CHAPTER 7

PHYSICAL INVENTORY OF THE CITY
City of Solon Master Plan

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While communities have distinct and identifiable borders, the ecosystem does not. As it crosses local, state, and federal borders it constantly changes due to natural and manmade forces. Humans can have a great impact on the amount of change that occurs by determining to control or not control the rate and scale of land development.

Land formations consist of many different layers which include, but are not limited to the topsoil, soil, bedrock, lakes, creeks, rivers, and vegetative cover. The location, size, and nature of these physical features can impact the manner in which proposed developments are designed and ultimately constructed.

The following is a brief description of Solon’s geology and soil conditions:

**Geology**
Geology is the study of the Earth’s rock formations. In Solon the bedrock typically consists of sandstone and shale deposits topped with a thick layer of glacial till. The depth to the underlying bedrock is generally at least sixty inches, but can be as shallow as twenty inches. The typical depth to the water table ranges from one to two and a half feet, while some areas the depth is six feet or more.

**Soils**
Knowledge of soil types is important to all types of land planning issues. The type of soil present on a project site will dictate if improvements are needed to overcome any inherent soil weakness or limitations. Soil conditions such as hardness, wetness, and low permeability can affect the cost and success of projects as complex as a commercial shopping center or as simple as an informal residential landscape design. (An early example of how soils effected development in Solon is described in the History of the City, Section 3.)

There are forty-seven specific types of soils located in Solon according to the 1980 Soils Survey of Cuyahoga County (See “Map 7-1-A). The three most common soil types are Wadsworth Silt Loam (0-2% slope), Mahoning Urban Land Complex (Undulating), and Fitchfield Silt Loam (0-2% slope). The Wadsworth Silt Loam is primary located in the north, northeast, and south central part of the city. The Mahoning Urban Land Complex which is also the most common soil in Cuyahoga County is located in the central to west part of the city. Fitchfield is located in the east central part of the city.

Each of these soil types generally have a silt loam texture at depths of 0-8 feet and then become more of a silty clay loam at depths greater than eight feet. Each soil percolates slowly and has a low to moderate shrink-swell potential. Of the soils located in Solon approximately 5% are hydric (high level of moisture) and 95% are non-hydric.
“Map 7-1-A” Soil Classifications

Source: City of Solon Department of Planning and Community Development
“Chart 7-1-A” below provides a breakdown of the soil types by percent slope of which the most common slope range is from 0-2%, which is generally level to gently sloping. “Map 7-1-A” represents the soils located in Solon while the Appendix provides a more detailed breakdown of the soil classifications.

![Chart 7-1-A: Soils by Percent Slope](chart.png)

Source: City of Solon Department of Planning and Community Development
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**Topography**

Topographic relief, changes in land elevation that can vary dramatically depending on location, is represented and measured by map contour lines. Solon, in general has low relief in the center of the city while the east and west borders are marked by steeper slopes due to Tinkers Creek and the Chagrin River respectively. As noted in the *History of the City*, founding settlers encountered low, swampy land at the central part of the city.

The highest point in Solon is located at an elevation of 1,244 feet above sea level and is located within the Mount Hope Cemetery at the southwest corner of Miles and Harper Roads. The lowest point, at an elevation of 884 feet above sea level, is located within the Chagrin River located at the northeast corner of the city. Therefore there is a difference in elevation of 360 feet between the highest and lowest point and which is further depicted on “Map 7-2-A”.

source: City of Solon Department of Planning and Community Development
“Map 7-2-B” below portrays ten feet contour lines for Solon’s entire geographic area.

“Map 7-2-B”, Ten Ft. Contour Topography Map

Source: City of Solon Department of Planning and Community Development
Watersheds

A watershed is an area of land where the water collects and eventually drains from the highest point, known as the ridge, to the lowest point, being a stream, river, or lake. Topography, along with many other factors such as soil type, vegetative cover, and impervious surfaces affect how quickly water will flow across the land surface or be absorbed into the subsurface. While much of the topography was created when the glaciers receded, the streams and rivers continue to re-shape the landscape. There are approximately 57 miles of rivers and tributaries that make up the drainage system in Solon.

Main watersheds are composed of smaller watersheds known as sub-watersheds. The Chagrin River and Tinkers Creek watersheds are the two main watersheds located in Solon, Tinkers Creek being the largest tributary of the Cuyahoga River. There are a total of seven sub-watersheds including: Tinkers Creek, Hawthorne Creek, West Beaver Meadow and East Beaver Meadow in the Tinkers Creek Watershed, and Liberty East, Chagrin North, and Chagrin South in the Chagrin River Watershed. “Map 7-2-C” provides the general location of each of these main and sub-watersheds.

“Chart 7-2-A” provides the approximate acreage of each of the watersheds.

<table>
<thead>
<tr>
<th>Watershed Name</th>
<th>Approximate Acreage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chagrin River Main Watershed</strong></td>
<td></td>
</tr>
<tr>
<td>• Chagrin North</td>
<td>1,732</td>
</tr>
<tr>
<td>• Liberty East</td>
<td>1,644</td>
</tr>
<tr>
<td>• Chagrin South</td>
<td>2,158</td>
</tr>
<tr>
<td><strong>Tinkers Creek Main Watershed</strong></td>
<td></td>
</tr>
<tr>
<td>• Hawthorn Creek</td>
<td>1,377</td>
</tr>
<tr>
<td>• West Beaver</td>
<td>2,555</td>
</tr>
<tr>
<td>• East Beaver</td>
<td>1,555</td>
</tr>
<tr>
<td>• Tinkers Creek</td>
<td>2,434</td>
</tr>
</tbody>
</table>

The Chagrin North, Chagrin South, and Liberty East sub-watersheds flow into the Chagrin River, which then flows into Lake Erie. The remaining four sub-watersheds, Hawthorne Creek, West Beaver Meadow, East Beaver Meadow, and Tinkers Creek flow into Tinkers Creek, which then flows into the Cuyahoga River and then to Lake Erie. Lake Erie flows into the St. Lawrence Seaway, which ultimately empties into the Atlantic Ocean.

The City manages its storm water runoff through various means including the existing natural storm water system (watersheds) and various manmade systems including ditches, storm sewers, open channels, retention and detention ponds. These systems are described in detail in the “City of Solon Storm Water Management Plan”, March 10, 2003.
Chapter 7: Physical Inventory of the City

“Map 7-2-C”, Watershed Map

Source: City of Solon Department of Planning and Community Development
Tree Cover
Tree cover is vitally important to the community as it lowers temperatures, removes air pollution, absorbs storm water, and makes neighborhoods attractive places to live and work. As development occurs, trees are selected for removal based upon the planned location of proposed buildings and infrastructure subject to relevant city ordinances. Of the 13,059 acres that comprise the City of Solon, approximately 5,460 acres or 42% is covered with varying degrees of tree cover. The land with no tree coverage accounts for 7,599 acres, or 58% of the remaining land.

Comparatively, Cuyahoga County has 125,917 acres of total tree cover, or 43%. Based on these numbers, Solon accounts for approximately 4.3% of Cuyahoga County’s tree cover.

“Map 7-2-D” depicts the tree cover distribution across the City. This map was created by delineating the tree canopy that was visible on the 2004 color aerial photos.
"Map 7-2-D", Tree Cover

Source: Ohio County Profiles for Cuyahoga tree cover from the Ohio Department of Development and USDA NAIP and 2004 aerial photos for Solon's tree cover.
City officials, developers, and residents alike must plan for the positive or negative effects a particular development project may have on surrounding neighborhoods and communities relating to storm water run off, traffic, noise, air pollution, light pollution, disturbances of animal habitat, and other impacts.

The factors of soil, topography, watersheds, and tree cover, as described in this chapter, are physical elements that greatly influence the overall success of the built environment.
Chapter 7: Physical Inventory of the City

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