

Bicycle Trail Plan

Village of Frankfort



September 2005

**VILLAGE OF FRANKFORT, ILLINOIS
BIKE TRAIL MASTER PLAN**

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Introduction

The July 1997 opening of the 21-mile long Old Plank Road Trail represented a landmark event in the long-time regional effort to construct a bicycle trail along the right of way of the former Joliet and Northern Indian Railroad. Since that time, the Village of Frankfort has worked to provide residents with direct access to the Trail through a system of interconnecting shared use trails along Village streets through various subdivisions and along key corridors. The Village subsequently developed a master bike plan to be used as a tool for constructing future linkages to the Trail, and as a means to enhance the quality of life for Village residents.

This Master Bicycle Plan Update is intended to provide a blueprint and tool for achieving the Village's stated goal of providing a direct link to the Old Plank Road by having an access point within a half-mile of each residence. This goal continues to become more ambitious as the Village corporate limits continue to expand, making the adoption and implementation of the master plan update an integral tool in achieving the Village's goals. This plan is intended to serve as a guide for establishing trails within existing developed areas in the community as well as a plan for future trail development as new neighborhoods are built.

Purpose

The purpose of the Bicycle Trail Plan is to improve the bicycle transportation network throughout the Village of Frankfort. This work product is an update of the 2004 Bicycle Trail plan and is part of an effort to maintain a document that is current and meaningful to the village.

Goals and Objectives

It is the goal of the Village of Frankfort to create and maintain, through this plan, an integrated system of bicycle facilities. These facilities provide safe, convenient travel for bicyclists throughout the village. The village recognizes the need to encourage bicycle travel for both transportation and recreation. Bicycle use conserves energy, contributes to cleaner air, reduces traffic, reduces the need for automobile parking, and improves personal fitness. Numerous key objectives have been established by this plan and are summarized as follows:

- **Develop an inventory of existing trail system.** This includes mapping all existing trails, performing a visual condition survey of the existing network, and establishing a Geographical Information Systems database containing attributes of existing trails.

- **Improve Frankfort's "Bike-Friendly Community" Rating.** This includes crafting the Village's master plan in a manner recognized by bicycling professionals and enthusiasts to maximize utilization and rider safety of the bike network. Improved ratings in this category are expected to increase probabilities for success in future trail grant applications to various regulatory and funding agencies. Specific master plan aspects of this objective include:
 - *Incorporate a balanced mix of Signed Shared Roadways, Bike Lanes and Shared Use Paths*
 - *Identify multiple linkages between trail segments within the Village.*
 - *Signing the bike trail network in accordance with guidelines established in the Manual of Uniform Traffic Control Devices.*

- **Update Master Bicycle Plan.** This objective includes identifying future trail locations and facility types on a map of Frankfort and surrounding areas. Data for future planned facilities is also to be stored within the Village's GIS System.

The master plan should include but not be limited to incorporation of the following goals:

- *Provide a marked trail within ½ mile of every residential property in the Village*
 - *Provide a direct connection to every school and park in the Village, as well as the Library, Village Hall, and Township Pool. Also provide linkages to major commercial centers.*
 - *Ultimately provide direct access from all trails to the Old Plank Road Trail.*
 - *Maximize transportation utility of trail system by paralleling Village streets as appropriate.*
 - *Identify opportunities for strategic additional trail linkages using utility rights of way. This includes potential development of the Natural Gas Pipeline and segments of Commonwealth Edison rights of way to supplement other trails.*
 - *Identify linkages with existing and planned trail segments in surrounding communities.*
- **Establish Trail System Design Guidelines.** This objective relies heavily on identifying published sources of design standards, guidelines and policies, combined with specific guidance for Village staff and developers when considering specific trail linkages through various properties.
 - **Develop a Capital Improvement Plan.** This task includes developing construction cost estimates for future trail system linkages, identifying priority segments to connect large areas to trip destinations, and preparing a maintenance schedule for existing and future trails.
 - **Identify Potential Funding Sources.** This objective includes developing an exhaustive list of potential funding sources for future trail system additions, and identification of which trail segments may be best suited for various grant funds.

Review of resident responses to the Village's website, coupled with feedback received by Village staff from members of the public, the development community, and elected officials all contributed to the development of these goals and objectives to define the framework of this plan. Numerous meetings with Village staff held over the course of the master plan preparation established and refined the plan goals and objectives.

Existing Conditions

A visual field survey of approximately 10 miles of the Village's existing trail system was conducted in August 2004 by Robinson Engineering, Ltd. The physical condition of each trail segment was characterized as excellent, good, fair or poor based on riding surface conditions, drainage elements, observed pavement failures (i.e. cracking), and quality of pavement markings/stripping. An inventory of all existing trail segments was developed that includes the various trail types, lengths, widths, surface types, surface conditions and recommended maintenance treatments. This inventory was entered into an MS Excel spreadsheet format and imported into the Village's GIS database so the attribute data for each segment would be accessible by clicking on a particular trail segment on the Master Bike Trail exhibit contained in this document. This data is contained within the overall (existing and planned) system inventory spreadsheet inventory in Appendix A.

Education

The issues of bicycle safety cannot be fully addressed without mentioning the importance of educational programs. Much of the bicycle crash data shows that the preponderance of bike collisions involve improper actions on the part of bicyclists, motorists, or both. Therefore, crash reduction efforts need to include educational programs to increase awareness of improper motorist and cyclist actions that are known to contribute to crashes and to promote correct actions for both.



Currently the village police department sponsors a bicycle education program for elementary school students throughout the community. Officers regularly visit local schools to teach students about bicycle safety. This instruction includes bicycle maintenance, safety precautions, riding tips, and defensive cycling techniques. This instruction is then followed up by a bike rodeo that is sponsored by the Frankfort Youth Commission. The rodeo includes an obstacle course and free bicycle registration. Registrations are used as a tool to help the department locate missing bikes throughout the community. The Village plans on investigating the possibility of creating an education program that would serve cyclists of all ages and riding abilities. To accompany our education program the Village plans on creating a Bicycle Safety Brochure. Included in the brochure would be bicycle maintenance, safety precautions, riding tips, and rules of the road.

Formal education programs alone will not provide all the needed education on bicycle safety. It is important that the parents inform themselves of the proper safety considerations and pass these on to their children. Parents must train their children regularly and monitor their actual performance when riding a bicycle. Adult bicycle riders must inform themselves of the rules and regulations for safe operation of a bicycle just as they would for the safe operation of a motor vehicle.

Types of Cyclists

The bicycling population in Frankfort is comprised of many segments of society with differing skills and abilities, as well as differing motivations for cycling. The type, location, and characteristics of bicycle facilities must take into account these segments of riders if they are to be served adequately. A given set of bicycle facilities and routes

will not be suitable for the entire cycling population. The following list is an attempt to classify this population into identifiable categories:

Avid cyclists- Considers the bicycle as the primary transportation mode for most trips. The availability of direct, high-speed routes that are relatively unfettered by traffic lights and stop signs is important. The avid cyclist will often choose to ride in the motor vehicle travel lane and along major routes without bicycle facilities. This group of experienced cyclists will typically avoid separated bike paths, particularly in neighborhood greenbelts. Avid cyclists are highly attuned to bicycle safety, so they are sensitized to potential hazards, and they continually anticipate and avoid compromising situations while riding. This group, although typically the most visible and vocal component of the bicycling community is actually a relatively small segment of the cycling population.

Regular bicycle riders- This group of cyclists will typically utilize bicycles as the preferred transportation mode, provided that the destination is reasonably close and a good bicycle route exists. The individuals in this group are usually working adults or mature high school students. This group also includes parents with child seats/carts. They appreciate the relative speed and convenience of the bicycle as compared to the car. These cyclists desire safe and efficient bicycle facilities and routes. They are willing to accept some out-of-direction travel to avoid routes perceived as hazardous. Some cyclists in this group feel uncomfortable riding along high-speed arterial streets even when bike lanes are provided. They are usually attuned to potential hazards such as opening car doors, and cars exiting or entering driveways. The regular bicycle rider wants to maintain momentum, but usually obeys traffic controls. This type of cyclist comprises a large segment of the cycling population in Frankfort.

Young regular bicycle riders- This is usually a child of junior high or high school age who routinely rides to and from school. Other trip purposes include

riding to visit friends, to the park, to shop, and for other after-school activities. This group of cyclists tends to have less experience negotiating traffic, so they are not always aware of potential hazards. They may choose routes unsuitable to their ability, and they often disobey traffic laws and traffic control devices. This group of cyclists tends to prefer the shortest route possible, because minimal pedaling effort seems more important than speed, and they tend to prefer bike lanes and bike paths. In Frankfort, this is a large segment of the cycling population.

Beginning bicycle riders- These are typically school-age children. They ride bikes to and from school only if a route exists consisting of bike paths and bike lanes on streets with relatively low traffic volumes. Beginning bike riders will typically only pedal to destinations in their neighborhood, and they seldom ride bikes across town. They are not “little adults” as some people seem to think, but individuals within the bicycling community that have very real experiential and physiological limitations. Cycling skills are not fully developed in this age group, and most of them have relatively limited experience riding a bike in traffic. Developmentally, this age group has physical limitations as well. Up to about age nine or ten, most children do not have well-developed peripheral vision, and they have difficulty with concepts such as closure speed (e.g. approaching motor vehicles). Younger bicycle riders typically have difficulty following a straight track, and they frequently weave from side to side when riding. Beginning bike riders are a relatively smaller segment of the cycling population.

Types of Bicycle Facilities

Published federal guidelines provide for four basic types of bicycle facilities: (1) shared use roadways, (2) signed shared roadways, (3) bike lanes, and (4) shared use paths. This section provides a general discussion of each type of bicycle facility for purposes of distinguishing between the various facilities typically contemplated in bike trail plans.

The term **Shared Use Roadways** simply refers to roads and streets that may be legally used by cyclists. Under Illinois law, cyclists may use any street or highway unless the road is posted otherwise. Generally, cyclists are prohibited only on Interstate Highways and other similar type routes. Therefore, nearly every street in Frankfort technically qualifies as a shared use roadway.

While cyclists may legally use any public roadway within the Village of Frankfort, this plan focuses on routes that are specifically intended for use by cyclists. **Signed Shared Roadways** are simply Village streets that are designated by bike route signs, and serve to provide continuity to other bicycle facilities through corridors where construction of a dedicated bike lane or shared use path is not feasible. The signage of these routes indicates that a determination has been made that these routes are suitable for bicycle use. These routes will be maintained in a manner consistent with the needs of bicyclists.

Bike Lanes are marked lanes on Village streets that are intended for the exclusive use



of bicyclists. Automobile traffic is prohibited on these lanes, but may cross the lane when making a turn. Bike lanes are often, though not necessarily, located on streets where parking is prohibited (Fig. 1), and where vehicular travel speeds are low enough to provide a level of comfort for experienced cyclists.

Figure 1 – Bike Lane (No Parking)

Design guidelines published by the American Association of Highway and Transportation Officials (AASHTO) present recommendations for inclusion of Bike Lanes on routes that allow parallel parking. An example of this configuration is shown in Figure 2.



Figure 2- Bike Lanes and Parallel Parking

Shared Use Paths are physically separated from roadways and are typically shared by cyclists, pedestrians, in-line skaters, and in some areas, equestrians. They are usually paved with an asphalt surface, but may also have a gravel or Portland Cement Concrete surface. It is relevant to note that sidewalks are not considered shared use paths, since bicycles are not legally permitted to operate on sidewalks. The Old Plank Road Trail is an example of a Shared Use Path.



Figure 3 – Shared Use Path

Bicycle Trail Master Plan

The updated Bicycle Trail Master Plan is presented in Exhibit A. The plan was developed using land use projections, pending development plans, and input from Village officials and staff. It will be a useful tool in guiding future trail development and is intended to function as a concept plan for future trail planning and implementation in

the Village of Frankfort. It is intended to be a fluid document: flexibility in its implementation will be dependent upon actual development conditions, available funding and land acquisition realities, and other factors that may change over time. Similar to the Village's comprehensive plan and infrastructure master plans, the Bicycle Path Master Plan can be expected to be updated periodically over time.

Examination of Exhibit A will verify that the following goals and objectives are met:

- **Existing trail system inventory.** The exhibit shows the locations and types of all existing trails within the Village of Frankfort, as well as existing trails in adjoining communities. Also depicted on this map are all public schools, parks, pools, Village Hall, Frankfort Library, and commercial centers, which represent key destinations of trail users. Furthermore, the spreadsheet in Appendix A contains an itemized listing of all trail segments, their material types, widths, and conditions from the 2004 physical survey performed as part of this plan.
- **Incorporate a balanced mix of Signed Shared Roadways, Bike Lanes and Shared Use Paths.** The various linetypes on the exhibit depict various trail types, both existing and planned, throughout the Village and adjoining areas. Various trail types are planned based on known geometric, topographic and developed conditions appropriate for each, including bike lanes proposed for streets already possessing sufficient width to accommodate them, shared use paths along routes or corridors where sufficient ROW exists, and signed shared roadways in fully developed areas where other trail types would be impractical or not cost-effective. The plan also proposes equestrian use trails in the southern third of the Village's planning area, promoting further balance in the types of trail uses promoted by the master plan.
- **Identify multiple linkages between trail segments.** The plan clearly identifies numerous north-south and east-west trail segments, as well as others along the ComEd and NGPL right-of-ways, Hickory Creek and other waterways, and routes through various subdivisions, as a means to provide users multiple

routes to reach various destinations. This feature will encourage avid users to vary their trail usage as well as help to distribute trail traffic among multiple avenues over time.

- **Provide a marked trail within ½ mile of every residential property in the Village; ultimately provide direct access from all trails to the Old Plank Road Trail.** The trails planned along north-south roadways throughout Green Garden Township achieve this goal in future development areas. Subtle trail extensions and signed shared roadways in strategic locations such as Connecticut Hills, Prestwick and others also help achieve this goal in developed areas where main transportation routes are not as close or do not facilitate trail development.
- **Provide a direct connection to every school and park in the Village, as well as the Library, Village Hall, and Township Pool. Also provides linkages to major commercial centers.** These key destinations, as well as those future destinations known at the time of this plan preparation, are also shown on the Master Plan exhibit.
- **Maximize transportation utility of trail system by paralleling Village streets as appropriate.** As discussed above, future development to the south is envisioned to include north-south bicycle trails along all major roadways including 80th Avenue, 88th Avenue, Center Road & Elsner Road. Several east-west streets are also planned to include trails. In already developed areas, signed shared roadways and bike lanes are planned along existing streets to further enhance meeting this Village objective.
- **Identify opportunities for strategic trail linkages using utility rights of way. This includes potential development of the NGPL and segments of Com-Ed rights of way to supplement other trails.** Planned trails along the NGPL and ComEd rights-of-ways accomplish this objective. Both agencies were contacted during this planning process and

have voiced support for working with the Village during implementation of future trails in these areas.

- **Identify linkages with existing and planned trail segments in surrounding communities.** The Master Plan exhibit depicts existing trails in Tinley Park, Will County Forest Preserve, and the Village of Mokena, as well as future planned trails obtained from existing master plans known at this time. Planned trails along creeks south of the Village mirror some preliminary plans proposed by Green Garden Township, and link north-south transportation routes preferred by the Village at strategic locations. The presence of an east-west NGPL right-of-way parallel to and between Steger Road and Stuenkel Road provides the Village with a unique opportunity to connect its trail system with that of the Will County Forest Preserve. The forest preserve is supporting a trail that would begin in the Thorn Creek Forest Preserve and run west along the NGPL through the village and connect to the Wauponsee Glacial Trail in New Lenox.

Signs

Another important element of implementing the Village's master bike plan will be installing appropriate signage along multi-use trails and designated bike routes along roadways. Signs including graphics shown in the Manual of Uniform Traffic Control Devices handbook that governs most vehicular traffic signs are recommended to identify trails, alert motorists of bike crossings and shared use roadways, and promote consistency throughout the Village's trail network. A complete sign inventory will also help to achieve another plan objective – that of becoming certified as a "Bicycle Friendly Community" by the League of American Bicyclists. A copy of the MUTCD guidelines pertaining to bike trail signage is included in Appendix B. There are five basic types of sign groups: warning signs, directional markers, informational signs, regulatory signs, and identification markers.

Warning Signs- These signs alert users of safety threats such as sharp curves, approaching intersections, and steep drop offs. Typically these signs are yellow and diamond shaped with black lettering.

Information Signs- These signs provide the trail user with useful or important information.

Regulatory Signs- These signs are usually white and rectangular with black lettering. Regulatory signs give information on trail use and etiquette.

Identification Markers- These signs identify trails and streets that cross the trails. All intersections and street crossings should have a sign identifying the street for trail users and a sign identifying the trail for road users. Overhead name blades should be located on underpasses and should include the street name and the block number. Trail maps and the name of the trail should be located at the beginning of each trail. Mile markers should be located every 0.25 miles. The identification markers are important to trail users, maintenance forces, police, and emergency personnel.

Directional markers- Directional markers use arrows or wording to indicate which direction to travel. These signs are important when multiple trails come together.

Intersections

In bicycle and pedestrian trail designs, intersections with roadways are very important. When trail and street intersection occur at-grade, some type of traffic control needs to be used, (signal, stop sign, yield sign, etc.) in accordance with the Manual of Uniform Traffic Control Devices. Mid-block crossings are most appropriately utilized for low traffic volume road crossings and when adequate sight

distances for both motor vehicles and trail users exist. Where a trail intersects a busy street, the trail crossing should be located at the pedestrian crosswalk (if applicable), and be clearly indicated to motorists of the roadway facility being crossed by signage and flashing beacons as warranted.

It is also important to eliminate blind spots at intersections where multiple use trails intersect with streets. Clear zone sight line triangles must be defined for the trails to eliminate blind spots. Landscape improvements designed within this zone must be below 2.5' and above 9' in height to provide unobstructed cross-visibility for trail users. See figure 4.

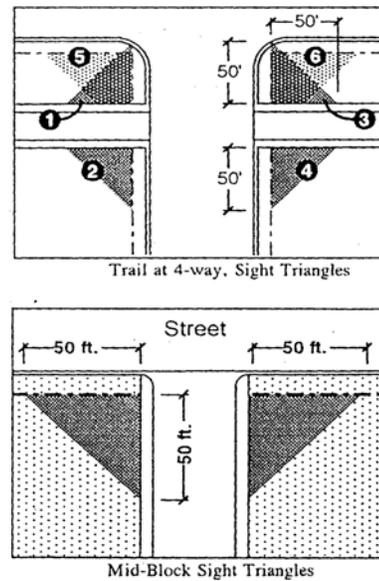


Figure 4 - Sight Line Triangles

Design Criteria

New bicycle facilities in the Village of Frankfort are recommended to be designed and constructed in accordance with the requirements of the latest edition of the *Guide for the Development of Bicycle Facilities*, published by the American Association of State Highway and Transportation Officials. This publication, attached as Appendix C, provides guidelines for design of the various bicycle facilities considered in the preceding section.

Several guidelines in the AASHTO *Guide* consider both *minimum requirements* and *recommended standards*; in the interest of providing a first-class trail network throughout Frankfort, and maximizing the safety of path users, adjoining motorists,

pedestrians and other users, it is recommended that Village of Frankfort design criteria reflect AASHTO recommended standards in most cases, and rely on minimum requirements only under specialized circumstances as approved by the Village Engineer.

A. Shared Use Path Widths

As discussed in the preceding paragraph, Frankfort will utilize AASHTO recommended standards rather than minimum standards when considering the width of shared use paths. While a minimum shared use path width of 8' is allowed under the AASHTO guidelines, it is clearly stated that a 10' minimum width is recommended. This leaves interpretation of this guideline open to parties with different interests. For example, whereas the most important concern of the Village of Frankfort is the utility and safety of a new path extension, a developer is typically concerned primarily about its cost, and will therefore advocate the 8' width regardless of the circumstances.

It is recommended that future shared use paths in Frankfort have a minimum width of 10' and in some cases 12'. This is due to two reasons: (1) trail usage in Frankfort, by virtue of its proximity to the heavily used Old Plank Road Trail, is higher than in many smaller or rural communities for which an 8' minimum may better apply, and (2) the significant increase of in-line skating uses on shared use paths has occurred over the past decade, after the original AASHTO guidelines were developed. These users often veer over path centerlines more than bicyclists or pedestrians, and will benefit from wider paths, especially when passing pedestrians, joggers or slow-moving cyclists. Furthermore, the wider path also provides a safer means to separate high-speed cyclists or skaters approaching from opposite directions. The 10' width provides both superior capacity and safety for trail users in Frankfort, and is recommended for future paths.

B. Shared Use Path Surfaces

Hard surfaces. Most existing shared use paths within the Village are surfaced with asphalt, though some have a Portland Cement Concrete (PCC) surface. Although PCC construction is extremely durable and perhaps aesthetically preferred in some cases, it is not ideal for trail use for a number of reasons. Firstly, the edge drop-off creates a potential hazard for bicyclists unless a shoulder is well-maintained. Secondly, the rigidity of the surface is undesirable for runners, and thirdly, the required expansion and contraction joints cause discomfort for cyclists and especially in-line skaters. Finally, PCC construction is typically more expensive than paths constructed of stone and asphalt. For these reasons, asphalt is the preferred surface for shared use trails.

Bituminous paths should be constructed with a minimum 6" aggregate base course overlaid with 2" bituminous surface.

Stone Screenings. Another option for shared use trails is a surface consisting of limestone screenings.

This surface is much more economical than asphalt and is also easy to maintain. This material is desirable for equestrian trails due to the improved footing provided, compared to asphalt. Screenings have been successfully used in DuPage County on the heavily used Illinois Prairie Path, as well as other trails. The path is typically constructed by stripping the topsoil, placing a gravel base, and then applying a 2-3" surface surface of limestone screenings. This coarse sand compacts very well and continues to harden over time. The surface provides excellent traction for cyclists, although is undesirable for in-line skaters due to the sand and dust that tends to foul wheel bearings. The noise caused by the sandy surface can improve safety in a shared



Figure 5 – Trail Surfaced with Limestone Screenings

use environment by providing a warning to pedestrians and equestrians of an approaching cyclist. Finally, because of their lower initial cost, limestone paths can provide an interim improvement until funds are available for an asphalt surface.

Figure 6 shows the surface of an established limestone path. Loose material is limited to the top eighth of an inch. Material below the surface has consolidated into a firm structure. The loose material provides good traction but tends to erode on steep slopes. In locations where slopes over 4% cannot be avoided, an asphalt



surface should be used. A limestone surface is suggested for new trails proposed along the NGPL right of way between Steger Road and Stunkel Road, and along the ComEd right of way running southwest from the Laraway Road / Center Road intersection.

Figure 6 – Limestone path surface

C. Shared Use Path Locations

Planned future trails shown on the center of the right-of-way on the master plan map could be constructed on either side of the roadway, depending on development patterns and geometric considerations. Mid-block crossings should be avoided for high volume and/or low visibility roadways. Ideally, street crossings should be made at principal intersections to increase the likelihood that the crossing will be protected by a stop sign or traffic signal.

Railroad crossings should be avoided wherever possible, though a limited number of designated crossings will be needed to facilitate trail linkage throughout the community as seen on Exhibit A. These instances need to be closely coordinated with the various railroads to insure maximum safety precautions are taken in designing, constructing and maintaining these crossings.

In areas where railroad crossings cannot be avoided, certain considerations must be made. Pavement surfaces at railroad crossings shall be designed, constructed, and maintained to permit safe, smooth crossings for all pathway users. The use of rubber mat materials in new installations can help to smooth the transition between pathway and track surfaces. Ideally, bike path crossings of rail lines should be made at right angles. In areas where this is not easily achieved road flare outs can be used. Extra wide spots in the road at railroad crossings can allow a cyclist to swing to the right or left as needed to cross the tracks at nearly a right angle. (See Figure 7) Where perpendicular crossings cannot be achieved through other techniques, commercially available compressed flange way fillers can help to enhance bicyclist safety. The gap between the road edge and the track bed should be repaired or filled as needed to compensate for uneven settling rates.

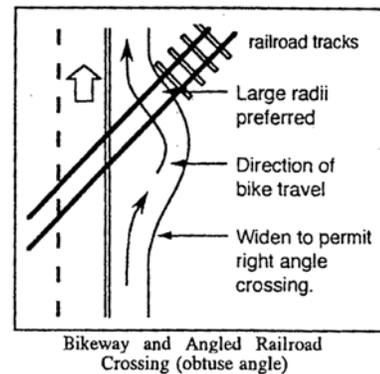
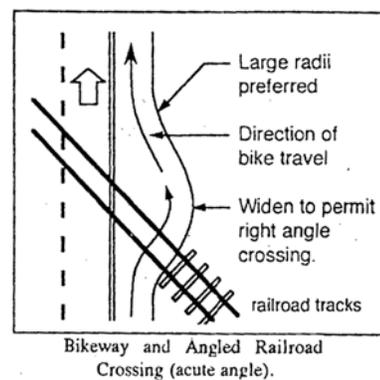


Figure 7 – RR crossing details

Trails along waterways may be located within floodplain areas, though fill placed in these areas must be compensated for in accordance with the Village's floodplain management ordinance. In these cases, it is recommended to locate paths outside of the floodway and 10-yr floodplain limits to avoid frequent inundation that could lead to

premature pavement deterioration. This will also minimize trail usage limitations after large storm events when floodplain storage areas are utilized.

Bike trail bridges at creek crossings should be strategically placed at points along the waterway that facilitate a minimum bridge span, minimize impacts to the regulatory floodway and wetlands, and incorporate all practical safety features. Prefabricated bridge structures with aesthetic features are typically the best choice for bike/pedestrian bridges, and can be installed with relative ease. While not necessarily required, the Village may consider standardizing its bridge design as a means to promote a consistent aesthetic appearance throughout the community. In all cases, bridge foundations should be designed in accordance with relevant site-specific geotechnical report recommendations.

D. Bike Lane Considerations. Bike lanes on roadways provide an excellent means of achieving non-motorized transportation through a community. **Striped bike lanes** are a minimum of 4' wide, and are configured along the right edge of the roadway with a solid white painted line. Bike lanes help to define road space, decrease the stress level of bicyclists riding in traffic, encourage bicyclists to ride in the correct direction of travel, and signal motorists that cyclists have a right to the road. Bike lanes help to better organize the flow of traffic and reduce the chance that motorists will stray into cyclist's path of travel. The addition of striped bicycle lanes has been shown to increase safety for both cyclists and motorists. In 1996, over 2000 League of American Bicyclists members were surveyed about the crashes (accidents) that they were involved in over the course of the previous year. As a consequence of this study, a relative danger index was calculated which showed that streets with bike lanes were the safest places to ride, having a significantly lower crash rate than either major or minor streets without any bicycle facilities. This is most evident in residential areas where striped lanes eliminate the cyclists need to navigate each residential curb cut.

A **wide outside lane** is also an acceptable means of promoting bicycle use on roadways. A wide outside lane is a typical traffic lane except wider, usually consisting of lane widths from 15-17' instead of the typical 11-12', and do not provide striping specifically designating a bike lane. Wide curb lanes provide extra space so motor vehicles and bicycles may share the lane. These wider lanes encourage cyclists to act more like motor vehicles and thus lead to more correct maneuvering at intersections.



Figure 8- Typical Wide Curb Lane

The decision to employ striped bike lanes or wide outside lanes should consider several factors. Wide outside lanes typically cost less to construct and maintain than bike lanes, and promote a shared usage of roadways. However, the presence of the stripe separating bicyclists from motor vehicles results in fewer erratic maneuvers on the part of motorists, and enhances the comfort level for all roadway users. Regular street sweeping and pavement surface quality are important maintenance factors to consider when promoting on-street bike usage, whether as striped bike lanes or wide outside lanes.

E. Equestrian Use of Paths

In the southern areas of the Village, it can be expected that shared use trails may receive equestrian use. In such areas, it is desirable to provide a separate path for use by equestrians due to the possibility of horses being frightened by approaching high-speed bicyclists. Equestrians prefer the sound footing provided by a graded turf or limestone path to asphalt, therefore, where sufficient space is available, such as in utility rights of way, a limestone path and graded turf path could be built initially, with the provision for a future asphalt path. Cyclists would initially use the limestone path, while equestrians would use the cleared and graded turf path. After the construction of the asphalt path equestrian use would be transferred to the existing limestone path.

Cyclists and pedestrians would then use the new asphalt path. Separation of the two paths should be 25 to 30 feet or more, if possible. Paths to be shared for equestrian use should be kept separate from rights of way to avoid conflict with vehicles.

Bicycle Parking Guidelines

Providing adequate bicycle parking for various land uses throughout Frankfort is another important feature of promoting bicycle use as a viable alternate means of transportation. It has been shown that modest amounts of bicycle parking at many dispersed locations are preferable to a few high capacity facilities. Cyclists tend to avoid parking facilities unless they are very close to their destination. Village review of development projects should ensure that bicycle-parking facilities are included where appropriate, and the Village may wish to consider revisions to its zoning ordinance incorporating the following bicycle parking guidelines:

- 1) Two bicycle parking spaces per multi-family residential dwelling unit.
- 2) For retail commercial developments, provide bicycle parking spaces in the amount of 10% of motor vehicle spaces required. Bicycle parking spaces should also be provided for 25% of number of employees during heaviest work shift.
- 3) Schools should be encouraged to provide bicycle parking spaces for 75% of their peak enrollment.
- 4) For public facilities including libraries, parks, churches, etc., provide bicycle parking spaces in the amount of 20% of motor vehicle spaces required.

The following features should also be considered:

- Bicycle parking facilities should be located in a way to promote their use by being visible and close to the cyclists' destinations.

- Bicycle racks should be conducive to accepting typical bike locking devices, and support two contact points to prevent bicycle damage.
- Lighting of bicycle parking facilities should be provided in areas where nighttime activity would be expected.

Capital Improvement Plan

The existing trail network in the Village of Frankfort contains approximately 10.25 miles of shared use paths, exclusive of the 7-mile portion of the 21-mile regional Old Plank Road Trail in Frankfort. While the Village is off to a great start in developing a trail network that reaches every subdivision in the community, the existing network is merely the beginning of the ultimate 146-mile trail system envisioned in the Master Plan. Implementation of a Capital Improvement Plan designed to extend the trail network to the largest number of users in the most cost-effective manner will achieve the objectives outlined in pages 2-4.

Maintenance of Existing Trails

All of the existing paths in the Village are relatively new, having been constructed after 1990, and as such have not yet experienced significant deterioration. However, the importance of maintaining bicyclist safety and enjoyment through a proactive trail maintenance plan cannot be understated. Therefore, a trail maintenance component is included within the Village's CIP in order to keep the trail system operating at maximum effectiveness.

Typical trail maintenance activities will include periodic pavement patching, pavement striping and markings, shoulder maintenance, seal coating, and in some cases, complete resurfacing. Crack filling is another potential maintenance activity, though this operation should be selectively utilized due to problems it may cause for in-line skaters and other specialty users. On-street trails (signed shared roadways, bicycle lanes, etc.) that may experience more rapid deterioration due to heavier vehicle

loadings, freeze-thaw effects on utility structures, and curb/gutter settlement will be given particular scrutiny during the Village's annual street maintenance program to maximize safe riding conditions for cyclists on these facilities.

A general outline for design lifetimes of various trail maintenance treatments is summarized as follows:

Bituminous seal coating	2-3 years
Crack filling	4-5 years
Re-stripping pavement markings (paint)	2-3 years
Re-stripping pavement markings (thermoplastic)	10 years
Aggregate shoulder maintenance	Annually (as needed)
Pavement patching (bituminous)	5-8 years
Pavement patching (concrete)	7-10 years
Pavement resurfacing	12-15 years
New trail construction / reconstruction	20-25 years

The Village will regularly track complaints it may receive from trail users in order to maintain a database of trail segments requiring attention, and inspections of all trails will be completed on a periodic basis (no more than every 2-3 years) to identify and prioritize system maintenance needs.

It is estimated that initially devoting 15% of the Village's annual trail system budget to maintenance of existing trails will offer an opportunity to keep existing trails in serviceable condition as the system expands. The percentage devoted to maintenance activities can be expected to increase over time as the trail network expands, and the objective of extending the network to all subdivisions is met, thereby decreasing the need for resources being directed to new trails.

Future Trail Extensions

The vast majority of future trail extensions south of Laraway Road are envisioned to be constructed by developers as those properties develop and annex into the Village of Frankfort. Similarly, trails along Hickory Creek connecting new subdivisions along St. Francis Road to US Route 30 and the Old Plank Road Trail will also be constructed by developers. Implementation of the Bike Trail Master Plan with respect to developer contributions will be a necessity toward ensuring the establishment of trails within and interconnecting new subdivisions to the existing trail network.

Numerous subdivisions in Frankfort were developed prior to the initiation of the trail network, and remain non-contiguous to the Old Plank Road Trail. It is likely that the Village of Frankfort will need to initiate, construct and fund trails serving these areas. The following priorities for future shared use path extensions to be initiated by the Village of Frankfort will serve areas that do not currently have efficient access to the Old Plank Road Trail:

- Prestwick OPRT Connection via former South WWTP property \$ 80,000
- Prestwick OPRT access via Prestwick Drive \$ 30,000
- Pfeiffer Road extension from OPRT to Sauk Trail \$130,000
- Hickory Creek extension from US 45 to Lighthouse Pointe \$125,000
- Laraway Road from Harlem Avenue to 80th Avenue \$230,000
- 80th Avenue from Sauk Trail to Laraway Avenue \$ 60,000
- Pfeiffer Road from Stone Creek to Laraway Avenue \$ 80,000
- Steger Road along Ashington Meadows frontage \$ 90,000
- Wolf Road from Vistana to Jackson Creek Park \$ 50,000
- NGPL Pipeline Trail from Scheer Road to US 45* \$300,000*

** The NGPL pipeline trail will involve Village initiation from the standpoint of obtaining easements and coordinating with the pipeline company, though a significant portion of the construction costs may be assumed by developers of subdivisions being planned in this area.*

The following priorities were developed for future trail extensions within developed areas to be initiated by the Village that would provide connectivity to destination points such as schools, parks, public buildings and commercial activity centers:

- US 45 extension from Hickory Creek to US 45 / US 30 \$195,000
- US 45 extension from Pleasant Hill Court to Jewel \$114,000
- Colorado Avenue from US 45 to Cedar Road \$ 30,000
- Colorado Avenue from US 45 to Hickory Creek \$ 30,000

The proposed Colorado Avenue paths consist of striped bike lanes, and are suggested as a high priority location due to their proximity to Lincoln-Way East High School, as well as their ability to improving the Village's Bicycle Friendly Community ranking by being the first striped bike lanes in the Village. Furthermore, this connection will link Abbey Woods and Lighthouse Point Subdivisions to the high school and eventually US 45 corridor, and also link Connecticut Hills to future commercial development planned along US 30 east of US 45, the Pfeiffer Road connection to the library, and ultimately the Old Plank Road Trail.

Finally, it is recommended that numerous shared signed roadways be given high priority during initial plan implementation to inexpensively increase the total mileage of recognized bike routes throughout the community, and quickly provide additional connectivity to the Old Plank Road Trail and other existing trails and destination points in accordance with the Master Plan goals and objectives. Signed shared roadways typically involve only minimal design and construction cost, as signage and striping in accordance with MUTCD guidelines are the main components of these facilities, and the cost for major construction is not needed along existing roadways. The following signed shared roadways have been identified as high or medium priorities:

- 108th Avenue (US 30 to Nebraska) \$4,100
- Franklin Avenue (Elsner Road to US 45) \$3,700
- Pleasant Hill Road (Pleasant Hill Ct. – US 45) \$1,000

• Old Frankfort Way (US 45 to White Street)	\$1,000
• White Street (OPRT – Old Frankfort Way)	\$1,200
• Sandalwood Drive (Elise Blvd. to Wolf Road)	\$6,200
• Heritage Knolls Subdivision (Wolf – Laraway)	\$4,000
• Misty Falls Lane (116 th Ave. – Wolf)	\$3,500
• Flagstone Turnpike (Scheer – 116 th Ave.)	\$2,700

These cost estimates are preliminary and include construction, engineering and contingencies, but do not include ROW acquisition. Forecasting too far into the future with a Capital Improvement Plan can be difficult due to the multitude of variables that can affect implementation. This is especially true for rapidly growing communities such as Frankfort. Periodic reviews and updates to this plan can be expected to reveal changing priorities depending on the direction of future growth, and the success of implementing the initial components of this plan.

A suggested Capitol Improvement Plan was created by Robinson Engineering and is attached as exhibit B. This suggested plan will provide guidance for future budget development.

Sources of Project Funding

As has been the Village's practice over the past few years, construction of the majority of new trails in the plan, particularly shared use paths, will be funded by adjacent developers as a condition of development approval. Many trail segments, however, are not adjacent to undeveloped areas, and will require alternative sources of funding. In addition to Village funds, available sources of funding for trail development include:

- CMAQ – Congestion Mitigation and Air Quality. These Federal funds are administered by the Illinois Department of Transportation and allocated to projects in the Chicago area by CATS. Projects compete on the basis of predicted air quality improvements resulting from the construction. Larger bike trail

projects have fared very well in this program, particularly if there are transit linkages to the trail system. This program requires a 20% local match.

- STP – Surface Transportation Program. These federal funds are also administered by the Illinois Department of Transportation, and are generally used for road improvements on the Federal Aid system. Projects are prioritized by the Will County Governmental League, and are subject to a \$1 million limit. Projects may include bike trails if constructed within the roadway right of way. This program also requires a 20% local match.
- Bike Path Program – The Bike Path Program is a state program administered by the Illinois Department of Natural Resources. This program provides a maximum of 50% funding assistance for land acquisition and construction of improvements along a single trail corridor. The maximum grant in a single year is \$200,000 and funds are provided on a reimbursement basis.
- RTP – Recreational Trails Program. This federal program provides up to 80% funding for land acquisition and construction of trails and is administered by the Illinois Department of Natural Resources. Projects are prioritized in cooperation with the Illinois Greenways and Trails Council. This program emphasizes equestrian, hiking/cross-country skiing, mountain bike and water trail projects, since no other specific trail funding sources exist for these activities.
- ITEP – Illinois Transportation Enhancement Program. This federal program is administered by the Illinois Department of Transportation. Projects are prioritized on a statewide basis and often are built in conjunction with an adjacent road improvement. Projects require a 20% local match. The goal of the ITEP is to allocate resources to well-planned projects that provide and support alternate modes of transportation, enhance the transportation system through preservation of visual and cultural resources, and improve the quality of life for members of the communities.

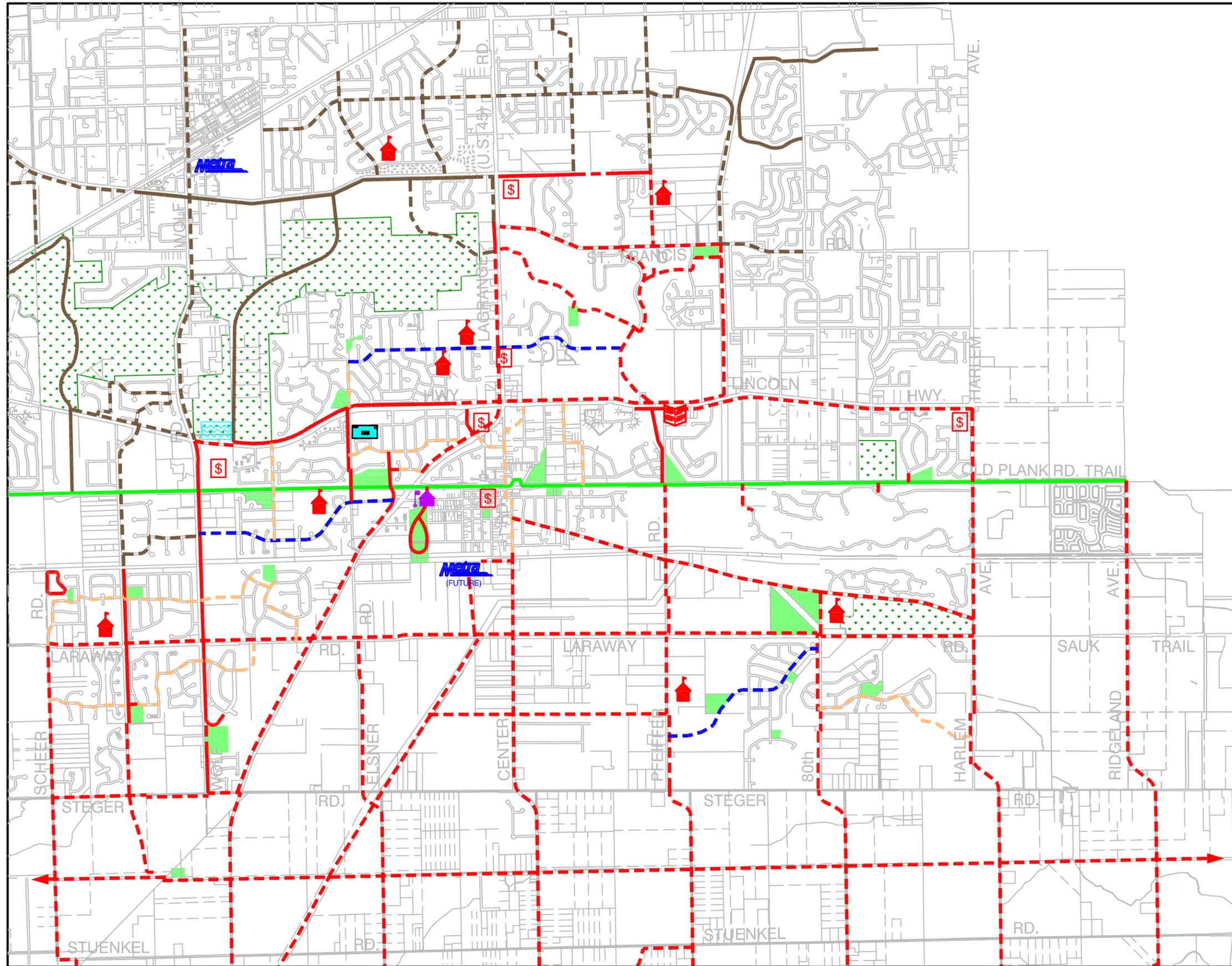
Appendices

Appendix A- Document available at the Village Hall for review

Appendix B- Document available at the Village Hall for review or at
<http://mutcd.fhwa.dot.gov/pdfs/2003r1/pdf-index.htm>

Appendix C- Document available at the Village Hall for review

Village of Frankfort Bicycle Plan Bicycle Trail Network



Existing	Future	
		Shared Use Path
		Bicycle Lanes
		Signed Shared Roadway
		Old Plank Road Trail
		Other Jurisdictions

Legend

- School
- Park
- Post Office
- Public Library
- Village Hall
- Public Pool
- Forest Preserve
- Metra Station
- Shopping Area



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Village of Frankfort Bicycle Plan

Bicycle Trail Network



Existing	Future	
		Shared Use Path
		Bicycle Lanes
		Signed Shared Roadway
		Old Plank Road Trail
		Other Jurisdictions

Legend

	School
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