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Bikeway Inventory System

Final Report

January 17, 2008

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T·Y·LIN INTERNATIONAL

SOLES & SPOKES
WALKING AND BICYCLING FOR TRANSPORTATION

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Bikeway Inventory System – Introduction

The purpose of this report is to describe the Chicago Metropolitan Agency for Planning's Bikeway Inventory System (BIS) and to explain its use. The Manual will document for CMAP staff and for its partners the methods and processes used to create the BIS. In addition, as new data is collected and existing data updated – by many different jurisdictions and agencies around the region – the manual will serve as an important resource helping to ensure consistent and coordinated data and data formats. This will in turn allow for valuable, comparative analysis and the production of consistent regional, sub-regional, and local bikeway planning maps.

The BIS includes geographic-based datasets for bike facilities in the Chicago metropolitan area, including Cook, DuPage, Kane, Kendall, Lake, McHenry, and Will Counties in northeastern Illinois. The BIS has been designed as a geodatabase using ArcGIS. The geodatabase contains feature classes for each identified bikeway plan within the seven-county area. These plans have been developed and adopted by local governments, sub-regional Councils of Mayors (COGs), Counties, and, in conjunction with all the region's stakeholders, by the Chicago Metropolitan Agency for Planning (*The Regional Greenways and Trails Plan*). The datasets, functions, and processes described herein represent the current state of our data and of the GIS system we use to analyze, map – and more broadly – communicate and coordinate bike planning efforts throughout northeastern Illinois. This Manual will be updated as new data, information, and technology become available.

BIS Datasets

The bicycle facility datasets in the BIS include available information about existing, planned, programmed, and future facilities and facility characteristics, which was initially received by the consultant, TY Lin International (TYLI), during the development of the regional Pedestrian and Bicycle Plan (*Soles and Spokes*, 2002-2004).

Exhibit 1: Data Field Categories Available in Feature Classes

Data Field Name	Possible Entries	Description
STREET NAME	[Name]	Name of the roadway that facility is on. This field will be blank for most off-street facilities.
NAME OF FACILITY	[Name]	Name most commonly associated with facility. This field will be blank for most on-street facilities unless they belong to a broader trail system.
GRAND ILLINOIS TRAIL	Yes/No	Does the facility belong to the Grand Illinois Trail System?
SYSTEM DESIGNATION	Great Western Trail Illinois Prairie Path	What is the facilities broader trail designation? Blank if none.
FROM REFERENCE	[Origin]	From and To reference fields are used to provide additional location information for facilities in regards to their origin and terminus. Facilities are labeled from their north/west (origin) point to their south/east (terminus) point.
TO REFERENCE	[Terminus]	
STATUS	Existing	Facility is constructed
	Programmed	Funding secured and/or construction underway
	Planned	Part of an adopted plan

	Future	Corridors being considered in future planning exercises
	Unknown	Unknown
FACILITY TYPE	Bike Lane	Facility has pavement markings, symbols, and signs
	Bike Route	Facility is signed but has no pavement markings and symbols
	Path	Designated off-street multi-use facility
	Unknown	Unknown
SURFACE	Paved	Facility is constructed of durable materials such as concrete or asphalt
	Aggregate	Facility is a graded surface composed of compacted gravel or larger sized particles
	Dirt	Multi-use facility not paved or with aggregates
	Unknown	Unknown
TOTAL WIDTH	[Value]	Total useable width of facility (bike lane or bike path). A multi-use path would include the outside aggregate strip on both sides and paved area for total width). A value=0 will represent an unknown width or a bike route.
SOURCE NAME	[Name]	File name where data was loaded from
MANAGING AGENCY1 & 2	[Name]	Name of the primary (1) and secondary (2) managing agencies or jurisdictional bodies
COMMENT1 & 2	[Date revised, etc.]	Comment fields.

Domains and Feature Class Properties

In order to create consistency among entries within the BIS, certain data fields have a pull-down menu with which to populate fields. These pull-down menus will help eliminate spelling mistakes and provide a higher level of consistency for the classification of facilities. Domains included in the BIS geodatabase and their values are as follows:

- GITRAIL – Yes, No
- STATUS – Existing, Programmed, Planned, Future, Unknown
- FACTYPE – Bike Lane, Bike Route, Path, Unknown
- SURFACE – Paved, Aggregate, Dirt, Unknown

The properties for the feature classes are as follows:

Exhibit 2: Feature Class Properties

Field Name	Data Type	Alias	NULL values	Default Value	Domain	Length
OBJECTID	Object ID					
SHAPE	Geometry (line)		Yes			
STNAME	Text	Street Name	Yes			80
FACNAME	Text	Facility Name	Yes			80
GITRAIL	Text	Grand Illinois Trail	Yes		GITRAIL	3
SYSDES	Text	System Designation	Yes			32
FROMREF	Text	From Reference	Yes			50
TOREF	Text	To Reference	Yes			50

STATUS	Text	Status	Yes		STATUS	24
FACTYPE	Text	Facility Type	Yes		FACTYPE	24
SURFACE	Text	Surface Type	Yes		SURFACE	24
TOTWIDTH	Double	Total Width	Yes	Precision and Scale = 0		
SORNAME	Text	Source File Name	Yes			24
AGENCY1	Text	Primary Agency	Yes			50
AGENCY2	Text	Secondary Agency	Yes			50
COMMENT 1	Text		Yes			80
COMMENT 2	Text		Yes			50

Current Data

As of December, 2007, the BIS contains 57 feature class datasets: 1 regional network file; 6 county files; 6 sub-regional (Council of Mayors) files; and 44 municipal files. Although all these datasets have the same (potential) attribute information (i.e. the attribute tables associated with each dataset have the same fields), not all the data has been entered for every feature. (For example, for one feature class object, we may have the object's status, but not its surface material; or the facility type, but not its total width.) Exhibit 5, below, gives the names and aliases for the 57 feature classes currently in the geodatabase.

Exhibit 3: Geodatabase Files **(as of 12/17/2007)**

	Feature Class Alias	Feature Class Name
	Regional Plan	
1	Northeastern Illinois Greenways & Trails Plan	CMAP_2007WorkingCopy
	County Plans	
1	Council_Kane2007_83	Council_Kane2007_83
2	DuPage County Regional Bikeway Plan	county_dupage_83
3	Lake County Transportation Plan	county_Lake_83
4	McHenry Co. - 2007 BikeUpdate	county_McHenryb2007_83
5	Will County Land Resource Management Plan	county_Will_83
6	County_Will_ForestPreserve_Trails_2007	County_Will_ForestPreserve_Trails_2007

	Council of Mayors Plans	
1	West Central Bikeway Plan	council_westcentralplan_83
2	Southwest Bicycle Plan (2001)	council_swsubplan_83
3	South Suburban Bikeway Plan (1996)	council_ssbplan_83
4	NWMC 2007 Update	council_nwbplan2007_83
5	council_nwbplan2007_Regional_Corridors_83	Northwest Municipal Conference (NWMC)\Regional_Corridors.shp
6	North Central Bikeways Plan	council_ncentbplan_83
	Municipal Plans	
1	Chicago Bicycle Facilities	muni_chiroutes_83
	Chicago Bicycle Lanes	muni_chilanes_83
	Chicago Bicycle Trails	muni_ChicagoPaths_83

2	DRAFT Aurora Bike Plan (March 2006)	DRAFT_muni_Aurora_83
3	Village of Algonquin Park Master Plan	muni_Algonquin_83
4	Arlington Heights Bikeways Map	muni_ArlingtonHeights2007_83
5	Barrington Bikeways 2007 Update	muni_Barrington2007_83
6	Village of Bartlett Bike Path Map	muni_Bartlett2007_83
7	Bolingbrook (Park District) Bike Trail Map	muni_Bolingbrook_83
8	Village of Buffalo Grove Bike Path map	muni_BuffaloGrove2007_83
9	Crystal Lake Bike Plan	muni_CrystalLake_83
10	Deer Path Bike Path	muni_DeerPath_83
11	Des Plaines Bicycle Plan	muni_desplaines2007_83
12	Downers Grove (Dupage clipped)	muni_DownersGrove_83
13	City of Elgin Bicycle System Plan	muni_Elgin_83
14	Elk Grove Village Bicycle Routes 2005	muni_elkgrovevillage2007_83
15	Evanston Bicycle Facilities	muni_evanston2007_83
16	Fox River Grove Bike Plan	muni_FoxRiverGrove_83
17	Frankfort Bike Plan	muni_frankfort_83
18	Glenview Bicycle Plan 2007	muni_glenview2007_83
19	Gurnee Trails/Bike Map/Plan	muni_gurnee_83
20	Hanover Park Bike Paths	muni_HanoverPark2007_83
21	Hinsdale Bike Routes	muni_Hinsdale_83
22	Homer Glen Transportation Plan (2003)	muni_HomerGlen_83
23	La Grange Mobility Plan - Bike Routes	muni_LaGrange_83
24	Lake Bluff Bike Plan	muni_LakeBluff_83

25	Lemont Bicycle & Pedestrian Plan	muni_Lemont_83
26	Lincolnwood Bicycle Plan	muni_lincolnwood2007_83
27	Lisle Bike Plan	muni_Lisle_83
28	Lockport Bicycle/Pedestrian System Master Plan (2003)	muni_Lockport_83
29	Midlothian Bike Routes	muni_Midlothian_83
30	Mount Prospect Bike Routes 2007	muni_MountProspect2007_83
31	New Lenox Greenway Plan	muni_NewLenox_83
32	Village of Northbrook Bike Route Map	muni_Northbrook2007_83
33	Northfield Bicycle & Pedestrian Access Plan	muni_Northfield2007_83
34	Oswegoland Park District Trail Guide	muni_Oswegoland_83
35	Palatine Park District Bike Trail Map	muni_Palatine2004_83
36	City of Park Ridge Bike Path Program	muni_ParkRidge2007_83
37	City of Rolling Meadows Bikeway Plan (2002)	muni_RollingMeadows2007_83
38	Roselle Recreation Routes	muni_Roselle_83
39	Village of Schaumburg	muni_Schaumburg2007_83
40	Skokie Bicycle Facility Plan, 2003	muni_Skokie2007_83
41	Streamwood Bicycle Plan	muni_Streamwood2007_83
42	Western Springs Mobility Plan - Bike Routes	muni_WesternSprings_83
43	Wheeling Bikeway System Plan (2003)	muni_Wheeling2007_83
44	Wilmette Bicycle Plan	muni_Wilmette2007_83

** The above list is accurate as of December, 2007*

File Projections

Regardless of the format in which the GIS files are received, they are redefined and re-projected in the following geographic and projected coordinate systems: North American Datum 1983 (NAD83) and NAD 1983 State Plane Illinois East FIPS 1201 (Feet). The process for defining and projecting a file's geographic and/or projected coordinate system is as follows:

Projecting to NAD83

The next step in the process is to project the data you wish to translate into NAD83 format. (The standard projection for the BIS is NAD83. This step is only necessary if the file was received in a projection other than NAD83. Refer to each file's respective section for received projection information.)

1. Open ArcToolbox, expand Data Management Tools, then Projections and Transformations, and **double-click Define Projection**
2. Click the open folder and browse to the appropriate folder and **Input Dataset or Feature Class,** then **click button to choose the Coordinate System**
3. Then, **Click Select**, to select the coordinate system of the data to be loaded
4. Then, **Click Ok**

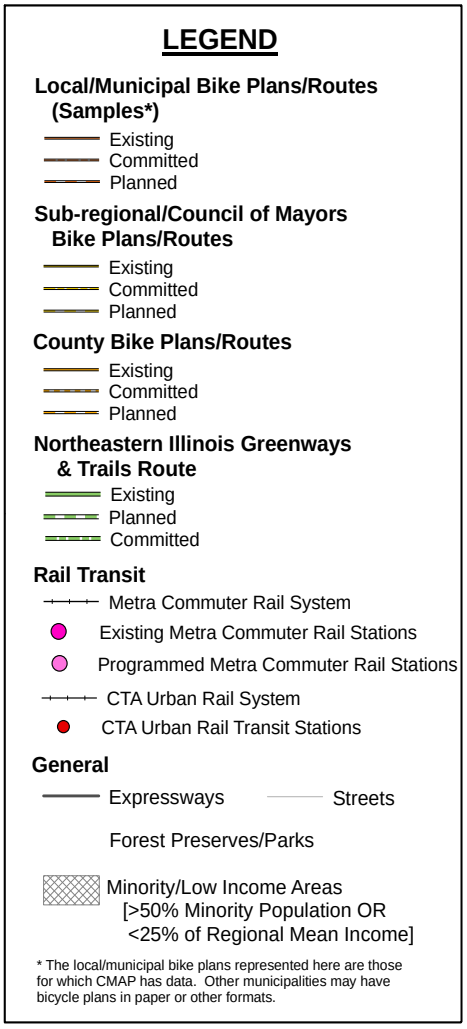
Alternatively, if the data is in an unknown coordinate system, or if spatial analysis tools require recreating the data in the same coordinate system, follow these steps:

1. In ArcToolbox, expand Data Management Tools, then Projections and Transformations, and Feature, and **double-click Project**
2. Fill out dialogue box fields
3. Under Output Coordinate System, select **NAD 1983 State Plane Illinois EAST FIPS 1201 (Feet)**
4. Then Click Ok

Metadata

The metadata provides the general and technical characteristics of the dataset. The metadata includes data identification, description, content, purpose, status, accessibility, the file creator and publisher, data quality, condition, spatial data organization, spatial reference, entity and attribute descriptions, distribution, and metadata reference information. The metadata uses, as default, the Content Standard for Digital Geospatial Metadata from the Federal Geographic Data Committee. The metadata is also provided in Extensible Markup Language (XML) formats.

Multiple Datasets & Data Hierarchy



As noted above, the current BIS contains areas of duplicated or overlapping linework. This is a result of: 1) the decision to include all available datasets, and 2) the fact that jurisdictions may overlap or be nested within other jurisdictions. No consistent effort has been made either to combine datasets or reduce segmentation of existing line work. For this reason, CMAP staff has developed – for the purposes of visual presentation (i.e. display maps) – a symbolization which distinguishes data types and, to some extent, data hierarchy. Data representation and data hierarchies can easily be modified or adjusted as visualization goals and mapping needs, as well as the accuracy of data obtained from different agencies about their facilities, change. For example, a local municipality might provide a dataset that contained more up-to-date, detailed, or otherwise more accurate data about bikeway facilities than the data which the county, in which the municipality resides, can provide. In this situation, CMAP might prioritize the visualization of the dataset provided by the local municipality, when analyzing or coordinating a specific planning or programming activity in this area.

The *de facto* solution, however, to the problems of data collection and hierarchy when jurisdictions overlap, has been to use the larger

geographic entities (counties and Councils of Mayors) as clearinghouses for, or collectors of, municipal data. The data flows, therefore, from municipalities to Councils of Mayors and counties, and finally to CMAP and into the BIS. Nevertheless, the BIS is designed to accommodate and contain plans and facilities from all levels of government and authoritative bodies, including, when available, Forest Preserve and Conservation Districts and state sources. This process, while not yet fully established, would allow CMAP to receive data from each of the seven counties and/or Councils of Mayors, thereby eliminating some duplication of line work and, in general, creating a more efficient system and process for maintaining and updating data and information.

The hierarchical system would thus include data unique to each county, which is based on the highest level of accuracy among the various datasets for the specific (sub)region. Until such a system is fully in place, however, there may not in fact be a single governing dataset, and the best representation of existing conditions will therefore be the result of combining multiple datasets.

Updating Procedures and Inventory Follow-up

As new non-motorized facilities are planned or constructed, a procedure has been established in order to update and improve the inventory map. This process has been designed to ensure that information is shared effectively and efficiently between CMAP, its partners, and the implementing authorities and public bodies.

Regular public meetings of the CMAP Bicycle and Pedestrian Task Force are held in order, in part, to capture and share news and information about non-motorized facilities being planned and built by implementing agencies. In addition, sub-regional Councils of Mayors have been encouraged to establish bicycle and pedestrian committees to develop bikeway and pedestrian plans as part of their transportation planning process, and to hold public meetings and include broad stakeholder involvement. Such committee meetings should occur on a quarterly basis. As regards the BIS, these meetings serve two functions: (1) To verify information in the CMAP BIS and (2) to receive new information about non-motorized facilities that are not yet recorded in the BIS.

This BIS map (entitled, in the Regional Transportation Plan, the Strategic Regional Bicycle and Pedestrian System Map – at:

http://www.cmap.illinois.gov/policy/transportation.aspx?ekmensel=c580fa7b_8_18_396_3) is available on the CMAP website. This 24/7 availability of the BIS, and other transportation and planning maps, increases the exposure of the BIS and intended to produce continuous public comment and input. Comments regarding the maps and other aspects of the BIS are sent directly to CMAP staff through a web-based comment form.

DATA INTEGRATION PROCESS

The BIS dataset, as stated above, houses multiple feature classes populated with bicycle facility information and, again as mentioned, may exhibit areas of duplicated facilities. Available data (shapefiles, interchange files, database files, etc.) may require translation into the adopted CMAP datafield structure and subsequent feature class. This is easily done using ArcCatalog, the feature class template, and the procedures for data integration. Combining all of the feature classes into one master file can be accomplished once all files have undergone the following procedure.

Creating a New BIS Feature Class (Load-File)

To start the translation process, a load-file needs to be created. Using ArcCatalog, create a new feature class by following these steps:

1. Open ArcCatalog and navigate to the BISgeodatabase; **double-click the BIS dataset**.
2. Select the contents tab, right-click in the contents window and **select new – feature class.**
3. **Type the name and alias** for the file you're translating; and select feature **Type** (usually "line")
4. Then **click Next>**
5. **Click Import** and browse to the BIS Geodatabase and **select BIS_Fields**
6. **Click Finish**

Translation: Loading Data

The final step in the process is to load available data into the new feature class (load-file) created above. Still using ArcCatalog load the data into the new feature class:

1. In ArcCatalog, select the BIS dataset in BIS geodatabase.
2. Select the contents tab and **select the feature class** as created above in to which data is to be loaded.
3. Right click the file and **select Load Data** to open the Simple Data Loader.
4. Click the **Input Data**, and **select the file to be translated** (this is the file projected to NAD83) by browsing to the folder containing that file, **click open, click add**, then **next**

NOTE: If more than one file is to be translated for a specific BIS feature class, then repeat step 4, making sure to check that the data has the same schema. You can also add more than one dataset at a time.

5. **Click next>** accepting the defaults for choosing an existing geodatabase and selecting the target feature class.
6. **Select appropriate Matching Source Fields** by clicking in the cell adjacent to the Target Field name you wish to match.
7. Once all matching source fields have been selected, **click next>**
8. Select **the Load all of the source data** button and **click next>**
9. **Click finish** (if any problems are encountered during the loading process, refer to the respective feature class's section).

Exhibit 4: SRBPS Map

Strategic Regional Bicycle and Pedestrian System (SRBPS)