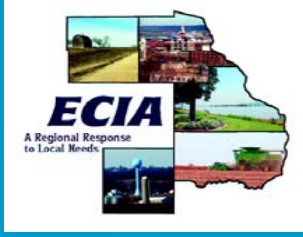
East Central Intergovernmental Association



ECIA

A regional response to local needs

Bicycle Compatibility Index Model (BCI)

by

Chandra Ravada

What is the BCI model?

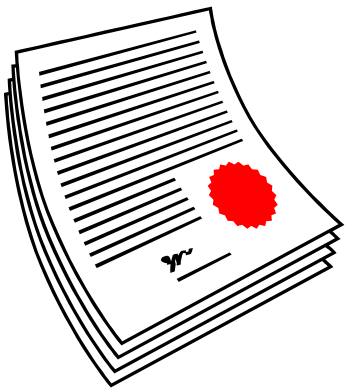
A set of mathematical equations which are used to determine the Level of Service (LOS) on existing and future road network.

Why do we do BCI modeling?

1. To determine when and where existing and future LOS changes will occur.

2. To aid in policy decisions.

3. To aid in making investment decisions (projects).



What Can we do with BCI Modeling?

1. **Operational Evaluation** - Existing roadways can be evaluated using the BCI model to determine the bicycle LOS present on all segments.

2. **Design** - Designers can assess new roadways or roadways which are being re-designed or retrofitted to determine if they are bicycle compatible.

3. **Planning** - The model provides the user with a mechanism to quantitatively define and assess long-range bicycle transportation plans.

How does BCI model work ?

- The BCI reflects the comfort level of bicyclist on the basis of observed geometric, surrounding land use and operational characteristics of a roadway.

- The lower the BCI value the greater the level of comfort a bicyclist experiences.

LOS	BCI Range	Suability Level
A	≤ 1.50	Extremely High
B	1.51 – 2.30	Very High
C	2.31 – 3.40	Moderately High
D	3.41 – 4.40	Moderately Low
E	4.41 – 5.30	Very Low
F	> 5.30	Extremely Low

Geometric Conditions

Variables	+/-	Relationship to BCI score
Number of Lanes	+	The greater the # of lanes the higher the BCI and the lower the bicyclist's comfort.
Lane Widths	+	The greater the lane width the lower the BCI and the greater the comfort level of the bicyclist.
Curb Lane Width	+	The presence of a wide curb lane lowers the BCI. Additional lane width lower the BCI. This has a positive impact on the bicyclist level of comfort.
Bike Lane Width	+	The presence of a bike lane lowers the BCI. Additional bike lane width lowers the BCI slightly. This has a positive impact on bicyclist comfort.
Pave Shoulder Width	+	The presence of a pave shoulder lowers the BCI. Additional pave shoulder width lowers the BCI. This has a positive impact on the bicyclist level of comfort.

Surrounding Land Use & Operational Conditions

Variables	+/-	Relationship to BCI score
The type of development or land use adjacent to the roadway.	+	For purposes of the model, only two classifications are required, "residential" and "other." During the development of the model the residential development type proved to be significantly different from all other types of development and was shown to positively impact the comfort level of bicyclists.

Variables	+/-	Relationship to BCI score
Speed Limit	-	The higher the speed the greater the BCI score and the lower the comfort level of the bicyclist.
85% Speed	-	The 85% speed is the speed at which 85% of the public travel. Without data this can be estimated by national trends. Again higher the speed the greater the BCI score and the lower the comfort level of the bicyclist.
AADT	-	The Annual Average Daily Traffic count gives the expected traffic volume on any given day. The greater the traffic volume the higher the BCI and the lower the comfort level of the bicyclist.

Operational Conditions & Parking

Variables	+/-	Relationship to BCI score
Large Truck %	-	The greater the % of large trucks the higher the BCI and the lower the comfort level of the bicyclist.
Right Turn %	-	The greater the % of right turns the higher the BCI and the lower the comfort level of the bicyclist.

Variables	+/-	Relationship to BCI score
Parking Lane	-	Presence of a parking lane increases the BCI and lowers the comfort level of the bicyclist.
% Parking Occupancy	-	Represents the number of parking spaces filled. The greater the % occupied, the lower the comfort level of the bicyclist.
Parking Time Limits	-	Parking turn over is partially a function of parking time limits. The shorter the time limit the greater the frequency of turn over, the higher the BCI and the lower the comfort level of the bicyclist.

Where to get the data ?

Data Groups	Inputs	City/County	IADOT	MPO
Geometric & Roadside Data	No. of Lanes (one direction)		●	
	Curb Lane Width (ft)		●	
	Bicycle Lane Width (ft)	●		
	Paved Shoulder Width (ft)		●	
	Slope		●	
Traffic Operations Data	Residential Development (y/n)	●		
	Speed Limit (mi/h)		●	
	85th %tile Speed (mi/h)		●	
	AADT		●	●
	Large Truck % (HV)		●	●
Parking Data	Parking Lane (y/n)	●		
	Occupancy (%)	●		
	Time Limit (minutes)	●		

How Did Dubuque Metropolitan Orginization use BCI Model ?

I. Establish a Bike & Pedestrian Group

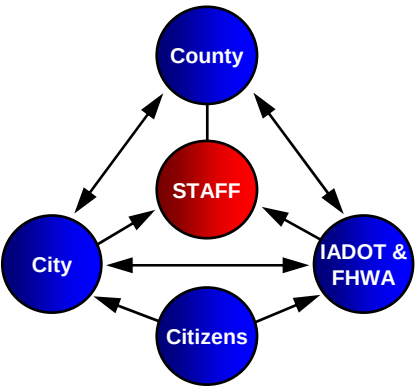
II. Present BCI Model and Take input

III. Prioritization

IV. Plan Implementation

Post Process

Established a Core group with citizens and public officials



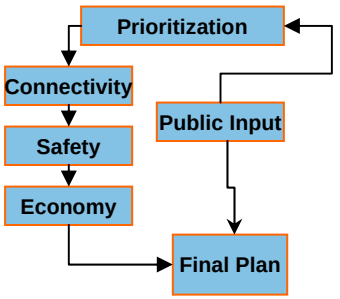
The BCI results where mapped for the MPO region and presented to the group.

Input was taken from the group

BCI MAP B BCI MAP F

Projects were selected from the input and prioritized based on:

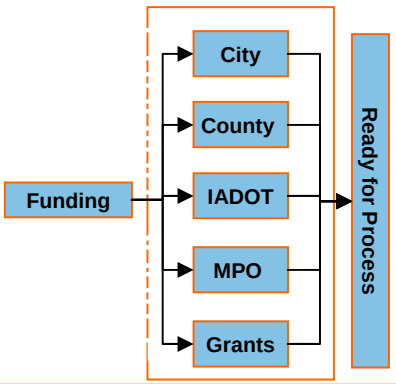
- Connectivity
- Safety
- Economic Development
- Security

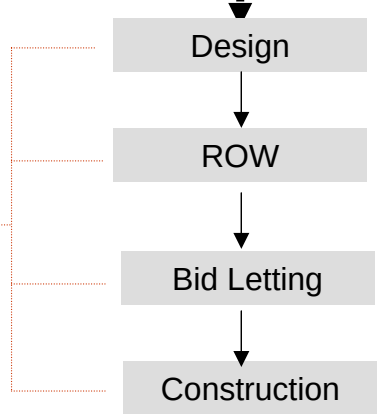


Final MAP

A financial Constrain Plan was developed based on commitment from

- City/ County
- MPO
- IADOT
- Grant Programs

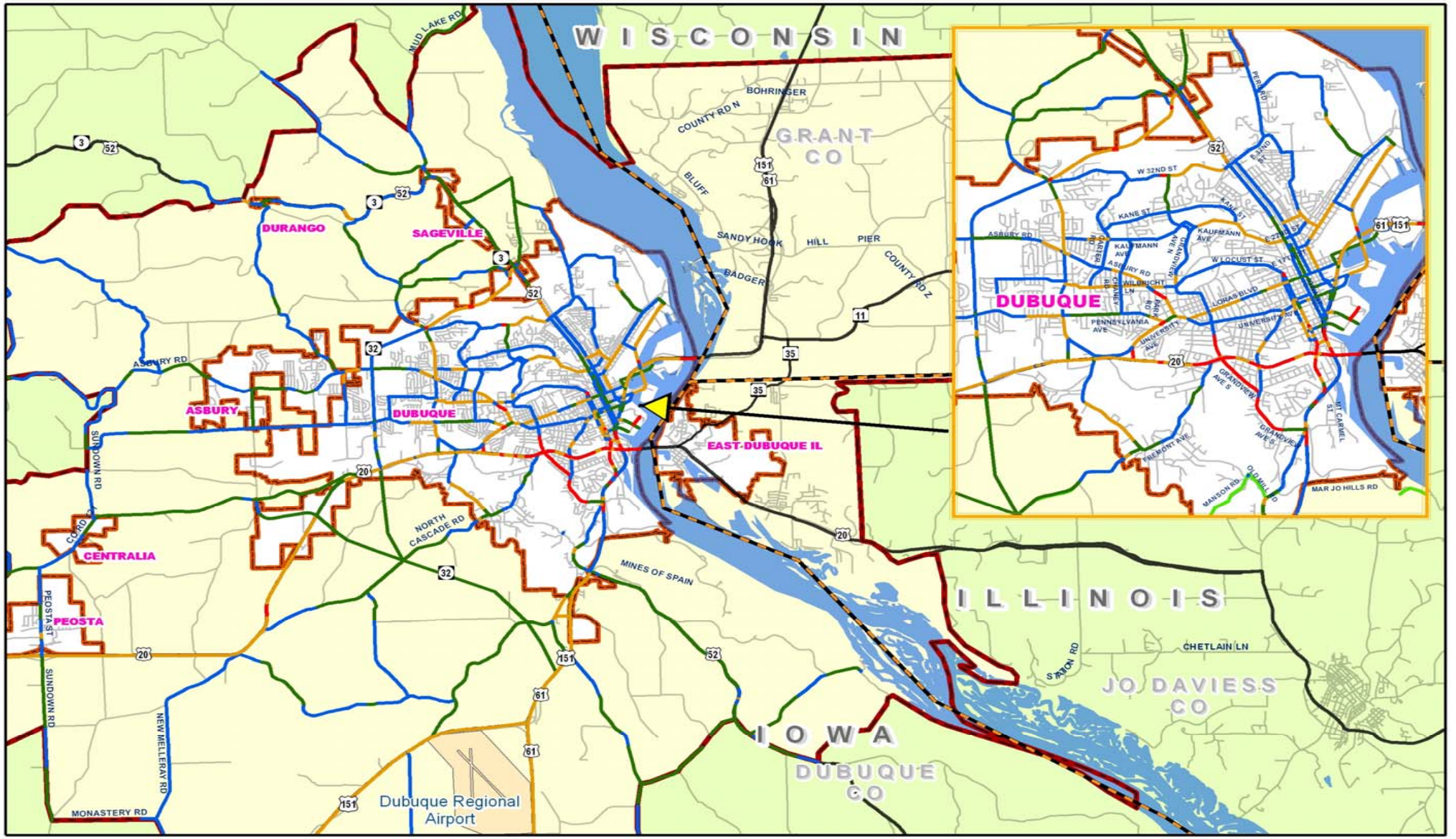




Dubuque MPO Goals (1) Support regional economy. (2) Maximum access to all recreational, residential, educational and commercial areas. (3) Promote safety. (4) Connectivity and Continuity of Bike & Pedestrian trails. (5) Follow State, Federal and AASHTO standards.

Thank you

Bicycle Compatibility Index (BCI) Level of Service for Routes in DMATS Area (Base)



Legend

- State Borders
- DMATS Area
- Cities
- County Border
- Mississippi River
- State HWY
- US HWY
- Streets/Roads
- Level of Service (A,B & C)
- Level of Service (D)
- Level of Service (E)
- Level of Service (F)

Scale
1:141,611

0 0.350.7 1.4 Miles

Date Created : 10/25/04
Date Revised : 11/29/04; 01/29/07
Created By : Chandra Ravada
Data Source : IDOT; Dubuque, Co.; City of Dubuque; DNR; ECIA Data: ILDOT; WIDOT
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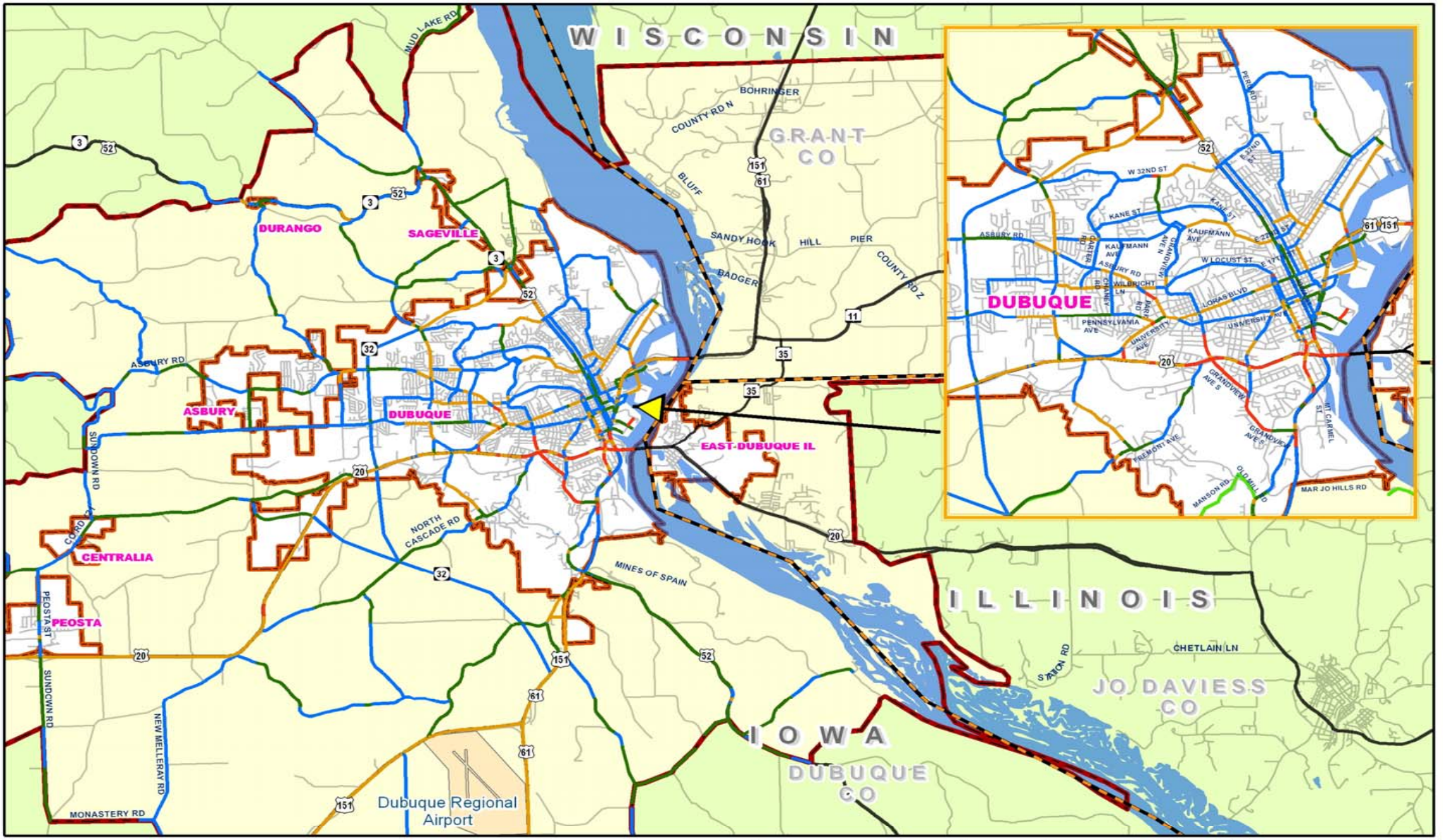
Map 6-5

Return

Bicycle Compatibility Index (BCI) Level of Service for Routes in DMATS Area (Future)



Legend

- State Borders
- DMATS Area
- Cities
- County Border
- Mississippi River
- State HWY
- US HWY
- Streets/Roads
- Level of Service (A,B & C)
- Level of Service (D)
- Level of Service (E)
- Level of Service (F)

Scale

1:141,611

0 0.5 1 2 Miles

Date Created : 10/25/04
Date Revised : 11/29/04: 01/29/07
Created By : Chandra Ravada
Data Source : IDOT; Dubuque, Co; City of Dubuque; DNR; ECIA Data: ILDOT; WIDOT
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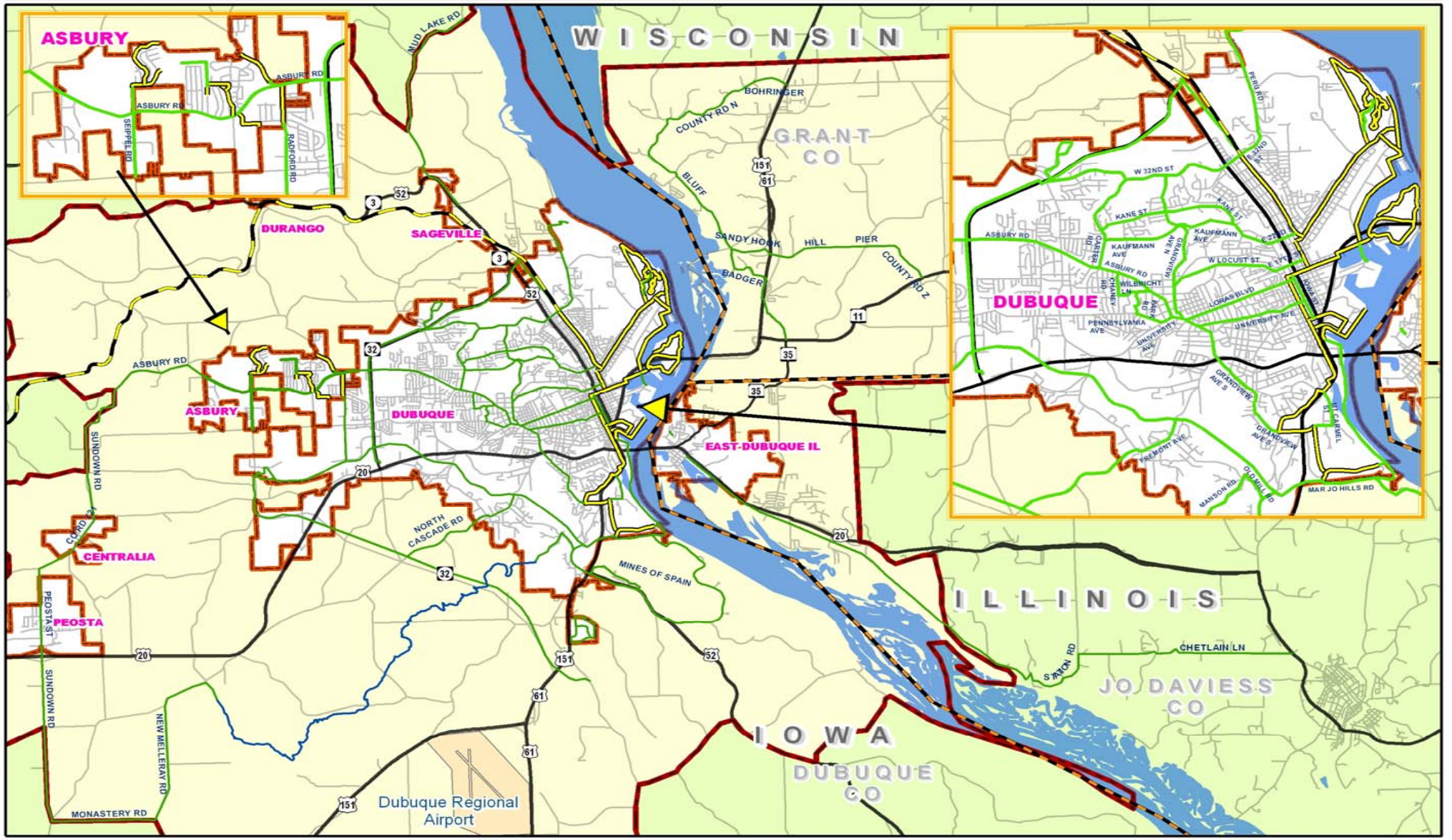
Map 7-5

Return

Existing and Proposed Bicycle & Pedestrian Routes in the DMATS Area



Legend

- State Borders
- DMATS Area
- Cities
- County Border
- Mississippi River
- State HWY
- US HWY
- Streets/Roads
- Heritage Trail (Existing)
- Existing Bike Trails
- Proposed Bike Trails (1999)
- Proposed Bike Trails (2005)

Scale
1:141,611

0 0.5 1 2 Miles

Date Created : 10/25/04
Date Revised : 11/29/04; 8/14/06
Created By : Chandra Ravada
Data Source : IDOT; Dubuque, Co; City of Dubuque; DNR; ECIA Data: ILDOT; WIDOT
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ECIA

Map 5-5

Return