

# Multimodal Planning Studies

## The Five E's of Bicycle Planning

*Bicycle and Pedestrian Plans commonly refer to the Five E's: Engineering, Education, Encouragement, Enforcement and Evaluation.*

*Simply providing bicycle facilities will not ensure that people will bicycle more or that a community will be bicycle friendly. Plans and recommendations focused on the Five E's help ensure that a plan is comprehensive and encourages bicycling and walking through a variety of means.*

### Engineering



- ❖ Engineering refers to physical infrastructure. This is the category that is typically thought of when people think about plans.
- ❖ Engineering recommendations are typically divided into short-term, medium-term and long-term priorities based on cost, ease of implementation and other factors.
- ❖ Engineering recommendations may include:
  - On-street facilities such as bike lanes, sharrows and traffic calming
  - Off-street paths
  - Directional and wayfinding signage
  - Bicycle and pedestrian bridges and tunnels
  - Bike parking facilities
  - Anything physical in nature that facilitates walking and bicycling for travel



### Education



- ❖ Education efforts typically focus on educating people about the rules of the road.
- ❖ Education may focus on teaching bicyclists, particularly children, how to properly interact with motorists and how to avoid the most common dangerous situations that occur for bicyclists.
- ❖ Education may also focus on making bicyclists aware that they have the same responsibility as motorists to follow the rules of the road.
- ❖ Motorist education typically focuses on reminding motorists of the rules of the road and how to properly interact with bicyclists and pedestrians.
- ❖ Education efforts may include:
  - Bike rodeos and helmet fairs
  - Public Service Announcements (PSAs)
  - Workshops for planners, engineers, law enforcement officials
  - Driver education and safe cycling classes



### Encouragement



- ❖ Encouragement activities focus on increasing bicycling and walking through fun and interesting activities.
- ❖ Encouragement activities may include:
  - Bike to Work Week activities
  - Bike and Walk to School Day
  - Workplace wellness programs
  - Cidovias
  - Community bike rides
  - Providing bicycling maps
  - Bike share systems

### Enforcement



- ❖ Enforcement activities focus on enforcing the rules of the road for all users - motorists, bicyclists and pedestrians.
- ❖ Enforcement also prioritizes having links between the law enforcement community and the bicycling community.
- ❖ Enforcement activities may include:
  - Efforts to reduce speeding
  - Efforts to increase motorists yielding to pedestrians and bicyclists where appropriate
  - Efforts to reduce bicycle theft

### Evaluation



- ❖ Evaluation efforts seek to quantify the impacts of the other "E's."
- ❖ Evaluation efforts may include:
  - Measuring the growth of bicycle and pedestrian facilities in a region
  - Measuring the rate of bicycling in an area or the number of users on a specific facility
  - Evaluating crash data for patterns and / or frequency

For more information about the Lawrence-Douglas County Metropolitan Planning Organization *Multimodal Planning Studies*, including the complete Countywide Bikeway System Plan report (and other study report documents), please visit:  
[www.lawrenceks.org/mpo](http://www.lawrenceks.org/mpo)



# Multimodal Planning Studies

## Countywide Bikeway System Plan



### Executive Summary

#### Project Overview

In 2013, the Lawrence-Douglas County Metropolitan Planning Organization (L-DC MPO) completed the Multimodal Planning Studies. The goal of this planning effort was to identify and prioritize transportation needs for commuters, pedestrians, cyclists and transit riders for the next five to ten years and to develop a range of short and long-term improvements to support a more multimodal region.

This Executive Summary documents the evaluation process and recommendations to develop plans for building and enhancing bikeways and facilities for bicyclists in Douglas County.

#### Vision & Goals Overview

The City of Lawrence and the L-DC MPO have conducted bicycle planning exercises since the mid-1970s. The most recent bicycle planning effort was carried out as part of developing T2040, the metropolitan transportation plan for the region.

This Countywide Bikeway System Plan serves to update and expand the existing bikeway system planning carried out for T2040 and previous planning efforts. This plan provides updates to the existing and planned T2040 bikeway network for the Lawrence urbanized area and proposes bikeway connections throughout the remainder of Douglas County, including the Cities of Eudora, Baldwin City, and Lecompton.

### BIKEWAY PLAN OBJECTIVES...

*The study goals listed below are built from the goals, objectives, and action steps of several previous studies, including the T2040 Plan, the 2004 Bikeway Plan, and the League of American Bicyclist recommendations.*

- Engineering - Increase Connectivity;
- Engineering - Foster Consistent Design Standards;
- Engineering - Plan and Construct Amenities;
- Enforcement and Safety - Minimize Crashes and Enforce the Law;
- Continued Participation - Maintain Organized Community Engagement;
- Education - Maintain Programs that Raise Public Awareness;
- Encouragement - Foster Cooperation and Promotion of Bicycling; and
- Evaluation - Monitor Outcomes and Document Results of Implemented Programs and Initiatives.

The overall study goals for the Countywide Bikeway System Plan are as follows:

-  To refine bikeway recommendations for the Lawrence Urban Area that build upon past bikeway recommendations;
-  To identify bikeway recommendations for the portions of Douglas County that have not previously had bikeways planned; and
-  To identify bikeway recommendations for four focus areas:
  - The areas around the Eudora public schools;
  - The areas around the Baldwin City public schools;
  - The area of Iowa and 6th Street in Lawrence; and
  - The connection between the Burroughs Creek Trail / Hobbs Park and Riverfront / Constant Park in Lawrence.

Maps displaying the existing and planned system of bikeways for the region can also be found at [www.lawrenceks.org/mpo/bicycle-planning](http://www.lawrenceks.org/mpo/bicycle-planning).

## Summary of Policy and Program Recommendations

### Five E's Recommendations

**Encouragement** - Develop community and employer-sponsored events; provide mileage reimbursements; and, in general, provide small incentives for bicycling; participate in national events and enlist the support of like-minded groups

**Education** - Deliver materials on rules of the road and other basic bicycling information via utility mailings, government websites, and workshops; continue utilizing Safe Routes to School program to raise awareness; develop maps, links to ordinances, and lists of bike shops and bicycling groups to publicize and use them to distribute bicycling information

**Enforcement** - Implement safety laws for motorists and cyclists and police each group equitably; use the results of crash analyses to develop typologies of crashes that focus on and troubleshoot accident clusters, and to develop strategies for improving safety

**Evaluation** - Monitor the outcomes and document the results of implementation of the other E's by utilizing surveys and bike counts to measure effectiveness; expand the Bicycle Advisory Committee (BAC) role to work with other groups to advance the causes of these five E's; hire a coordinator to organize, manage, and implement planning projects relating to bike & pedestrian issues

**Engineering** - Utilize the resources of the local government public works departments to plan and construct infrastructure to support strategies for improving the bicycling environment and facilities in the region

### Other Program / Policy Recommendations

**Connections to Transit** - Build bicycle parking facilities and connect bicycle facilities and routes to transit stops; continue installing bike racks on all buses

**Funding** - Explore ways of maximizing the efficiency of existing sources of funding for transportation improvements, such as installing bicycle facilities in conjunction with roadway resurfacing; submit multiple project-specific applications each cycle to KDOT's Transportation Alternatives Program (TAP); hire a grant writer

**Bike Share** - There exists a propensity for deploying a bike sharing system in Downtown Lawrence and the KU Campus; conduct a full bike share feasibility analysis to determine if such a system could work and how it would be funded

## Examples of Potential Improvements



EXISTING (Eudora County Route 1061 / Church Street)



PROPOSED (Paved shoulders and sidewalk on west side)

### Five E's Performance Measures

**Engineering** - Track the number, type, and condition of facilities and prioritize capital and maintenance improvements accordingly, including:

- Mileage of bicycle lanes and routes
- Mileage of streets rated by bicycle level of service
- Number, capacity, and location of bike racks
- Overpasses / underpasses
- Number of bicycles being shared
- Response time to address hazards

**Education and Enforcement** - Track the schools participating in the Safe Routes to School program, children instructed in bike safety, bicycling-related workshops, training time logged by staff, training time logged by police, citations issued to bicyclists and motorists, and number of helmets distributed annually

**Encouragement** - Track the number of promotions, programs, and publications that encourage bicycling in the Lawrence-Douglas County Region

**Evaluation and Planning** - Track the number of bicycling groups and members, as well as bicycle planners, educators, and enforcers; review and update the Complete Streets Policy as needed

**Usage and Safety** - Use National Bicycle and Pedestrian Documentation Project guidelines to count, track, report, and otherwise record bicycling and associated information; leverage this data for grant writing and planning purposes

## Facility Types - Each type below contains several key points / features



### Bike Lane

-  Denoted by pavement markings; dashed where cars may share space
-  Bi-directional lanes recommended for two-way arterials and collectors
-  Recommended for one-way streets for one bike lane



### Shared Lane Marking, Collector or Arterial

-  Also called "sharrows", these markings denote where motorists and bicyclists share roadway space
-  Lane size dictates sharrow position
-  Recommended for streets with speed limits of 35 mph or less



### Buffered Bike Lane

-  Striped buffer zone between bike and car lanes
-  May also include buffer between bike and parking lanes
-  Recommended for roadways featuring wide cross-sections and / or high traffic speeds



### Shared Lane Marking, Neighborhood

-  Features the use of sharrows along narrower residential streets
-  Enhances safety by alerting people and motorists that bicyclists may be present



### Climbing Bike Lane

-  Designed for roadways with steep slopes
-  Uphill direction contains the "climbing lane" which features exclusive use for bicyclists
-  Downhill direction contains shared use lane for cars and bikes



### Signed Bike Route

-  Features systematic signage posted along routes
-  Signage includes information about destinations from current position, route conditions, etc.
-  May be established along any type of bicycle facility



### Colored Bike Lane

-  Bike lanes are painted with a color, typically green
-  Recommended for high-conflict areas such as complicated intersections, lane merging, turning lanes, etc.



### Bike Route w/ Paved Shoulders

-  Provides a paved shoulder for bicyclists to use along signed bike routes
-  Benefits both roadway and bicycle users, as well as increasing the longevity of the roadway via reduced maintenance



### Cycletrack (Protected Bike Lane)

-  Physically separated from streets and sidewalks offering enhanced safety
-  Uses curbs, bollards, street parking, planter boxes, landscaping, etc.
-  Recommended on multi-lane roadways; can be one or two lanes that are either one- or -two-way



### Shared Use Path

-  Features off-street facility shared by bicyclists and pedestrians
-  Typically located in parks, greenways, utility corridors, abandoned railway corridors, etc.
-  May be used by joggers, skaters, wheelchair users, and in some cases equestrians



### Neighborhood Greenway / Bicycle Boulevard

-  Features the use of low-traffic, local streets and promotes the priority of bicyclists via signage and markings
-  May include traffic calming elements such as speed humps, traffic circles, traffic diverters, etc.



### Side Path

-  Features a shared use path parallel to a roadway
-  Designed for two-way travel for bicyclists and pedestrians
-  Should augment other on-road facilities; not suitable for environments with numerous intersections / conflicts