
The Alameda

Protected Intersections

Protected intersections are a critical piece of high quality bicycle transportation systems, extending bicycle infrastructure along corridors into the intersection by providing well identified, priority bicycle movements in all directions, and minimizing or eliminating possible interactions with motorized vehicles.

Source: City of Davis

E. Covell Boulevard & J Street

DAVIS, CALIFORNIA

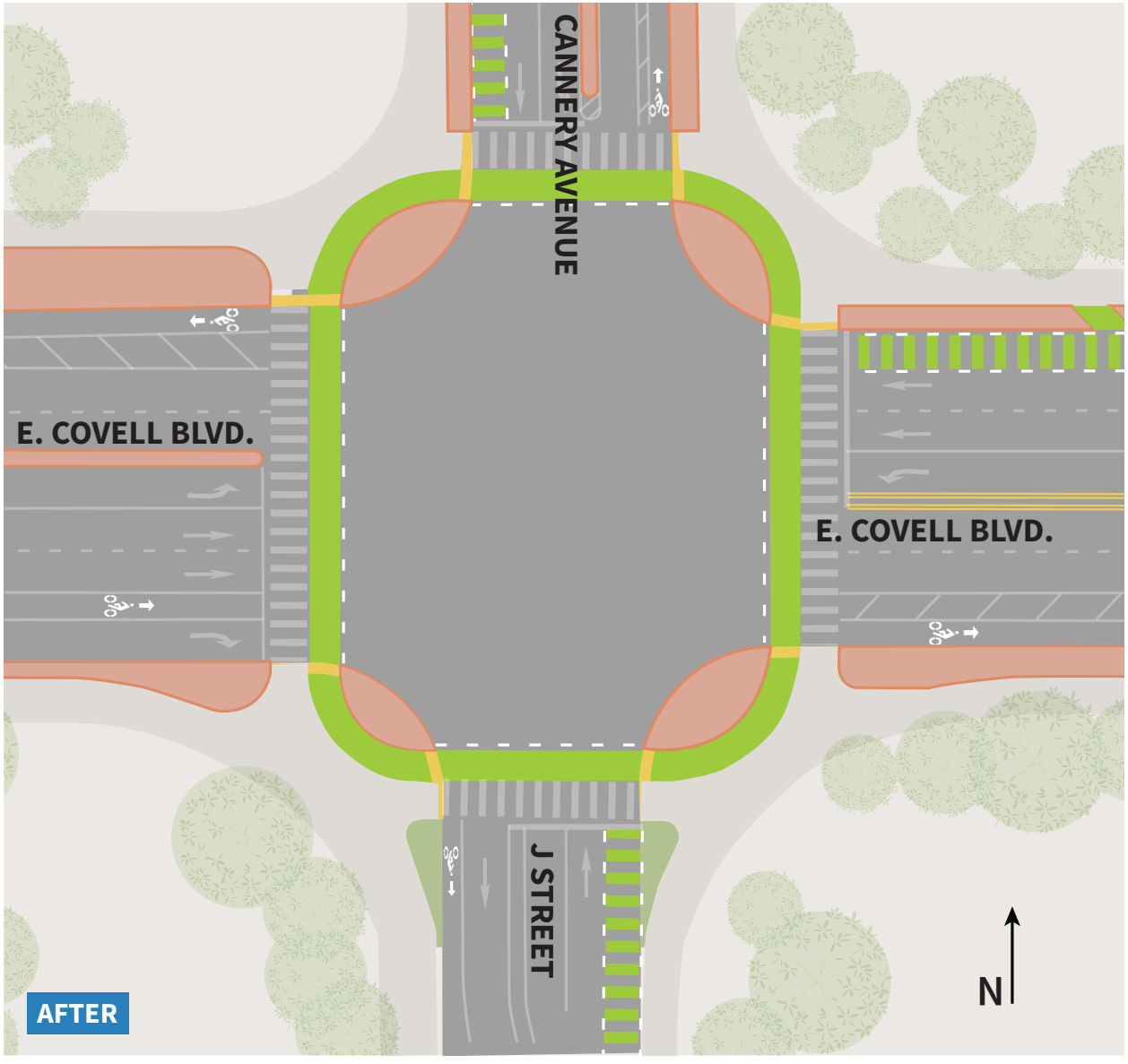
Metro pop: 219,116 | City pop: 68,111

Source: City of Davis

Source: Google Maps

The first U.S. signalized Dutch-style intersection doesn't require any special knowledge to navigate.

- The intersection's intuitive design allows cyclists to safely navigate without much signage or education.
- The intersection serves as an entrance to a large mixed-used development in northern Davis.



Key Outcomes

Increased Visibility
Due to the large pedestrian refuges at each corner of the intersection, both pedestrians and bicyclists are placed in front of right-turning drivers for better visibility.

Better Connectivity
The intersection is specifically designed to accommodate bicyclists both on the roadway and on the multi-use path to the south of intersection.

EAST COVELL BOULEVARD

- Arterial Street
- ADT: 21,500
- Speed: 35 mph

J STREET

- Collector Street
- ADT: 2,900
- Speed: 30 mph

RESPONSIBLE AGENCY

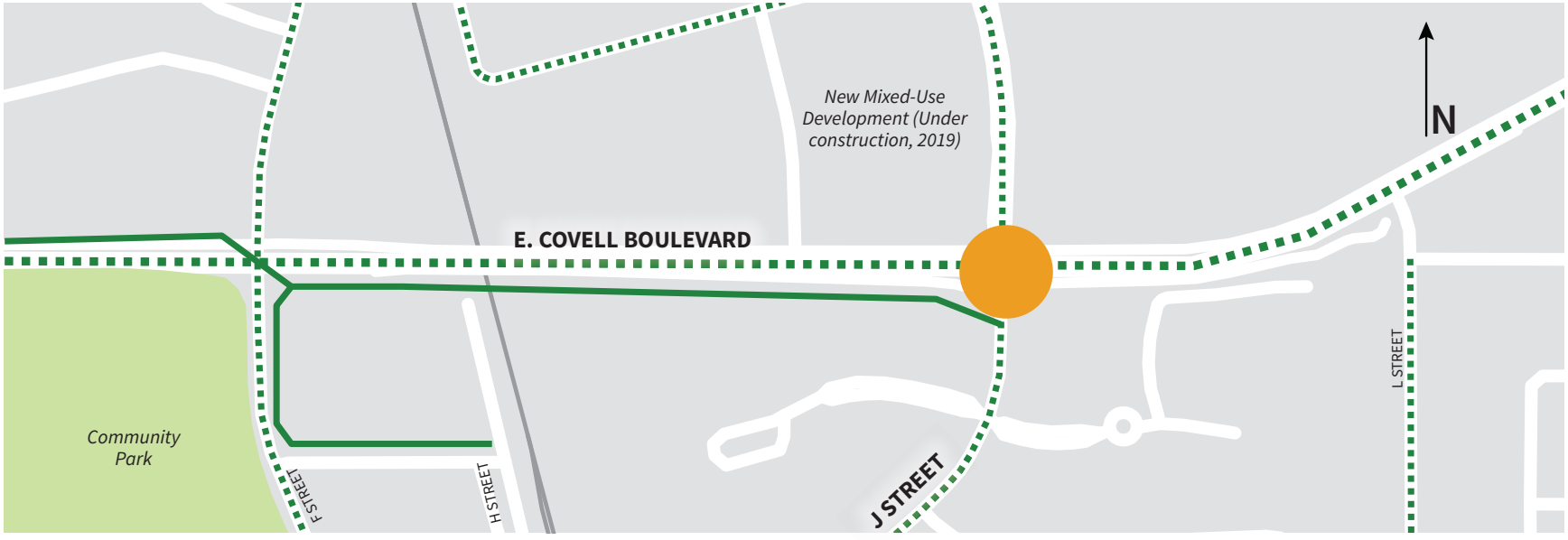
- City of Davis

E. Covell Boulevard & J Street

DAVIS, CALIFORNIA
City Median Household Income: $57,683

E. Covell Boulevard & J Street Context

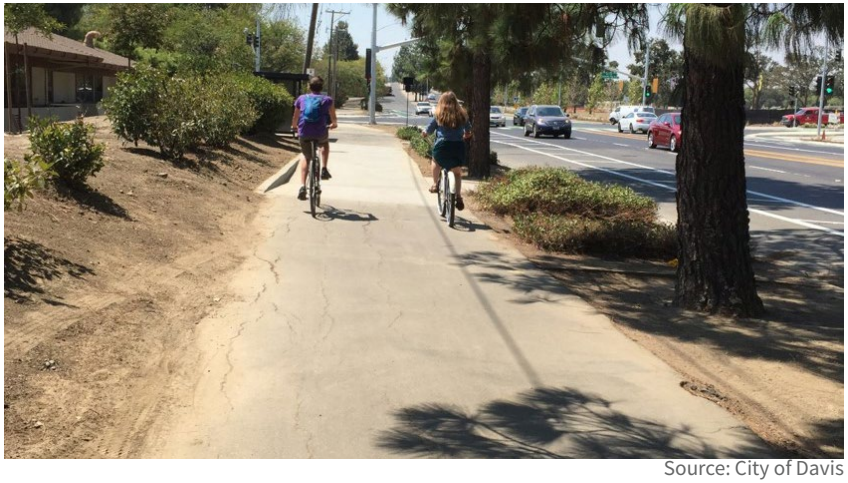
- In 1967, Davis was the first American city to create "a lane for the preferential use of bicyclists." Fifty years later, Davis was also the first American city to open a protected intersection.
- The intersection was first identified as needing improvements by a corridor study along East Covell Boulevard. The study was prompted by the application for development of the Cannery Project, a proposed mixed use development located to the north of East Covell Boulevard.
- The intersection redesign was led by the City of Davis and The New Home Company, with The New Home Company funding the project for a total cost of $1 million.
- Some local residents expressed concerns, as the original plan for the intersection was to create an underpass for bicyclists and pedestrians. However, another location was eventually selected for an underpass and the City Council approved a Dutch style intersection for East Covell Boulevard and J Street.
- The City learned lessons they will apply to their next protected intersections. These include narrowing the crossing distance to make it safer for pedestrians and cyclists; tightening the turning radii on the barrier islands to slow right-turning vehicles; angling the ramps to allow for people on bikes to ride onto the ramp without having to greatly adjust their speed (50-foot radius); and making the ramps more visible through signage.



PROTECTED INTERSECTION

Source: City of Davis

Cyclists comfortable with on-street bike lanes can cross the intersection as before construction.

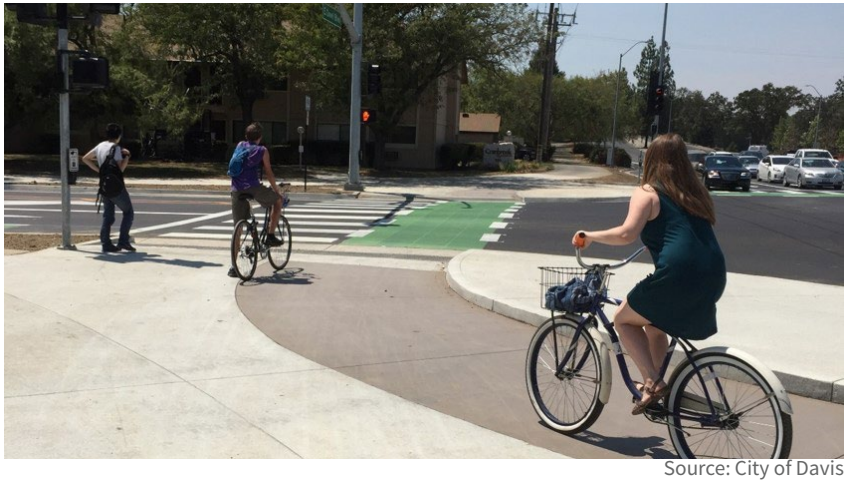


Source: City of Davis

Less comfortable cyclists can take advantage of the protected mixed-use path.

Source: City of Davis

Ramps were installed to allow riders to transition between the bike lanes and the multi-use path located nearby.



Source: City of Davis

Protected intersections are more comfortable and less stressful for all users, including children and their parents.

200 West & 300 South (Broadway)

SALT LAKE CITY, UTAH

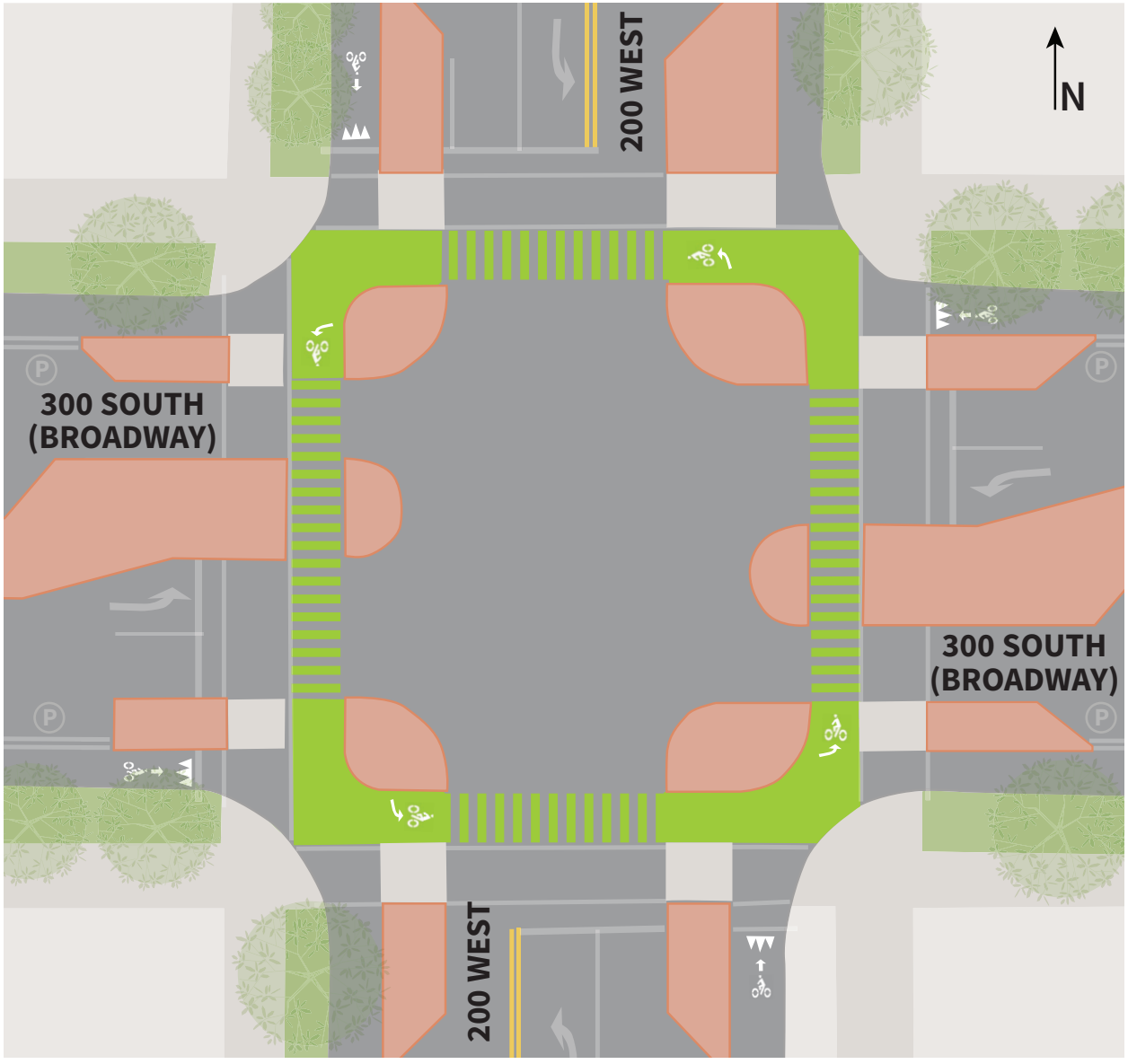
Metro pop: 1,186,187 | City pop: 193,744

Source: Alta Planning + Design

Source: City of Salt Lake City

A protected intersection allows for the continuous separation of protected bikes along two Salt Lake City bicycle corridors.

- The Dutch-style intersection establishes protected connections between two streets with bike facilities.
- The safe intersection helped increase cycling on the newly designed 300 West (Broadway) corridor.



Key Outcomes

Part of a Larger Project
The reconstruction of this intersection was part of the 200 West Protected Bike Lane Project in 2015. Protected bike lanes had been previously installed along 300 South (Broadway) in 2014.

Clear Design
Green paint was used in all bicycling areas, including those protected by curbs. This clearly separates the bicycle and pedestrian facilities from one another.

200 WEST

- Collector Street
- ADT: 2,200
- Speed: 25 mph

300 SOUTH (BROADWAY)

- Collector Street
- ADT: 6,500-8,000
- Speed: 20 mph

RESPONSIBLE AGENCY

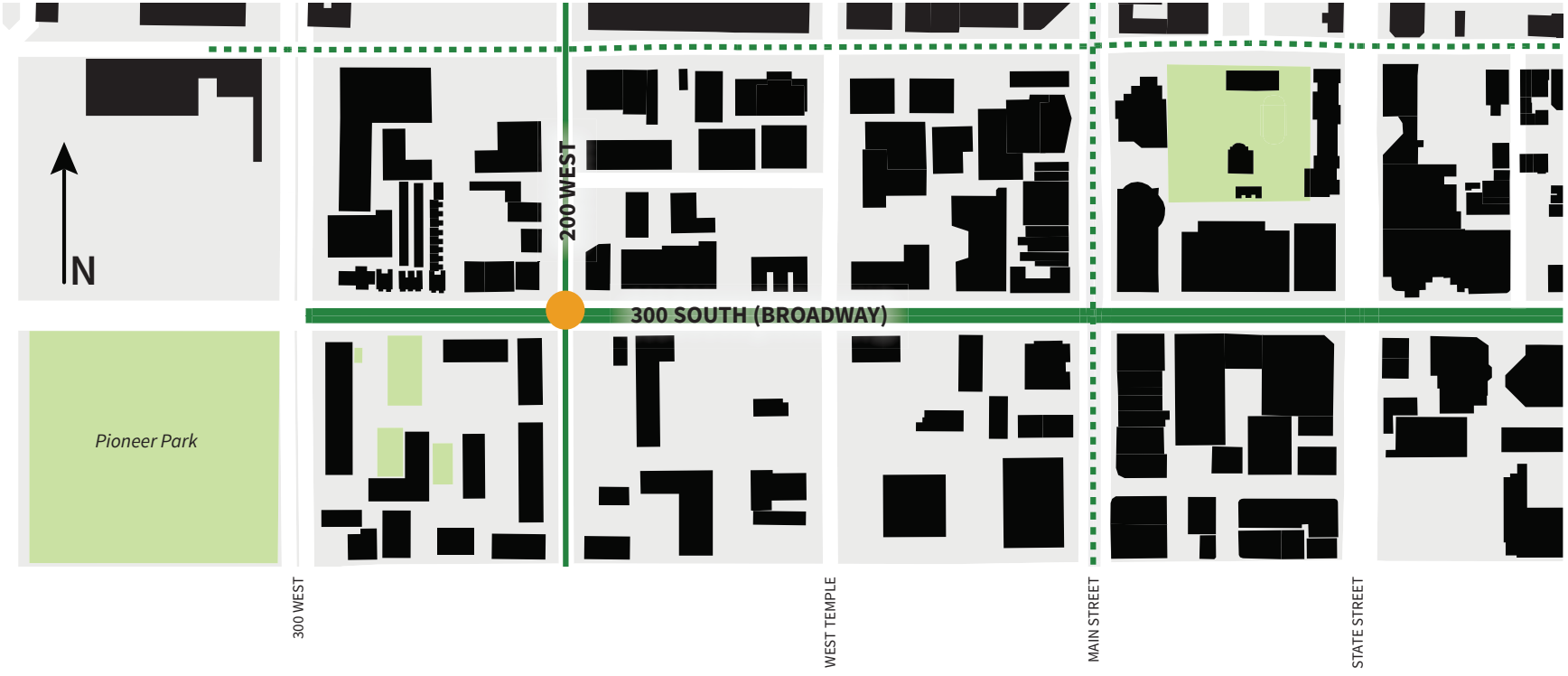
- City of Salt Lake City

200 West & 300 South (Broadway)

SALT LAKE CITY, UTAH
City Median Household Income: $50,353

200 West & 300 South (Broadway) Context

- This was the second Dutch-style intersection built in the United States.
- The intersection redesign was generally supported by local businesses and gross receipts increased in the year after the installation of the protected bike lanes on 300 South (Broadway). Bicycle usage increased by nearly 30 percent along the corridor, including more family and casual cyclists.
- A similar design was proposed for the improvement of 200 West. During the design phase, the City met residents and businesses to address potential issues with the proposed design.
- The City of Salt Lake City has invested in increasing their bicycle network across the city through both infrastructure and outreach.



Source: KSL.com

The City closed the intersection for a celebratory "Biketoberfest" event.

Source: KSL.com

Residents were taught how to navigate the intersection by volunteers and temporary signage.

Source: City of Salt Lake City

Many businesses have seen more customers bicycling, even overflowing the parking provided.

Source: City of Salt Lake City

The bike lanes along 200 West and 300 South are protected by both curbs and parking.

15th Street NW, West Street, Florida Avenue & New Hampshire Avenue

WASHINGTON, D.C.

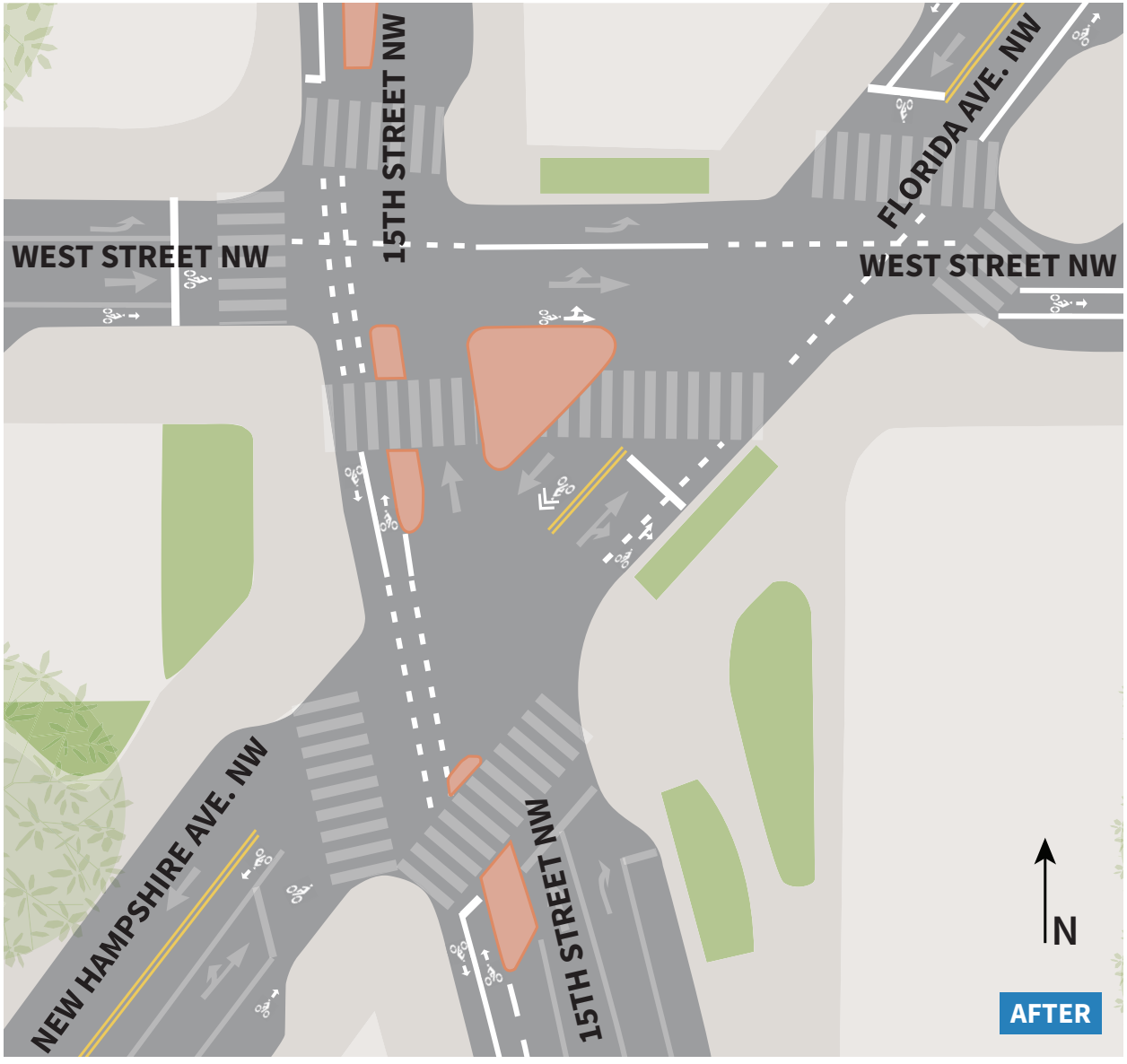
Metro pop: 6,011,752 | City pop: 601,723

Source: DDOT

Source: DDOT

A complex starburst intersection was made safer for vehicles, bicyclists, and pedestrians.

- A pedestrian fatality in 2009 at this starburst intersection spurred safety improvements for all modes.
- The intersection re-design also lowered vehicular speeds, increasing safety for users of all modes.



Key Outcomes

Cycle Track Extension
By reducing 15th Street from 3 lanes to 2, Washington's District Department of Transportation (DDOT) was able to extend the 15th Street cycle track. Some 550 cyclists use the cycle track during the morning commute and nearly 600 bicyclists during the evening commute.

Reduced Illegal and Unsafe Maneuvers
Prior to the safety improvements, wide lanes and a lack of proper signage allowed drivers to make high-speed or illegal turns through the complicated intersection. Tighter curb radii, fewer and narrower lanes, and new signage all help reduce vehicle speed through the intersection.

INTERSECTION

- ADT: 31,200
- Speed: 25-35 mph

RESPONSIBLE AGENCY

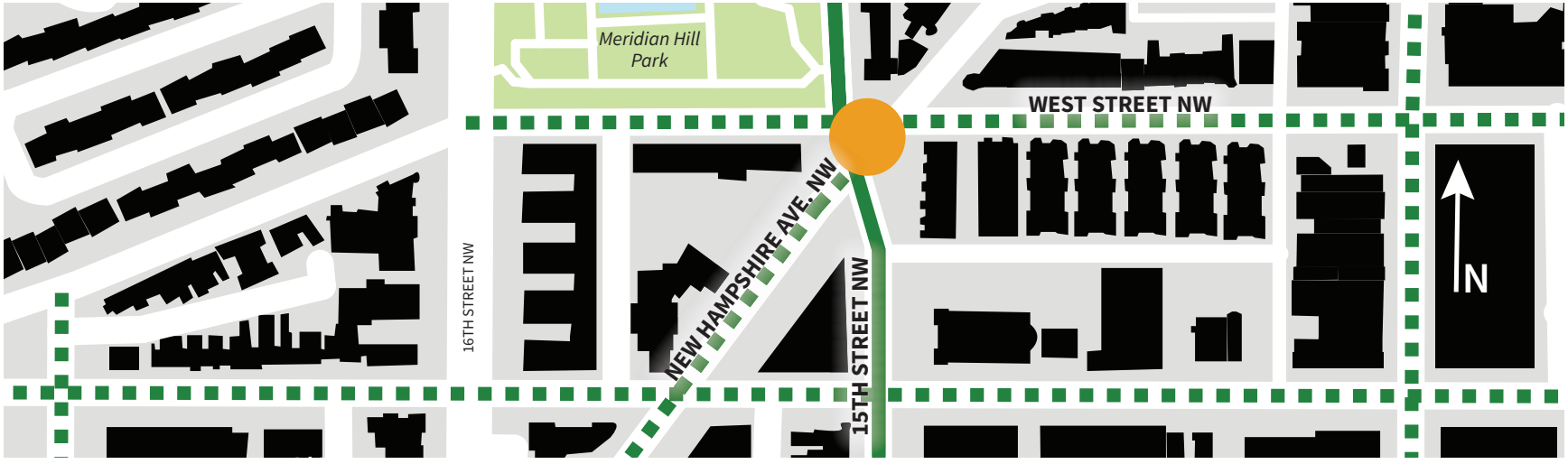
- District DOT

15th Street NW, West Street, Florida Avenue & New Hampshire Avenue

WASHINGTON, D.C.
City Median Household Income: $72,935

Street Context

- In 2009, a pedestrian was struck and killed in a crosswalk at the intersection. Since speed was a contributing factor in the pedestrian fatality, DDOT placed temporary measures at the intersection to reduce vehicle speeds and clarify traffic patterns.
- Flexible channelization posts reduced turning speeds in the dedicated slip lane. Signage and pavement markings alerted drivers of a previously unmarked merge section. A one-way northbound bike lane on 15th Street narrowed the automobile lane and reduced speed through the intersection.
- With the temporary improvements in place, DDOT completed a study at the intersection for a permanent solution. Construction began in 2015.
- The final design reclaimed much of the unnecessarily generous area previously dedicated to vehicles and turned it over to bicyclists and pedestrians. The 15th Street cycle track was extended through the intersection and given dedicated signals. The high-speed slip lane was removed and turned into a pocket park that now houses a Capital Bike Share station. The reduced number of lanes and wider sidewalks decrease pedestrian crossing time in the crosswalks. Narrower streets and increased green space aid in stormwater management and improve the aesthetics of the intersection.
- Though some in the community were frustrated by the amount of time it took to finish construction, residents are pleased with the results. From a local blog on bicycle infrastructure: “It took a long time to come, but this is public space done right.”



Source: Washington Area Bicyclist Association

The 15th Street 2-way cycle track continues through the intersection.

Source: Washington Area Bicyclist Association

Parked cars and curbs provide protection for cyclists.

Source: DDOT

The area is home to a significant number of bicycle commuters.

Source: Washington Area Bicyclist Association

A high-speed turn lane became a spacious pedestrian plaza.

Source: Washington Area Bicyclist Association

Reclaimed street space allows room for bike share bicycles.

Hopkins Street & The Alameda

BERKELEY, CALIFORNIA

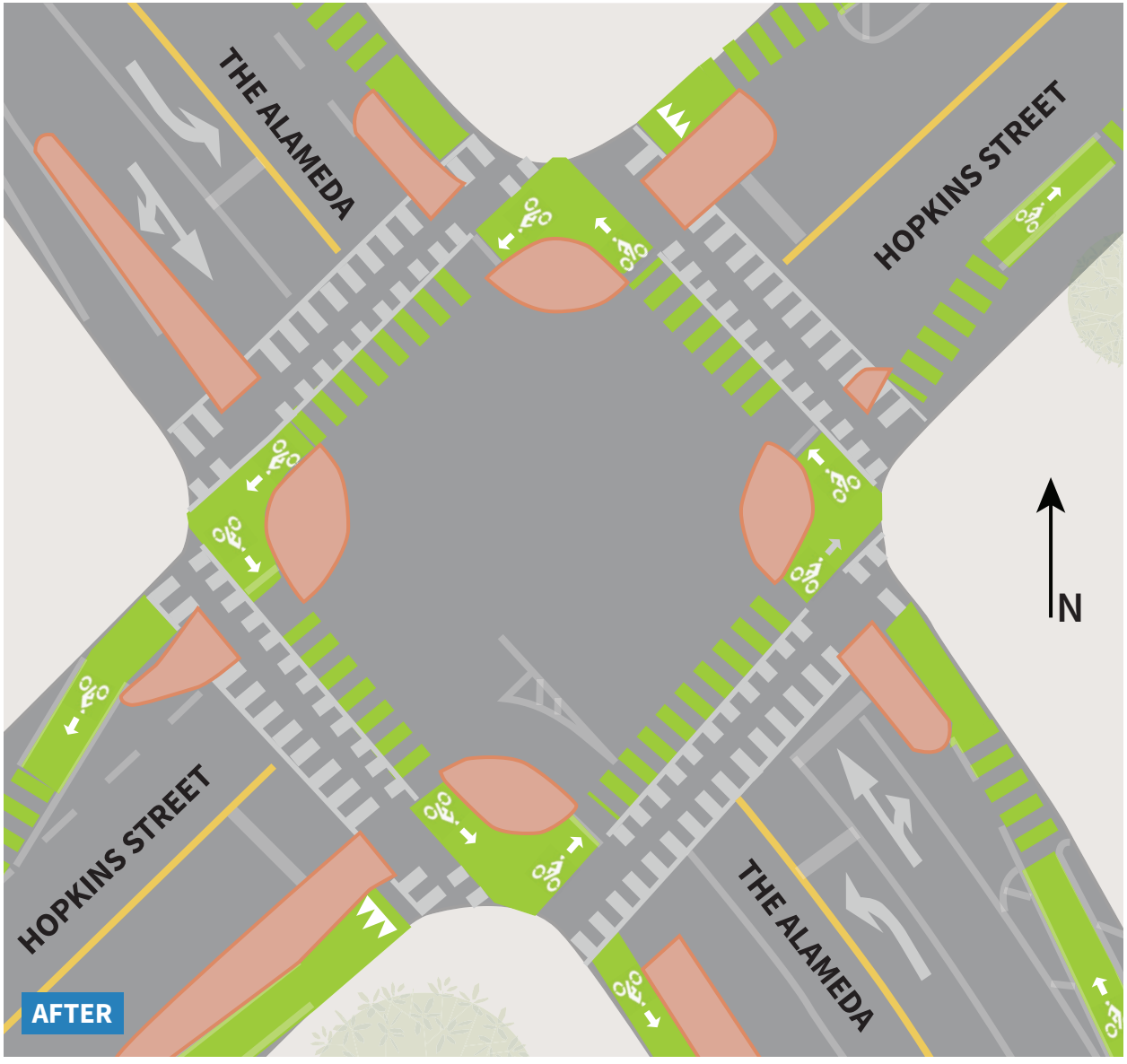
Metro pop: 4,727,357 | City pop: 118,585

Source: Amanda Leahy

Source: Google Maps

Drainage concerns in a Safe Routes to School improvement project resulted in a protected intersection for bicyclists in Berkeley.

- Concrete islands were installed in each corner of the intersection.
- One island was extended to accommodate a bus loading platform.
- Corner ramps were updated to current ADA standards.



Key Outcomes

Improved Pedestrian Safety Near School
The tighter turning radii resulted in a vehicle turning speed reduction from 19 mph to 14 mph, dropping the risk for severe pedestrian injuries by nearly 50 percent.

Reduced Costs
Construction of the corner islands and protected bike lanes cost less than the pedestrian curb extensions initially proposed at the intersection.

HOPKINS STREET

- Collector Street
- ADT: 5,100
- Speed: 25 mph

THE ALAMEDA

- Major Arterial
- ADT: 22,000
- Speed: 25 mph

RESPONSIBLE AGENCY

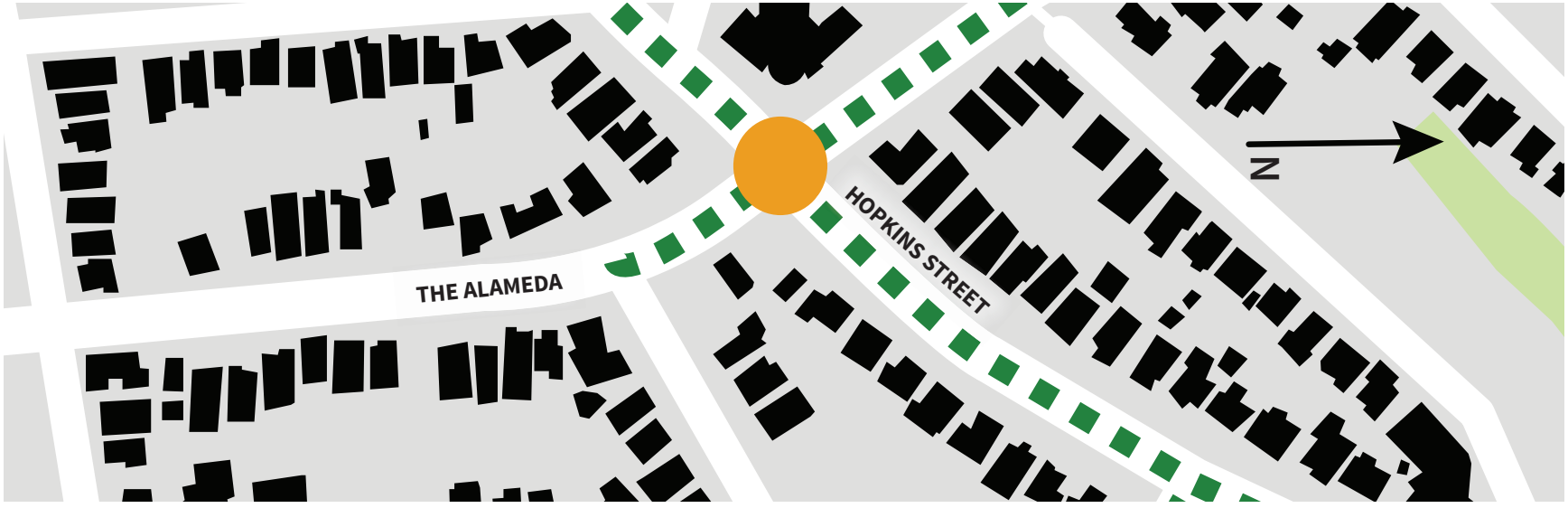
- City of Berkeley

Hopkins Street & The Alameda

BERKELEY, CALIFORNIA
City Median Household Income: $70,393

Hopkins Street and The Alameda Context

- The intersection received a Safe Routes to School grant in 2010 to add pedestrian curb extensions in an effort to make crossing the streets safer for children at the nearby school.
- Complications arose during the design process. Two legs extend uphill, two legs extend downhill, and the intersection is crowned in the center, which made drainage a concern. The City found that allowing drainage along the existing gutters was more cost effective than redesigning stormwater management. Creating the separate islands and widening the drainage routes allowed the protected bicycle lanes in the intersection.
- After implementation, many local residents sent concerns and comments to the City. In response to this, the City improved delineation during a scheduled resurfacing project the following summer. Curbs at islands were painted white, striping with raised, retroreflective crowns was placed around the islands, and the bike lanes were painted green to increase visibility of the new infrastructure to drivers unfamiliar with the intersection. Additional striping directs drivers along the intended routes.



Source: Dave Amos

Children often cross at the intersection to reach the public library on the northwest corner.

Source: Amanda Leahy

An extended island accommodates a bus stop.

Source: Amanda Leahy

The first phase added islands, protected bike lanes, and high-visibility crosswalk markings. After resurfacing, striping with raised, retroreflective crowns was added around the islands.

Source: Dave Amos

The City may upgrade the existing bike lanes to separated bike lanes or cycle tracks in the future.

Mike Goodno

Mike Goodno is a Bicycle Program Specialist for the District Department of Transportation (DDOT) in Washington D.C.

Mike is responsible for implementing biking infrastructure from the city's transportation master plan through planning, design, and community outreach.

What do you do as a Bicycle Program Specialist?
It's changed over the years. Right now, my focus is on the on-street bikeway side. Our transportation master plan has a bike element that outlines the bike network, so what I'm doing is trying to implement the planned bike facilities and looking for opportunities to put in bikeways throughout the city.

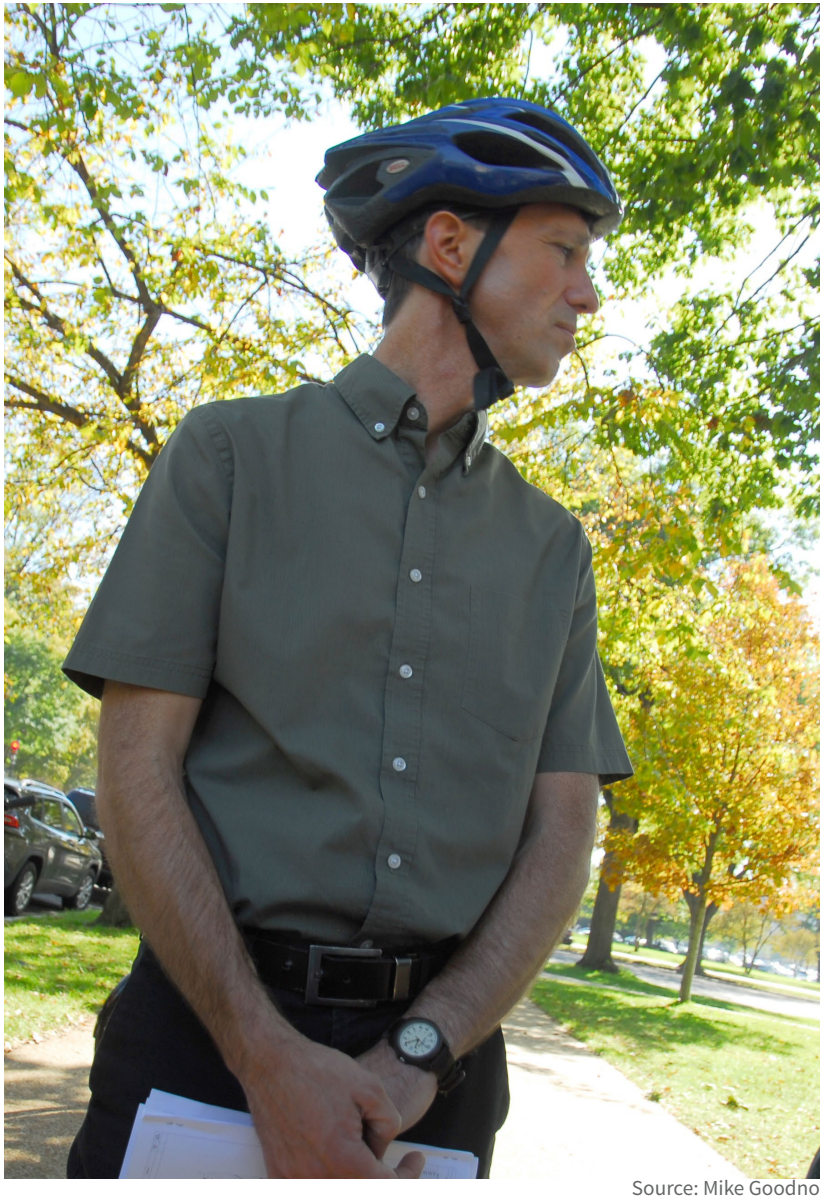
At first, we built the easier ones, where bikeways fit in the existing roadway without removing any parking or travel lanes. Then for the last few years, it's become more difficult. The protected bike lanes, for example, take more room on the street, so a big part of my job has been responding to the resulting community concerns.

In addition to the design, I do a lot of the planning and outreach for the bike network, attend meetings, and work with the bike advocates to understand their priorities and how they want to see the network built out. The feedback from bike advocates and community members is very useful. I receive many requests for streets we might not have thought about at the master plan stage.

Source: Mike Goodno

What are some of the struggles and challenges you've faced implementing new biking facilities in DC?
A big challenge is the roadway constraints, and parking is always an issue as well, especially when we put in protected bikeways. If we keep the parking on the street with a protected bike lane, that usually means removing a travel lane, so that's a really big balancing act.

Another struggle is educating the public about protected bike lanes. Some people don't know what they are and when they hear the word "bike", there can be some fear. But adding a protected bike lane doesn't always mean that vehicle travel lanes or parking lanes are going away, or that traffic is going to get worse. Often we are able to put in protected lanes after studying the vehicle and bike traffic thoroughly and we make other street improvements that actually improve the traffic flow for both vehicles and bikes.



Source: Mike Goodno

Another big issue is that certain parts of the city have street widths that make adding bike infrastructure challenging. Often in these areas there are changing demographics where historically there have been older people who don't necessarily ride a bike and then younger people come into the community who do bike and who want more bike infrastructure; and it's been tough to put in that infrastructure.

How have you handled public outreach for your bike projects? Historically, it's really been up to us. We've gone out and met with neighborhood-elected officials in the advisory neighborhood commissions. Whenever we're touching a certain area, we notify them of changes in the lane configuration. Typically I would go to a meeting, but it's always been the planner from DDOT trying to sell the project.

Starting last year, there's been a group called the Ward 3 Bicycle Advocates, and they've been helping promote bike projects in their area, which has been really great. They reach out to the advisory neighborhood commissioners and community groups before me. Plus, they comment on DDOT-planned projects and they have some of their own ideas. They've been warming up some of the local officials and council members to inform them about biking issues, which has been really great. This type of grassroots advocacy has really been helpful!