ROAD DIET

Improving Safety, Livability, and Economic Development

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8.9.16

When and Where the first Road Diet installed in the US?

- **Billings, Montana in 1979**
  - 4 lane undivided to 3 lanes (TWLTL)
  - ADT = 10,000 vehicles
  - Reduced crashes
  - No increase in vehicle delay

- Gained popularity

  in the 1990s

Improving Safety, Livability, and Economic Development

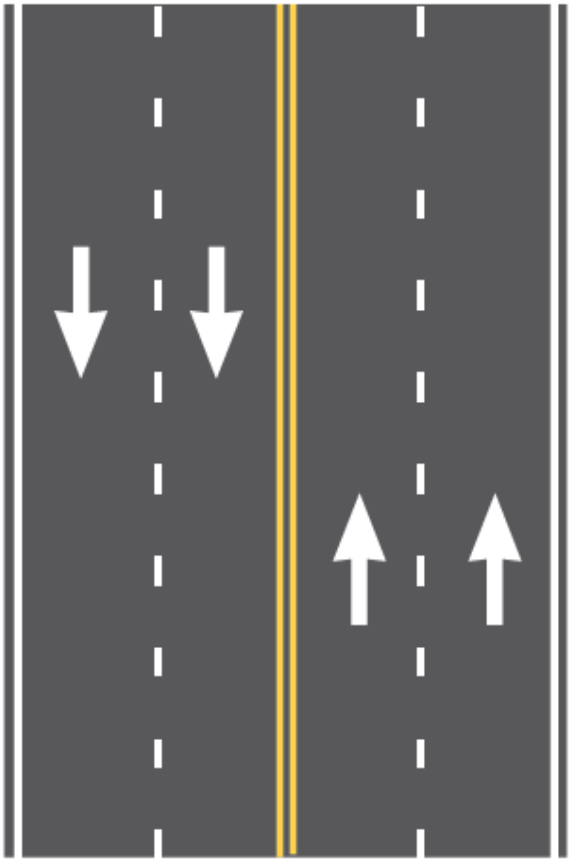
Road Diets are known to improve:

- Safety for All Users
- Pedestrian, Bicycle, and Transit Facilities
- Livability
- Economic Development

Soapstone Dr., Reston, VA

4 to 3 Lane Road Diets

Before



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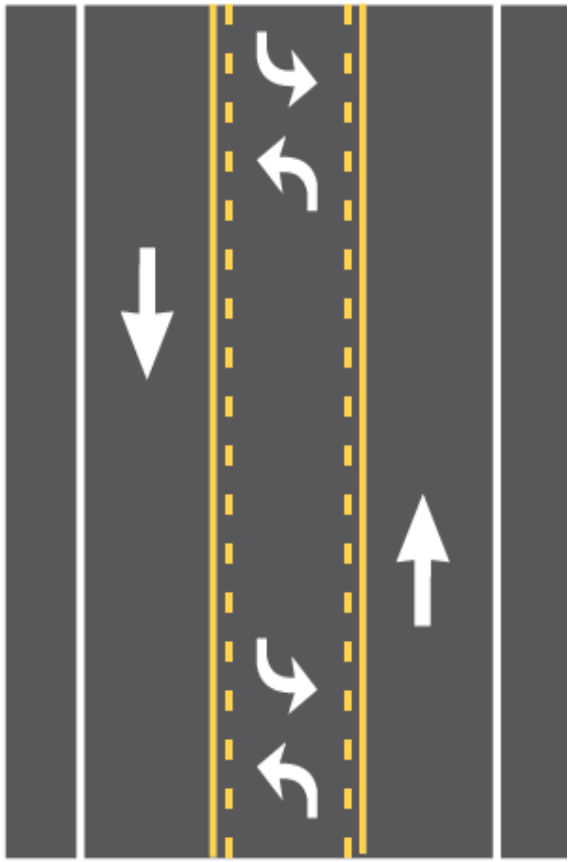
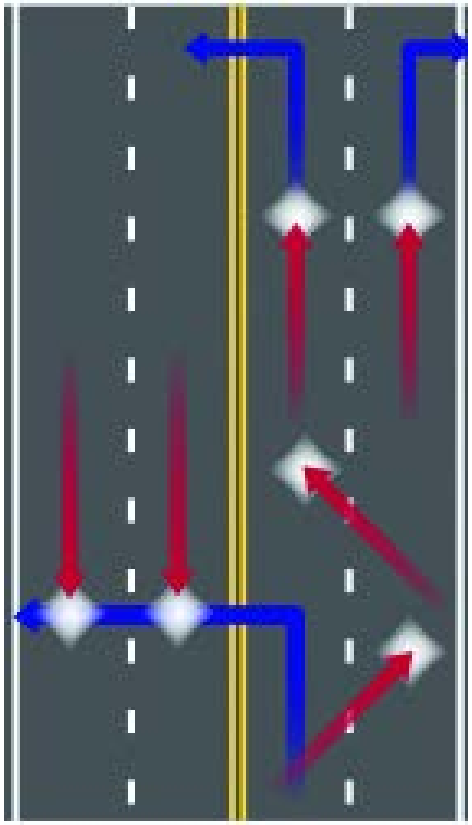


Safer Midblock Behavior

Road Diet Benefits:

- Reduces Conflict
- Fewer (and/or Narrower) lanes
- Dedicated bicycle lanes
- Wider shoulders
- Protected left turns
- Reduces aggressive driving

Before



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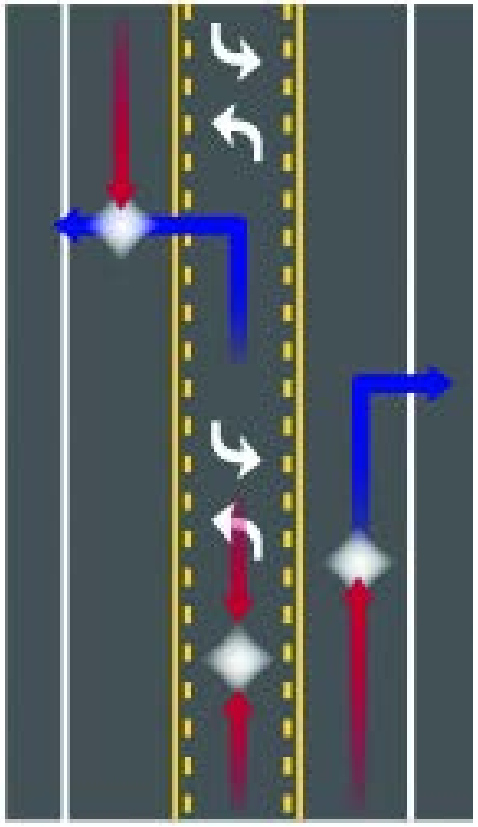
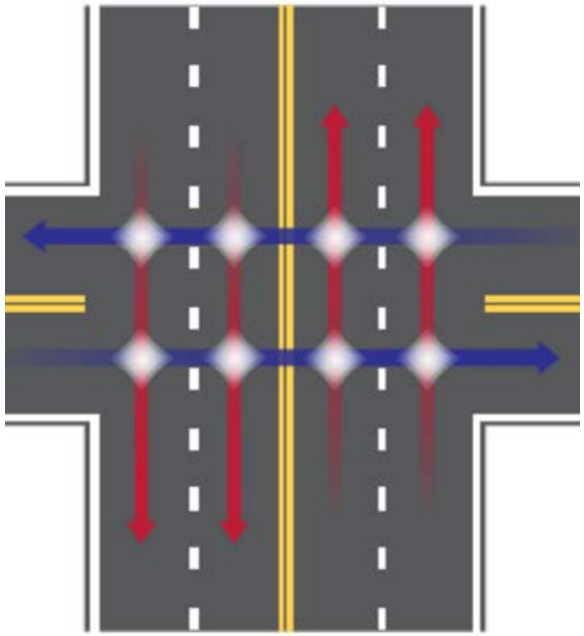


Safer Intersections

Before



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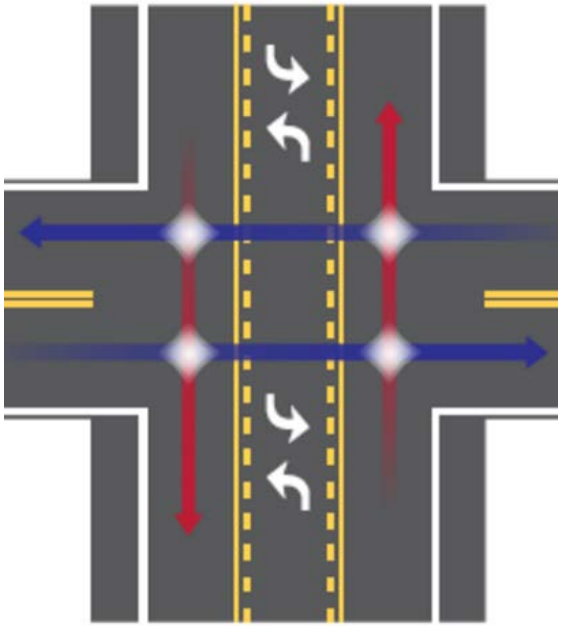


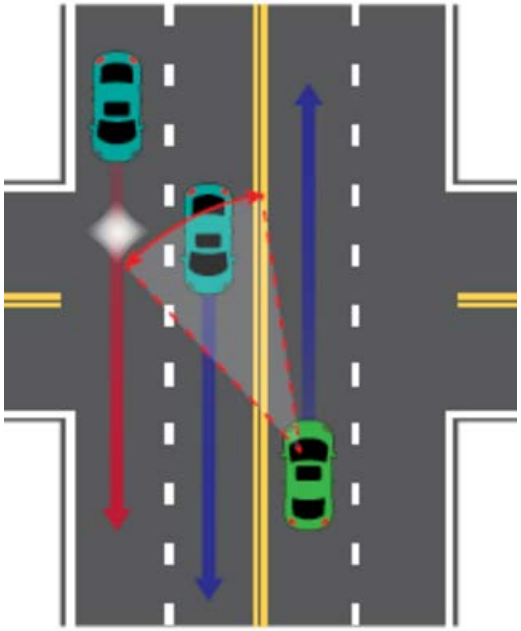
Road Diet Benefits:

- Less potential crash points
- Fewer (and/or Narrower) lanes
- Dedicated turn lane
- Curb bulb-outs
- Pedestrian Refuge Islands

ROAD DIET

Safer Maneuvers

Before



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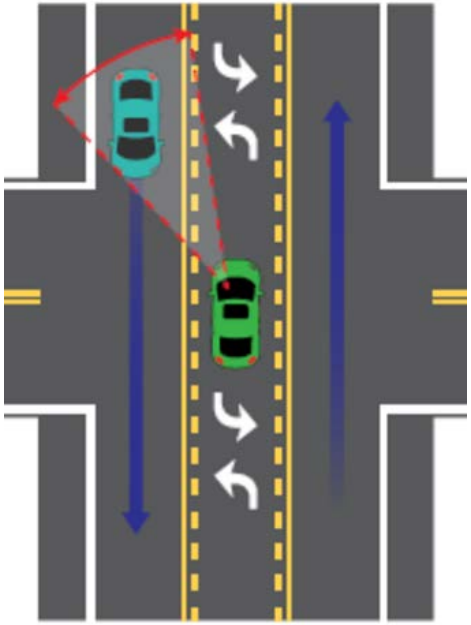

Road Diet Benefits:

- Improved site distance
- Easier to make left turn
- Easier to see pedestrians and bicyclists crossing street

Decrease in Top-End Speeders

Location	Speed	Decrease
Stone Way, Seattle, WA	10+ mph	80%
Nickerson St, Seattle, WA	10+ mph	94%
Lawyers Rd, Reston, VA	5+ mph	90%

Road Diets Save Lives

HSIS
HIGHWAY SAFETY INFORMATION SYSTEM

The Highway Safety Information System (HSIS) is a multi-State safety database that contains crash, roadway inventory, and traffic volume data for a select group of States. The participating States—California, Illinois, Maine, Michigan, Minnesota, North Carolina, Ohio, Utah, and Washington—were selected based on the quality of their data, the range of data available, and their ability to merge the data from the various files. The HSIS is used by FHWA staff, contractors, university researchers, and others to study current highway safety issues, direct research efforts, and evaluate the effectiveness of accident countermeasures.

U.S. Department of Transportation
Federal Highway Administration

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SUMMARY REPORT

Evaluation of Lane Reduction "Road Diet" Measures on Crashes

This Highway Safety Information System (HSIS) summary replaces an earlier one, Evaluation of Lane Reduction "Road Diet" Measures and Their Effects on Crashes and Injuries *(FHWA-HRT-04-082), describing an evaluation of "road diet" treatments in Washington and California cities. This summary reexamines those data using more advanced study techniques and adds an analysis of road diet sites in smaller urban communities in Iowa.*

A *road diet* involves narrowing or eliminating travel lanes on a roadway to make more room for pedestrians and bicyclists.[1] While there can be more than four travel lanes before treatment, road diets are often conversions of four-lane, undivided roads into three lanes—two through lanes plus a center turn lane (see figure 1 and figure 2). The fourth lane may be converted to a bicycle lane, sidewalk, and/or on-street parking. In other words, the existing cross section is reallocated. This was the case with the two sets of treatments in the current study. Both involved conversions of four lanes to three at almost all sites.

Road diets can offer benefits to both drivers and pedestrians. On a four-lane street, speeds can vary between lanes, and drivers must slow or change lanes due to slower vehicles (e.g., vehicles stopped in the left lane waiting to make a left turn). In contrast, on streets with two through lanes plus a center turn lane, drivers' speeds are limited by the speed of the lead vehicle in the through lanes, and through vehicles are separated from left-turning vehicles. Thus, road diets may reduce vehicle speeds and vehicle interactions, which could potentially reduce the number and severity of vehicle-to-vehicle crashes. Road diets can also help pedestrians by creating fewer lanes of traffic to cross and by reducing vehicle speeds. A 2001 study found a reduction in pedestrian crash risk when crossing two- and three-lane roads compared to roads with four or more lanes.[2]

Under most annual average daily traffic (AADT) conditions tested, road diets appeared to have minimal effects on vehicle capacity because left-turning vehicles were moved into a common two-way left-turn lane (TWLTL).[3,4] However, for road diets with AADTs above approximately 20,000 vehicles, there is an increased likelihood that traffic congestion will increase to the point of diverting traffic to alternative routes.

While potential crash-related benefits are cited by road diet advocates, there has been limited research concerning such benefits. Two prior studies were conducted using data from different urbanized areas. The first, conducted by HSIS researchers, used data from treatment sites in eight cities in California and Washington.[5] The second study analyzed data from treatment sites in relatively small towns in Iowa.[6] While the nature of the treatment was the same in both studies (four lanes reduced to three), the settings, analysis methodologies, and results of the studies differed. Using a comparison of treated and matched comparison sites before and after treatment and the development of negative binomial regression models, the earlier HSIS study found a 6 percent reduction in crash frequency per mile and no significant change in crash rates at the California and Washington sites. Using a long-term (23-year) crash history for treated and reference sites and the development of a hierarchical Poisson model in a Bayesian approach, the later Iowa study

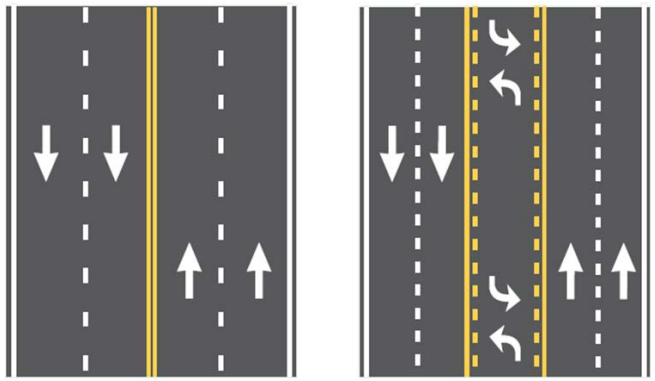
1

CMF:	**0.71** (0.02)
Published:	2010
Locations:	CA, IA, WA
ADT Range:	3,700 – 26,400

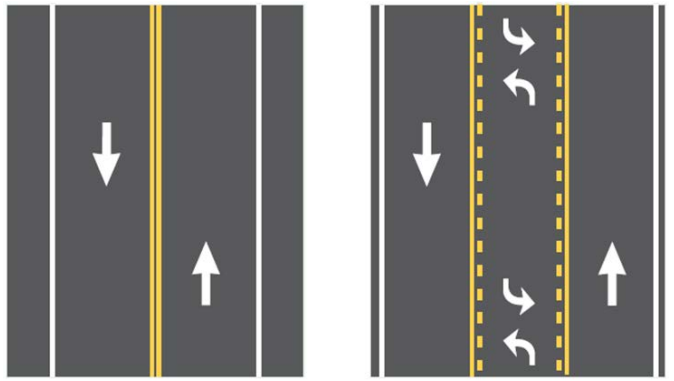
*CMF developed for 4 to 3-lane Road Diet conversions.

More Example Reconfigurations

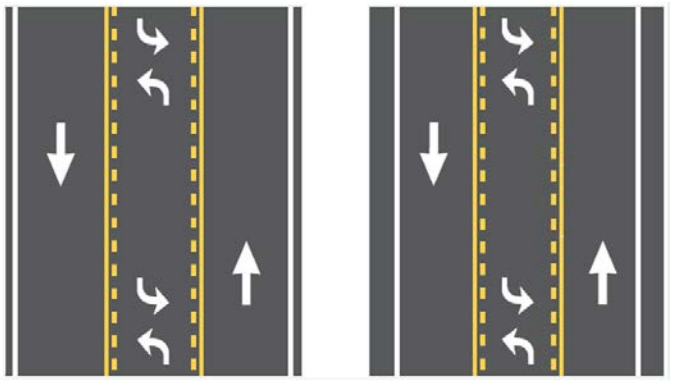
4-Lane to 5-Lane



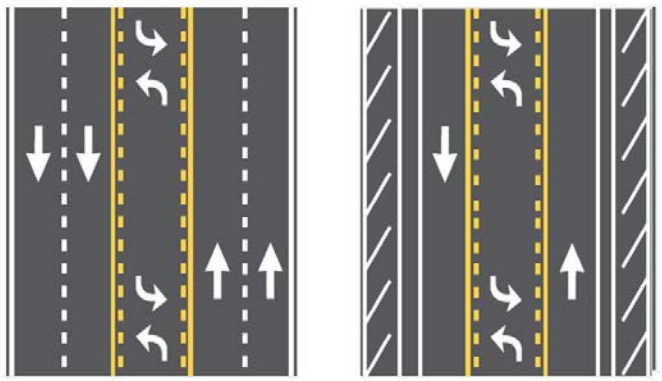
2-Lane to 3-Lane



3-Lane to 3-Lane



5-Lane to 3-Lane



Non-Motorized Safety

Multimodal

Bike Usage	Increase
Stone Way, Seattle	35%
Dexter Ave, Seattle	30%
7th St, Los Angeles	200%

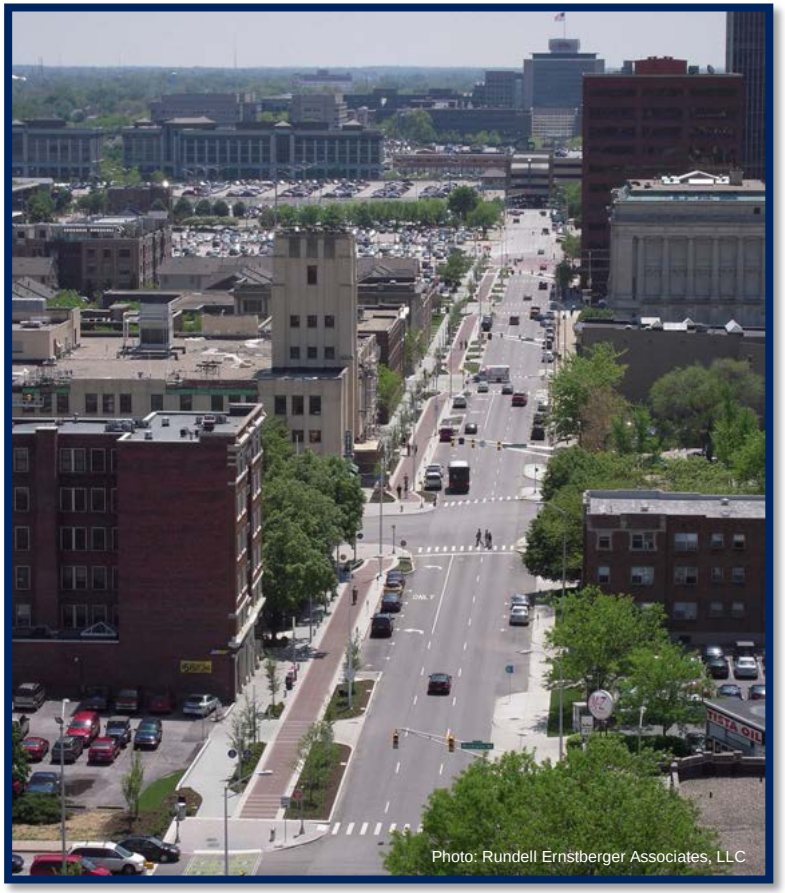
Transit Usage	Increase
Stone Way, Seattle	35% Bus Ridership

Benefit: Cost Savings

Money	10s of thousands	Vs.	Millions
Time	12 - 18 Month	Vs.	5 - 6 Years

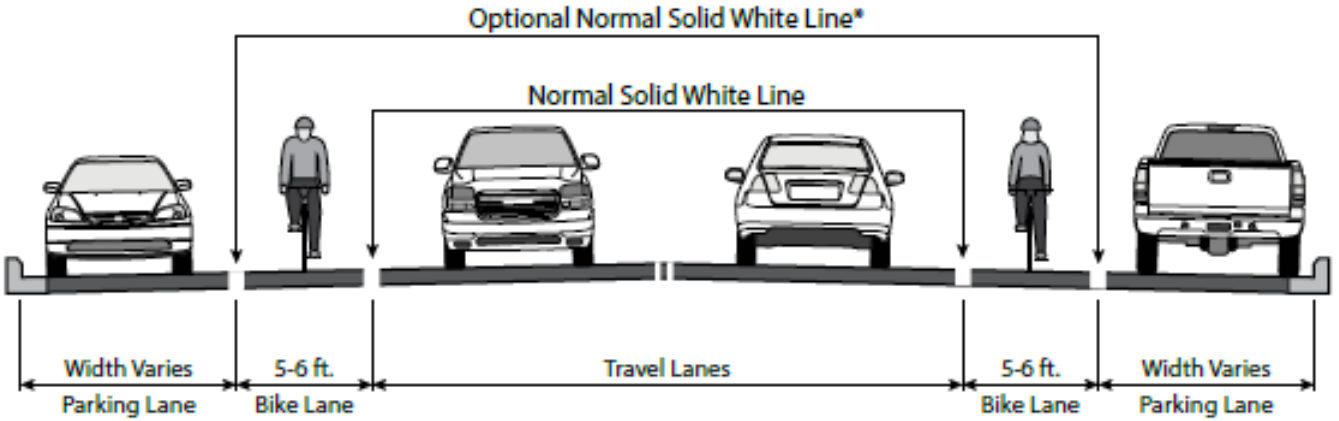
Elements of Design

- Sight distance
- Grade
- Horizontal alignment
- Superelevation
- Access management



Bicycle Facilities

- Typical bike lane: 5 ft
- Min. width: 4 ft
- If space is **≥ 7ft.** consider adding buffer or protected bike facility



On-Street Parking

- Minimum width: 7-8 ft
- Desirable width: 10-12 ft
- Shared bicycle and parking = **13ft.**
- Solid white line between bikes and parking

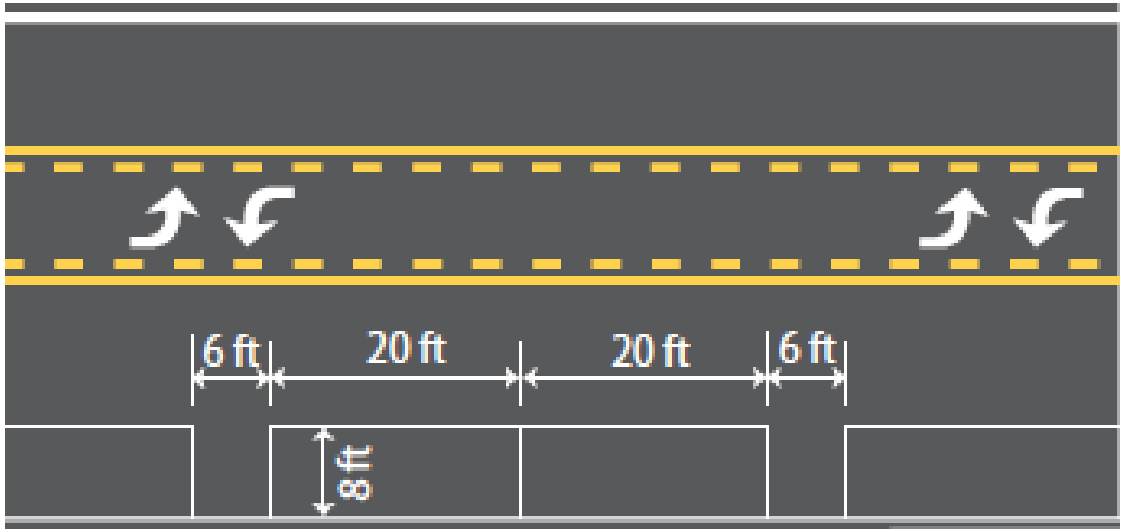


Figure showing "Paired" Parallel Parking

Case Studies

Improving Safety, Livability, and Economic Development

Genesee County, MI

Background

- Genesee County Metropolitan Planning Commission (GCMPC) assessed all 4-lane roads in its jurisdiction
- Schools scattered throughout the jurisdiction

Genesee County, MI

Road Diet Results

- Reduced crashes by 30%
- Improved livability

"Road Diets are seen as treatments that can be used to keep a downtown area 'current' and follow the national [livability] trends."
~ GCMPC

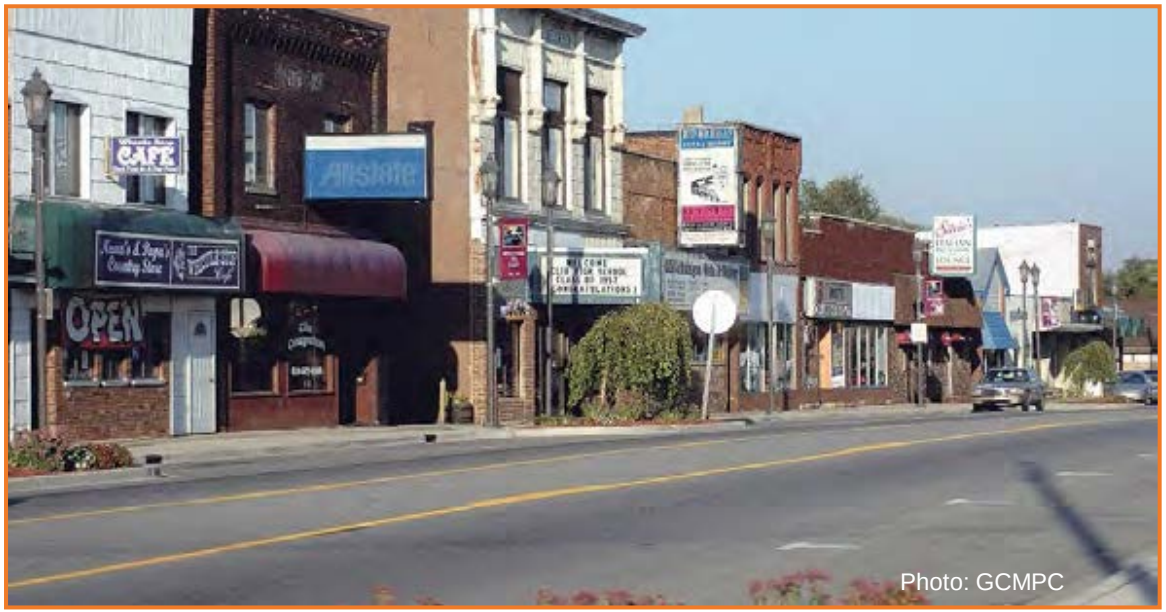


Photo: GCMPC

Indianapolis Cultural Trail, Indianapolis, IN

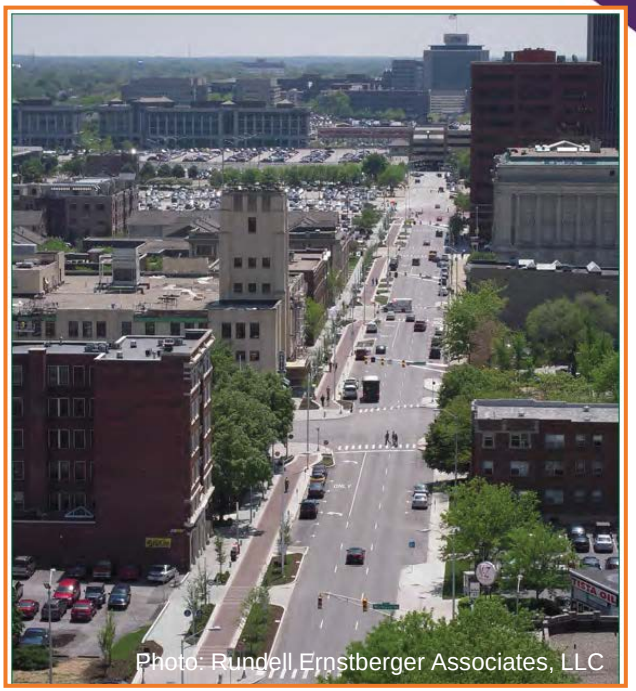
Background

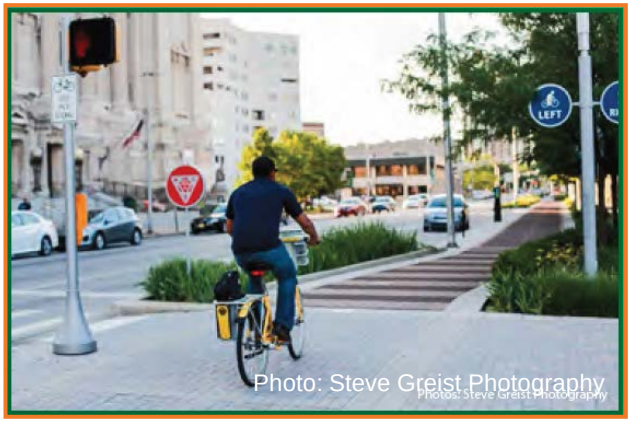
- Cultural trail needed expansion and completion
- Planned for future economic development
- Desired increased shared space for bicyclists and pedestrians

Indianapolis Cultural Trail, Indianapolis, IN

Road Diet Results

- Increased bicycle and pedestrian traffic
- $300 million of new development along route

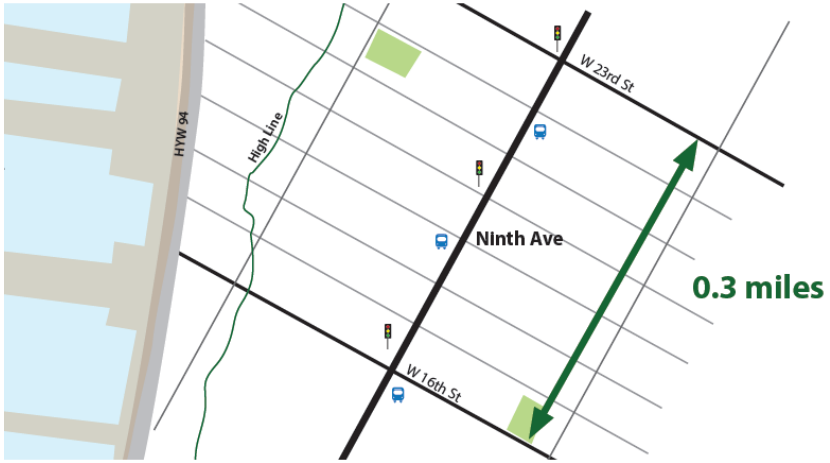




9th Ave, Manhattan, NY

Concerns

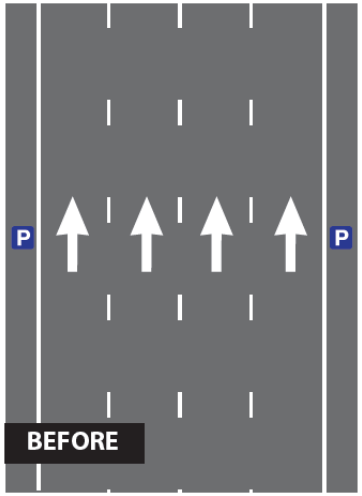
- No bicycle lanes
- Few pedestrian safety features
- Increased congestion

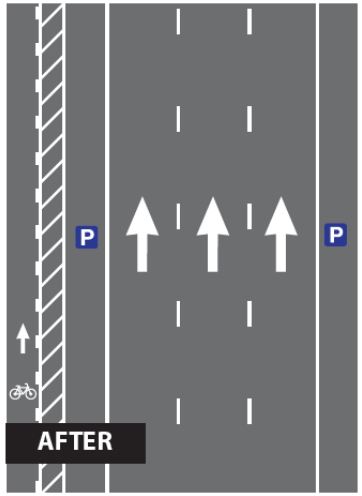


9th Ave, Manhattan, NY

Road Diet Results

- Protected bicycle lanes with signals
- Received ITE Transportation Planning Council Best Program Award
- 58% decrease in injuries for all users



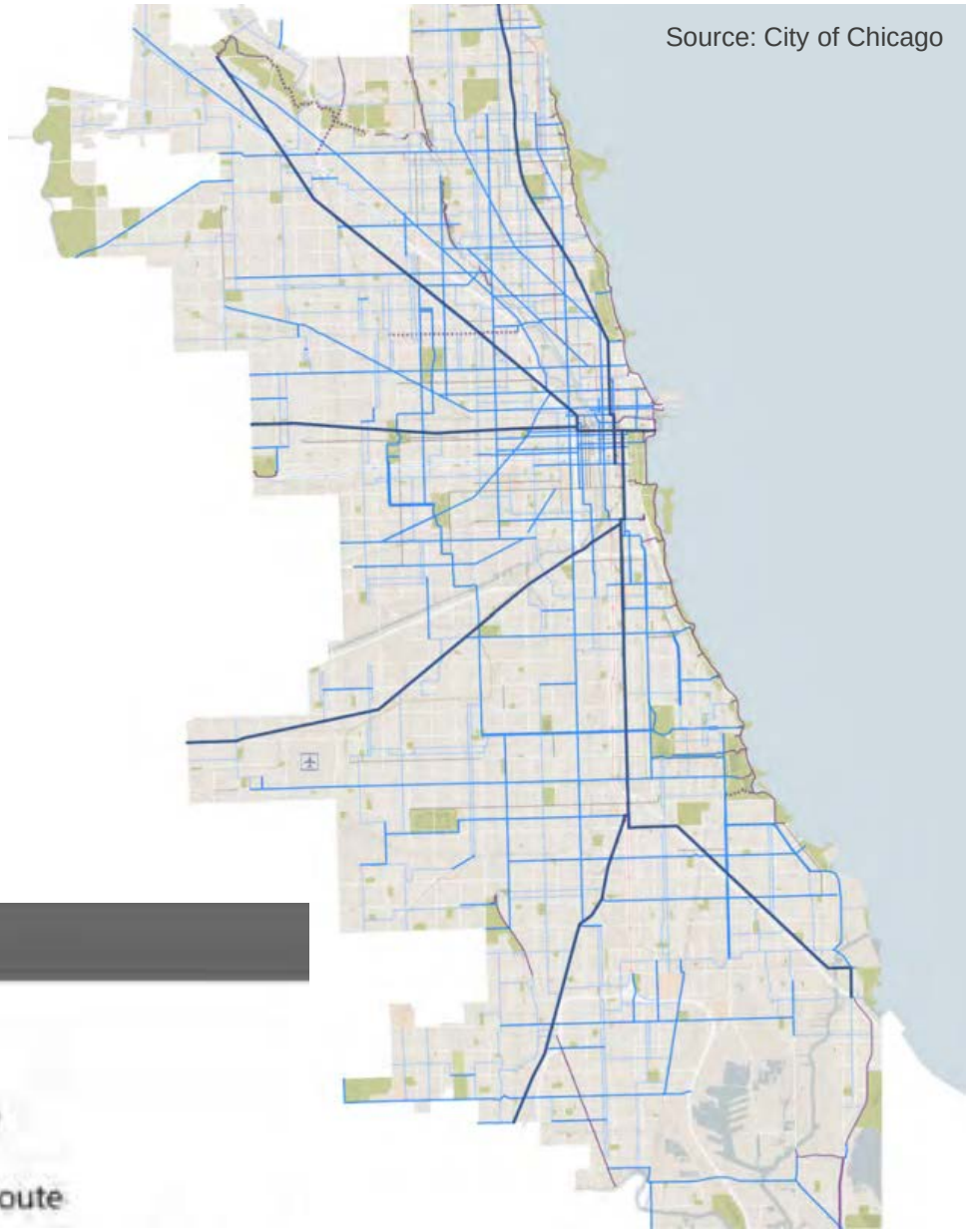


Chicago – 2020 Cycle Plan

Background

- Plan to install 100 miles of dedicated bicycle lanes
- Accomplished in part with Road Diets

Chicago's Plan for Expanding Bicycle Network

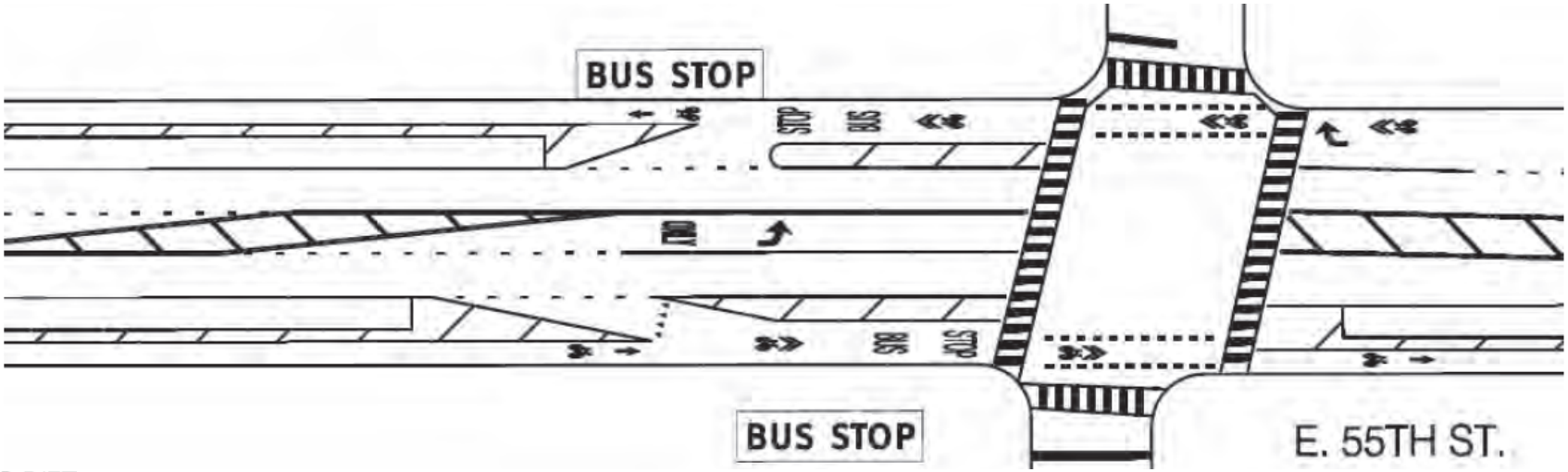


ROAD DIET

55th St, Chicago, IL

Concerns

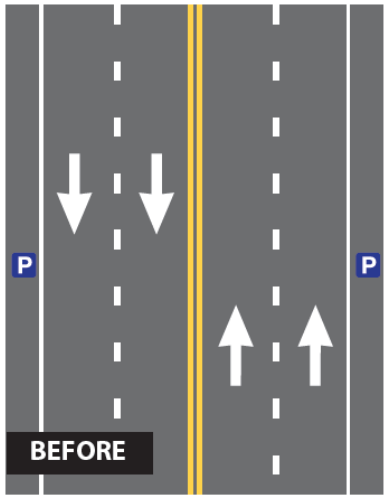
- Impact on bus routes
- Safely incorporating bicycle lanes

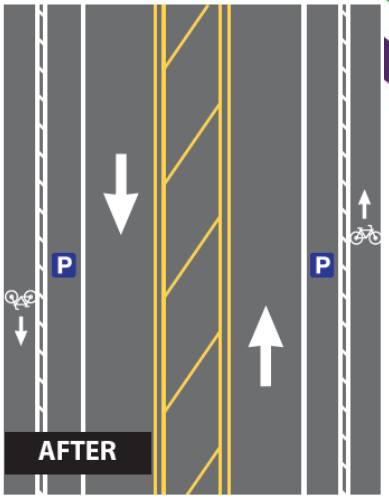


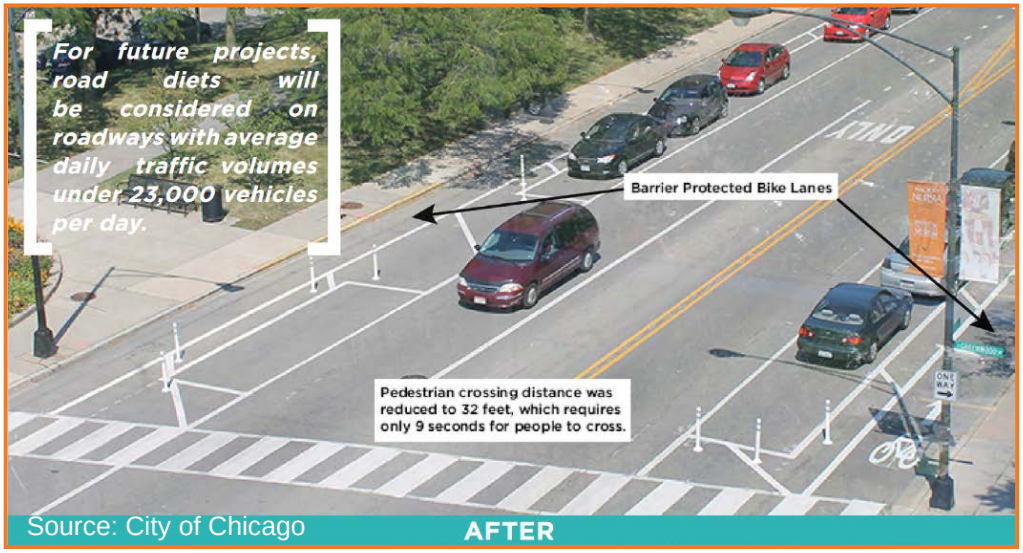
55th St, Chicago, IL

Road Diet Results

- Reduced speeds
- Improved pedestrian safety
- Improved livability







Lawrence Ave, Chicago, IL

Concerns

- Did not fit residential feel of community
- Pedestrian-car crashes count was 11 times higher than the average Chicago street
- Bicycle traffic exceeded state threshold for dedicated bicycle lane

Lawrence Ave, Chicago, IL

Road Diet Results

- Reduced speeds
- Improved pedestrian and bicycle safety
- Improved livability
- Promoted economic growth with increase in foot traffic

Tying it All Together

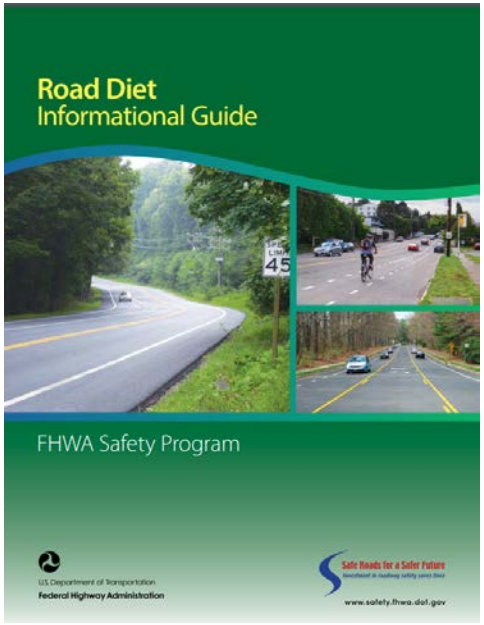

Photo: PeopleForBikes

Road Diets:

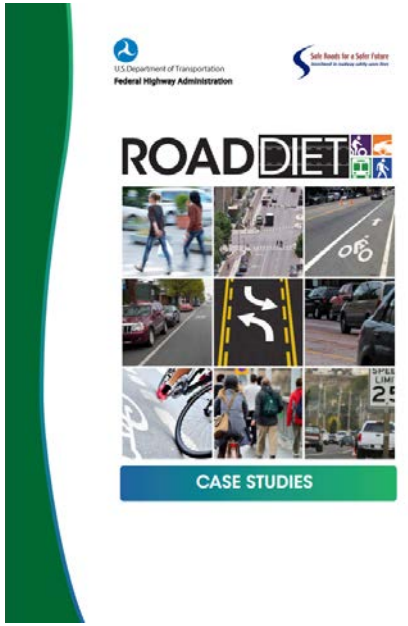
- Save Lives
- Accommodate all modes
- Expands bicycle networks
- Increase Livability
- Promotes Economic Growth

Additional Resources

Informational Guide



Case Studies



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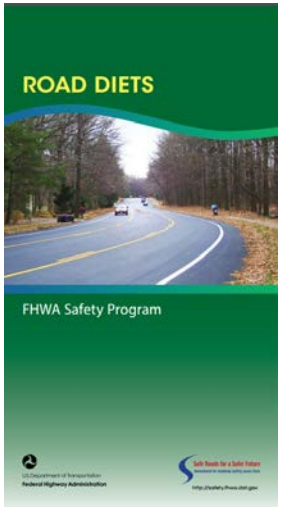
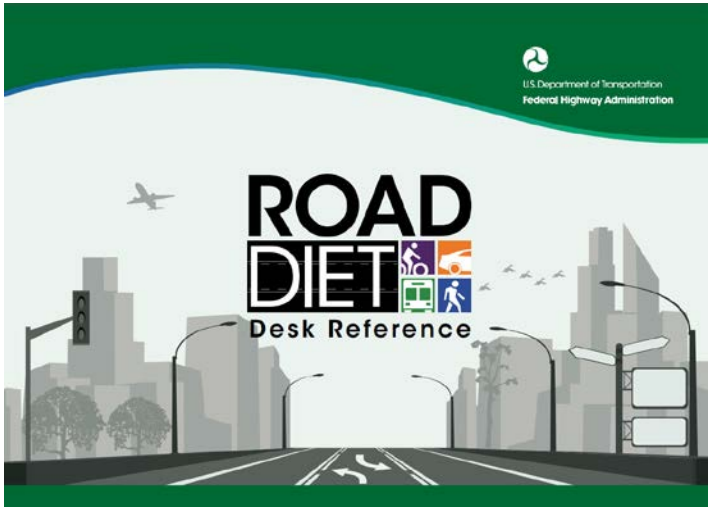


Desk Reference



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