

Building a bike friendly Chicago

How video data is moving Chicago forward

Becoming the Most Bike-Friendly City in the United States

In 2011, Mayor Rahm Emanuel set out a bold vision;

By 2020, Chicago will have developed a 645-mile network of on-street bikeways that will encourage Chicagoans to ride their bikes. At the core of this vision are three guiding principles:

- 1 Provide a bicycle accommodation within ½ mile of every Chicago resident
- 2 Provide a greater number of bikeways where more people live
- 3 Increase the amount of infrastructure where ridership is high, while establishing a strong backbone of infrastructure

“The Streets for Cycling Plan 2020 establishes the framework for Chicago to be the most bike-friendly city in the US and will create economic opportunity in our neighborhoods and throughout the city”

– *Streets for Cycling Plan 2020*

Bicycling on the Rise, Safety an Issue

Why the bold vision? Chicago was facing safety issues. Research showed that bicycling was the fastest growing form of commuting in Chicago, but up to 60% of riders were concerned about the safety of riding in traffic.

Major Changes Require Major Data Points

Much of the infrastructure development focused on Complete Streets projects, which involve significant alterations to the roadways so that they are safe and comfortable for all modes of travel. Major changes require major data points. Chicago needed a data collection solution that would:

- Fit their tight budget
- Rapidly collect data across the city
- Be accurate and verifiable

This eBook outlines how the City of Chicago used advanced data collection to help achieve its vision.

Why is Chicago so focused on becoming the most bike-friendly city in America?

Safer People, Safer Streets

Chicago's future plans are a reflection of an initiative set out by the U.S. Transportation Secretary Anthony Foxx. Foxx's Safer People, Safer Streets plan aims to increase walking and biking, while reducing pedestrian and bicyclist fatalities. Ped and bike fatalities in the United States have been on the rise since 2009.

- In 2012, **4,743** pedestrians and **726** bicyclists were killed in crashes with motor vehicles
- In 2012, **76,000** pedestrians were injured



Major Health & Economic Benefits

While safety is a priority, Chicago expects to see economic and health benefits from having a bike-friendly community.

- Safety for pedestrians and bicyclists
- Reduced transportation costs
- Increased productivity
- Attractive to employers
- Healthier people are more productive
- Healthier people have lower health costs
- Increased real estate values

Reaching the Goal: Gaps in Data Collection

Fish Transportation Group (FTG) has been collecting pedestrian and bicycle data for the City of Chicago Department of Transportation (CDOT) since 2011. During the first season of data collection, Fish was asked to use the city-owned combination of infrared data collectors for pedestrian counts and tubes for bicycles.



Chicago was implementing a lot of Complete Streets projects where the road was being drastically altered to make it safer for peds and bikes. FTG required a good baseline of data before locations were identified and work started. Data collection was an area where CDOT and FTG were continuously trying to improve in order to get the hard data needed for traffic analysis purposes.

FTG determined some major gaps in data collection using the infrared and tube data collection tools.

Gap	Detail
Lack of solid verifiable data	Major road changes beign made. Data had to be of high quality and verifiable.
More ped and bike data was required	A large volume of data is required to expose gaps and identify areas of concern in the network. Needed to maximize bidjet efficiency.
Crash and count data required	Need to calculate exposure* when prioritizing road facilities for improvement.
Safety	Tubes need to be deployed halfway into travel lanes during a gap in traffic, risking the safety of field staff.
Existing methods not working	Tubes were dangerous, unreliable, and often required re-counts. Needed a better solution.

* Exposure: Requires comprehensive multi-modal count data alongside crash data to calculate relative risk of crashes and conflicts during different periods of the day.

Miovision as the Solution

To properly address the gaps in data collection, FTG and CDOT fully transitioned to Miovision technology to collect ped and bike data and perform Level of Service analysis. FTG utilized Miovision’s Scout Video Collection Unit (VCU).

Project Objectives

Evaluate the work required, set expectations, and baseline ridership

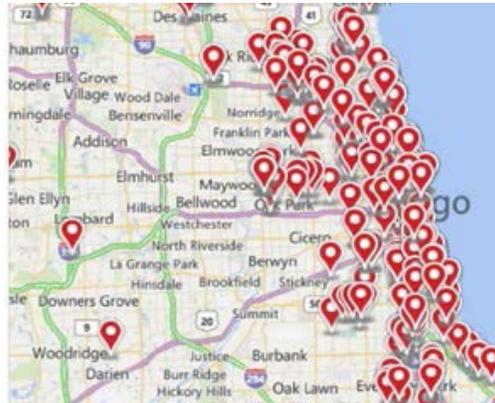
Prove the success and provide data on bicycle ridership numbers

Ensure reliable and verifiable datasets were used

Project Overview

Between March 2012 and October 2014, Miovision’s Scout VCUs were deployed in over 500 locations across Chicago. Of the 500 locations, over 100 were focused in the downtown core. Each location required only a single camera to capture data.

During that period, in the downtown core alone, there were over 500,000 ped and bike data points collected.



Project Snapshot: Dearborn and Washington

The Dearborn and Washington intersection is located in Chicago’s loop district. The chart on the right shows the level of data collected during a 10-hour period. There were a total of 45,000 pedestrian and 1,100 bicyclist data points collected.

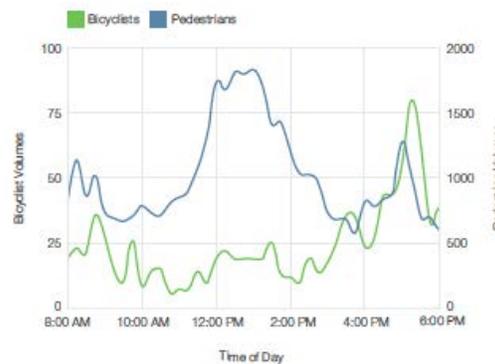


Figure 3: Dearborn and Washington: Ped and Bike Volumes

Results and Benefits

Compared to alternative data collection options (Figure 4), Miovision’s video data collection technology provided FTG with these key results and benefits:

1. Accuracy

- Data is collected properly the first time
- Very little recounts are required
- Video can be reviewed and verified to ensure accuracy
- Ped and bike behavior is observable as a complement to raw data

2. Safer Data Collection

- Scout VCU setup is done at the roadside, eliminating the need to install during gaps in traffic
- Setup complete in under 10 minutes

3. Efficiency

- Scout deployment requires only one person for install vs. two or more for tubes
- Equipment deployment takes less than 10 minutes, and can be retrieved in less than 5 minutes

4. Differentiation Between Ped and Bike Counts

- Video technology can differentiate between pedestrians and bicyclists
- Traffic data (cars and trucks) could also be measured if necessary

“I felt that not only would the data be more accurate, but it would be safer for us that we’re not in the middle of the road trying to nail down a tube. Now we can collect data throughout the year without worrying about street sweepers or snow plows.”

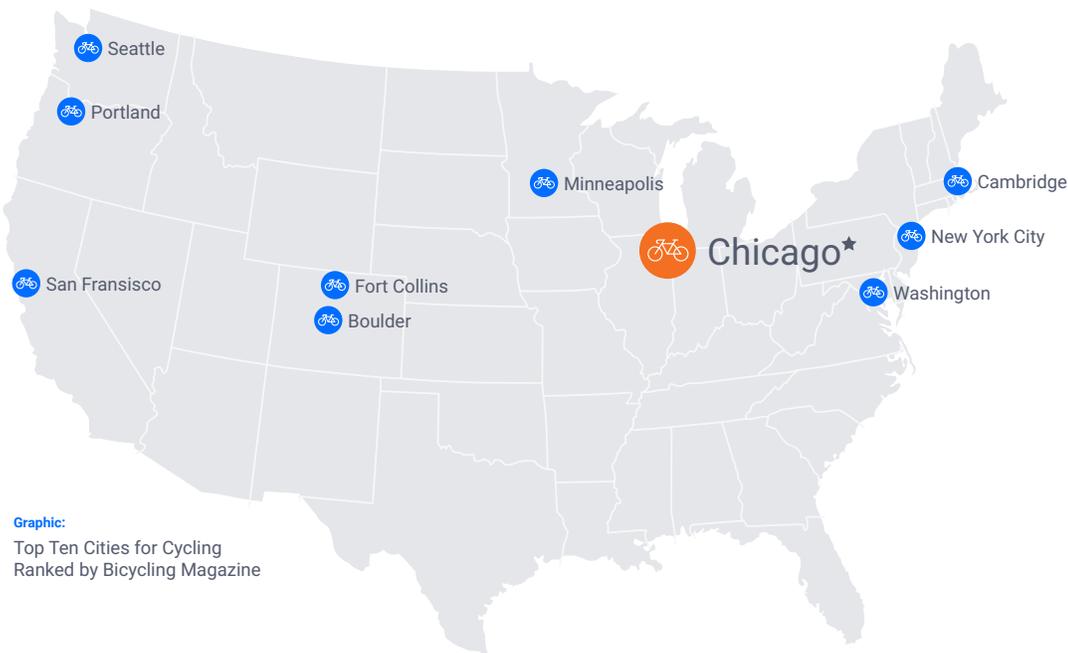
- Cindy Fish, Owner/
Principal, Fish
Transportation Group

	Manual Counting	Tubes	Video (Computer Video)	Passive & Active Infrared
Description	Manual tabulation of peds and bikes on site or from video	Air tube laid across the path senses interruptions to pressure	Video recording and postprocessing with computer vision	Passive detects a change in thermal contrast. Active detects an obstruction in the beam.
Pros	Minimal equipment needs Ability to get extra data	Inexpensive to operate Simple operation	Verifiable data Ideal in crowds	Thoroughly tested Low cost
Cons	High labor cost Extensive training required	Can't count pedestrians Bicyclists may swerve to avoid	Emerging Non-standardized	Undercounts in crowds, side-by-side travelers and is subject to interference
Directional Ped & Bike	Yes	Bike Only	Yes	Volume only, no differentiation
Ease and Safety of Deployment	★★ Can require counter to be at the roadside for extended periods	★ Must enter the roadway to deploy	★★★ Quick, non-intrusive set-up	★★★ Passive has quick set-up adjacent to the path. Active requires alignment of components.
Accuracy and Verification	★★ Dependent on the individual and not verifiable	★ Error in low speeds and not verifiable	★★★ Counts at all speeds with verifiable video recording	★★★ Undercounts side-by-side travelers and is subject to interference
Portability	★★★	★★★	★★★	★★★
Weather Versatility	★★ Susceptible to inclement weather	★ Damaged by snow plows and street sweepers	★★★ Can count in all but the heaviest of precipitation	★ Air temperature affects accuracy with passive. Precipitation can interfere with active.

Chicago's Progress

Miovision's technology has contributed to steady progress towards Chicago's vision. Efficient and accurate data collection has played a key role in achieving some important milestones for the city:

- Since 2011, Chicago has installed over **85.5 miles** of protected bike lanes
- The plan to install **100 miles** of protected bike lanes is on track to be completed by May 2015
- Chicago's bikeways now total more than **227.5 miles**
- In 2014, CDOT installed **more miles** of bikeways than in any other previous year
- In October 2014, the city was named the **Second Best City** in America for Cycling by Bicycling Magazine. This was up from fifth place in 2012



Graphic:
Top Ten Cities for Cycling
Ranked by Bicycling Magazine

1. New York City, NY
2. **Chicago, IL ★**
3. Minneapolis, MN
4. Portland, OR
5. Washington, DC
6. Boulder, CO
7. San Francisco, CA
8. Seattle, WA
9. Fort Collins, CO
10. Cambridge, MA

About Miovision

Miovision is a technology company that empowers transportation professionals, through data and infrastructure, to improve the transportation experience. With over 500 customers in 50 countries across the world, Miovision provides meaningful solutions to real challenges facing today's traffic systems.

About Fish Transportation Group

Fish Transportation Group, Inc. (FTG) specializes in multimodal transportation planning, focusing on the integration of transportation, land use, and community factors to improve mobility for all users of the transportation system.

FTG focuses on transportation and land use planning supportive of all modes of transportation to provide efficient access and circulation, minimize conflicts and ensure safe modal interaction. Site access, internal movements, and parking distribution area all carefully considered ensuring efficient flow and minimizing conflicts.

Planning for transit-oriented accessibility offers benefits such as increased walkability, greater density supportive of more commercial development, and increased travel choices for local visitors and residents.

FTG has completed many transit oriented development plans, corridor studies and sub-area plans, community access and circulation plans, pedestrian and bicycle plans, and parking analysis. FTG works closely with municipalities, counties, and transportation and transit agencies serving the region.

To complete these planning projects, FTG frequently works in collaboration with other consulting firms to provide a high level of transportation planning expertise. FTG also provides traffic data collection services including turning movement counts, average daily traffic counts, pedestrian and bicycle counts, speed studies and gap studies.