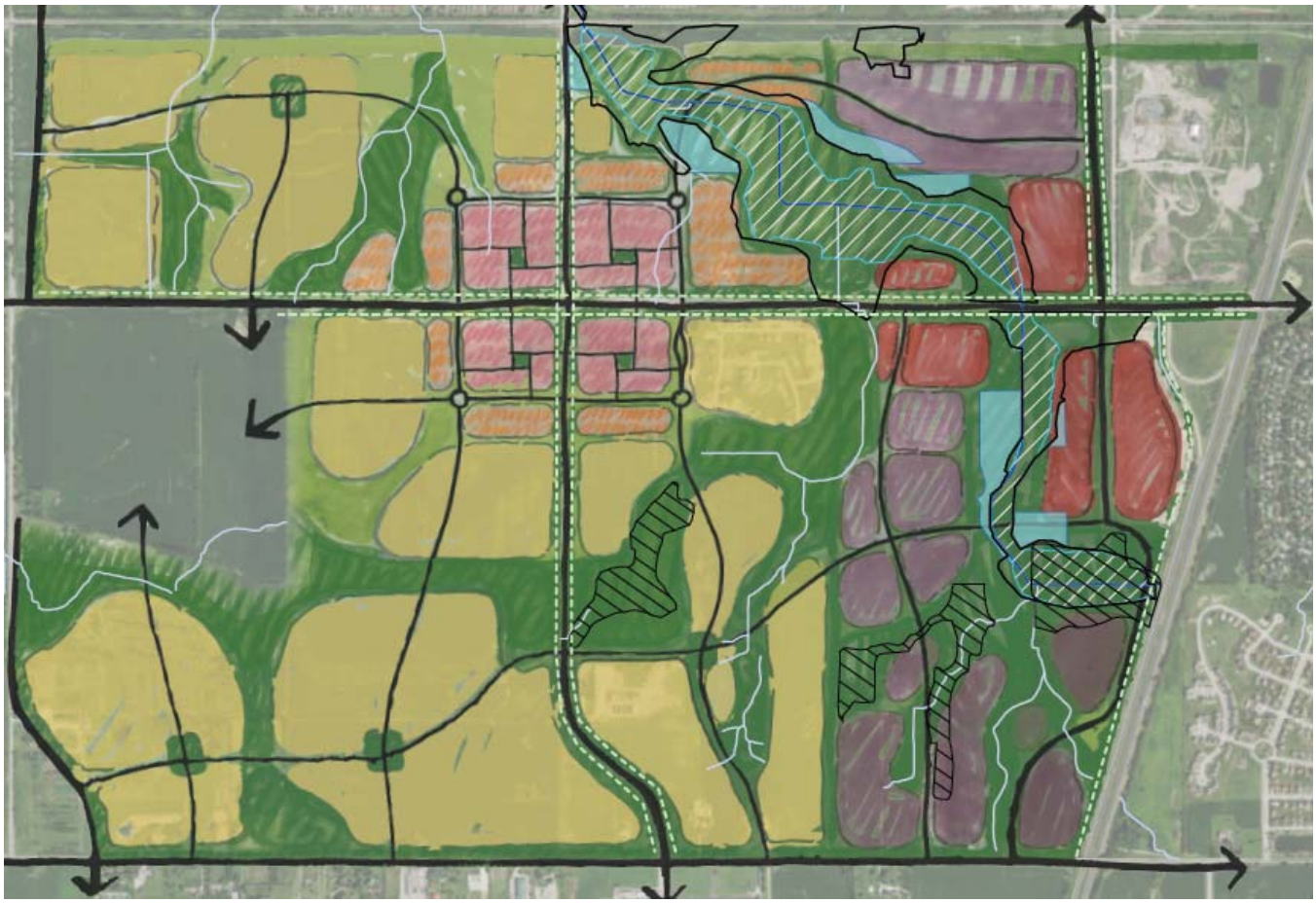
Richton Park Western Development Corridor Green Infrastructure Development Plan

August 18, 2017



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Introduction and Background

One of the last remaining development areas within the Village of Richton Park is west of Interstate 57. Due to the I-57 interchange at Sauk Trail Road, the area is an attractive location for economic development activity. This is evidenced by the recent development by Walmart. The area is also blessed with significant natural resources, including floodplain, headwater streams, and wetlands. While these natural resource areas create constraints for commercial and residential development, they also present significant opportunities to create unique development styles that can serve to attract businesses and residents looking for scenic beauty and passive recreation amenities.

To assist the Village, CMAP entered into an agreement with Richton Park under its Local Technical Assistance program and retained Conservation Design Forum and Geosyntec Consultants to develop a master plan for the Western Development Corridor, west if I-57, that integrates development with natural resource protection and stormwater management.

The corridor study area extends from the Canadian National Railroad in the north to Steger Road in the south and from I-57 in the east to just west of Ridgeland Avenue in the west.

This project was divided into two phases. Phase 1, which is the subject of this report, included the development of a concept plan that delineates proposed development, compensatory storage, naturalized detention, and wetland and stream buffer areas. These areas were also integrated with future land uses in the Village's Comprehensive Plan to create a broad vision that illustrates how future development, open space, and natural resources can be connected throughout the west side of Richton Park.

The Phase 1 project tasks included:

- Task 1 – Existing Conditions Mapping and Analysis
- Task 2 – Floodplain Analysis
- Task 3 – Preparation of an Integrated Green Infrastructure Development Concept Plan
- Task 4 – Technical Memorandum (this document)

The following sections of this report describe the work that was conducted under the four tasks above and loosely follows the task sequence.

Existing Conditions Mapping and Analysis

Data was obtained from CMAP (1ft topography, parcel data, and flow path analysis), the Village of Richton Park (Comprehensive Plan and water bodies), National Wetland Inventory (wetlands), FEMA (floodway and floodplain), and USDA Natural Resources Conservation Service Web Soil Survey (hydric soil rating). Additional layers were developed as part of the existing conditions analysis by Conservation Design Forum and Geosyntec based on aerial photography (additional wetlands) and terrain analysis (flood depth).

- Figure 1 – Richton Park Hydrology: This map illustrates drainage patterns of the study area, including topography; ridge lines and drainage paths; tributary streams; and Hickory Creek.

- Figure 2 – Existing Floodplain/Floodway Map with Topography: This map shows the FEMA floodplain and floodway along with depths and heights below and above the 100-year flood stage (BFE),

respectively. The darker the blue, the greater the depth of flooding. This blue shading shows the amount of fill that would be required to raise an area above the BFE to make it suitable for development. The greater the progression from dark green to orange, the higher the ground elevation above the BFE. This shading progression shows the amount of cut that would be required to lower an area below the BFE so that it could be used to provide compensatory storage. Areas that are not shaded are more than 15 feet above the BFE. The blue shading also shows that significant portions of Sauk Trail and its frontage are below the BFE and subject to flooding. Development within the floodplain and floodway is regulated by MWRD, Illinois DNR, and FEMA. Restrictions against fill and development in the floodway is greatest and essentially not allowed. Fill in the flood fringe between the floodway and floodplain boundaries is less restricted but compensatory storage must be provided for fill. The topographic analysis component portion of this map was developed for use in subsequent tasks to determine floodplain areas that could be reclaimed with the least amount of fill and areas that could be used for compensatory storage with the least amount of earthwork.

- Figure 3 – Streams, Wetlands, and Hydric Soils: This map depicts existing streams and wetlands as obtained from Richton Park, the National Wetland Inventory, and as interpreted from aerial photography by the project team. Hickory Creek is a perennial stream that generally flows year round and has a regulated floodplain. The tributary headwater streams are typically intermittent and do not have a floodplain regulated by Illinois DNR. However, drainageways with more than 100 acres of drainage area (including the unnamed tributaries shown on this map) are regulated by MWRD to provide flood protection and are typically regulated by the Corps of Engineers for their wetland values. Wetlands are also regulated by the Corps of Engineers. Hydric soils are not regulated but can present limitations for development in terms of soil strength and wetness. Hydric soils also locations that may be suitable for wetland restoration.

- Figure 4 – Ecological Integrity: This map combines the information from the previous maps with existing land use to produce an ecological integrity map. The map was used in subsequent steps to guide development areas. Developed and ROW areas are no longer available for development. Hickory Creek, its tributaries, and wetlands should be protected along with minimum buffers. Agricultural areas within the floodway and floodplain should be restored to native riparian vegetation and consideration should be given to converting the row crop agriculture to more sustainable agricultural production involving perennial crops and farming practices that prevent soil erosion and sustain soil health. Agricultural areas outside the floodplain are most suited for future urban development activities. For reference, parcel boundaries are included on this map.

Revised Floodplain Mapping

As discussed above, the existing FEMA floodplain provides a significant constraint to providing commercial frontage along Sauk Trail. Simultaneously, the team noted that the area and depth of floodplain represented a significant volume of runoff relative to the drainage area at the railroad crossing. A topographic analysis showed that the volume of floodplain storage is equivalent to 10.9 inches of runoff over the drainage area. This runoff depth is nearly double the runoff depth of 5.7 inches that would be expected from a 100-year, 24-hour rainfall event. Thus, it was clear that the analysis in the current FEMA study did not adequately account for the attenuation that would result from floodplain storage. To address this issue and better understand the floodplain, the team was retained by the Village, under separate contract, to re-analyze the system to account

for the floodplain storage and develop an approximate updated flood profile, floodplain boundary, and floodway boundary. The report documenting the floodplain analysis and results are provided in Appendix 1. As noted in the report, the analysis was approximate based on limited topographic data. While the rigor of the analysis would not meet the standards required by FEMA for a Letter of Map Revision (LOMR), the calculated, revised flood profile should be accurate within a few tenths of a foot. The work completed under this task can be used as the starting point for preparing a LOMR application.

As documented the report, the revised 100-year base flood elevation drops from elevation 731.0 feet to 725.5 feet. The existing and revised floodplain boundary and floodway are depicted in Figure 5. As can be seen, the change in boundary location is significant and results in significantly greater usable frontage along Sauk Trail.

Integrated Green Infrastructure Development Plan

The mapping analysis documented above was used to develop a plan that integrates development goals with naturally occurring and engineered stormwater green infrastructure. However, prior to presenting the analysis, the following paragraphs define naturally vs engineered stormwater green infrastructure.

> Naturally occurring Green Infrastructure: Naturally occurring green infrastructure includes streams, wetlands, floodplains, and native uplands that provide many ecosystem functions. These functions include rainwater and nutrient capture and recycling within the soil profile, maintenance of soil health by deep rooted native vegetation, flood attenuation within floodplains, and wildlife habitat through connected corridors and the habitat structure of diverse wetlands, woodlands, and prairies. Naturally occurring green infrastructure also provides numerous cultural benefits such as scenic beauty, an enhanced sense of open space, and passive recreational opportunities with the inclusion of trail systems. Generally, preservation is the primary strategy for providing naturally occurring green infrastructure. While this type of green infrastructure can be created, it is typically preferable and more cost effective to preserve and restore existing green infrastructure.
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> Engineered stormwater Green Infrastructure: Engineered green infrastructure are practices integrated into development areas and designed to mimic natural water and nutrient cycle processes. These processes include water infiltration and evaporation, nutrient filtration and adsorption, and flood attenuation. Man-made green infrastructure practices are numerous but include permeable paving, bioretention rain gardens, green roofs, naturalized drainage and detention practices, and establishment of natural landscapes. Integration of site planning, engineering, and landscape architecture is essential to functional and beautiful green infrastructure that can help to achieve regulatory stormwater requirements in a cost effective and space-efficient manner.

Preserving and restoring naturally occurring green infrastructure can occur through land acquisition, land use planning, and zoning and subdivision standards that require preservation of existing green infrastructure. Implementation of engineered green infrastructure can be encouraged by stormwater ordinances, subdivision standards, and zoning overlay districts that require runoff reduction, water quality improvement, and peak flow attenuation. Because many green infrastructure practices are relatively new technology, review of existing subdivision and stormwater code is necessary to ensure that green infrastructure is not only allowed but encouraged. Provision of guidance and engineering standards are also necessary to facilitate the use of green infrastructure practices. Within Richton Park, minimum stormwater standards are established by MWRD.

The focus of the first phase of this planning effort for the Western Development Corridor of Richton Park was on land use planning to preserve naturally occurring green infrastructure and to guide integration of that green infrastructure into future urban development. There were several documents and plans used to guide development of the Integrated Green Infrastructure Development Plan. Those were:

Green Infrastructure Mapping: This is the mapping that was developed under task 1 of this effort as described previously in this document. (Figures 1 - 4)

Revised, Provisional Floodplain and Floodway Mapping: This is the revised floodplain mapping described in the previous section. Although the revised floodplain boundary depicted is not the official regulatory mapping that would apply to future development, the boundary was estimated based on additional information relevant to current methods for determining flood profiles and mapping of floodplain and floodway boundaries. While more rigorous documentation would be necessary to modify the official regulatory maps, it is believed that the boundaries shown are representative of what would become the regulatory boundary if the Village of Richton Park chooses to go through the Illinois DNR and FEMA map revision process.

Richton Park Comprehensive Plan[1]: The Richton Park Comprehensive Plan was used to generally guide the types and location of land uses in the Western Development Corridor. Land uses from the comprehensive plan along with the FEMA and revised floodplain/floodway boundaries are included as Figure 6.

Market Study[2]: A market study was prepared by SB Friedman for the Western Development Corridor. The study evaluated the regional trade area relevant to Richton Park to determine the overall demand for retail commercial as well as the existing level of commercial supply that would compete with commercial development in Richton Park. The study considered the quantity of demand and supply as well as the geographic distribution. It also considered the specific assets and constraints of the expected primary competitors to the Richton Park area. The study found that the trade area could likely support 280,000 to 500,000 square feet of retail/commercial within the Richton Park project area through 2025. Friedman reports that this translates into 46 to 85 supportable gross acres after considering typical floor area ratios and typical requirements for stormwater and open space. The market study is included as Appendix 2.

Using the information above, three maps were developed as described below.

1. Figure 7 – Potential Sauk Trail Development Areas: This map identifies potential development areas adjacent to Sauk Trail along with development constraints such as floodplain, wetlands, stream corridors, and the Nicor pipeline. The map also identifies potential compensatory storage and detention areas to allow for modest floodplain fill and meet detention storage requirements.

    a. Proposed Development Boundaries: The development boundaries were drawn to avoid encroachment into the floodway but allowed modest encroachment into the flood fringe to

[1] Comprehensive Plan, Village of Richton Park, Houseal Lavigne Associates with Gewalt Hamilton Associates, Active Transportation Alliance, Christopher Burke Engineering, and Conservation Design Forum, October 2014.
[2] Village of Richton Park, Illinois Retail Market Analysis for the I-57 Corridor, SB Friedman Development Advisors, November 2016

create usable development parcels. For each of the parcels, approximate areas are provided along with key dimensions. The proposed development areas were focused along Sauk Trail where the greatest pressure for commercial development will occur. However, any of the lower ecological integrity agricultural areas outside the floodplain shown on Figure 4 are potentially suitable for urban development.

b. Compensatory Storage Areas: The development boundaries encroach into the proposed floodplain in several locations as can be seen from the map. One area in particular is the area north of the existing Walmart development where compensatory storage was constructed during development of the Walmart. By locating that compensatory storage elsewhere, that land along Sauk Trail could be reclaimed for development uses. Potential compensatory storage areas are shown on the map. These areas were specifically located to avoid encroachment into land that would likely be most valuable for commercial development, including areas with Sauk Trail frontage. They were also located along the edge of the floodplain where the existing grades are lowest to minimize required earthmoving.

The table below quantifies the area and volume of floodplain fill north and south of Sauk Trail. The quantities are summarized for two areas – north and south of Sauk Trail – since permitting requires that compensatory storage be located in the general vicinity of the fill. The area associated with the blue potential compensatory storage zones in Figure 6 are provided in the "Surface Area" column. The next column quantifies the volume of cut that would be required to meet the MWRD 1.1:1.0 compensatory storage ratio for floodplain fill. Because the potential compensatory storage areas are above the BFE, there is a volume of soil above flood stage that must be removed prior to excavating to create the compensatory storage. This excess material is listed in the "Overburden Volume" column. Finally, the average depth of the compensatory storage below flood stage is shown in the last column. As can be seen from the "Surface Area" column, the area of potential compensatory storage well exceeds the area of fill and the depth of cut is very shallow. Thus, it is unlikely that all the area designated as potential compensatory storage area would be required. During the design and permitting phase, it is likely that area of compensatory can be reduced. To aid in selection of the most appropriate compensatory storage areas, a table has been added to Figure 6 to provide the area and over-burden volume for each of the potential compensatory storage areas.

Location	Surface Area (ac)	*Volume (ac-ft)	**Over Burden Volume (ac-ft)	Calculated Average Depth (ft)***
Fill North of Sauk Trail	6.2	18.9	-	-
Cut North of Sauk Trail	13.0	20.8	37.7	1.6
Fill South of Sauk Trail	7.1	43.9	-	-
Cut South of Sauk Trail	12.6	48.3	57.4	3.8

* Volume based on 1.1:1 MWRD Ratio and volume below 726 Contour
**Volume above 726 Contour
*** depth below 726 Contour

2. Figure 8 – Near Term Green Infrastructure Development Concept Plan: This map identifies potential development layouts in the vicinity of the existing Walmart. The retail buildings shown represent approximately 700,000 square feet plus 16 potential out-lots. The total area occupied is approximately 85 acres. These areas are consistent with the level of development that the S.B. Friedman Retail Market Analysis indicated could support in the near term.

3. Figure 9 – Long Term Green Infrastructure Development Concept Plan: This plan illustrates a development pattern that is consistent with the Village's Comprehensive Plan as well as the guiding principles and recommendations of this document. The plan extends west to Harlem Avenue and excludes the area within the Frankfort Village municipal boundary.

   Consistent with the future land uses in the Richton Park Comprehensive Plan, the plan includes Regional Commercial, Local Commercial (Mixed Use Development with Commercial Focus), Industrial/Office (Office/Light Industrial), Residential (various densities indicated), and Natural Area (Naturalized Open Space with Passive Recreation). To meet the project goal of integrating development with natural resource protection and stormwater management, the plan includes preservation of broad corridors along Hickory Creek, the tributary headwater streams, and wetlands. In addition, the hydric soils identified in the first task of this project were generally used to define open space areas between development zones. The Corridor Green Infrastructure Landscape Treatment along the major roadways signifies that bioretention or similar systems as well as street trees should be provided to manage runoff along these corridors.

   The map is intended to illustrate a development pattern consistent with the goals of this project and should not be considered a specific land use plan.

Guiding Principles and Recommendations

To assist the Village of Richton Park with Implementation of the Integrated Green Infrastructure Development Plan, guiding principles and implementation recommendations were prepared and are attached as Appendix 3. The Guiding Principles are intended to be used to guide future development in the Richton Park Western Development Corridor. The Recommendations are intended to provide guidance for preparing the tools and regulations necessary to implement the Green Infrastructure Development Plan.

Next Steps

This document represents the work completed under Phase 1 of the CMAP and Richton Park Local Technical Assistance agreement. CMAP has pledged to work with the Village on a Phase 2 agreement to assist the Village in beginning to implement the recommendations in the Guiding Principles document.