Bikeway Inventory System

October 2015

Chicago Metropolitan
Agency for Planning

SOLES & SPOKES

WALKING AND BICYCLING FOR TRANSPORTATION

TABLE OF CONTENTS

Contents

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 are 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 separate feature classes for each identified bikeway plan (or plan with a bikeway component) within the seven-county area. These plans have been developed and adopted by local governments, sub-regional Councils of Mayors, 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.

Database Structure

As a collection of bikeway plans (or bikeway components to larger plans), this inventory represents CMAP's current knowledge of the extent of bikeway planning in the region. What this inventory does not attempt to do is create a single seamless representation of combined bikeway plans. So, for example, if two adjacent communities show a planned sub-regional bike route, they may not necessarily align. See the "Multiple Datasets & Data Hierarchy" section for guidance on displaying features from multiple sources.

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). It has been updated by CMAP staff as well as by submittals by partner agencies and consultants. All most-current plans available to CMAP are stored in the feature dataset *BISdataset*. As of 2014, the naming convention of feature classes within this dataset have been standardized to the following:
Category_Geography_Year_PlanType_Source where:

Category	General category for source (CMAP, Council, Muni, etc.)
Geo	Geography represented (if it represents a Council area, their acronym (i.e. SSMMA) goes here.
Year	Year of plan.
Type	Type of plan.
Source	Source (muni name or council/agency acronym); not required if identical to Geo

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. 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.

Also included (outside of the BISdataset) is a single, empty feature class **BISfields**. This is a template feature class with which users can create new bikeway feature classes, either by digitizing features directly into a copy of it, or by using the "load features" function in ArcGIS to import an existing shapefile to match the BIS data schema (see "Data Integration Process" below).

Domains and Feature Class Properties

In order to create consistency among entries within the BIS, certain data fields are associated with domains that have a prescribed list of values; while editing these fields have a drop-down window with this list of values, which will help to eliminate spelling mistakes maintain consistency for the classification of facilities. Domains currently included in the BIS geodatabase and their values are as follows:

YesNo	Yes/No values; assigned to GITRAIL field but can be assigned to other binary fields as well.
STATUS	Existing, Programmed, Planned, Future, Unknown
FACTYPE	Examples: Bike Lane, Bike Route, Path; see *Appendix 1: Facility Types* for complete list.
SURFACE	Paved, Aggregate, Dirt, Unknown

File Projections

All BIS feature classes are in the NAD 1983 State Plane Illinois East FIPS 1201 (Feet) projection. Any data received for the BIS in other projections are re-projected into this projection as a part of the import procedure.

Metadata

The metadata provides the general and technical characteristics of the dataset. The metadata may include 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. See the Data Integration Process section for more information if you are submitting a dataset for inclusion in the BIS.

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 (see Figure 1). 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.

To the extent practical, CMAP prefers to receive bikeway plan data through county and subregional transportation planning agencies. Local plans are ideally consistent with and reflected by county and subregional bikeway plans.

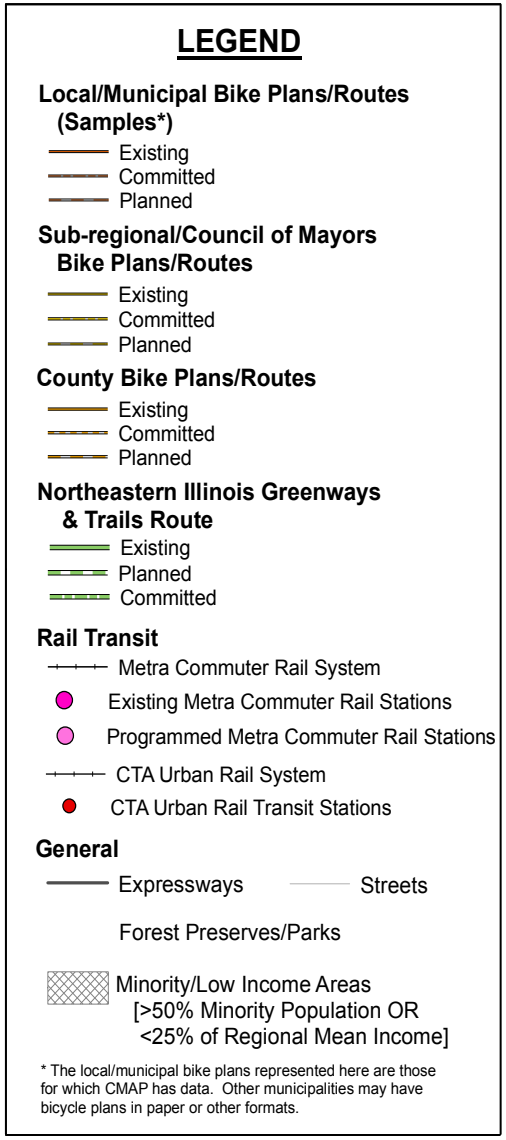

Figure 1: Multiple dataset display example

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. An important function of such meetings is to track subregional plan implementation. As regards the BIS, these meetings serve two additional 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.

Data Integration Process

The BIS dataset, as stated above, houses multiple feature classes populated with bicycle facility information may exhibit areas of duplicated facilities. Available data (shapefiles, interchange files, database files, etc.) may require translation into the adopted CMAP datafield structure (see *Appendix 2: BIS Fields*) 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.

<u>Creating a New BIS Feature Class (Load-File)</u>
To start the translation process, a load-file needs to be created. The load-file is an empty feature class containing all of the attribute fields listed in Appendix 2. Using ArcCatalog, create a new feature class by following these steps:

1. Open ArcCatalog and navigate to the BIS geodatabase; expand so that the **BISdataset** is visible
2. Right-click on **BISdataset** and then select **New – Feature Class**
3. Type the **Name** and **Alias** for the file you're translating; and select feature **Type** (usually "Line Features")

4. Then click **Next >**; keep the Configuration Keyword set to "Default" and click **Next >** again,
5. Click **Import** and browse to the **BIS Geodatabase** and select **BIS_Fields** (this is the step that creates BIS attribute fields for your new dataset)
6. Click **Finish**

<u>Translation: Loading Data</u>

The final step in the process is to load available data into the new feature class (load-file) created above. Prior to loading data, you must verify the following:

- Confirm that your input data is in the **NAD 1983 State Plane Illinois East Zone (US Feet)** coordinate system. If not, you will need to re-project the data into that coordinate system before you can proceed.
- Confirm that the attributes in your input file match the schema (field type & length) listed in *Appendix 2: BIS Fields*. Any mis-match of input attributes to load-file attributes will result in an error message and exclusion of mis-matched records. Examples of mis-matches: fields where the input field is formatted as numeric while the target field is formatted as text; input text field holds more characters than target text field.

1. In ArcCatalog, browse to your newly-created feature class within the **BISdataset**;
2. Right-click on the feature class and select **Load > Load Data** to open the Simple Data Loader
3. Click the folder icon by the **Input Data** window and navigate to the input file that you wish to load; click on that file, then click **open**, then **add**, then **next**
   Note: the Simple Data Loader allows for loading of multiple input files at this step. However, all input files must have identical schema for the process to work at this step. If you are prevented from loading multiple files, simply load a single file, and then repeat the process to load additional files.
4. Click **Next >** at the next window ("Select the target geodatabase…"), accepting all defaults
5. At the next window, you match up the fields from your input file ("**Matching Source Field**" in the right column) to the **Target Fields** in the left column. The Data Loader will automatically match up those fields whose names are identical; others

will read **<none>** and you will need to identify the appropriate source field using the drop-down list. If your input file does not have a match for a particular Target Field, leave the Source Field set to **<none>**

6. Once all matching source fields have been selected, click **Next >**
7. Make sure **Load all of the source data** is checked, and click **Next >**
8. Click **Finish**. The data should now be loaded.

Metadata

If you are providing data for inclusion in the BIS, we ask that at a minimum you fill in the "Description" section of the dataset's metadata. Any reference to a plan or other publication should include the publication date. Below are some examples:

This data set contains the existing and planned bikeways (paths, bike lanes, or bike routes) in the Village of New Lenox. The data comes from the 2002 New Lenox Bicycle and Pedestrian Facilities Master Plan.

This data set contains the existing and planned bikeways (paths, bike lanes, or bike routes) within the McHenry Council of Mayors. The line features were created by amalgamating on-street and off-street bikeways feature classes from each of the municipalities of the McHenry Council of Mayors with additional updates by consultant staff. This feature class represents the planned bikeways of communities within the McHenry Council of Mayors.

This data set contains the existing and planned bikeways (paths, bike lanes, or bike routes) in the Oswegoland Park District. The line features were created by digitizing the on-street and off-street bikeways portrayed in the Oswegoland Park District Trail Guide, April, 2004, which was produced by the Oswegoland Park District.

ESRI no longer supports the Federal Geographic Data Committee (FGDC) metadata standard. We recommend that you use the **ISO 19139 Metadata Implementation Specification** as the default style for viewing or editing metadata in the BIS. You can change this setting in ArcCatalog through **Customize > ArcCatalog Options > Metadata**.

Appendix 1: Facility Types

Below is a complete list of all facility types employed in the current BIS:

Facility Type	Definition	Definition Source
Bike Lane	"A portion of roadway designated for preferential or exclusive use by bicyclists by pavement markings and, if used, signs. A bicycle lane is intended for one-way travel, usually in the same direction as the adjacent travel lane, unless designed as a contra-flow lane."	AASHTO Guide for the Development of Bicycle Facilities, 4th Edition, 2012.
Buffered Bike Lane	A variety of bike lanes, these are "conventional bicycle lanes paired with a designated buffer space separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane."	NACTO Urban Bikeway Design Guide, 2nd Edition, 2014.
Cycle Track	"A cycle track is an exclusive bike facility that combines the user experience of a separated path with the on-street infrastructure of a conventional bike lane. A cycle track is physically separated from motor traffic and distinct from the sidewalk. Cycle tracks have different forms but all share common elements—they provide space that is intended to be exclusively or primarily used for bicycles, and are separated from motor vehicle travel lanes, parking lanes, and sidewalks. In situations where on-street parking is allowed cycle tracks are located to the curb-side of the parking (in contrast to bike lanes)."	NACTO Urban Bikeway Design Guide, 2nd Edition, 2014.
Protected Bike Lane	A variety of cycle track, sometimes referred to as "One-way Protected Cycle Tracks," these are "bikeways that are at street level and use a variety of methods for physical protection from passing traffic. A one-way protected cycle track may be combined with a parking lane or other barrier between the cycle track and the motor vehicle travel lane."	NACTO Urban Bikeway Design Guide, 2nd Edition, 2014.
Raised Cycle Track	A variety of cycle track, these are "bicycle facilities that are vertically separated from motor vehicle traffic. Many are paired with a furnishing zone between the cycle track and motor vehicle travel lane and/or pedestrian area. A raised cycle track may allow for one-way or two-way travel by bicyclists."	NACTO Urban Bikeway Design Guide, 2nd Edition, 2014.

Facility Type	Definition	Definition Source
Bike Route	"A roadway or bikeway designated by the jurisdiction having authority, either with a unique route designation or with Bike Route signs, along which bicycle guide signs may provide directional and distance information. Signs that provide directional, distance, and destination information for bicyclists do not *necessarily* establish a bicycle route."	AASHTO Guide for the Development of Bicycle Facilities, 4th Edition, 2012 (emphasis added).
Bicycle Boulevard	"A street segment, or series of contiguous street segments, that has been modified to accommodate through bicycle traffic and minimize through motor traffic."	AASHTO Guide for the Development of Bicycle Facilities, 4th Edition, 2012.
Path	"A bikeway physically separated from motor vehicle traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Paths may be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users. Most paths are designed for two-way travel." Officially referred to by AASHTO as a "shared use path."	AASHTO Guide for the Development of Bicycle Facilities, 4th Edition, 2012.
Sidepath	A path (see above) "located immediately adjacent and parallel to a roadway."	AASHTO Guide for the Development of Bicycle Facilities, 4th Edition, 2012.
Land-based Greenway	A corridor of natural landscape or diverse natural and cultural features that lacks an existing, planned, or potential trail.	CMAP Northeastern Illinois Greenways and Trails Plan.
Not a Bicycle Facility	Features included in a BIS feature class that do not represent bicycle facilities (i.e. pedestrian-specific facility).	CMAP
NA	Not available	
Unknown	Unknown	

Appendix 2: BIS Fields

NOTE: 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 facility's status, but not its surface material; or the facility type, but not its total width. To the extent possible, we attempt to record the FACTYPE and STATUS for each feature.

Field Name	Descriptive Name	Domain	Description	Field Type	Length
OBJECTID	Object ID		*System field*		
Shape	Geometry (line)		*System field*		
STNAME	Street Name		Name of the roadway that facility is on. This field will be blank for most off-street facilities.	Text	80
FACNAME	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.	Text	80
GITRAIL	Grand Illinois Trail	YesNo	Does the facility belong to the Grand Illinois Trail System?	Text	3
SYSDES	System Designation		What is the facility's broader trail designation? Blank if none.	Text	50
FROMREF	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.	Text	50
TOREF	To Reference (terminus)			Text	50

Field Name	Descriptive Name	Domain	Description		Field Type	Length
STATUS	Status	STATUS	Existing	Facility is constructed	Text	24
			Programmed	Funding secured and/or construction underway		
			Planned	Part of an adopted plan		
			Future	Corridors being considered in future planning exercises		
			Unknown	Unknown		
FACTYPE	Facility Type	FACTYPE	See Appendix 1 for the complete list of facility types.		Text	24
SURFACE	Surface Type	SURFACE	Paved	Facility is constructed of durable materials such as concrete or asphalt	Text	24
			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		
TOTWIDTH	Total Width		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.		Double	
SORNAME	Source File Name		File name where data was loaded from		Text	32
AGENCY1	Primary Agency		Name of the primary (1) and secondary (2) managing agencies or jurisdictional bodies		Text	50
AGENCY2	Secondary Agency				Text	50
COMMENT1	Comment 1		Space for adding comments (i.e. "data revised," etc.)		Text	80
COMMENT2	Comment 2				Text	50
Shape_Length	Line Length (feet)		*System field*			