commercial strips. As development intensity increases, so does the need for access management.

Zoning can help manage access by limiting the total number of new access points being created on the higher-order (or roadway with the higher functional class) roadway. For example, large, intensive uses that generate high numbers of traffic volume should be directed towards roadways that have the capacity to meet those demands. Land uses generating fewer trips should be targeted towards roadways with more limited capacity.

3. **Connectivity:** Highway connectivity through an established functional classification system increases capacity over a discontinuous network of cul-de-sacs. Municipalities can enhance the local grid with local roadways designed to supplement and support a higher-order state highway network. Cul-de-sacs can be required to be connected with paths, with greenways linking new neighborhoods with schools and public transportation. Patterns of new residential streets are typically circuitous and feature numerous cul-de-sacs. This development pattern not only discourages both pedestrian and transit use, it can ultimately be more costly to maintain over time. Area roadway networks that feature a high degree of connectivity give everyone - pedestrians, transit users and motorists - a greater degree of mode choice.

4. **Multi-modalism:** New streets can be created in a manner that accommodates more than just vehicular traffic. Mandating adequate shoulder width can not only provide a safer travel route for bicyclists, it can also provide a safer pull-off area for motorists as well as extend the life of the roadway. Wherever possible, shoulders should be provided alongside new roadways to ensure good pedestrian circulation. A recommended buffer of 5 feet is recommended between any roadway and sidewalk for improved safety. Actual sidewalk width should be greater than 4 feet or more, depending upon the intensity of development.

5. **Coordination** - Ongoing coordination with modal operators, such as EMTA is also important in the planning and design of new roadways. Bus turnouts, berths and park and ride facilities should be incorporated into roadway or development designs, as appropriate.

6. **Smart Transportation/Context Sensitive Design:** While more of a consideration than a planning tool, Smart Transportation and Context Sensitive Design essentially means that "one size may not necessarily fit all". Streets and bridges should be designed according to the adjacent land use and community character. It also ensures that transportation planning is done in a way that is responsive to the other planning goals of the community as they relate to land use and economic development.

Official Map

The study area municipalities should consider developing an Official Map for the purpose of identifying areas needed for future public capital investments. Article IV of the Municipalities Planning Code provides the legal details regarding the Map. Alternatively, the municipalities should work with potential developers to ensure preservation of adequate right of way for proposed transportation improvements.

1. An Official Map would provide the affected municipalities with a powerful tool in shaping the highway network in undeveloped land. While this can be relatively expensive, it is the most effective tool available to ensure that the right of way is preserved, thus eliminating the need to retrofit the proposed improvement.
2. Would preserve the access needed to industrial and commercially zoned properties, thus making them more marketable.
3. The Pennsylvania Municipalities Planning Code (MPC) describes an Official Map as a "land use ordinance" and is prepared and adopted in accordance with the procedures set forth in Article IV of the MPC. The Official Map would supplement the municipalities' existing land use control ordinances (subdivision and land development, zoning, landscaping, etc.) already in place. This would give planning and development offices a powerful tool in shaping the highway network on undeveloped land and reserve private land for future public uses.

Landscaping Ordinance

Summit and Waterford Townships and Waterford Borough may want to consider adopting a landscape ordinance. This ordinance could be used to enact new standards for all non-residential development with regards to provisions for: access drives, greenways, buffering, and general site landscaping around buildings and parking areas. A buffer of at least ten (10) feet should be required between the right-of-way line and an abutting parking lot.

Landscaping provides additional delineation between roadway and driveway entrances and parking lots. It improves safety by channeling traffic through specific traffic corridors by creating buffers between pedestrians and automobiles. In addition, landscaping also provides environmental benefits such as cleaning the air, reducing heat and mitigating stormwater runoff.

When designing landscaped parking areas, the following principles should be considered:

- Incorporate well-graded and landscaped buffers at parking areas perimeters to screen the parking area from streets and other facilities;
- Use landscaping to divide large paved areas into small, defined parking areas;
- Use landscaping materials that are native to the area. Avoid using plantings that might not survive temperature and precipitation extremes to which they could be exposed; and

- Avoid tall shrubs in end islands and other areas where sight distance could be a problem. An area from two (2) feet to six (6) feet above the pavement surface needs to be free of vegetation that can obstruct sight distance.

Once a landscaping ordinance has been adopted, the study area municipalities should continue to support the objectives incorporated within the ordinance, and monitor its effectiveness. Any problem areas should be documented and forwarded to the Erie County Department of Planning for its review and recommendations for amending the ordinance. Efforts to inform and educate developers and others as to the justification and specific applications of this new ordinance can pay dividends with respect to long term applications of the ordinance. Simple fact sheets or workshops can be effective ways to communicate these changes.



Landscaping creates a natural buffer between the parking areas and sidewalks.

Outdoor Lighting Ordinance.

While outdoor lighting is an important safety element for motorists, it can also be a nuisance in adjacent residential areas. Some lighting can cause excessive glare and light trespass. The study area municipalities may wish to consider adopting an outdoor lighting ordinance that recognizes the benefits of outdoor lighting while providing clear guidelines for its installation and in maintaining the area's character.

The purpose of the ordinance would be to reduce the problems caused by improperly designed and installed outdoor lighting. It would be intended to minimize problems of glare and light trespass. Finally, it would also help to reduce the energy and financial costs of outdoor lighting by establishing regulations which limit the area that certain kinds of outdoor lighting fixtures can illuminate and by limiting the total allowable illumination of lots located in the study area. All business, residential and community driveway, sidewalk and property luminaries should be installed with the idea of being a "good neighbor", with attempts to keep unnecessary direct light from shining onto abutting residential properties or streets.

Some suggested minimum standards for outdoor lighting would be to:

1. Provide lighting in outdoor public places where public health, safety and welfare are potential issues
2. Protect drivers and pedestrians from the glare of non-vehicular light sources
3. Protect neighbors and the night sky from nuisance glare and stray light from poorly; shielded, aimed, placed, applied or maintained light sources
4. Promote efficient design and operation with regard to energy conservation
5. Protect and retain the established character of the study area.

Transfer of Development Rights (TDR) Program

TDRs can be a powerful land preservation and conservation technique used within the context of the municipal zoning ordinance. Through TDRs, growth can be effectively directed away from one location to another, where development is more desirable and planned for. Said another way, development rights are moved from a preservation zone and moved to a receiving, or transfer zone.

With TDRs, development "rights" are sold and ultimately separated from the title of a specific property. Those development rights can then be transferred by the purchaser to another location.

Along the US 19 corridor for example, development rights could be sold from an existing, commercially-zoned property in exchange for its fair market value. The result is that the property owner can continue to farm his land or preserve it as open space, while the purchaser of the development rights would in turn be permitted to develop another parcel (the "receiving" zone) more intensively than would otherwise be permitted.

Some other considerations in implementing a TDR program include:

- TDRs compensate landowners for reduction in development potential and facilitates the strategic direction of the US 19 corridor.
- TDRs are optional.
- TDRs can only be used within a single municipality or among municipalities with a joint ordinance.

Transportation System Recommendations

Corridor-Wide Improvements:

Access Management

Improved access management in the study area accomplishes two main study objectives, that of preserving US 19's capacity as well as its safety. Managing access to and from the highway's abutting properties is a valuable planning tool as it manages the safety and capacity of the highway. As such, the study area municipalities and PennDOT need to balance the needs of property owners who require access, and highway travelers who need mobility and freedom of movement.

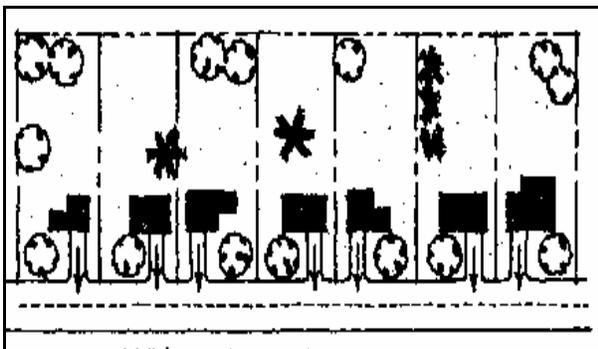
"[C]ontrolling land use and access management [along US 19] may defer the onset of unacceptable operations for years and should be pursued." - Erie County LRTP

This is the definition of good access management: Providing access to land while preserving the flow of traffic on the adjacent highway network. Implementation of an access management program along the US 19 corridor will help preserve the capacity of the roadway while managing the overall number of potential conflict points by reducing the number of driveway access points and providing driveway connections between properties along the corridor.

Access management addresses the location and design of street and driveway connections to the roadways, as well as subdivision and site design. Because it involves both land use and transportation, access management requires cooperation among government agencies responsible for land development and transportation decisions. Land use planning techniques can be used to promote access management and provide consistency in legal and regulatory practices.

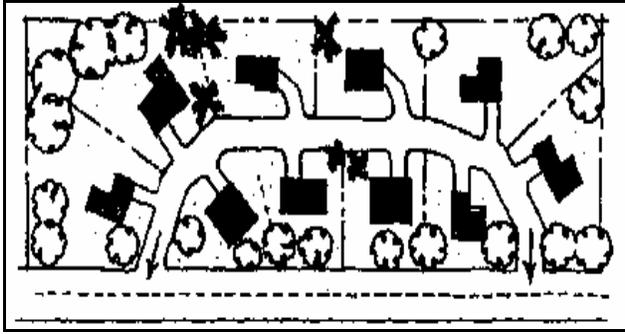
Access management is one of the most direct ways in which transportation agencies and local governments can deal with adverse effects of development on the transportation system's performance. Careful planning of access in newly developing areas and good policy for driveway spacing and design can avoid many problems of congestion and safety that would otherwise occur.

Good traffic flow occurs if turning movements on and off arterial roads are minimized and concentrated at places where they can be done safely.



Seven driveways, seven lots

An example of poor (left) and good (next page) access management.



Two driveways, ten lots.

PennDOT is very committed to incorporating access management principles into transportation and land use planning to increase safety options for its customers, the traveling public. We need to be proactive rather than reactive with access management - since it is necessary to support growth and development in a reasonable, safe and efficient manner. This is especially true since accessibility can be affected by 1) changes in the transportation system, 2) changes in demographic and development patterns, and 3) a combination of changes in both transportation systems and demographic patterns.

The Transportation Research Board (TRB) defines access management as the systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to the roadways. It also involves roadway design applications, such as median treatments and auxiliary lanes, and the appropriate spacing of traffic signals.

The purpose of access management is to provide vehicular access to land development in a manner that preserves the safety and efficiency of the transportation system. It incorporates the delicate balance between constitutional rights, private property rights, and state regulations.

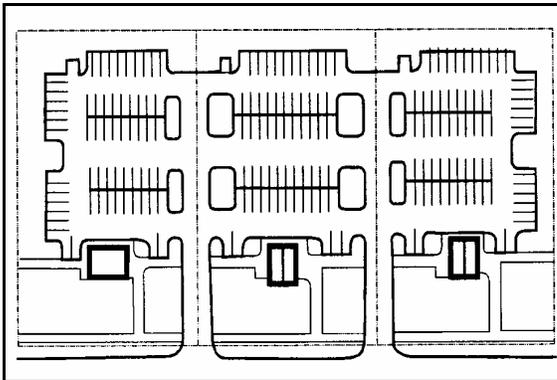
Access management seeks to limit and consolidate (driveway) access along major roadways, while promoting a supporting street system and unified access and control systems for development, such as along US 19. Implementation of access management principles can result in both reasonable access to uses along the roadway, while allowing the highway to function as an efficient thoroughfare into the future. Access management can achieve the following objectives:

- recognize the role of certain roadways in a community to carry traffic between municipalities and to be part of a regional highway system;
- allow these important roadways to be designated as thoroughfares;
- minimize circumstances that would undercut the ability of these designated roadways to offer safe and efficient movement of traffic; and
- maximize opportunities for these designated roadways to function as efficient thoroughfares into the future.

The design and location of driveways merits special consideration as these at-grade intersections affect safety and capacity. The municipalities should consider the joint development of an access management plan which would require shared driveways and parking areas, as well as regulating driveway spacing.

1. **Cross Access Drives:** Many of the major traffic generators within the study area such as highway commercial uses are not connected by a service drive or sidewalk, making “one-stop shopping” an impossibility for consumers. Summit and Waterford Townships and Waterford Borough should develop and adopt a landscape ordinance. The townships and borough should support the implementation of the landscape ordinance since it would incorporate a provision to provide for the creation of cross access drives and easements, particularly in areas zoned as “Business/Business Transitional” Districts.

These driveways and easements would offer improved safety. Adjacent businesses with complementary services would also benefit from improved circulation between sites. Owners of new development would then need to record an easement on the deed, allowing joint use and access, as well as a maintenance agreement, outlining the maintenance responsibilities. Access points should be planned for adjacent parcels as site plans are submitted to encourage joint driveways.



An example of Cross Access Drives (shared driveways).

For existing properties, the municipality will have to work with the individual property owners and businesses to encourage them to create drive connections between their properties and potential opportunities for joint parking. The townships and borough should develop an incentive package to encourage existing adjacent property owners to create joint driveways. Because the development is already in place, property owners already have highway occupancy permits or driveway permits, there is no simple or adequate legal way to force joint driveway creation and/or development of frontage roads. The townships and borough have a tremendous opportunity before them to create a comprehensive partnership incentive package to work with existing property owners toward improving the overall transportation system in the community. Some of the incentives that could be considered are as follows:

- Define a US19/PA 97 Transportation Improvement District (TID) for application of this incentive package with criteria for improvements (so all potential participants are treated equally). A TID is a "district," a geographic area organized for the purpose of improving the existing road system. The TID does not represent a single city, nor is it a large government agency.
- For property owners that are willing to consider combining their driveways and potentially share parking, the township and/or county should consider committing funding to those property owners to construct sidewalks for their properties. In addition, the township and/or county should agree to a maintenance agreement for the joint portion of the driveway and any frontage road connections for snow removal, paving, and curb maintenance. The townships and borough should also consider actually absorbing the cost of building the combined driveways, where five (5) or more property owners have formed a partnership for such improvements.

This program should be implemented incrementally with a certain budget set aside each year. The program should only apply to designated improvement districts along the US 19 corridor.

This program, if applied, would result in a reduced number of access points along US 19 for existing properties and would reduce the overall number of traffic conflict points caused by closely spaced driveways. The townships and borough should attempt to obtain an average spacing of 250 feet or greater between access drives. This standard should be included in the incentive program to determine eligibility. Traffic signals may be needed for high volume driveways.

2. **Driveway Spacing** - The more driveways, the higher the potential conflicts on the road. Fewer driveways spaced further apart will allow for a more systematic merging of traffic and present fewer challenges to drivers.

The townships and borough should include in their respective subdivision ordinances a driveway spacing requirement of at least 500 feet for local streets that are classified as Major Arterials or higher. This would provide a safe distance between driveways and limit the overall number of access points preserving capacity and reducing congestion.

3. **Frontage/Marginal Access Roads** – Frontage and marginal access roads are non-limited access roadways that can greatly improve access management along a highway corridor. Frontage roads generally run parallel to a primary highway corridor and provide access to it at appropriate intervals. As such,

frontage roads can help mitigate the disruption that intensive land development can cause on the safety and capacity of the overall highway corridor. Other benefits of marginal access roads include:

- Avoids the purchase of access rights during highway widenings and/or upgrades
- Positively effects the operation of a highway corridor, as well as land values and development patterns.

Highway Safety Improvement Considerations

With the increase of traffic flow along this corridor congestion and safety are of concern with the municipalities and general public.

1. The possible construction of turning lanes along the corridor should be considered. The most desirable treatment to address congestion and safety associated with left turn movements along the US 19 corridor would be to introduce a median with left turn bays at appropriate locations in conjunction with adopted access management policies. However, in existing more heavily developed portions of the corridor, a two-way left turn lane (TWLTL) may be a more feasible option provided free flow speeds are less than 45 mph. Along with the turning lane warrants, sight distances and vertical curves should be checked.

As with any roadway improvement involving TIP (Transportation Improvement Program) funds, a traffic analysis needs to be completed. If the outcome warrants these roadway improvement efforts, they should be considered as a prospective project with the State Transportation Commission's TIP update through the Erie Metropolitan Planning Organization (MPO).

2. Requests for speed limit reductions could also be considered as warrants for turning lanes are met and development trends head southward along the corridor. These requests need to be sent into the PennDOT District Office by the municipalities. Speed limit reductions are based on existing "running" corridor speed, accident history, sight distances, as well as surrounding roadway land use/development. Enforcement of the speed limit aids in the safety of the corridor.
3. As a result of the corridor traffic safety audit, the following roadway improvements could be considered to be placed on the TIP or coordinated with the maintenance program as warranted:

- a. Address physical objects in the US 19 corridor, including unprotected swales. PennDOT should coordinate with Summit Township and its ongoing storm sewer program as part of this.
- b. Raised pavement markers (RPMs) should be installed near the I-90 interchange where the roadway surface is light-colored (concrete).
- c. Improve sight distance at US 19's intersections at Dorn and Townhall Roads.
- d. Improve sight distance at PA 97's intersection with Townhall Road.
- e. Improve sight distance at the intersection of Robison and Old French Road.
- f. Vertical curves in the area near the intersection of Townhall Road may be deficient for the posted 55mph speed limit.

Off-Street Parking

The study area municipalities should consider amending their respective zoning ordinances to incorporate the following off-street parking principles:

1. **Shared Parking Areas** – Consider revising the zoning ordinances to allow for shared parking areas, particularly when it can be demonstrated that peak demand periods would not occur at the same distinct time periods. This may result in less paved areas and improved coordination of the layout design of adjacent uses (potentially more interconnectivity). Shared parking strategies will result in fewer total parking spaces needed when compared to the total number of spaces needed for each land use or business separately. Land uses often used in specific shared parking arrangements include office, restaurants, retail, colleges, churches, cinemas, and special event situations. Shared parking is often inherent in mixed-use developments, which include one or more businesses that are complementary, ancillary, or support other activities.
2. **Rear and Side Yard Parking** – The encouragement of parking in the rear and side yard as opposed to the front yard of commercial and institutional development can help support a pedestrian-oriented environment. This will reduce the dominance of the parking areas between the street and primary building and reduce the visual blight of endless parking lots.
3. **Developer Incentives** – Municipalities can offer incentives to developers who are willing to provide side and/or rear parking instead of front parking such as density bonuses to allow for a higher floor area ratio and higher maximum lot coverage percentage to accommodate the increased driveway lengths.

Bicycle/Pedestrian

The study area municipalities should consider enhancing bicycle/pedestrian facilities planning for the corridor, including:

Conducting assessments of existing bicycle/pedestrian facilities in the corridor. The identification of such a network should consider several issues, including:

- **Identifying major bicycle and pedestrian traffic generators and destinations** – This step identifies the study area’s most significant generators of bicycle and pedestrian traffic and where the greatest demand exists for those facilities.
- **Identifying major existing bicycle and pedestrian facilities** – This step includes the identification of the study area’s existing facilities that the study area can build from and add to. These trails – as major facilities for non-motorized modes – can serve as a starting point from which the township can extend or add additional facilities to complement what it already has in place.
- **Identifying where additional facilities should be improved, located or developed** – this step entails identifying “gaps” in a proposed network and can include links such as state and local roadways and off-road trail linkages. In the case of state-owned roadway facilities, the committee may designate them as being part of a local (or county) priority bicycle/pedestrian network and should be considered for wider shoulders or other improvements as they are reconstructed or part of routine “betterment” projects by PennDOT.

Implementing a bicycle/pedestrian checklist to be distributed at the pre-meeting for major subdivision proposals. A sample checklist should ask the following questions:

- Are sidewalks needed in the area?
 - Presence of worn paths in the area
 - Adjacent land uses generating pedestrian trips
 - Possible linkages/continuity with other pedestrian facilities
- Is the development in a high-density land use area that has a high level of bicycle/pedestrian traffic?
- Is the land development located within walking distance of a school or other community facility?
- Are there signage needs?

Waterford Area Improvements

Waterford Borough and Waterford Township should work with the Erie County Department of Planning, as well as PennDOT District 1-0, in implementing a comprehensive package of improvements geared toward improving the area's transportation concerns through the greater Waterford area between US 19's two intersections with PA 97 at the northern and southern ends of Waterford Borough. This includes traffic safety and throughput through the area, in addition to parking issues and "walkability" for pedestrians. A series of recommendations is offered here as part of this improvement package.

Intersection Improvements

1. Improve US 19's intersections with PA 97 at both ends of Waterford Borough either through signalization or the construction of roundabouts.
2. This recommendation address the single most significant traffic issue identified and is one of the most important improvements suggested in this study. The County’s travel demand model validates that the intersection(s) of US 19 and PA 97 are the two most significant “pinch points” in the corridor between Union City and the City of Erie. It is projected by the year 2030, under the baseline zoning build-out and public preferred scenarios, both the intersections would operate at a Level of Service (LOS) F.

Figure 20: Existing vs. 2030 Base Comparison

Location	% Change in Daily Traffic		AM Level of Service				PM Level of Service			
	SB/EB	NB/WB	Existing		2030		Existing		2030	
			SB/EB	NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB	NB/WB
US 19 South of I-90	19.6%	25.8%	A	B	B	C	B	A	C	B
US 19 North of Townhall Rd.	52.2%	37.3%	B	A	B	C	A	A	C	B
US 19 North of Elk Creek	55.2%	48.2%	A	A	B	C	A	A	C	B
US 19 South of Moore	58.6%	54.1%	A	A	B	B	A	A	B	B
US 19 North of Talcott	60.8%	58.5%	A	A	B	C	A	A	B	B
US 19 North of Rt. 97 Merge	63.9%	61.9%	A	A	B	B	A	A	B	B
US 19/PA 97 South of 19/97 Merge	57.6%	53.5%	B	E	E	F	B	C	E	F
Moore between US 19 and Rt. 97	11.2%	5.8%	A	A	A	A	A	A	A	A
Townhall between Old French and Rt. 97	4.6%	5.6%	A	A	A	A	A	A	A	A
Robinson between Parson and Old French	28.2%	128.6%	A	A	A	A	A	A	A	A
Rt. 97 South of I-90	46.5%	43.8%	A	A	A	A	A	A	A	A
Rt. 97 North of Townhall Rd.	64.5%	51.4%	A	A	A	A	A	A	A	A
Rt. 97 North of Elk Creek	64.9%	62.4%	A	A	A	A	A	A	A	A
Rt. 97 North of Talcott	72.3%	57.8%	A	A	A	A	A	A	A	A
Rt. 97 North of US 19 Merge	67.7%	53.7%	A	A	A	A	A	A	A	A
US 19/PA 97 North of US 19/PA 97 Split	49.0%	58.3%	C	D	F	F	A	B	E	F
US 19 South of US 19/PA 97 Split	37.0%	38.2%	A	A	A	A	A	A	A	A
PA 97 South of US 19/PA 97 Split	66.5%	59.6%	A	A	C	C	A	A	B	B

This data, along with the projected peak hour turning movements for the year 2030 supports a roundabout design concept. Roundabouts offer improved levels of service during the peak periods than signalization or “no-build” alternatives (see table below).

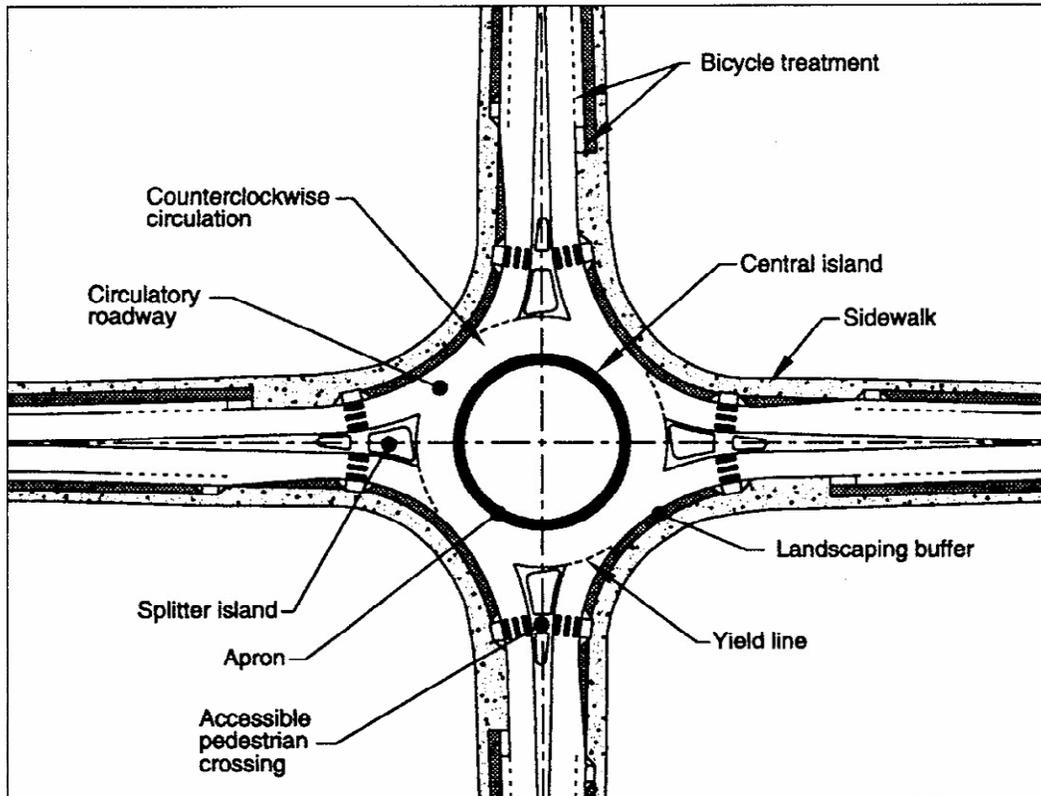
Figure 21: Projected (2030) Peak Hour Level of Service

Control Method	North Intersection		South Intersection	
	AM	PM	AM	PM
Existing (US 19 at PA 97)	F (131.2)	F (1860.7)	F (120.9)	F (3223.4)
With signal*	C	C	C	C
With roundabout*	A	B	A	A

* North intersection consolidated to provide a signalized intersection at the existing US 19 and School Access Road and the School Access Road realigned to be a T-intersection with PA 97.

An illustration of a typical roundabout design follows:

Figure 22: Key Roundabout Features



3. Improve the signalized intersection in Waterford to include upgraded signal equipment and retiming.
 - The existing signal presently acts as a traffic calming device and is a choke point for commuters traveling between eastern Erie County and the City of Erie.
 - A new signal head was installed in 2004, but other related equipment such as the signal controllers should be considered for replacement.
 - The retiming and signal upgrade efforts could be completed in conjunction with the consideration of the construction of the roundabouts north and south of said intersection.
 - Motorists presently have difficulty gaining access to US 19 from intersecting borough streets. The retiming effort would allow for improved “gaps” in the corridor’s traffic stream.

Pedestrian Facilities

1. Improve the walkability of Waterford Borough through a streetscape design that includes sidewalk and crosswalk standards. Any project level planning for roadways such as US 19 through downtown Waterford should include pedestrians as a critical element. In the spirit of "Context Sensitive Design", improvements to roadway design should consider the access needs of other modes of transportation such as bicycles, pedestrians and public transportation. In the case of pedestrians, crossing measures are needed to ensure frequent and safe opportunities to cross US 19. Crossing distances should also be kept to a minimum and can be aided by traffic calming techniques such as the Chokers described elsewhere in this report.

Crosswalks serve as the pedestrian right-of-way across a street and should inform motorists of the location of the pedestrian crossing as well as assure the pedestrian that a legal crosswalk exists at that location. The Manual on Uniform Traffic Control Devices (MUTCD) provides guidelines for marked crosswalks, as well as standards and guidance for various crossing improvements, including signs, signals and other treatments.

2. Extend existing sidewalks on Main Street north and south to the developments at the intersections of US 19 and PA 97. In conjunction with the extension of Waterford Borough's Main Street character, provisions for pedestrians through sidewalks should be made available. Attributes of a well-designed sidewalk include the following:
 - The sidewalk should be accessible to all users and meet ADA requirements.
 - Sidewalks should be six feet in width or even wider, depending upon the location and level of pedestrian trip generators.
 - Sidewalk areas, particularly in places like downtown Waterford, should be more than areas to travel, but should provide places for people to interact in public places. Sidewalks are important contributors not only to pedestrian accommodation and safety, but can contribute to the character of neighborhoods and business districts and strengthen their identity.

Parking

Conduct a detailed on-street parking analysis for the Main Street area which would address how best to design/improve parking patterns (and availability) in the borough and reduce conflicts with traffic flow.

- Such a study administered by the MPO would address how to best improve parking patterns in the borough and improve pedestrian safety and traffic throughput.
- Parking is an acknowledged need in the borough. A study would identify the most effective way of providing parking in the borough, whether it be

through the current use of angle parking, parallel parking, or off-street parking.

- Parking spaces along the borough commons are being used as an ad hoc park and ride. This study would provide resources for a park and ride within the community. This would allow more parking spaces for businesses, which could possibly encourage more businesses to locate within the borough.
- Changes in the downtown parking area could result for improvements in streetscaping, wider sidewalks, and other pedestrian-related treatments such as bulb-outs to improve safety. More pedestrian movement adds in the attractiveness of business retention and expansion.

Traffic Calming

Consideration should be given to adopting a toolbox of traffic calming devices with guidelines for implementation in designated areas.

Traffic calming devices should not be used indiscriminately, but should be implemented within the guidelines of an overall development plan to discourage through traffic in residential neighborhoods and provide safety for pedestrians, particularly in downtown Waterford.

Several traffic calming techniques and their related benefits include:

- **Bulb-Out** - Keeps vehicles from entering a neighborhood while still allowing egress
- **Diagonal Diverter** - Discourages commuter traffic by forcing turns; returns streets to pedestrian use
- **Channelization** - Prevents left turns from an arterial to a residential street
- **Guardrail Closure** - Eliminates through traffic.
- **Speed Humps** - Promotes the smooth flow of traffic at slow speeds
- **Speed Tables** - Used at intersections, a speed table will reduce intersection approach speeds and result in improved intersection safety.
- **Chokers** - Narrows the street to slow traffic, reduce pedestrian crossing times and improves safety.
- **Chicanes** - Curb bulb-outs at mid-block locations to reduce traffic speeds and improve safety.
- **Traffic Circles** - Improves intersection capacity and reduces the potential of head-on collisions.

Transit - Establish Express Bus Service

The Erie Metropolitan Transit Authority (EMTA) should consider providing express bus service from the study area to the City of Erie via a new park and ride facility located within the limits of Waterford Borough.



1. EMTA currently provides a fixed route service along the US 19 corridor from Erie to Waterford and beyond to the City of Corry. The possibility of acquiring a grant to expand this service to express could be explored by EMTA.
2. Approximately 40 percent of workers residing in Waterford Township commute to the City of Erie for employment. Table 18 below provides more commutation pattern data for all study area municipalities.
3. The existing transit stop in Waterford Borough provides no way for a transit vehicle to exit the travel lane. This results in disruption to traffic flow. The Township and EMTA may want to look into the availability of land and funding sources to construct a park and ride facility within the community. The park and ride facility would also free up prime parking spaces within the Borough which are needed for business growth.

ESTIMATED COSTS – Lighted, 50 space park and ride facility are approximately \$80,000.

Table 18: Study Area Commutation Patterns vis a vis the City of Erie

Municipality of Residence	Municipality of Employment	Percent Total of Resident Workforce	Number
Erie City	Waterford Borough	0.2%	88
Erie City	Waterford Township	0.2%	84
Erie City	Summit Township	4.0%	1701
Summit Township	Erie City	37.0%	994
Summit Township	Waterford Borough	1.0%	28
Waterford Borough	Erie City	29.4%	216
Waterford Borough	Summit Township	12.2%	90
Waterford Borough	Waterford Township	4.6%	34
Waterford Township	Erie City	38.0%	701
Waterford Township	Summit Township	9.8%	181
Waterford Township	Waterford Borough	6.5%	120
Union City	Erie City	13.7%	189

Source: U.S. Census