COMPREHENSIVE PLAN 1992

- Adopted by the Brown Township Trustees February 12, 1992
- Adopted by the Mid-Ohio Regional Planning Commission June 18, 1992
- Adopted by the Franklin County Commissioners September 22, 1992

BROWN TOWNSHIP TRUSTEES

- Gary Dever, Chair
- Pam Sayre
- Ron Williams

BROWN TOWNSHIP CLERK

- Rosemary Smith

COMPREHENSIVE PLAN STEERING COMMITTEE

- Chris Holmes, Chair
- Susie Kramer, Vice Chair
- Glenn Elfrink
- Lee Edwards
- Connie Esler
- Barbara Huggett
- Harold Jerman

MID-OHIO REGIONAL PLANNING COMMISSION

- Vince Papsidero, AICP, Project Manager
- Eden Carlson, Graphics Specialist
- Debbie Batson, Secretary

TECHNICAL REVIEW COMMITTEE

- City of Columbus, Planning Division Hilliard City Schools
- City of Columbus, Sewerage and Drainage Division MORPC, Transportation Department
- City of Columbus, Water Division National Park Service, Planning and
- City of Hilliard Environmental Quality
- Columbus and Franklin County Metropolitan Norwich Township Trustees
- Parks District Ohio Department of Natural Resources
- Darby Creek Association Div of Natural Areas/Preserves
- Franklin County Board of Health Prairie Township Trustees
- Franklin County Engineer's Office The Nature Conservancy
- Franklin County Soil and Water Conservation District The Ohio State University, Depts
- Franklin County Zoning Department of City and Regional Planning and Landscape Architecture

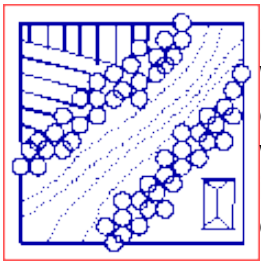
SPECIAL THANKS

Special thanks and appreciation are extended to the Brown Township Comprehensive Plan Steering Committee and Brown Township Civic Association for assisting in the circulation of the household

survey and public meeting notices. Thanks are extended to Principal Rob Spicer of Brown Elementary School for providing meeting space for our first public meeting. Thanks are extended to Susie Kramer, Steering Committee Vice Chair, for providing sound equipment at our public meetings. Thanks are extended to those individuals who participated on the Technical Review Committee. Thanks are extended to the Hilliard branch of the Columbus Metropolitan Library and Manager Kathleen Doss for making draft planning documents available to the public.

Natural Environment

Introduction



The natural environment forms the foundation on which development and land use occur, providing both constraints and opportunities to growth. Within unincorporated areas such as Brown Township, the natural environment plays an even greater role in defining land use. Lacking central water and sanitary sewer service, for instance, restricts most forms of intensive development because of the natural constraints found in poorly drained soils.

In fact, Brown Township is severely constrained by various natural limitations. As Figure 5 indicates, natural conditions in the Township limit the effectiveness of septic systems, such as a high water table, poorly drained soils, a nearly flat terrain and a substantial aquifer. As a result of these constraints and opportunities, we have to carefully determine future land use taking the natural environment into account. Limiting factors such as poor drainage and a high water table serve as "red flags" for properties containing these and other constraints.

Planning Issues

The following major planning issues are the focus of the Natural Environment Element:

A. Drainage
Brown Township is severely constrained from a drainage
standpoint due to poorly drained soils and topography. The planning issue relates to: 1) the ability to properly drain existing property; and 2) the potential impact from additional development, whether of a low, medium, or high density.

B. Big Darby Creek
The Big Darby is considered a vital Township resource. The planning issue here relates to potential negative impacts from additional development, whether in the Township's planning area or within the greater watershed. Urbanization has begun to occur within the Hellbranch watershed, a portion of the Big Darby watershed.

Geology

The Brown Township planning area lies within the glaciated till plain of Central Ohio, which contains all of Franklin County. The area containing both Brown Township and Franklin County was glaciated during at least two different glacial periods, according to the Franklin County Soil Survey. Evidence of the first glaciation (Illinoisan) can be found in fine, well-sorted sands in buried valleys beneath the second glaciation (Wisconsin) which left glacial till. The Wisconsin ice sheet last visited Central Ohio about 16,000 years ago.

The bedrock level is an important planning consideration from many perspectives. This potential constraint can affect foundations, leach fields and similar development considerations. An analysis by the Ohio Capability Analysis Program (OCAP), Ohio Department of Natural Resources (ODNR), determined that no portion of Brown Township has a depth to bedrock of less than 20 feet, in fact about 80 percent has a depth to bedrock of 50 feet or greater. The OCAP assessment is based upon well logs.

Soils

Soil Characteristics

Soils are an important factor in the development process. Soil types impact such considerations as building design, location and engineering. In areas where centralized water and sewer services are unavailable, soil types are more relevant in determining whether on-site sanitary treatment and disposal systems are feasible, as well as below grade floor elevations.

Glacial advances that covered Central Ohio deposited and compacted glacial till over the bedrock surface. Glacial till consists of compacted dirt and small stones. It is very dense, very high in clay content and ranges in thickness from 20 feet to over 100 feet. This till poses a nearly impermeable barrier to water. The soils in Brown Township formed out of the surface of this glacial till following the glacial period. The effects of weathering, topography, drainage and plant and animal activity combined to give the soils their present characteristics.

The natural soil limitations found throughout Franklin County have resulted in the need for at least one acre of suitable soil to provide a housing site where central services are unavailable. Franklin County has found the lot size for lots less than five acres in size without central water and sewer service have averaged about 2.2 acres in size.

Soil conditions are extremely important to land development. Home sites may fall prey to failing foundations, wet basements or poor ground water due to soil conditions. Soil bearing capacity may prevent construction of large scale buildings. Unsewered areas may have severe constraints (high water table) that limit on-site sanitary treatment and disposal systems such as leach fields. High water tables can limit sites for a variety of uses.

Soil Suitability

Soils in Brown Township were assessed using a four-tier process that places each soil into a grouping relative to suitability for development. The source for information on soil characteristics is the Franklin County Soil Survey. The following categories, partly based on Franklin County Subdivision Regulations, were used to assess the Township. The Franklin County Soil Survey should always be consulted on a site specific basis. Map no. 2, Soils Suitability, displays this analysis.

A. Group No 1: Floodplain

Avoid Development - Group No. 1 contains soils that are regulated under the Franklin County Subdivision Regulations as "Floodplain and Poorly Drained Soils." These soil types are either found in floodplains or are poorly drained. The frequency, duration and extent of flooding may vary, however, in most cases these soils do not constitute acceptable sites for building and leaching areas. The analysis found that only small, isolated portions of Brown Township are categorized by Group No. 1 soil types, principally found within the Big Darby 100-year

floodplain.

B. Group No. 2: Generally Unfavorable for Development
Group No. 2 contains soils that are regulated under the Subdivision Regulations as "Soils With Wetness and Drainage Limitations." Seasonally high water tables are present near the surface of the ground in these soils much of the year. Lack of positive surface drainage (periodic ponding in undrained depressions) is also a characteristic. The creation of new building and leaching areas should be avoided in these soils.

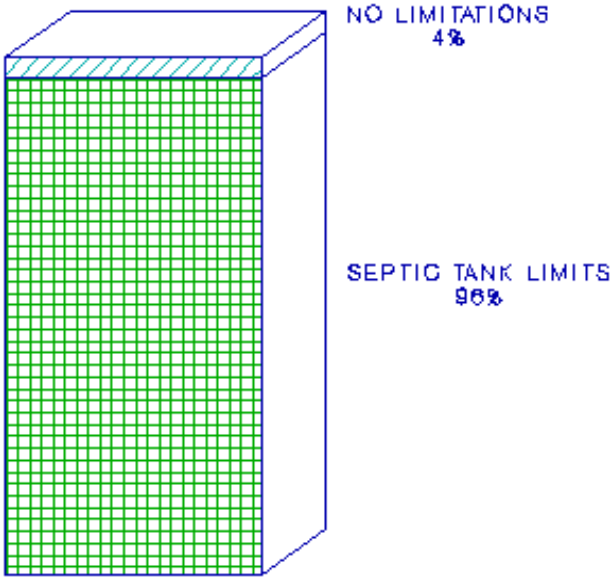
The analysis found that Group No. 2 soils, which can pose significant constraints for development, are found extensively throughout Brown Township. No portion of the Township is spared from these soils and major concentrations in particular can be found along Alton-Darby Creek Road between I-70 and Washington Township. Additional major concentrations are found in the central portion of the Township. It is clear that these soils are a major limiting factor for development within the Township.

The predominant soil type found in Group No. 2 is Kokomo Silty Clay Loam. This soil, according to the Franklin County Soil Survey, is very poorly drained, found in lower areas and depressions, receives runoff from adjacent higher soils, and is often subject to ponding. Kokomo drained has high potential for cultivated crops, hay, pasture and trees. Kokomo is severely limited for building site development, sanitary facilities and recreation uses. Kokomo soils are discouraged as building sites and leaching areas under the Subdivision Regulations.

C. Group No. 3
Developable with Site Specific Limitations - Group No. 3 includes soil types that may have site specific limitations that require additional consideration relative to appropriate activity, with the possible need for additional engineering, design and construction techniques. The Soil Survey again must be consulted for site specific limitations. These soils are mostly found within the immediate Big Darby Creek area and are limited in scope and location.

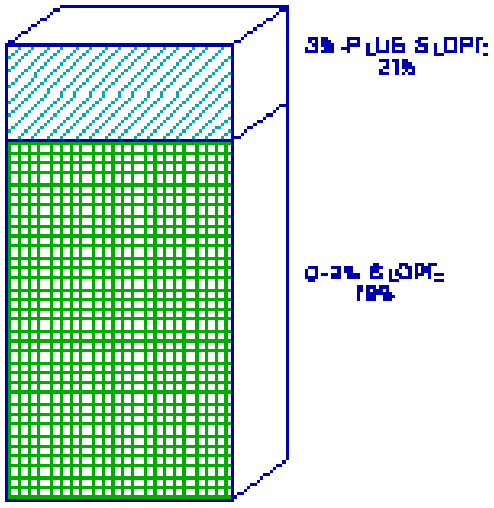
D. Group No. 4
Generally Suitable for Development - This final group contains remaining soil types that are generally suitable for development and pose few natural restrictions. Again, the Soil Survey should be consulted on a site specific basis to determine appropriate activity given soil characteristics. Group No. 4 soils, which are more suited for development, are found spread throughout the Township, intermingled with Group No. 2 soils. Major concentrations, however, are found closer to Big Darby.

Septic System Limitations



Soils analysis can indicate limitations for on-site septic systems based upon soil characteristics. Limiting factors include slow percolation, soil wetness, flooding and slope. OCAP assessments for Brown Township indicate that about 96 percent of the Township contained characteristics that severely limit septic system operation. Figure 4 depicts these conditions. The only areas not experiencing severe constraints were isolated locations along Big Darby Creek north of I-70. The Limitations for Septic Tank map shows those areas with constraints.

As a result of poor soil quality, the Franklin County Board of Health has required a lot containing at least one-acre of suitable soil for placement of a septic system. Again, Franklin County experience has shown that actual lot sizes have averaged around 2.2 acres.



Topography

Slope

Topography relates to surface relief and is an indication of the type and intensity of land use that may occur. Slope, the change in topography over a given distance, affects location of utilities, land use, design and siting of structures, drainage and general aesthetic considerations. Topography, therefore, affects the character of a specific location and the general potential of a much larger area. Map No. 3, Slope, illustrates slope characteristics within the Township.

Several "rules of thumb" exist relative to the impact of slope on land use and these rules vary depending on whether the author is an engineer or a land planner. Slopes of four percent or less are relatively flat and can be used for a variety of intensive activities depending on site specific constraints. Water often collects and saturates landscapes in such areas, however, about 37 percent (5,343 acres) of the planning area is frequently flooded due to stormwater ponding.

The more significant impact from slope is in the 0 to 2 percent category, where about 79 percent of the planning area is impacted, as shown in Figure 6. This represents about 11,480 acres, the majority of which is located in the central portion of the Township, north of I-70. Areas impacted by 0 to 2 percent slopes are also located south of I-70.

The level topography also creates problems for drainage systems and streams. Hellbranch Creek and Hamilton Ditch, which together function as eventual stormwater outlets for about one-third of the Township, are not deep and have shallow gradients and therefore are generally ineffective in removing excess stormwater.

Slopes between four and ten percent are considered easy grades and can be suitable for development sites, however, slopes above five percent can make truck access difficult and require more expensive building modifications. These slopes may also impact septic system design and construction practices. Slopes in excess of ten percent require additional expense as building sites, increase the cost of utility extensions, and are more affected by erosion. Slopes in excess of 20 percent are generally recommended for preservation as open space. The use of any land with steep slopes can result in severe erosion and slippage.

The areas depicted with significant slopes, above 12 percent, are found in the planning area along the Big Darby Creek valley. These areas occur in clusters both north and south of I-70, but predominate south of the interstate. (It should be noted, the Franklin County Subdivision Regulations recommend against placement of individual wastewater treatment and disposal systems utilizing soil absorption on such slopes.)

Prime Agricultural Soils

Agriculture plays an important role in the economic, cultural and social framework of Brown Township. Once agricultural land is disturbed or replaced by another land use, it cannot be effectively returned to agricultural production. The Franklin County Soil Survey classifies soil types for agricultural purposes in a series of eight classes, ranging from Class I (soils having slight limitations that restrict their use) to Class XIII (soils and miscellaneous areas having limitations that preclude their use for commercial crop production).

In Brown Township the majority of soils are classified under Class II, about 95.8 percent, and are fairly well distributed throughout the Township. This class is further sub-classified based upon specific limitations. About 17 percent of Class II soils are at risk of erosion unless close growing plant cover is maintained. About 82 percent of Class II soils are limited by water either in or on the soil which interferes with plant growth and cultivation (in most soils wetness can be corrected by artificial drainage).

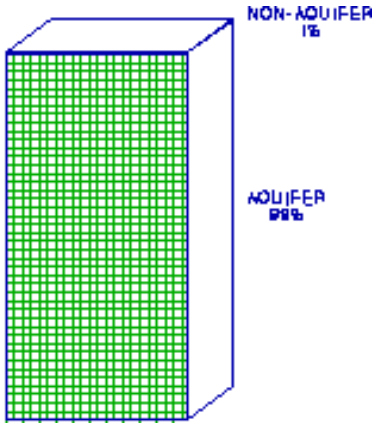
Most of these soils have wetness limitations, but can be or are used effectively for agricultural production, often with agricultural tile drainage systems. Even without tile drainage systems, these soils are still considered prime agricultural soils. Crop production, however, may be reduced from the over abundance of soil moisture.

Groundwater

Groundwater Availability

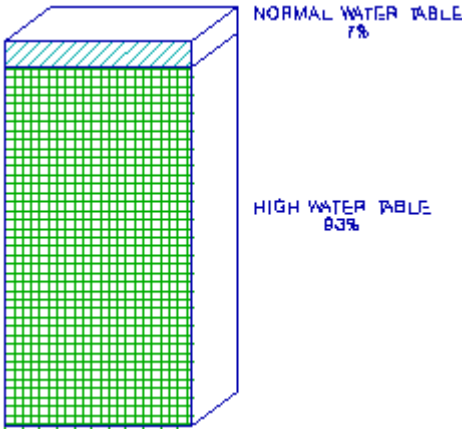
The availability of groundwater is particularly important in those areas where centralized water service is unavailable. The availability of groundwater, therefore, directly impacts land use relative to type and density, and can also serve as a constraint when there is an overabundance. In general, low density single family residences can be adequately supplied by wells yielding as little as five to ten gallons of water per minute, according to the Ohio Department of Natural Resources (ODNR). An industry or stock farm may require as much as 100 to 500 gallons per minute or more. Simultaneously, the amount of water being generated from an aquifer can decline as the number of wells increase, resulting in the need for deeper wells to intersect additional aquifers, if available.

Groundwater availability is not a general limitation within Brown Township for intensive land use. Yields should be sufficient for single family needs. Almost the entire Township (99.5 percent) is typified by yields up to 175 gallons/minute (about 99.5% or 14,417 acres), according to ODNR. Only a small portion of the Township in the Elliot and Hayden Run Roads area is affected by lesser yields (5 to 10 gallons/minute) which is the remaining 0.5% of the Township or 78 acres. Map No. 4, Groundwater Availability, depicts flow rates. The majority of the Township is underlain by an aquifer, as shown in Figure 7.



Seasonally High Water Table

A high seasonal water table can present constraints for development, impacting structural characteristics such as foundations and basements, as well as service needs such as on-site treatment and disposal of sanitary waste. The seasonal high water table is the highest level of a water saturated zone in the soil in most years.



Brown Township, as well as much of Franklin County, suffers from seasonally high water tables. About 37 percent (5,359 acres) of the planning area has a water table that is at the surface or within one foot of the surface, while 56 percent (8,074 acres) has a water table within 1.5 to 3 feet of the surface. Together about 93 percent of the Township is impacted in this way, as shown in Figure 8.

Tributary System

Tributaries

Brown Township is located within the Big Darby Creek watershed, which is a portion of the Scioto River drainage basin. Big Darby's headwaters rise near East Liberty in southeast Logan County and flow about 78 miles, emptying into the Scioto near Circleville in Pickaway County. The creek and its tributaries drain an area of about 557 square miles, including portions of Logan, Union, Champaign, Clark, Madison, Franklin and Pickaway Counties.

The Township is drained by several tributaries, in particular Hamilton Ditch which services about one-third of the Township, functioning as the eventual stormwater outlet for the eastern portion of the planning area. Hamilton Ditch is tributary to Hellbranch Creek. Several other minor ditches are located in the western half of the Township, including Sherwood, Worthington-Sherwood, Leap and Burkett Ditches. All of these ditches are in the Darby Creek watershed. Map No. 5, Tributary System, depicts this information.

Floodplains

The 100-year floodplain has been mapped along Big Darby Creek, Hamilton Ditch and Clover Groff Ditch. The 100-year floodplain is far more extensive along Hamilton and Clover Groff Ditches than along the Big Darby, reflecting the nearly level topography found along the two ditches. Land use impacts, thereby, are geographically more extensive in the eastern portion of the Township.

Stormwater Drainage

Drainage is an important land use consideration, because areas that are poorly drained can result in a variety of negative impacts: wet basements, cracked foundations, flooded property and related maintenance problems. Agricultural areas are particularly impacted by poor drainage.

The nearly level topography that typifies Brown Township is a leading cause, in addition to poorly drained soils, for poor stormwater drainage because it places physical limits on natural drainage systems such as streams. Hamilton Ditch, which drains about one-third of Brown Township, has a shallow depth and gradient, is heavily silted and vegetated and is generally ineffective in removing excess stormwater.

A. OCAP/ODNR Assessment

An assessment prepared by the Ohio Capability Analysis Program (OCAP) shows about 78 percent (11,278 acres) of the Township has drainage problems; either "very poorly drained" or "somewhat poorly drained". The balance (22 percent) has "good drainage" and of that, only about 5 percent is considered "well drained" based upon this assessment. Figure 9 shows this relationship.

The Ohio Department of Natural Resources noted in its corridor study of Big Darby Creek that portions of the flat uplands, which have Crosby and Kokomo soils, are poorly drained and have a high

water table, resulting in problems of ponding, basement flooding, and septic tank failure.

B. Local Studies

Drainage problems in Brown Township have been officially identified in studies dating to at least 1969, when the Franklin County Comprehensive Plan stated, "Because of the extreme flatness of the area and difficult drainage problems north of I-70 near Hilliard, it is recommended that the area (Brown Township) not be residentially, commercially, or industrially developed."

The Water-Related Facilities Plan, prepared by Burgess & Niple, Ltd., for the Mid-Ohio Regional Planning Commission in 1969, questioned the investment for physical drainage improvements in the Township, noting that "severe ponding may be expected regardless of the drainage facilities provided, with distressing consequences attendant on those who build there."

C. MORPC Study

The Brown Township Drainage And Land Use Study, prepared by MORPC in 1982 for the Township Trustees, delineated boundaries of three major drainage areas in the Township and developed specific drainage policies for each.

The following is excerpted from the study:

Area A

The western portion of the Township, Area A exhibits positive surface drainage (generally greater than two percent slope) and drains into Big Darby Creek. As a result, stormwater drainage is not a limitation for development in Area A.

Outlets to Big Darby Creek are a number of parallel ditches. While the lower reaches of these ditches have good flow characteristics, the upper reaches extend into Area B where topographical conditions allow for an average slope of one-half percent or less.

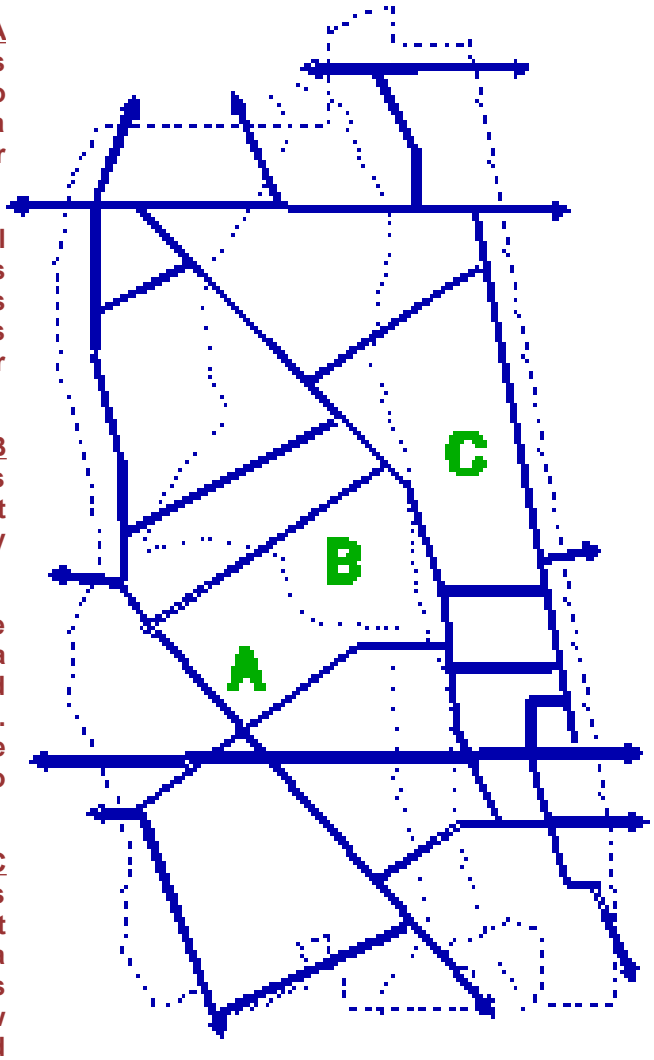
Area B

The central portion of the Township, Area B is subject to poor local drainage conditions due to flat topography, but eventually drains to Big Darby Creek, a suitable stormwater outlet.

Area B soils are subject to severe local ponding. Site specific constraints to development result from a high water table, depressional and flat terrain, and inadequate surface or subsurface drainage outlets. The nearly flat topography serves to negate positive drainage, even with the addition of improvements to the major ditches leading to Big Darby.

Area C

The eastern portion of the Township, Area C is subject to poor local drainage conditions due to flat topography and drains into Hellbranch Creek via Hamilton Ditch. Neither tributary effectively removes stormwater for Area C due to the existing shallow gradient (which is compounded by siltation and



heavy vegetation in the tributaries).

Area C is the most severely impacted by drainage restrictions of the three study areas in Brown Township. Area C constitutes the upper watershed for Hamilton Ditch which has an average slope of 0.11 percent between Scioto-Darby Creek Road and I-70. A "drainage sensitive area," Area C contains soils subject to seasonal ponding and extensive 100-year floodplains.

A ditch improvement project would upgrade the flow characteristics of Hamilton Ditch, thereby providing an improved outlet for subsurface tile connections. But such an improvement would not address the site and area conditions of undrained depressions and flat surface grades. As the study states, "such a project would only be effective in helping the high water table in the immediate vicinity" of Hamilton Ditch.

Sedimentation of Hamilton Ditch would continue to be a maintenance problem, because of the extremely flat ditch grade and low flow velocities. (A further restriction is the high groundwater table coupled with extreme levelness, which together restrict on-site wastewater systems for residences.)

D. Franklin Soil and Water Conservation District

The FSWCD began a stormwater management study of the Hellbranch watershed in late 1991. Those results should be reviewed in light of this Plan following the District's completion of their study.

Woodlands

TO SAVE WOODLANDS . . .

How much forest land is enough? How much should be preserved relatively unspoiled for our children and future generations? The answer is unclear and the need is difficult to forecast. In the past, as Ohio developed, no one had the forethought to protect and preserve even one square mile of virgin land. Will unchecked development cause remaining forest land to disappear except for a few publicly-owned areas?
--From Saving Central Ohio's Forest Tracts
Mid-Ohio Regional Planning Commission

Woodlands

Woodlands serve a variety of important roles within developed and developing areas. As a part of the natural landscape, woodlands provide cover for wildlife. Woodlands and fence rows serve an aesthetic role in providing form and recognition to the landscape, a role that enhances any public park. On a more technical level, old wooded sites often are indicative of soils unfavorable to development and even agriculture because of high ground water and poor drainage. Although cherished by residential developers as exceptional housing sites and even sometimes developed at low densities with no-build zones, experience shows that without careful efforts heavier vegetation may die from development impacts.

The woodlands surveyed as a part of this project comprise a variety of vegetative areas that are not virgin timber, a rare commodity in Central Ohio. Aerial photographs were reviewed to identify heavy vegetation within the planning area, undeveloped wooded tracts and fence rows. Map No. 6, Woodlands and Wildlife Habitat, indicate the location of woodlands.

Brown Township contains a scattered range of woodlots and fence rows, as well as vegetative cover along many tributaries. Woodlots are found in most parts of the Township, except the most central area which tends to lack any substantial vegetative areas. Seven forest tracts identified as a part of a 1975 survey conducted by the Ohio Department of Natural Resources (ODNR) for MORPC are found in the Township planning area. All tracts appear to remain intact, based upon 1989 aerial photographs. These forest tracts are the following:

A. Tract 26
A 20-acre forest tract located southeast of Davis Road halfway between Walker and Alton-Darby Creek Roads; the tract was described as "a small but nice beech woods (one to one and a half feet diameter), scattered red oaks, spicebush, ash, and sapling sugar maple." The survey recommended preservation by the owners.

B. Tract 38
A 34-acre forest tract located on the southeast side of Patterson Road.

C. Tract 39

A 38-acre forest tract located due east of the intersection of Morris and Amity Roads. A section of the tract had been heavily grazed at the time of the survey, with the balance containing mixed oak woods, large specimens of white oak, shagbark hickory, red oak, spicebush, young sugar maple in understory, a good representative spring flora and a ponded stream at the upper end which was attracting migrating ducks.

D. Tract 40
A 74-acre forest tract located east of the intersection of Davis and Walker Roads, this tract consisted of scattered large oaks, few beech, shellbark and shagbark hickory, wild black cherry, blue beech, very dense understory of sapling sugar maple, dogwood, spicebush and grape, and sparse spring flora.

E. Tract 42
A 25-acre forest tract located on the west side of Alton- Darby Creek Road just north of I-70; the tract was noted as being a well-stocked young woods, mostly pole-sized red maple with black cherry, shagbark hickory, and ash associates. At the time of the survey the tract was under private protection.

F. Tract 51
An 85-acre forest tract located on the east bank of Big Darby Creek just south of I-70, a majority of the site is owned by the Ohio Trefoil Girl Scout Council. The survey noted ravine-cut hillsides containing mainly oak, scattered large white oaks, young black cherry, sycamore and shagbark hickory, redbud and dogwood in understory, and the condition of spring flora was undetermined.

G. Tract 52
A 42-acre forest tract located southwest of the intersection of Feder and Amity Roads, the tract was noted as a large swamp forest with extensive wooded pools adjacent to old water-filled gravel pits, mixed oaks, red maple, boxelder, black cherry, spicebush, and excellent spring flora.

Wetlands

Wetlands are areas periodically inundated by water or that have water-logged soils for periods during the growing season, although a definitive definition is currently under reconsideration by the Federal Government. The U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency defined wetlands at one point as:

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Although wetlands typically have been drained to provide tillable land, today we realize wetlands offer numerous benefits:

- Storage and slow release of stormwater;
- Groundwater recharge and maintenance of stream flow;
- Water quality maintenance through capture of sediment and pollution (farm runoff); and
- Wildlife habitat and recreation.

The results of draining or filling wetlands include increased runoff and the risk of flooding, a lowered groundwater table, increased sedimentation in streams, poorer water quality and declines in wildlife. The U.S. Army Corps of Engineers regulates certain activities within defined wetlands through the Section 404 review process. The Corps' jurisdiction includes such activities as dredging, placement of fill material, ditching, levee and dike construction, landclearing involving relocation of soil material, landleveling, and road and dam construction. The Ohio Environmental Protection Agency may also be involved through the Section 402 review process.

Hydric soils have been identified as former and existing sites of wetlands or possible sites for future wetlands. Many of these soils are currently drained through artificial means. If those systems, such as subsurface tiles, are removed, these soil types could revert to a wetlands state. An assessment of Brown Township finds a significant majority of the Township is impacted by hydric soils. This factor, taken into consideration with other characteristics such as high water table and poorly drained soils, further supports the concern that Brown Township is very limited for most types of development.

Wildlife

The Big Darby's Ecological Significance

The Big Darby Creek watershed is the healthiest and most diverse aquatic system of its size in the Midwest and is among the top five warm freshwater habitats in the nation. The creek winds through a 556-square-mile watershed that includes remnant prairies and savannas once part of a tallgrass prairie ecosystem. It harbors 86 species of fish, including the endangered scioto madtom, and 40 species of mollusks. Big Darby . . . also filters groundwater and helps recharge aquifers.

- From Last Great Places The Nature Conservancy

Wildlife

The extent of wildlife within Franklin County is typically limited to a variety of mammals, birds and limited fish found within such an urbanized county. The degree of diversity and quantity of such wildlife increase as appropriate habitats are protected or recreated. Brown Township is unique in Central Ohio in that a portion of Big Darby Creek flows through the planning area.

Big Darby Creek, along with Little Darby Creek, are a state designated scenic river. The Darby Creeks are also currently under consideration for designation in the national wild and scenic river system. Big Darby Creek has been rated as one of the top aquatic communities in Ohio by the Ohio Natural Heritage Program (ODNR) and is classified as an exceptional warm water habitat by the Ohio Environmental Protection Agency (OEPA). The U.S. Department of Agriculture designated the watershed as a Hydrologic Unit in an effort to promote the control of non-point pollution which degrades water quality, thereby reducing habitat area which sustains the extraordinary variety of species in the Darby Creeks.

The Nature Conservancy, a private international conservation organization, has designated the watershed as one of 12 "Last Great Places" through which they seek to develop local partnerships to protect fragile natural resources at the ecosystem level.

Due to the vast interest in the Darby watershed, a partnership of over 20 local, state and federal agencies, and institutions and private participants has been formed to provide for better communication and coordination of efforts in the protection and preservation of the Darby Creeks.

ODNR's Division of Natural Areas and Preserves has identified at least four locations within the Brown Township planning area where state endangered species of mollusks have been

found. Map no. 7, Woodlands and Wildlife, indicates the location of habitat areas. Increasing urbanization has and will continue to result in increased water consumption and demand, sewer requirements, stormwater runoff and soil erosion from construction sites, which all have the potential to endanger the existence of mollusks in Big Darby, as well as other wildlife currently in the Township, according to ODNR.

As The Nature Conservancy has written, "While the rural character of the Darby plains has helped maintain Big Darby Creek's exceptional water quality, changes in the landscape have begun to threaten the aquatic organisms. " TNC cites three major threats to Big Darby's ecology: increased suburbanization, deforestation of stream corridors and agricultural runoff.

Recommendations

Recommendations provide direction to implement the policy recommendations of the Brown Township Comprehensive Plan. The actions contained in this section reflect priorities and planning concerns related to the natural environment. Details regarding implementation are provided in the Land Use and Implementation Elements.

Objective A

To continue to ensure building sites, including wastewater systems, are appropriately located based upon soils, topography, drainage, wetlands and woodlands, among other factors.

Recommended Actions

1. It is recommended that the minimum lot size for a single family residence should be 2.5 acres.

   Given soil limitations, lot split patterns throughout unincorporated Franklin County and the Township's present density, it is recommended that the minimum lot size for single family homes without water and sewer service be 2.5 acres. Franklin County's Low Density Residential (LDR) District would be a suitable mechanism for implementing this recommendation in accordance with the 2010 Land Use Concept.

2. It is recommended that land suitability standards as found in the Franklin County Subdivision Regulations be applied to parcels proposed for residential uses that exceed five acres in size. Currently state law precludes this recommendation from being implemented. However, two options are available:

   A) Support should be expressed to revise state enabling legislation to extend subdivision requirements to lots up to 10 acres in size (as currently proposed in the Statehouse); and

   B) Under Sec. 103.00 of current (1991) proposed Subdivision Regulation revisions, a "Certificate of Review" could be issued by Mid-Ohio Regional Planning Commission if requested for unincorporated tracts otherwise exempt. The certificate process would involve staff review and Technical Review Group assessment concerning development potential for use as a homesite. The review would not create an obligation for any public agency because there is no statutory permission, but would provide sound land planning and engineering review of potential homesites prior to application submittal for building and health permits.

3. Hydric soils are recommended to continue to be used in the review of development proposals. Uses not appropriate to hydric soils should be discouraged.

   The land use impact of poorly drained soils in Brown Township is well documented. Hydric soils are an indication of this constraint, as well as evidence of prior or existing wetland characteristics. Hydric soils should continue to be used in evaluating appropriate sites for construction, as well as on-site wastewater systems.

4. Submittal of a drainage plan is recommended to continue to be required as a zoning certificate requirement.
5. Under Sec. 705.022[6] of the Franklin County Zoning Resolution, surface drainage features and underground storm drainage facilities must be addressed when a zoning compliance certificate application is submitted. This requirement includes submittal of a grading plan and storm sewer layout, including existing and proposed surface and subsurface draining features, and how storm runoff will be handled. Increased enforcement and monitoring is strongly endorsed.

Objective B

To protect environmentally sensitive areas, such as floodplains and woodlands, from adverse land use changes and impacts.

Recommended Actions

1. Woodlands are recommended to be protected from adverse impacts and managed as a vital natural resource.

   The Comprehensive Plan encourages private and public property owners to protect and preserve existing wooded areas. Major wooded tracts are the few remnants of our original landscape and today provide unique character to Brown Township. Such wooded areas should be used and managed as a resource. (Please see the Woodlands Preservation Land Use Policy in the Land Use Element.)
2. Open space in the form of woodlands and the 100-year floodplain are recommended for preservation.

   Open space preservation is a goal as a means of protecting and preserving the 100-year floodplain from encroachment and in preserving existing woodlands. The preservation of the floodplain to ensure its maximum ability to accommodate storm runoff is a goal. (Please see the Open Space Land Use Policy in the Land Use Element.)
3. The creation of natural areas and preserves along Big Darby Creek is supported.
4. The Comprehensive Plan recognizes the appropriateness of creating natural areas and preserves along Big Darby Creek within Brown Township as a means of safeguarding and preserving the creek's ecology.

Objective C

To continue and expand efforts to protect Big Darby Creek from the adverse impacts of land use change and development.

Recommended Actions

1. 1. A land use mechanism is recommended to provide a buffer area for conservation purposes along Big Darby Creek and to manage land use and development within the Big Darby Creek corridor.

   A land use mechanism is recommended to serve two goals:

   A) To create and maintain a 140-foot buffer area for conservation purposes, measured from the centerline of Big Darby which would preclude development and encourage natural vegetative growth; and

   B) To manage land use change within the immediate corridor that would ensure development is appropriate and compatible with Big Darby Creek.(Please see the Flood Plain River Protection District in the Land Use Element for further details.)
2. Filter strips are recommended as important conservation practices along all tributaries within the Township.

   For all tributaries other than the Big Darby, filter strips comprised of grasses and at least 15 feet in width should be maintained along each side, as measured from the top of the bank of each tributary. The filter strips help to reduce sedimentation that otherwise impacts Big Darby's water quality. Property owners and farm operators are encouraged to consult with the Franklin Soil and Water Conservation District.
3. Cooperation is recommended with other public and private agencies dedicated to protecting Big Darby Creek.

   The Ohio Department of Natural Resources, The Nature Conservancy and Metropolitan Parks District of Columbus and Franklin County, as well as any other public or private conservation body, should be assisted in their efforts to preserve and protect unique habitat and natural areas and preserves along Big Darby Creek.

Objective D

To protect and preserve agriculture as a viable land use within Brown Township.

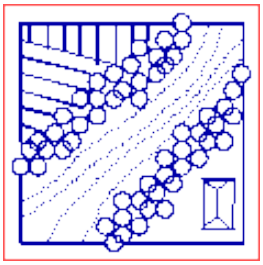
Recommended Actions

1. Land use controls are recommended that would provide an option to property owners to preserve agricultural activities.

   A zoning mechanism is suggested to provide, at a property owner's option, a means of preserving a portion of a working farm, while permitting the balance to develop as a low density, platted residential subdivision. The goal is to provide property owners the ability to receive a financial gain from their land, while meeting an expressed public desire of protecting farmland. (Please see the Agricultural Preservation Overlay District in the Land Use Element.)

Facilities and Services

Introduction



This Element of the Comprehensive Plan focuses on various public facilities and services and cultural assets that comprise or affect Brown Township. Given the lack of certain public facilities such as central water, storm sewer, and sanitary sewer services, this discussion in many respects is limited in scope. This Element focuses on: water systems, wastewater treatment and disposal systems, stormwater drainage, transportation, safety services, township facilities, and community facilities and resources (parks and recreation, education, historic resources and archaeological resources). Map No. 8, Public Facilities and Services, illustrates the location of many of the items discussed in this Element.

Planning Issues

The following major planning issues are the focus of the Public Facilities and Services Element:

A. Drainage
Brown Township is severely constrained from a drainage standpoint, due to limited soils and topography. The planning issue relates to: 1) the ability to properly drain existing property; and 2) the potential impact from additional development, whether of a low, medium, or high density.

B. Transportation
Although rural in character, transportation as everywhere is an issue. Several road improvement projects have been scheduled within the Township and as area growth continues it is expected that additional improvements will be necessary to handle added traffic volumes and existing deficiencies.

Water and Wastewater Systems

Brown Township, which lies within the Big Darby Creek watershed, is partially located in the City of Columbus regional utility service area. The western boundary of the City's service area includes the Hellbranch Run watershed, which includes both Clover Groff and Hamilton Ditches. To extend services into this watershed may involve lift stations and other engineering requirements, according to Columbus staff.

Franklin County has agreed not to accept new package treatment plants associated with new development. The City of Columbus has on the other hand agreed to permit the County to connect wastewater plants to the regional system without annexation. A prior study conducted for Franklin County in 1979 (Malcolm Pirnie, Preliminary Engineering Report, Sewage Plan, Southwestern Franklin County) estimated the feasibility of constructing a proposed sanitary sewer system to serve the Big Darby watershed in western Franklin County and determined the cost to be $7 million.

Water Systems

Central water service, whether public or private, is not available in the unincorporated portions of Brown Township. Groundwater yields, as noted in the Natural Environment Element, are generally not a limitation for most forms of agriculture and single family homes. The present groundwater yield in almost the entire Township (99.5 percent) is about 175 gallons per minute, according to the Ohio Department of Natural Resources. Groundwater quality may vary by location. The limited portions of Brown Township that have been annexed to the City of Hilliard are not provided with central water service at this time.

Wastewater Systems

Wastewater treatment and disposal occurs in Brown Township on a lot by lot basis, given there are no centralized services available either public or private. There were no indications in the household survey of significant concerns or problems regarding household wastewater treatment and disposal, despite soil limitations that are prevalent throughout the Township. Areas recently annexed to the City of Hilliard are not serviced with central sanitary sewers at this time.

Stormwater Drainage

The current system which provides stormwater drainage within Brown Township is comprised of natural drainageways (tributaries and swales) and built systems (subsurface drainage tile and ditches). This is essentially a private collection of various components and the ability to adequately service individual properties within the Township is limited by a number of factors, including low slope (0%-2%), lack of ditch and tributary maintenance, and inability to comprehensively service subsurface tile systems.

The burden for maintaining much of this system falls to private property owners who must individually maintain on-site portions of these interconnected systems. Drainage from single family homes is sometimes connected to overloaded farm tiles. At the same time, however, the amount of stormwater flow may decrease from areas converted from active tillage to residential yards with turf.

Transportation

Streets and Highways

A. Franklin County Thoroughfare Plan

The Franklin County Thoroughfare Plan establishes functional classifications for major roadways within the County and Table 1, Functional Roadway Classifications, summarizes these classifications. When a subdivision in unincorporated Franklin County abuts a public right-of-way (ROW) that is shown on the Thoroughfare Plan and according to the plan additional ROW is needed, subdividers are required to dedicate that additional ROW to Franklin County in accordance with the Thoroughfare Plan.

FUNCTIONAL CLASSIFICATIONS Brown Township	
CLASSIFICATION	**ROADWAY**
MAJOR ARTERIAL	Roberts Road Scioto-Darby Creek Road Amity Road (Between Roberts and Feder Roads)
MINOR ARTERIAL	Alton-Darby Creek Road Dellinger Road Feder Road Walker Road (East of Roberts Road)
COLLECTOR	Walker Road (West of Roberts Road) Davis Road
Source: Franklin County Thoroughfare Plan (1971)	

The Thoroughfare Plan, which is currently under review, indicates only three major recommended improvements within the Township: the realignment (straightening) of Roberts Road at its junction with Walker Road which is presently a dog-leg intersection; the realignment of Amity Road north of Roberts (a proposal that will be deleted from the Thoroughfare Plan update given the canceled plans for an onstream reservoir); and a new connecter between Dillinger Road and Feder Road.

B. Transportation Plan (1991)

The Transportation Plan, prepared by the Mid-Ohio Regional Planning Commission, lists highway deficiencies and recommends improvements, and lists deficient bridges. The plan catalogs long-term transportation needs and is a precursor to actual scheduling of such improvements. The major improvements presented in the plan relative to Brown Township are widening and safety improvements along Scioto-Darby Creek Road.

C. Transportation Improvement Program (TIP) 1992-1996

The TIP is a staged, multi-year schedule of federally-funded transportation improvements in Franklin County and the surrounding transportation planning area. Any federally-funded transportation project must appear on the TIP before it is eligible to receive federal funds. No improvement projects for the Brown Township planning area have been identified on the TIP

for FY1991 to FY1995.

D. Franklin County Engineer's Office
The Franklin County Engineer's Office has scheduled a number of improvement projects within Brown Township over the coming years. These projects include the following:

1. Beach Road and Bridge; bridge replacement, widen and upgrade east approach, improve
   intersection sight distance at Amity; scheduled for after 1995; no cost estimate.

2. Dellinger Road between Amity and Hubbard; rebuild roadway and two-lane pavement; scheduled for 1992; cost is $1.5 million.

3. Walker Road between Roberts and Jones; widen two-lane pavement and realignment; scheduled for beyond 1995; cost is $1 million.

4. Scioto-Darby Creek Road; widening; scheduled after 1995; no cost estimate.

E. Traffic Volumes
Traffic Count Comparisons, presents a summary and comparison of traffic counts for specific locations within unincorporated Brown Township. In general, traffic volumes have increased throughout the Township, reflecting growth patterns and continued residential development. The following major observations are made:

1. The traffic on Scioto-Darby Creek Road increased at its junction west of Alton-Darby Creek Road, while it decreased east of Alton-Darby Creek Road.

2. Traffic along Feder Road has increased by more than 50 percent between 1988 and 1990 at its intersections with Alton-Darby Creek and Amity Roads.

Table 2: TRAFFIC COUNT COMPARISONBrown Township
ARTERIAL INTERSECTION 1989-90 1985-88
ROBERTS ROAD East of Walker 1700 1207
West of Walker --- 708
West of Alton-Darby --- 1108
East of Alton-Darby --- 808
East of Amity 1109 ---
West of Amity 1009 1008
East of Hubbard 909 706
West of Hubbard 709 606
ALTON-DARBY CREEK ROAD North of Roberts --- 2008
South of Roberts --- 1707
South of Scioto-Darby 2600 2207
North of Feder 2400 1508
South of Feder 2500 1508
AMITY ROAD North of Feder --- 1805
South of Feder --- 605
South of Roberts 1009 808

North of Roberts 1409 ---
WALKER ROAD South of Scioto-Darby --- 507
North of Roberts --- 1107
South of Roberts --- 408
SCIOTO-DARBY CREEK ROAD West of Alton-Darby 2300 2607
East of Alton-Darby 4200 3807
FEDER ROAD East of Alton-Darby 6500 4408
West of Alton-Darby 4800 3208
East of Amity 3309 1805
Note: "---" represents a location where a count was not taken.Source: Transportation Department, MORPC

F. Traffic Issues
The household survey conducted for the Comprehensive Plan revealed that 58 percent of the residents ranked street conditions as "good". Comments focused upon functional needs within the arterial system in Brown Township, such as speeding by motorists, heavy traffic, deteriorating road conditions, problematic intersections and dog leg intersections. Specifically:

1. For speeding, perceived heavy traffic and road conditions, the following roads were identified as exhibiting at least one of these concerns: Alton-Darby Creek, Amity, Davis, Elliot, Feder, Hayden Run, Roberts, Scioto-Darby Creek and Walker.

2. Two problematic intersections were identified: Amity Road at Roberts Road and Alton-Darby Creek Road at Scioto-Darby Creek Road.

3. The following dog-leg intersections were identified as concerns: one along Patterson Road, two along Morris Road and two along Walker Road (south of Roberts Road). Comments received at Public Meeting No. 1 and in subsequent correspondence indicated support for maintaining these dog-legs.

Bikeways

In 1974 MORPC prepared a regional bikeway plan for Franklin County which had as a goal development of a balanced and diversified transportation system that did not totally depend on the private automobile. A basic system of regional bikeway connectors as proposed, linking various communities within the planning region, with the function of the connectors to ensure continuity of routes between various communities. The proposed routes were designed to facilitate safe and convenient cycling.

Brown Township is linked to the remainder of the County in the phase II of the Plan, the schedule of which is undecided at the present time. In the Township, the following roads were identified as bikeways: Roberts Road; Scioto-Darby Creek Road; and Amity Road.

Implementation

Implementation of the Comprehensive Plan is recommended to occur principally through the Franklin County zoning program through zoning text and map changes, with additional actions occurring at the administrative level. The Implementation Element proposes additional options for addressing this most important component of the comprehensive planning process.

Land Use Management

The function of land use management at the County level involves various public agencies, with the authority to adopt zoning changes held by the Franklin County Board of Commissioners. Table 7 summarizes these various functions and responsibilities and identifies the respective public agency.

LAND USE MANAGEMENT Franklin County	
RESPONSIBILITY	**AGENCY**
Annexation	Franklin County Commissioners and Respective City Council
Zoning and Floodplain	Franklin County Commissioners
Subdivision Plats	Mid-Ohio Regional Planning Commission
Stormwater	Franklin County Engineer's Office
On-Site Sanitary / On-Site Water	Franklin County Board of Health
Residential Building Code	Franklin County Building Department
Commercial Building Code	State of Ohio
Roads	State of Ohio (ODOT) Franklin County Engineer's Office Brown Township Trustees

As a result, close coordination is necessary to ensure that all participating agencies are communicating. Part of the responsibility for this coordination in the areas of zoning and subdivision regulations falls to the Technical Review Group established under the Franklin County Subdivision Regulations.

Implementation Opportunities

The following opportunities for implementing the Comprehensive Plan are proposed for consideration:

A. Zoning Resolution Changes

Following adoption of the Comprehensive Plan, the zoning resolution and map changes recommended in the Land Use Element are recommended to be implemented.

B. Ad-Hoc Township Planning Committee

An Ad-Hoc Township Planning Committee has been proposed by the Steering Committee, answerable to the Trustees, to serve in an unofficial capacity in the area of land use planning.

The Committee could provide input to the Trustees on planning matters, would assist the Trustees in promoting the Comprehensive Plan and could oversee a regular update of the Plan.

C. Cooperative Agreements
To provide a means of commitment on the part of various County-level agencies to assist the Township whenever possible in implementing this Plan, cooperative agreements may be valuable. These documents could state that the respective agency:

Has as a programmatic goal the implementation of the Brown Township Comprehensive Plan whenever a recommendation or goal presented in the Plan can be addressed through the respective agency's normal and ongoing operations, provided said recommendation or goal is within the respective agency's statutory authority, and does not conflict with the agency's legal mandates and the public's health, safety, and general welfare.

Such agreements would be limited in their applicability and do not necessarily offer a concrete commitment to fulfill the Plan's objectives. However, it would provide an indication of an agency's willingness to work with the Brown Township Trustees in reaching mutually beneficial results.

Updates

The Comprehensive Plan is not "written in stone" and should be reconsidered on a regular basis. Circumstances change that can affect the priorities of Township residents, as well as the economic, social and political factors that influence Brown Township. It is important therefore to consider this document for review and updating on a regular basis, perhaps every three to five years as a minimum time frame. Such an update could be prepared in memorandum form and adopted as an amendment to the Plan's policies and recommendations.

Glossary

ACCESS
A way or means of approach to provide physical entrance to a property.

AESTHETIC
The perception of artistic elements, or elements in the natural or built environment which are pleasing to the eye.

AESTHETIC ASSETS
Components of the built or natural environment that are aesthetically pleasing and contribute to a community's sense of identity.

AQUIFER
An underground bed or stratum of earth, gravel, or porous stone that contains water.

AQUIFER RECHARGE AREA
The exposed ground level portion of the aquifer.

BASIN, DETENTION
A storage facility for the temporary storage of stormwater runoff intended to completely empty.

BASIN, RETENTION
A pond, pool, or basin used for the permanent storage of water runoff with a permanent water level.

BUFFER STRIP
Land area used to visibly separate one use from another or to shield or block noise, lights, or other nuisances.

BUILDING ENVELOPE
The two-dimensional space within which a structure is permitted to be built on a lot and which is defined by yard setbacks.

BUILT CONSTRAINTS
Characteristics of the built environment that constrain human land use activities, such as sanitary sewer service area limits, high-voltage power lines, and hazardous waste facilities.

BUILT ENVIRONMENT
The physical elements and characteristics relating to land use, structures, and buildings constructed and/or used by persons.

CONSERVATION EASEMENT
An easement precluding future or additional development of the land.

CLUSTER
A development design technique that concentrates buildings in specific areas on the site to allow the remaining land to be used for recreation, common open space, or preservation of environmentally sensitive features.

DEMOGRAPHICS
Characteristics of the population, such as age, gender, and income.

DEVELOPER
The legal or beneficial owner or owners of a lot or of any land included in a proposed development

including the holder of an option or contract to purchase, or other persons having enforceable proprietary interests in such land.

DEVELOPMENT
(1) The division of a parcel of land into two or more parcels; (2) The construction, reconstruction, conversion, structural alteration, relocation or enlargement of any structure; (3) Any mining, excavation, landfill or land disturbance; (4) Any use or extension of the use of land.

EXURBAN
An intensity of land use that is less dense and lower scale than suburban, but not as undeveloped as a rural environment, including large lot, single family residential scattered development, agriculture, and open space.

FILTER STRIP
A strip of land along a tributary that contains grasses, trees and shrubs which serve to filter sedimentation and chemicals from runoff.

FLOODPLAIN
The channel and relatively flat area adjoining the channel of a natural stream or river which has been or may be covered by floodwater.

FLOODWAY
The channel of a natural stream or river and portions of the floodplain adjoining the channel, which are reasonably required to carry and discharge the floodwater or flood flow of any natural stream or river.

FLOODWAY, REGULATORY
The channel and the adjacent land areas that must be reserved in order to discharge the regulatory base flood.

GEOLOGY
The science that deals with the history of the earth and its life, especially as recorded in rocks, such as geologic features.

GROUNDWATER
The supply of freshwater under the surface in an aquifer or soil that forms the natural reservoir for potable water.

HAPHAZARD DEVELOPMENT PATTERN
A sporadic pattern of development that is not concentrated or clearly geographically directed (see "sprawl").

HOUSEHOLD WASTEWATER TREATMENT AND DISPOSAL
An approved method of treating and disposing of human waste, such as septic tanks and leach fields, without the use of a central sanitary sewer system.

INFILL DEVELOPMENT
The construction of new buildings on scattered vacant sites in a developed area.

LANDSCAPE
The addition of lawns, trees, plants, and other natural and decorative features to land.

LAND USE
A description of how land is occupied or utilized by persons.

MINI-FARMS
A residential piece of property, typically five acres or larger in size, in which a degree of agricultural, horticulture, floriculture, or animal husbandry is pursued, subordinate to the principle use which is

typically single family residential.

MORPC
Mid-Ohio Regional Planning Commission.

NATURAL CONSTRAINTS
Characteristics of the natural environment that constrain human land use activities, such as the 100-year floodplain, wetlands, and poorly drained soils.

NATURAL ENVIRONMENT
The physical elements and characteristics relating to land, water, air, plant, and animal life.

OCAP
Ohio Capability Analysis Program.

ODNR
Ohio Department of Natural Resources.

OEPA
Ohio Environmental Protection Agency.

OHPO
Ohio Historic Preservation Office.

RESIDENTIAL, LOW DENSITY
Single family residential land use with lot sizes in the one-half acre to one acre range (or .5 to 1 dwelling unit per acre).

RESIDENTIAL, SUBURBAN
Single family residential land use with lot sizes of less than one-half acre (.25 to .16 units per acre), typically including platted subdivisions and central utilities.

RESIDENTIAL, VERY LOW DENSITY
Single family residential land use with lot sizes greater than one acre.

RURAL
A sparsely developed area where the land is predominantly undeveloped or primarily used for agricultural purposes.

SCREENING
A method of visually shielding or obscuring one abutting or nearby structure or use from another by fencing, walls, berms, or densely planted vegetation.

SETBACK
The distance between a building or any projection thereof and the street right-of-way or property line.

SLOPE
The degree of deviation of a surface from the horizontal, usually expressed in percent or degrees.

SPRAWL
An uncontrolled or unmanaged form of urban/suburban growth that uses land inefficiently and which can result in traffic congestion, land use conflicts and increased infrastructure costs.

STREET, COLLECTOR
A street which collects traffic from local streets and connects with minor and major arterials.

STREET, MAJOR ARTERIAL
A street with access control, channelized intersections, restricted parking, and which collects and

distributes traffic to and from minor arterials.

STREET, MINOR ARTERIAL
A street with signals at important intersections and stop signs on the side streets, and which collects and distributes traffic to and from collector streets.

SUBURBAN
An intensity of land use that is characterized by medium density and lower scale development, typified by platted subdivisions and commercial/retail concentrations.

TIP
Transportation Improvement Program.

TOPOGRAPHY
The configuration of a surface area showing relative elevations.

TRANSITIONAL AREA
(1) An area in the process of changing from one use to another; (2) An area which acts as a buffer between two land uses of different intensity.

TRIBUTARY
A stream or creek that flows into a larger stream or river, which together with other tributaries comprise the drainage system of a watershed.

URBAN
An intensity of land use that is characterized by high density and compact development, typified by large cities with extensive industrial, commercial, and residential areas.

WATER TABLE
The upper surface of groundwater, or that level below which the soil is seasonally saturated with water.

WATERSHED
The area drained by a given stream or river.

WETLANDS
Those areas that are inundated or saturated by surfacewater or groundwater at a frequency and duration sufficient to support and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Bibliography

Burgess & Niple, Ltd., Water Beyond 2000 (Draft), City of Columbus, Columbus, OH, 1990.

Burgess & Niple, Ltd., Water Beyond 2000-Phase 2 Draft Interim Report, City of Columbus, Columbus, OH, 1991.

City of Columbus, Growth Potential (1985- 1995), Office of Management and Budget, Columbus, 1985.

Coughlin, Robert E. and Keene, John C., The Protection of Farmland: A Reference Guidebook for State and Local Governments ,National Agricultural Lands Study, Washington, D.C.

Daniels, Thomas, et al, The Smalltown Planning Handbook, American Planning Association, Chicago, IL, 1988.

Getzels, Judith and Thurow, Charles, Rural and Small Town Planning, American Planning Association, Chicago, IL.

Heyer, Fred, Preserving Rural Character, American Planning Association, Chicago, IL, 1990.

Martin, William T., History of Franklin County, Columbus, OH, 1858.

Mid-Ohio Regional Planning Commission, Brown Township Drainage and Land Use Study, Columbus, OH, 1982.

Mid-Ohio Regional Planning Commission, Land Use Issue Paper, Brown Township Comprehensive Plan, Columbus, OH, 1991.

Mid-Ohio Regional Planning Commission, Natural Environment Issue Paper, Brown Township Comprehensive Plan, Columbus, OH, 1991.

Mid-Ohio Regional Planning Commission, Public Policy Issue Paper, Brown Township Comprehensive Plan, Columbus, OH, 1991.

Mid-Ohio Regional Planning Commission, Public Services and Facilities Issue Paper, Brown Township Comprehensive Plan, Columbus, OH, 1991.

Mid-Ohio Regional Planning Commission, Subdivision Regulations of Franklin County, Ohio, Columbus, OH, 1989.

Mid-Ohio Regional Planning Commission, Traffic Zone Analysis Program, Columbus, OH, 1990.

Mid-Ohio Regional Planning Commission, Transportation Improvement Program, Columbus, OH, 1991.

Mid-Ohio Regional Planning Commission, Transportation Plan, Columbus, OH, 1990.

Mid-Ohio Regional Planning Commission, Recommended Thoroughfare Plan, Columbus, OH, 1971.

Moskowitz, Harvey S. and Lindbloom, Carl G., The Illustrated Book of Development Definitions, Center for Urban Policy Research, Rutgers University, Piscataway, NJ, 1987.

Ohio Department of Natural Resources, Ohio Capability Analysis Program, Columbus, OH, 1976.

Ohio Department of Natural Resources, User's Guide to the Ohio Capability Analysis Program, Columbus, OH, 1978.

Ohio Historic Preservation Office, Ohio Historic Inventory, Columbus, OH, 1990.

Steiner, Frederick, Ecological Planning for Farmlands Preservation, American Planning Association, Chicago, IL, 1981.

Stokes, Samuel N., et al, Saving America's Countryside, A Guide To Rural Conservation, Johns Hopkins University Press, Baltimore, MD, 1989.

U.S. Department of Agriculture, Soil Survey of Franklin County, Ohio, Columbus, OH, 1977.

Yaro, Robert D., et al, Dealing With Change in the Connecticut River Valley: A Design Manual for Conservation and Development, Lincoln Institute of Land Policy and the Environmental Law Foundation, Boston, MA, 1989.

http://www.browntwp.org