



Denver Bike Map



Pedestrian and Bicycle
Information Center

Problem

The City of Denver’s original bike map was created in 1996 using graphic arts software. To update the map in its existing format would be a cumbersome, time-consuming process which would involve determining where changes occurred to streets and bike infrastructure and then either adding or updating those features. The goal of the map update was to create an easily-maintainable, readable, user-friendly map that clearly defined the location of current bike routes, bike lanes, bike shops, places of interest, and planned improvements to Denver’s bicycle network.

Background

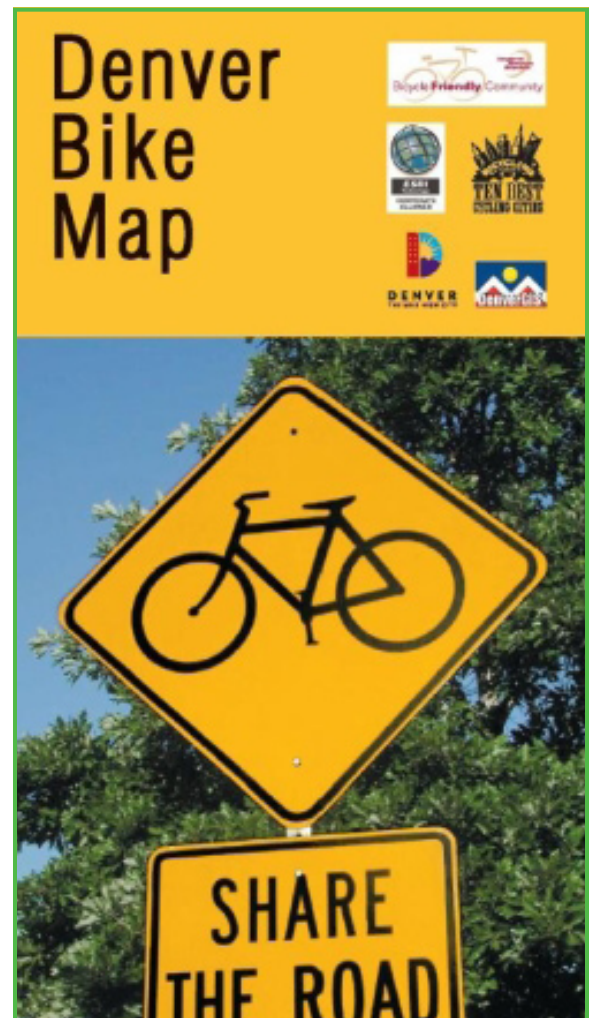
In 1998 Denver Geographic Information Systems (DenverGIS) was formed; it is now a centralized GIS department that supports more than 30 departments and manages more than 800 map layers and associated information resources within the City and County of Denver. GIS uses computers and software to map and analyze location-based information. By 2004 a great deal of the time-consuming process of converting the city’s infrastructure from paper-based maps to a digital GIS format had been accomplished.

Between 1996 and 2004 Denver grew substantially. The closure and development of Stapleton Airport and Lowry Air Force Base, the redevelopment of Lower Downtown, and the development of the Central Platte Valley resulted in many new roads, bridges, and other improvements, including many enhancements to Denver’s bicycle infrastructure.

Solution

The benefits of using GIS technology to update the bike map included leveraging the large amount of GIS data the city had created since 1998. The Denver Bicycle Master Plan had defined 25 designated bike routes, which by 2004 had already been entered into a GIS format. These routes use bike lanes, shared lanes, and off-street facilities, such as the Platte River and Cherry Creek Trails. In addition, un-numbered neighborhood routes connect between the principal routes. Denver also has an extensive trail system using river corridors, drainageways, and open space.

The process of creating a new GIS map began in July 2004 with a review of existing routes, recently added bike lanes, and planned future improvements. New map layers for bike lanes, bike shops, and bike trail ramps were produced. A base map was created using the Environmental Sciences Research Institute (ESRI) ArcMap software. Careful selection of colors and symbols ensured that the final product would be as clear and useful as possible. Besides data development, the most time-consuming part of this project was the placement of labels. The map contains over 5,000 street labels.



The image on the cover of the new Denver Bike Map is worth a thousand words.

Denver Bike Map — Denver, CO

Clear cartography demands that labels be legible and not overlap. To provide open space on the map and avoid a cluttered appearance, street name labels were aligned at one end.

Besides route information, the map contains other useful facts for bicyclists:

- Contact information for all local bike clubs and bike advocacy groups
- Phone numbers for many city agencies, such as Street Maintenance, Trail Maintenance, Traffic Operations, Neighborhood Inspection Services, Animal Shelter, Graffiti Hotline, Smoking Vehicle Hotline
- Police Department contact information, including for the Bicycle Recovery Unit and the Bicycle Safety Unit
- Text and photos showing how to use the bike racks and luggage bays on Regional Transportation District (RTD) buses and bring bikes on board RTD light rail vehicles
- Xcel Energy contact info (for street and trail lighting)
- Graphic illustrations about sharing the trail, multi-use trail shared responsibilities, sharing the road, bike laws, bike theft prevention, and other topics

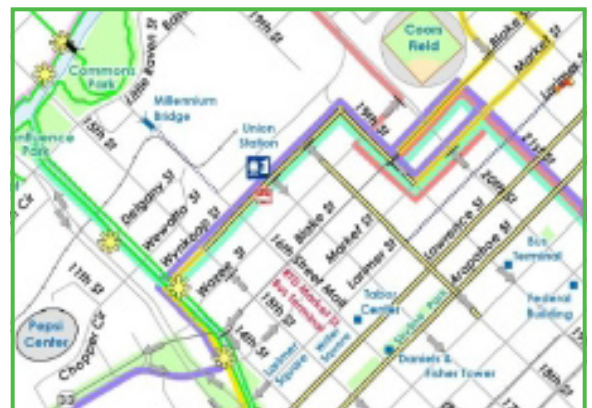
Field and office work to confirm finished projects and expected completion dates for future developments were necessary to create the map. This process was performed by the City's Public Works - Capital Projects Management unit. All these development sites include new streets, bike lanes, trails, and open spaces (with phased implementation schedules). The Community Planning and Development Department contributed graphic arts support. The cities of Calgary, Alberta and Chicago and the Chicagoland Bicycle Federation graciously allowed the use of their graphic illustrations.

The map is in full color and was printed on archival quality, waterproof and tear-resistant paper that can survive the rigors of bicycling. Conveniently for the city, a local printer specialized in working with this particular paper.

Results

The Denver Bike Map won both the "Best Single Cartographic Product—Large Format" and "Best Overall Map" categories in the map gallery competition in August 2004 at the Environmental Research Systems Institute International User Conference in San Diego. It was chosen from over 1,000 entries from entities such as National Geographic and the United States Geological Survey. The map is also printed in The ESRI Map Book, Volume 20 and will appear in Designed Maps: A Sourcebook for GIS Users in February 2008.

An update of the map was produced in December 2006. By creating the map in GIS format, any edits made over the years to the map's geographic features (streets, parks, schools, bike shops, etc.) automatically appear on the map. This allows a fast, streamlined updating process which leverages existing workflows and eliminates duplication of effort. Currently, the Denver Bike Map is being updated as the city adds facilities and new streets to its road network. A new edition of the map is planned for 2009.



This section of the Denver Bike Map shows the results of giving careful consideration to colors, symbols, and placement of street labels.

For more information, please visit the Pedestrian and Bicycle Information Center Web site at www.walkinginfo.org.

Denver Bike Map — Denver, CO

Costs

Over 4,000 copies of the map were purchased from February to July 2007. The printing price is about \$1 each. The map sells for \$5. Retailers such as bookstores, bike shops, and the Denver transit agency may purchase the map in bulk for \$2.50 each (allowing a 100 percent markup). Sales revenue goes into a dedicated fund for printing future editions of the map.

It is difficult to calculate the cost of producing the new Denver Bike Map. Much of the data had already been created by DenverGIS; this was a sunk cost. The real expense came from the city staff time used to develop the map: “staff months” of effort were needed.

Web site to view the map

<http://www.denvergov.org/Portals/482/documents/BikeMapPage1.pdf>

<http://www.denvergov.org/Portals/482/documents/BikeMapPage2.pdf>

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Image sources

Map cover photo, James MacKay; map section, City and County of Denver, CO

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