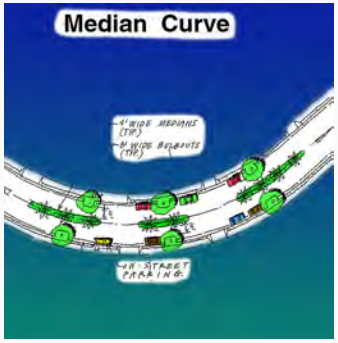
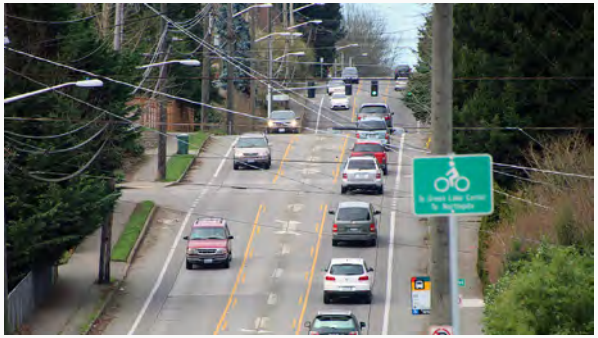
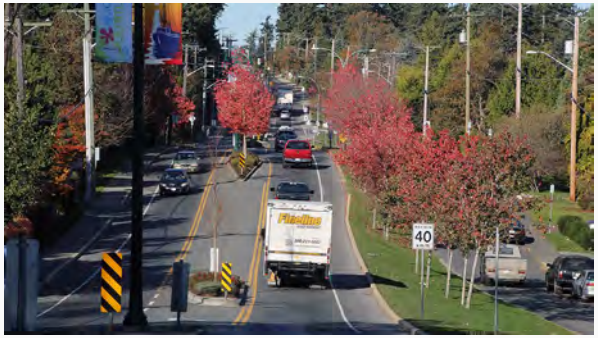
BLUE ZONES®

Road Diets
(Repurposing Streets)







Dan Burden,
Director of Innovation & Inspiration
Blue Zones, LLC
July 2022

Every blizzard proves motorists prefer two lane roads

Indeed, motorists place medians and edge buffers on 4-lane roads when they get to design them (before snowplows arrive). So why not convert to 2-3 lanes, when conditions allow?

South Central, MI

POTTSTOWN, PA

Farmington, NM


E. North ST
E. North ST
ONE WAY
W. North ST
W. North ST
ONE WAY
Coffee
ISUZU


MAIN STREET, GRAND JUNCTION, CO
3RD ST


University Avenue in Palo alto, CA
Which U.S. President laid out this street?

Dixie Highway, West Palm Beach, Florida

How It Works: The Road Diet (East Boulevard, Charlotte, NC)

East Boulevard, a four lane, undivided roadway, was prone to high-speed travel with a high level of crashes. The roadway was not pedestrian friendly and offered few crossing opportunities.

The City and neighborhood agreed on a plan that transformed the street and adjacent neighborhoods into more of a main street environment with aesthetics such as trees and making it easier to bike and walk along and across the road, while moderating motor vehicle speeds and handling the same amount of motor vehicle traffic. The Dilworth Neighborhood voted unanimously to support the project in April 2005.

The lane reduction was for 1.5 miles, and completed in phases over 5 years, and included 20 pedestrian crossing islands.

The total funding amount was $1,300,000

Avon, Colorado once had a five-lane road through the heart of its downtown. Now it is a 2-lane road. Both concepts below bring traffic speeds down to 20 mph, handle all the traffic that needs to be served, and amps up walking, transit and bicycling.

Repurposing a Street

This placeless street above created no joy or opportunity. The street was re-imagined and became the vibrant, fun and successful street on the right. The question should not be "won't it cost too much?" Instead frame the conversation on "what block in our town will do the most to turn our downtown around?"

Thanks to Victor Dover and Kenneth Garcia

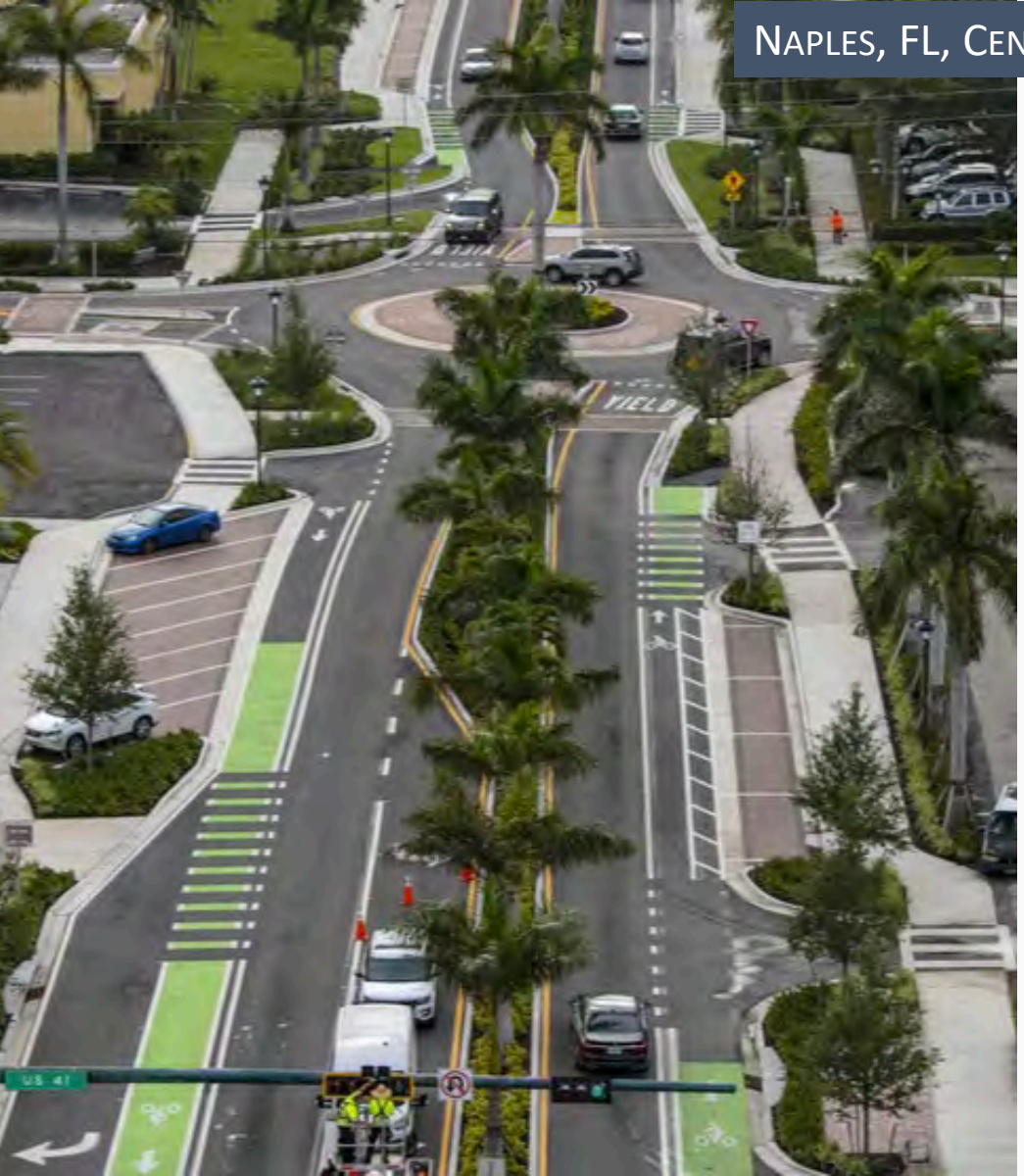
Case study: Edgewater Drive (Orlando) Resurfacing Project

- **$589,000 project scheduled in FDOT 5-year work plan**
- **FDOT open to 3-lane option if City takes over jurisdiction**
- **Changes must be accepted by neighborhood and business associations; before/after studies**

EDGEWATER DRIVE, ORLANDO, FL

Naples, FL, Central Avenue

Naples, FL, Central Avenue



Purpose

A Road Diet's primary objective is to improve safety for all roadway users, while increasing livability by creating a bicycle- and pedestrian-friendly environment. This in turn can encourage economic growth by increasing property values and attracting businesses.

Road Diets are an opportunity to redesign and reallocate roadway space to better meet the needs of all users and can be tailored to reflect the individual needs and desires of the communities in which they are implemented.

FHWA

Topics:

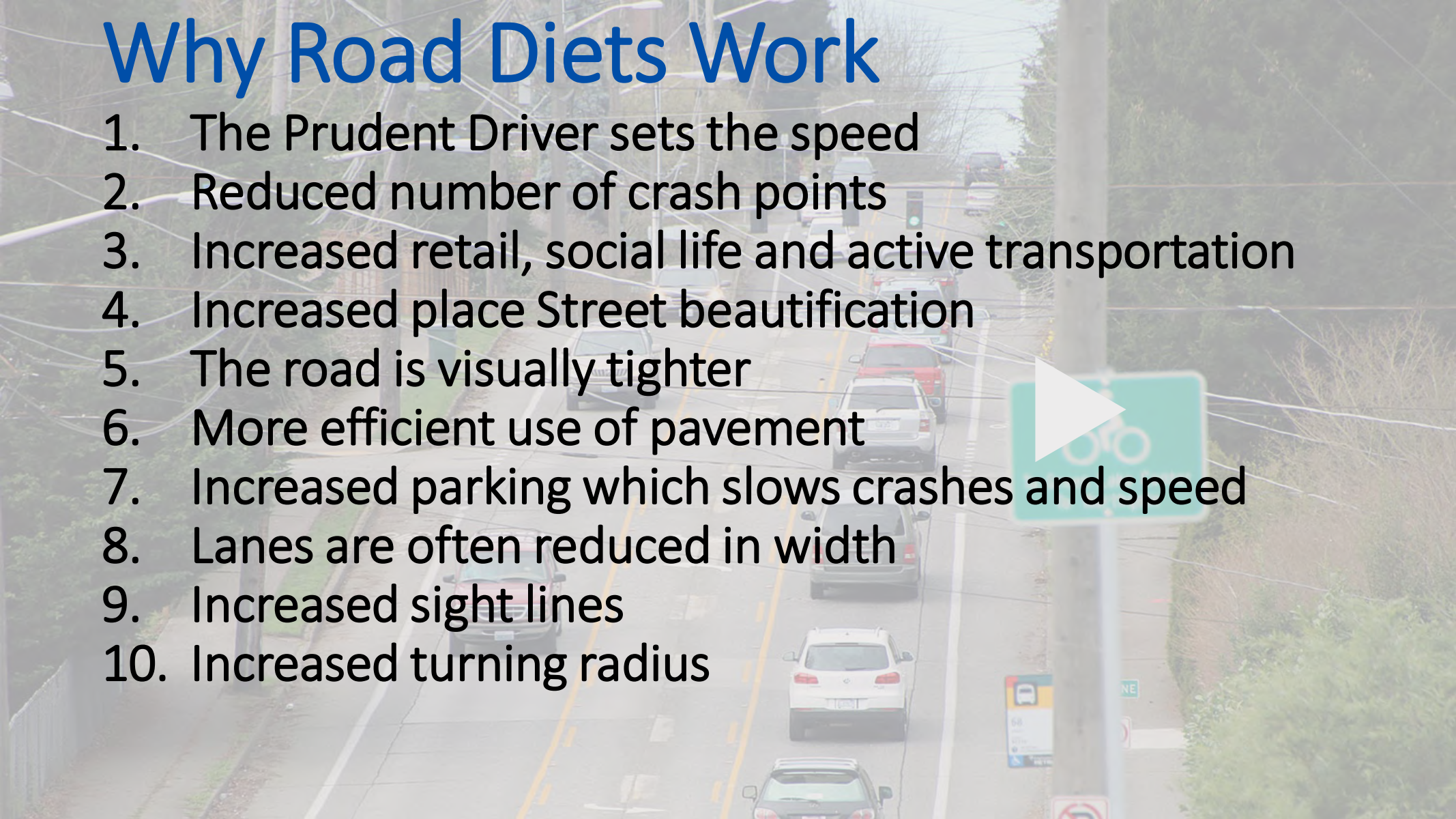
1. Road Diet Myths
2. Results of a Road Diet
3. Safety and Capacity
4. Economics
5. Emergency Response, Freight
6. Intersection Solutions
7. Midblock
8. Engagement Process
9. Best Practices
10. Discussion

8 Modern Road Diet Myths

1. Will divert traffic
2. Will slow me down* (*YES, AND THIS IS GOOD)
3. The public does not support Road Diets
4. If you remove a travel lane, then traffic will back up
5. Road Diets hurt Local Businesses
6. Road Diets are too narrow for large vehicles.
7. Road Diets delay emergency responders.
8. Road Diets are not good for freight

Why Road Diets Work

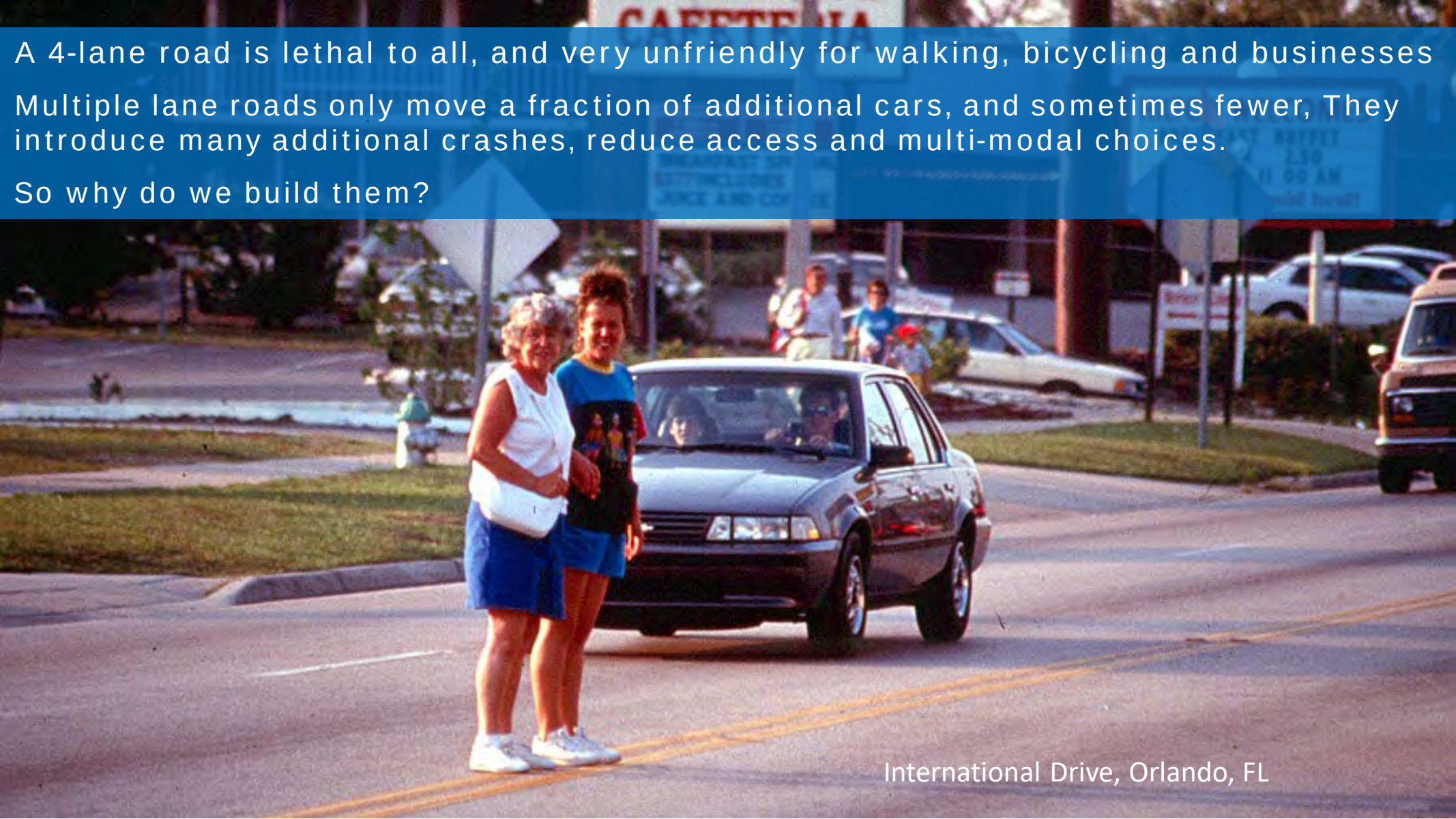
1. The Prudent Driver sets the speed
2. Reduced number of crash points
3. Increased retail, social life and active transportation
4. Increased place Street beautification
5. The road is visually tighter
6. More efficient use of pavement
7. Increased parking which slows crashes and speed
8. Lanes are often reduced in width
9. Increased sight lines
10. Increased turning radius



A 4-lane road is lethal to all, and very unfriendly for walking, bicycling and businesses

Multiple lane roads only move a fraction of additional cars, and sometimes fewer, They introduce many additional crashes, reduce access and multi-modal choices.

So why do we build them?



International Drive, Orlando, FL

If the new street is more attractive, the majority of motorists elect the reinvented street even if speeds are cut in half. Delray Beach, Florida)

PRINCIPLES FOR INCENTIVIZING ACTIVE TRANSPORTATION

- Support short local trips, rather than regional trips;
- Stop building streets for peak hour traffic;
- Roadway efficiency is of less importance than safety;
- Make walking and cycling inviting, easy and comfortable;
- 20 mph is appropriate for downtowns and neighborhoods;
- Start with 10’ travel lane as the default width;
- Start with 10-30’ corner radii as the default;
- Build compact, low speed intersections;
- Green with native trees and shrubs;
- Activate place through mixed use development;
- Use short signal cycles in people-rich areas

(60 seconds)

Perfect streets achieve a 50:50 ratio, with one-half of the Right of Way designated to moving vehicles (measured curb-to-curb) and one-half used for parking, sidewalks and green features.

IMAGE LOCATION: SACRAMENTO, CALIFORNIA


ORANGE BEACH, AL

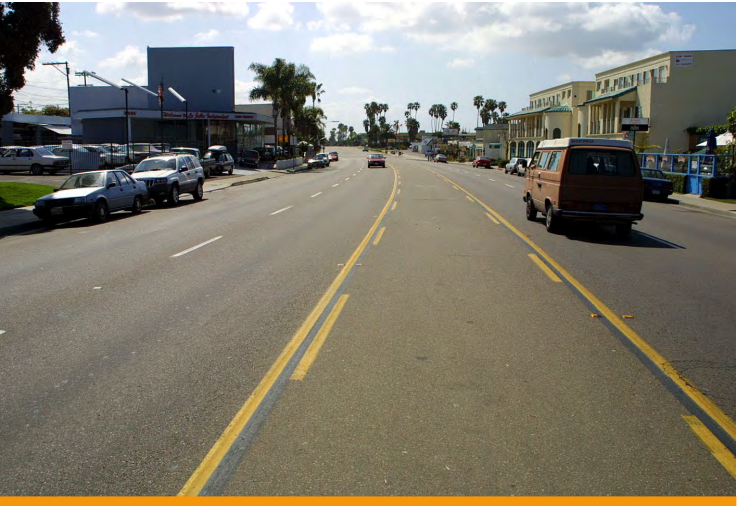
Sioux City, Iowa

The street above was converted to a design similar to the street below.

Lake Oswego, Oregon

Streets must become “right-sized” for their greater purpose.

LaJolla Boulevard, Birdrock, San Diego, California



Before

After

Roundabout intersections are not just much safer, reducing personal injury crashes by up to 70%, they can be designed to move 30-50% more traffic per lane. In the San Diego area, a two-mile portion of a 5-lane street was converted to 2 lanes, by applying roundabouts for a road that must carry 23,000 vehicles per day. New stores moved in, sales of existing retail increased 30%, bicycling and walking increased exponentially. This regional success is now being applied in other parts of Northern San Diego.

Travel lanes on La Jolla Blvd in Bird Rock, San Diego, were reduced from five to two, with modern roundabouts calming traffic and allowing the elimination of turn lanes at intersections. On-street parking was added to both sides of LaJolla Blvd, including diagonal parking on the beach side.

The traffic count remained approximately the same before and after the changes—about 22,000—and yet La Jolla Boulevard has been transformed to a walkable, pleasant street from one that was hostile to pedestrians. Average speeds were reduced from 40-45 mph to 19 mph. Noise levels dropped 77 percent and retail sales rose 30 percent. Traffic crashes fell by 90 percent, and motorists got home sooner. How?

LaJolla Boulevard, Birdrock, San Diego, CA

La Jolla Boulevard, Birdrock, San Diego, CA

Speeds above (35-45)

Speeds below (18-22)

LaJolla Boulevard, Birdrock, San Diego, CA

Litmus Test

Does the “change” reward the what we value the most, our health, the short trip and active transportation?

Change: Change in policy, street design, land use, operations, transit initiative, etc.

SAN DIEGO, CA

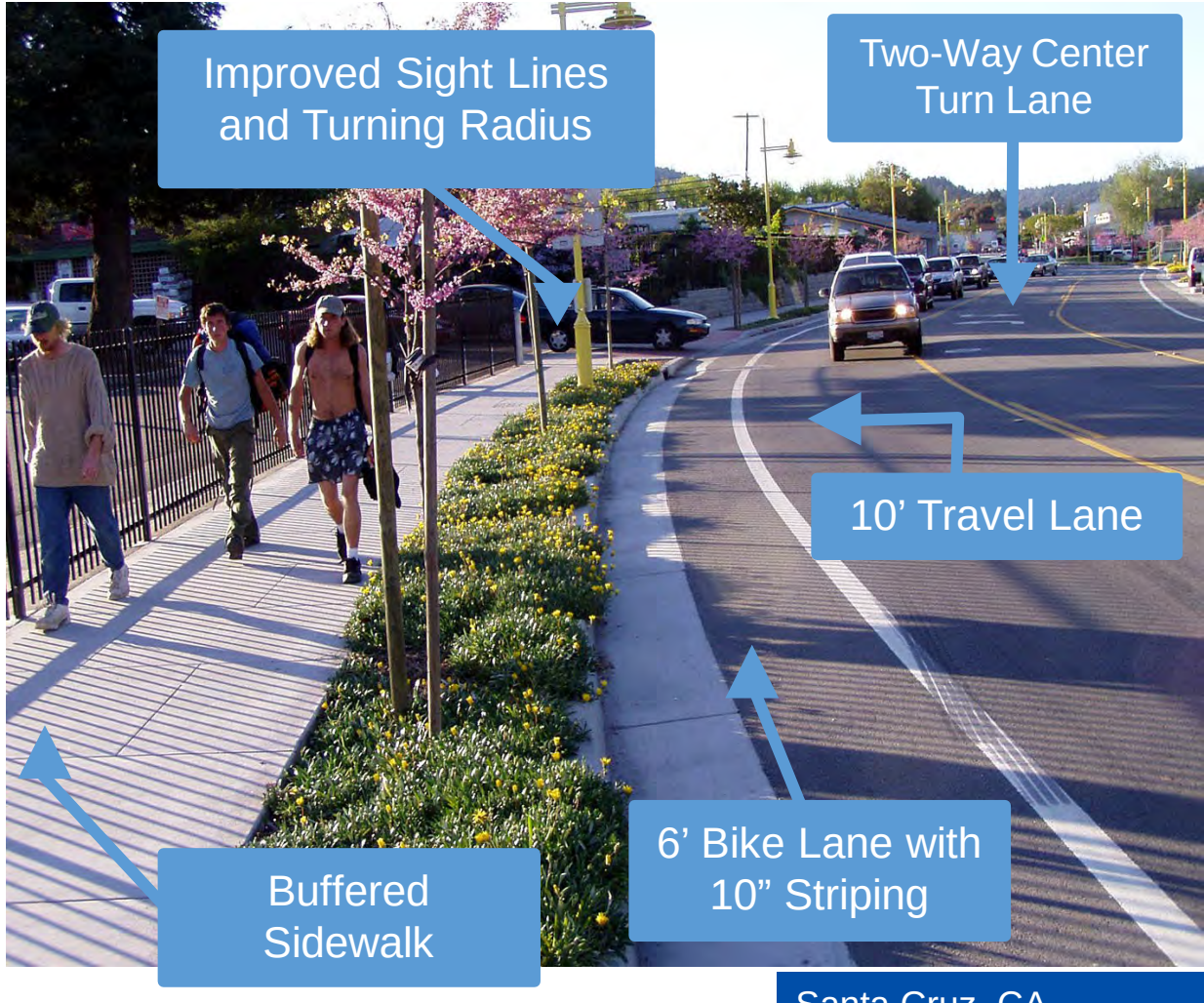
Muscatine, Iowa

73% reduction in crashes

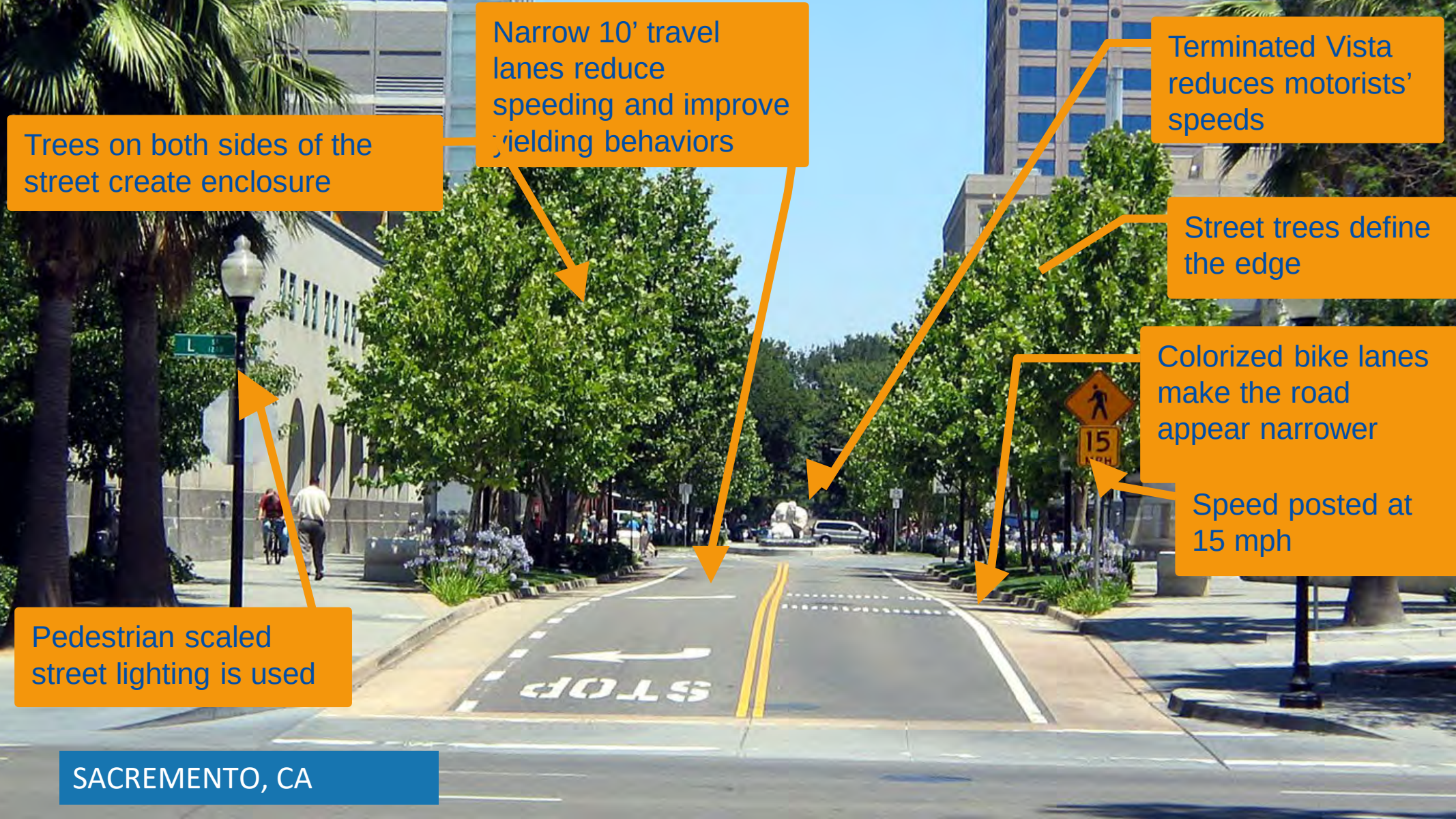
Albert Lea, MN

The Typical Road Diet

- A typical road diet converts a former 4-lane road into a 2-lane road, plus a center turn lane and bike lanes.
- The bike lanes create an added buffer to the sidewalk, allow a greater turning radius, improving sight lines.
- Motorists benefit from less speeding and an overall crash reduction of 19-47% (Sometimes higher).
- Crossing islands can be added, providing pedestrian refuge.

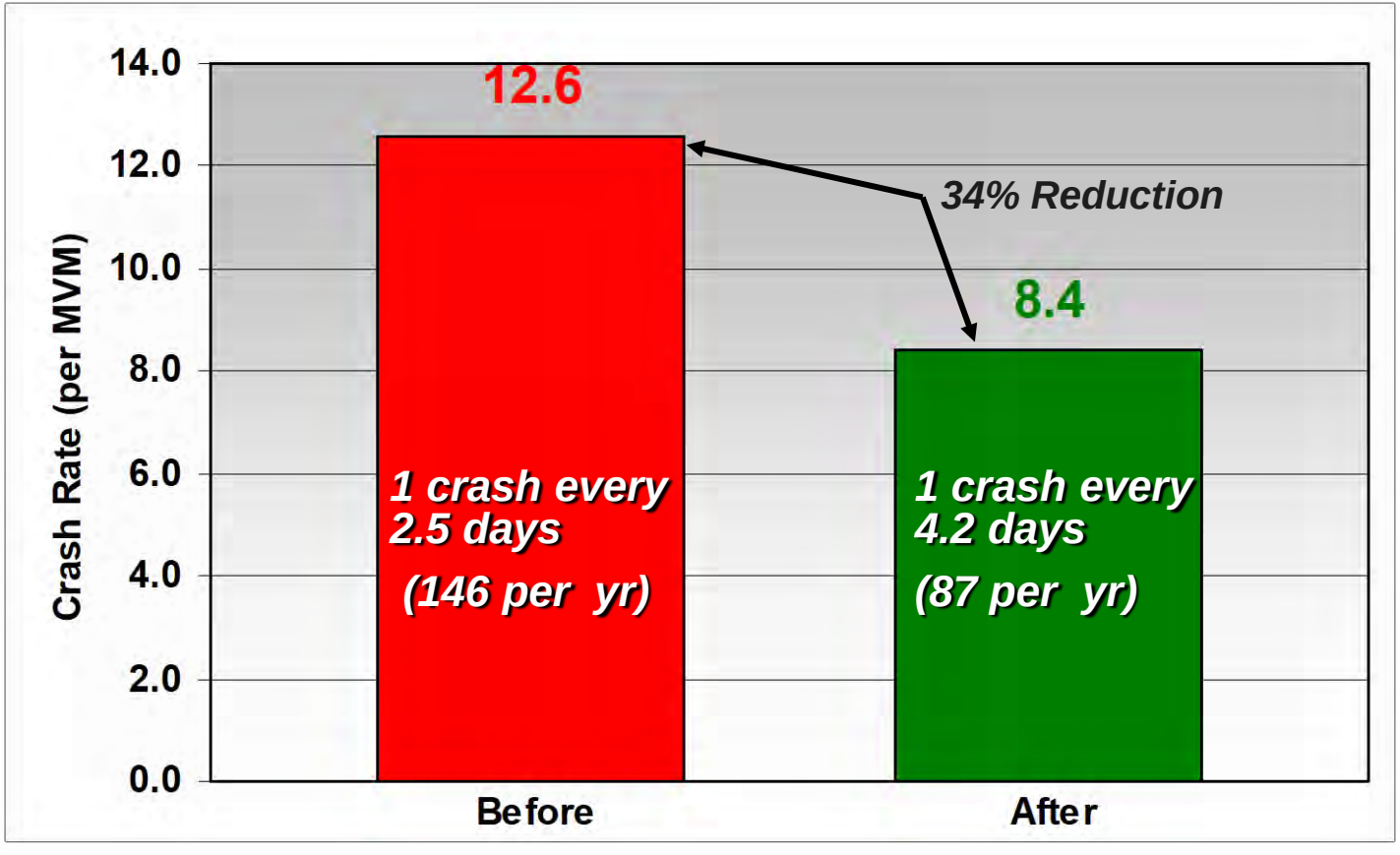


Santa Cruz, CA


Narrow 10’ travel lanes reduce speeding and improve yielding behaviors
Terminated Vista reduces motorists’ speeds
Trees on both sides of the street create enclosure
Street trees define the edge
Colorized bike lanes make the road appear narrower
Speed posted at 15 mph
Pedestrian scaled street lighting is used
STOP
15
SACRAMENTO, CA

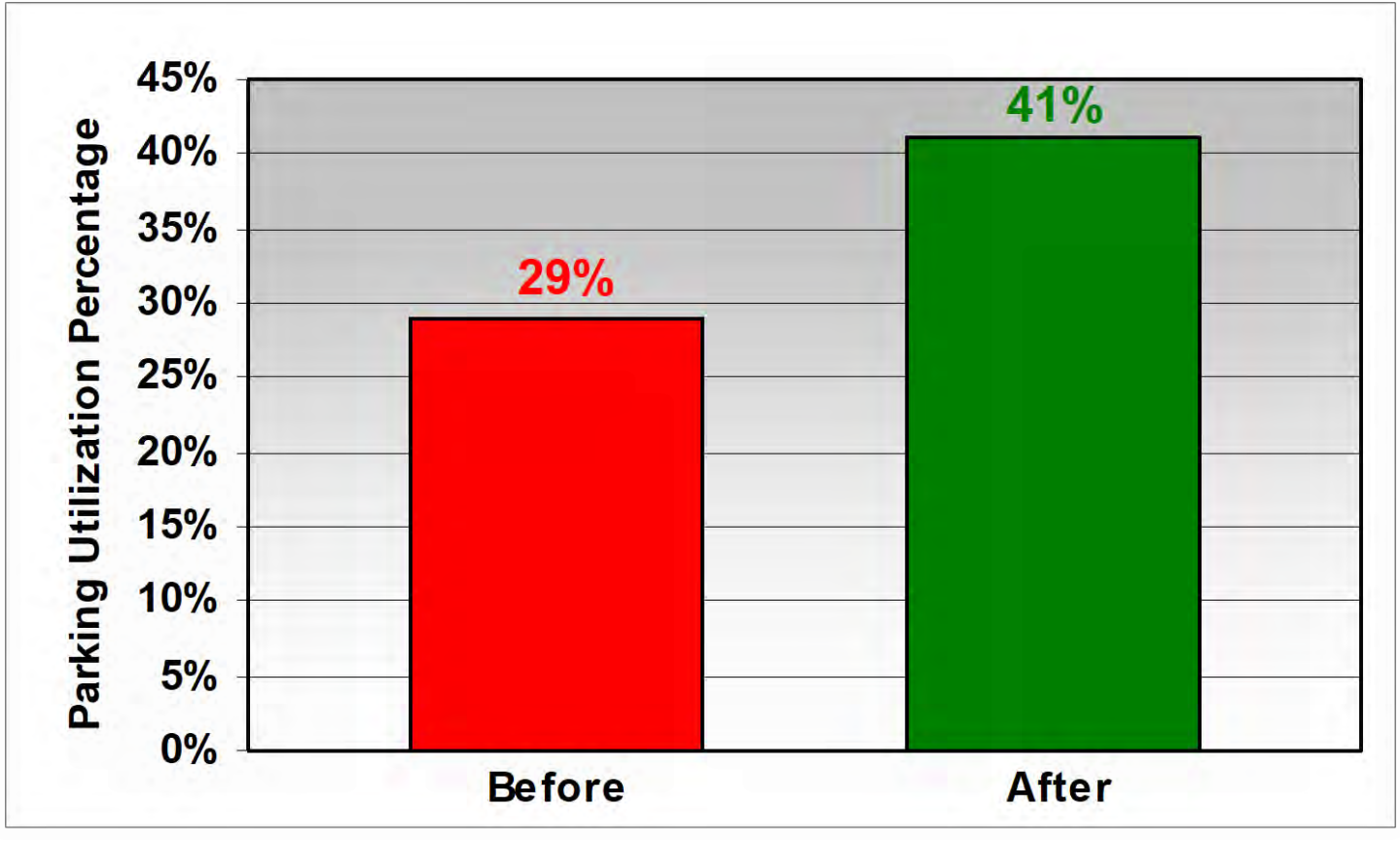
Results of a Road Diet

Edgewater Drive: Impact of Road Diet

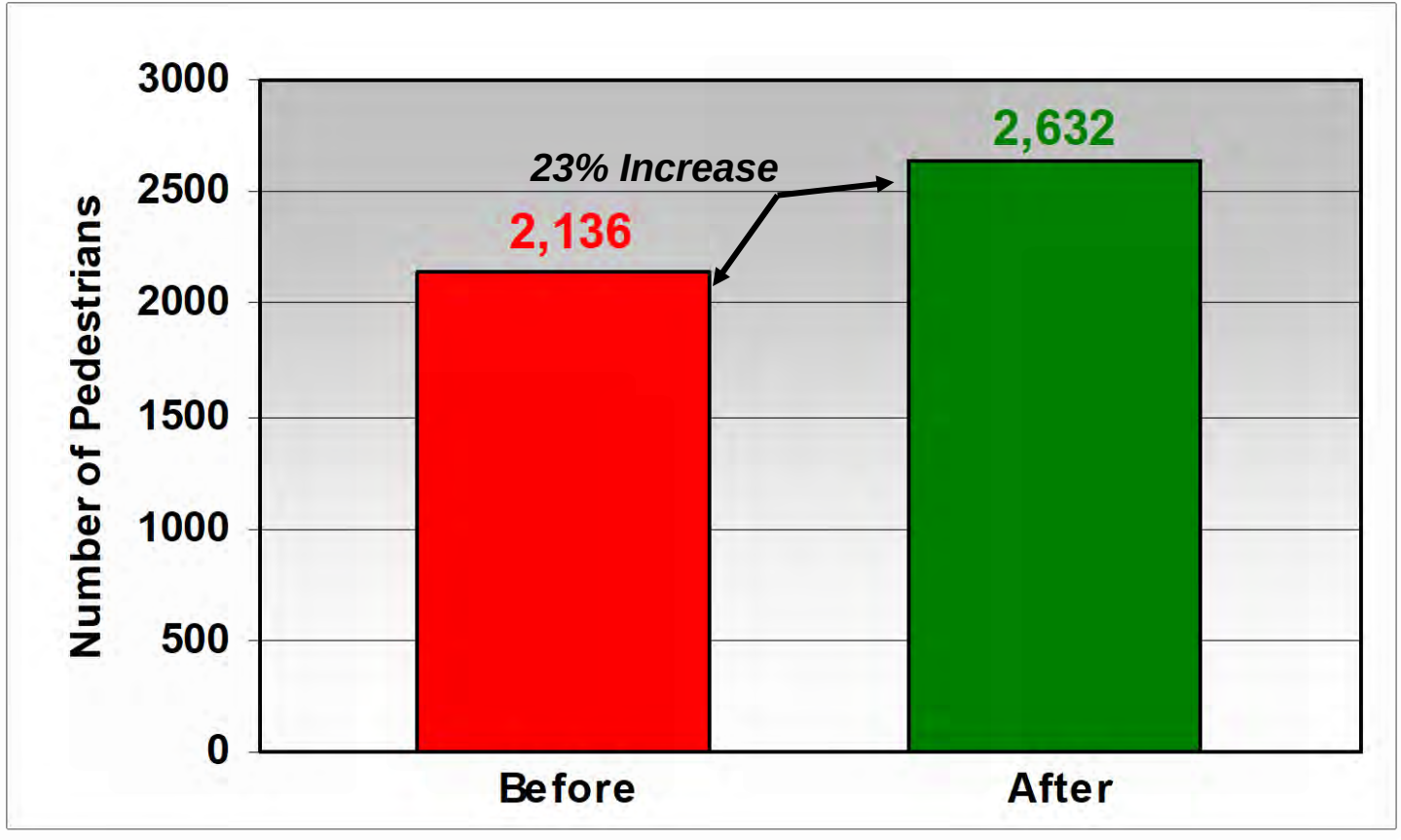


- Crash Rate declined by 34 percent
- Injury Rate declined by 68 percent

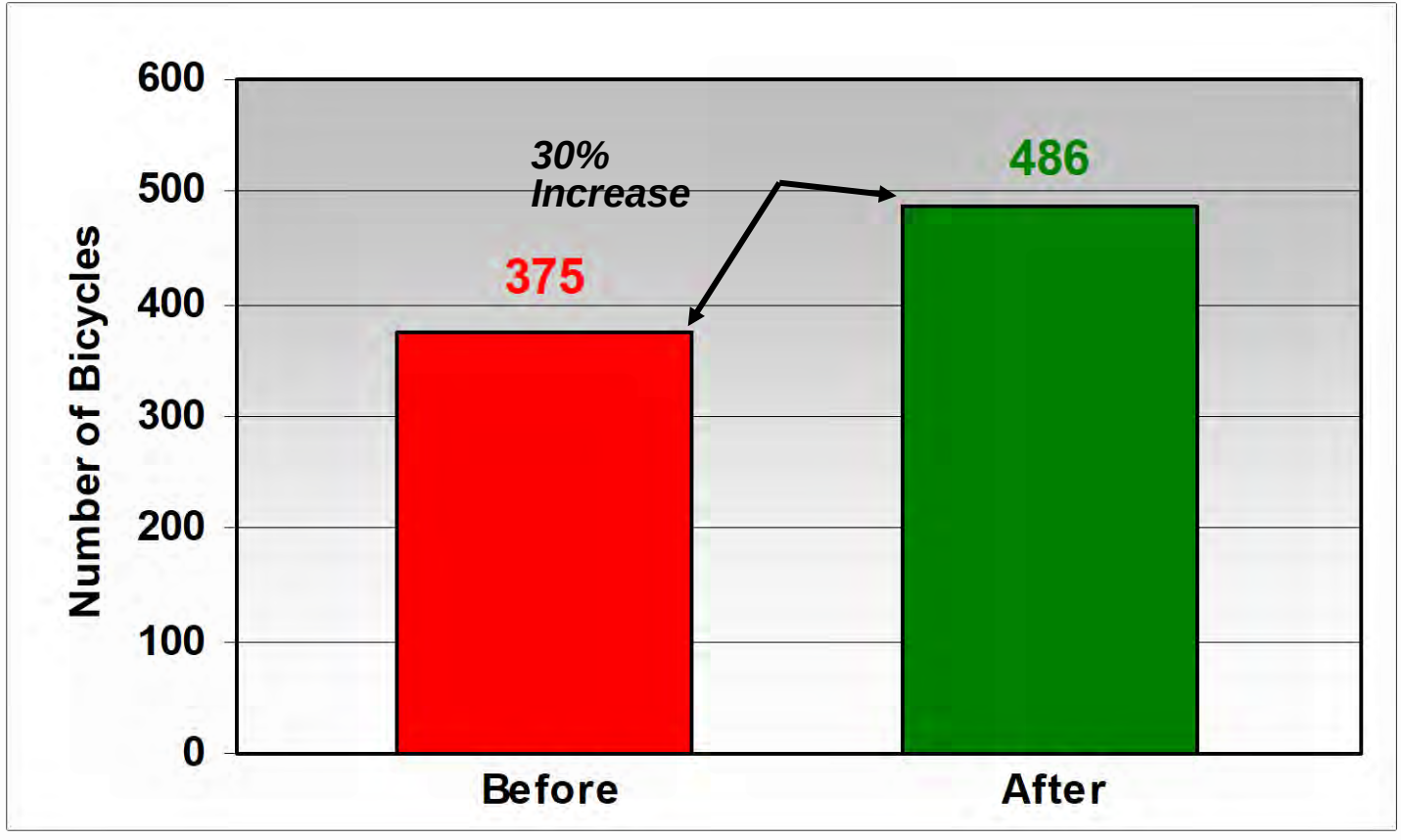
Edgewater Drive: Impact of Road Diet



Edgewater Drive: Impact of Road Diet



Edgewater Drive: Impact of Road Diet

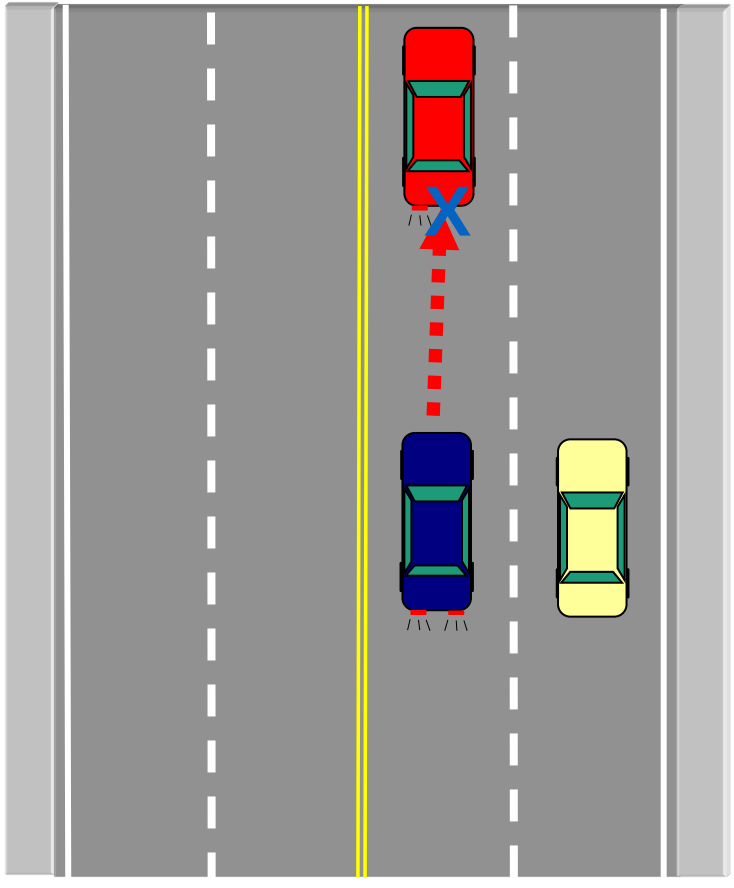


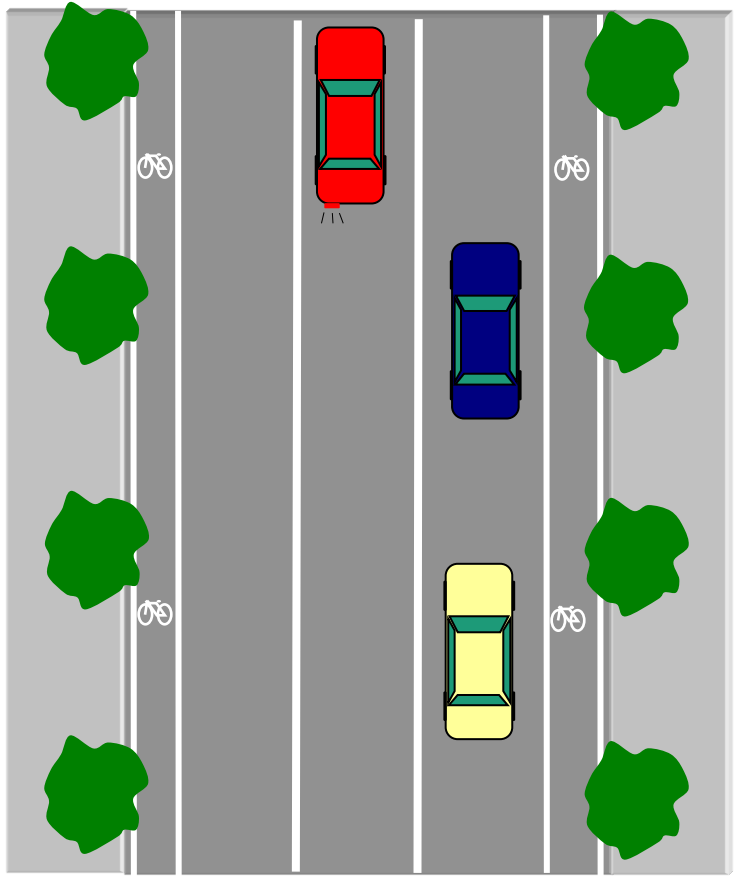
Safety and Capacity

Seattle Conversions (4 to 3 Lane))

Roadway Location	Date Change	ADT Before	ADT After	Collision Reduction
Greenwood Ave N N 80th St to N 50th	Apr-95	11872	12427	24 to 10 58%
N 45th Street Wallingford Area	Dec-72	19421	20274	45 to 23 49%
8th Ave NW Ballard Area	Jan-94	10549	11858	18 to 7 61%
Martin Luther King Jr W North of I 90	Jan-94	12336	13161	15 to 6 60%
Dexter Ave N Queen Ann Area	Jun-91	13606	14949	19 to 16 59%
24th Ave NW NW 85th to NW 65th	Oct-95	9727	9754	14 to 10 28%

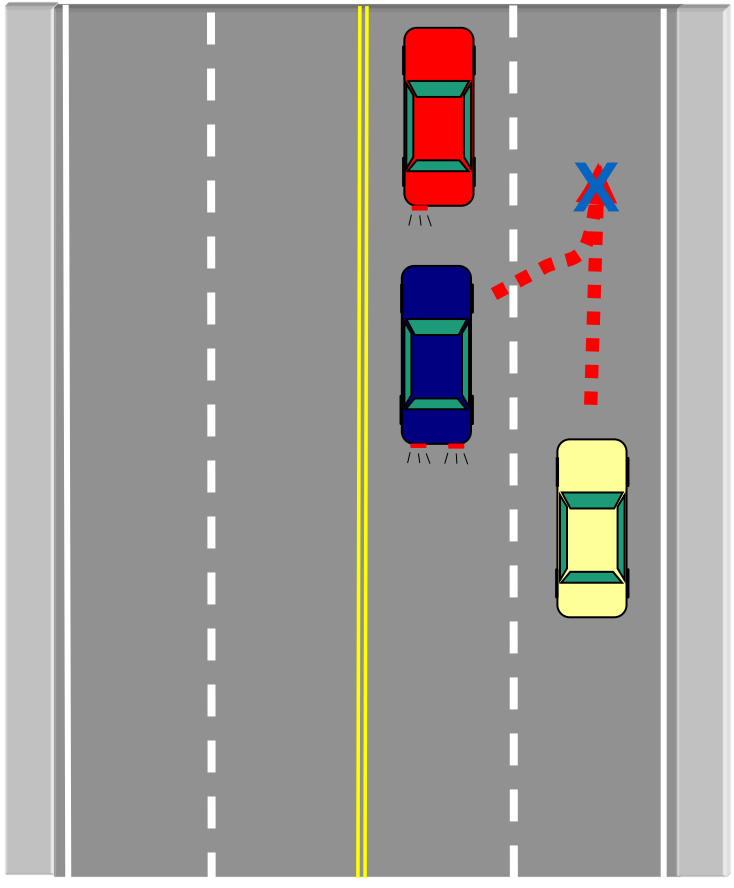
3 crash types can be reduced by going from 4 to 3 lanes: 1 – rear enders

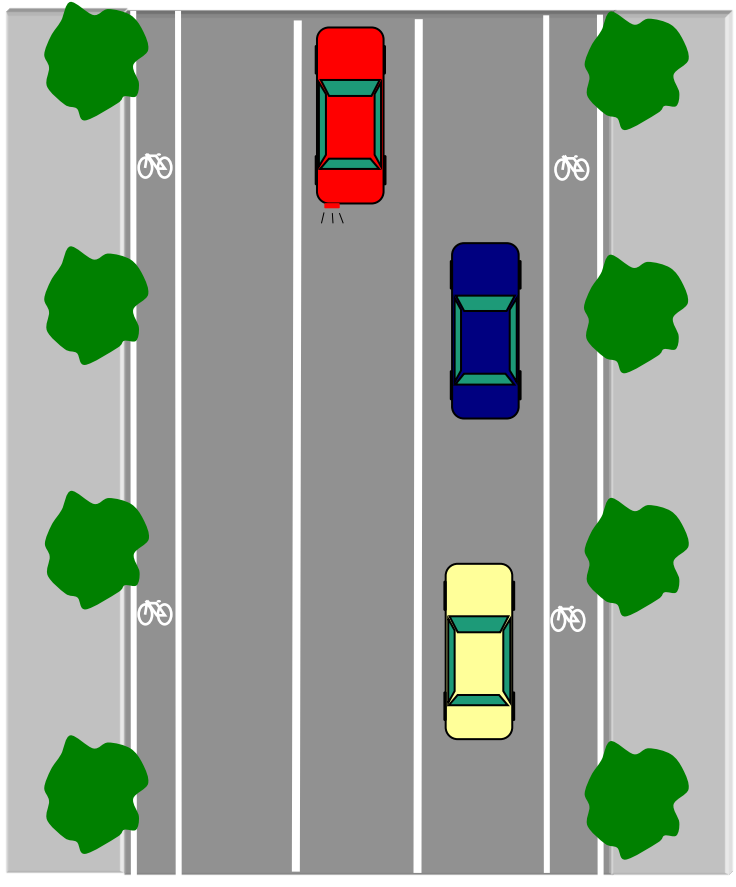




Courtesy, Oregon DOT

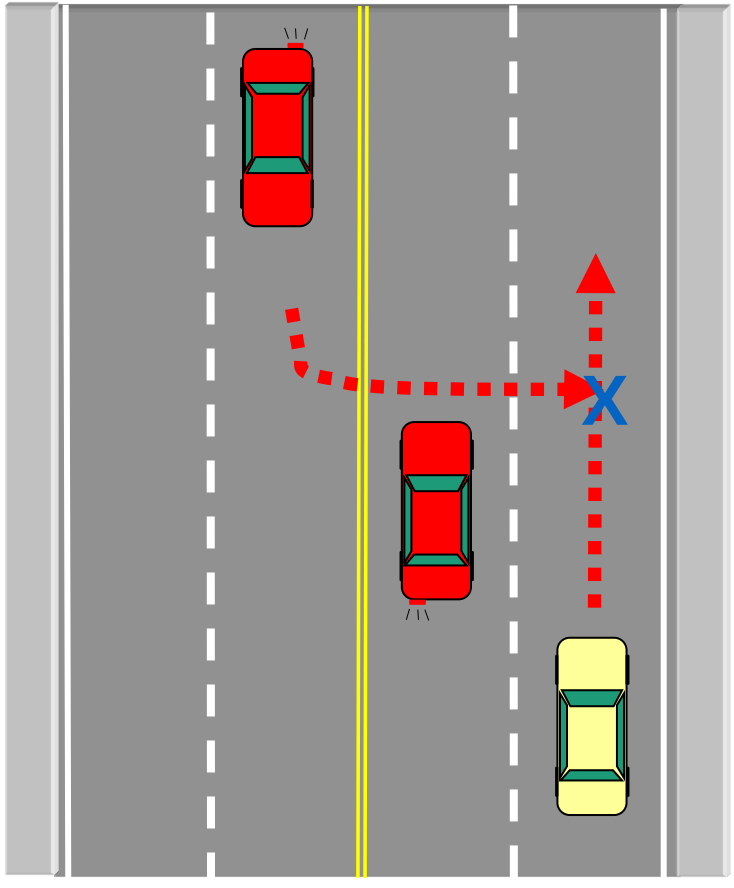
3 crash types can be reduced by going from 4 to 3 lanes: 2 – side swipes

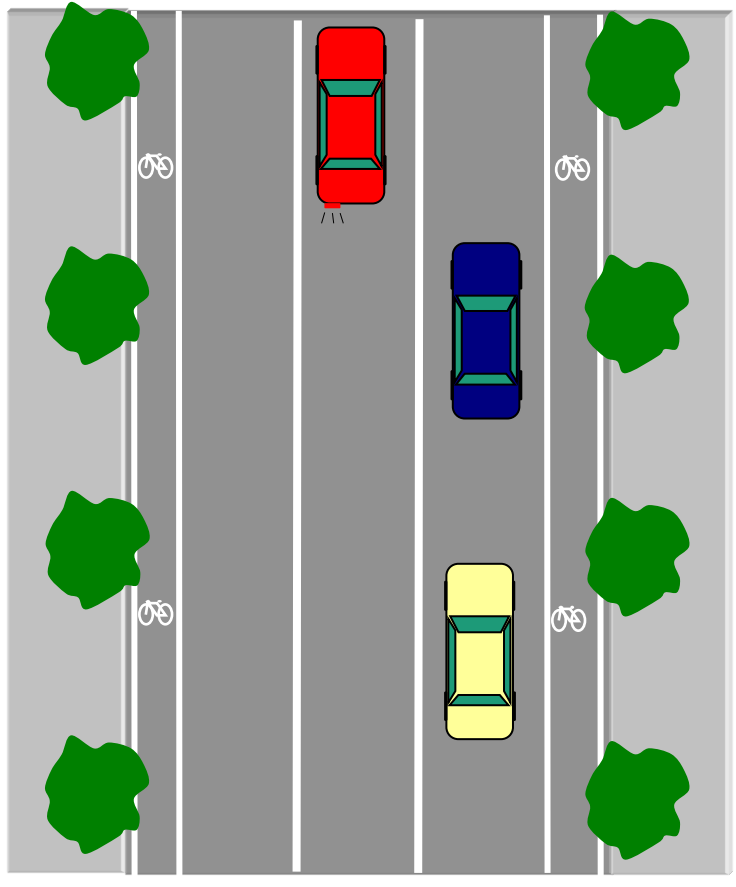




Courtesy, Oregon DOT

3 crash types can be reduced by going from 4 to 3 lanes: 3 – left turn/broadside





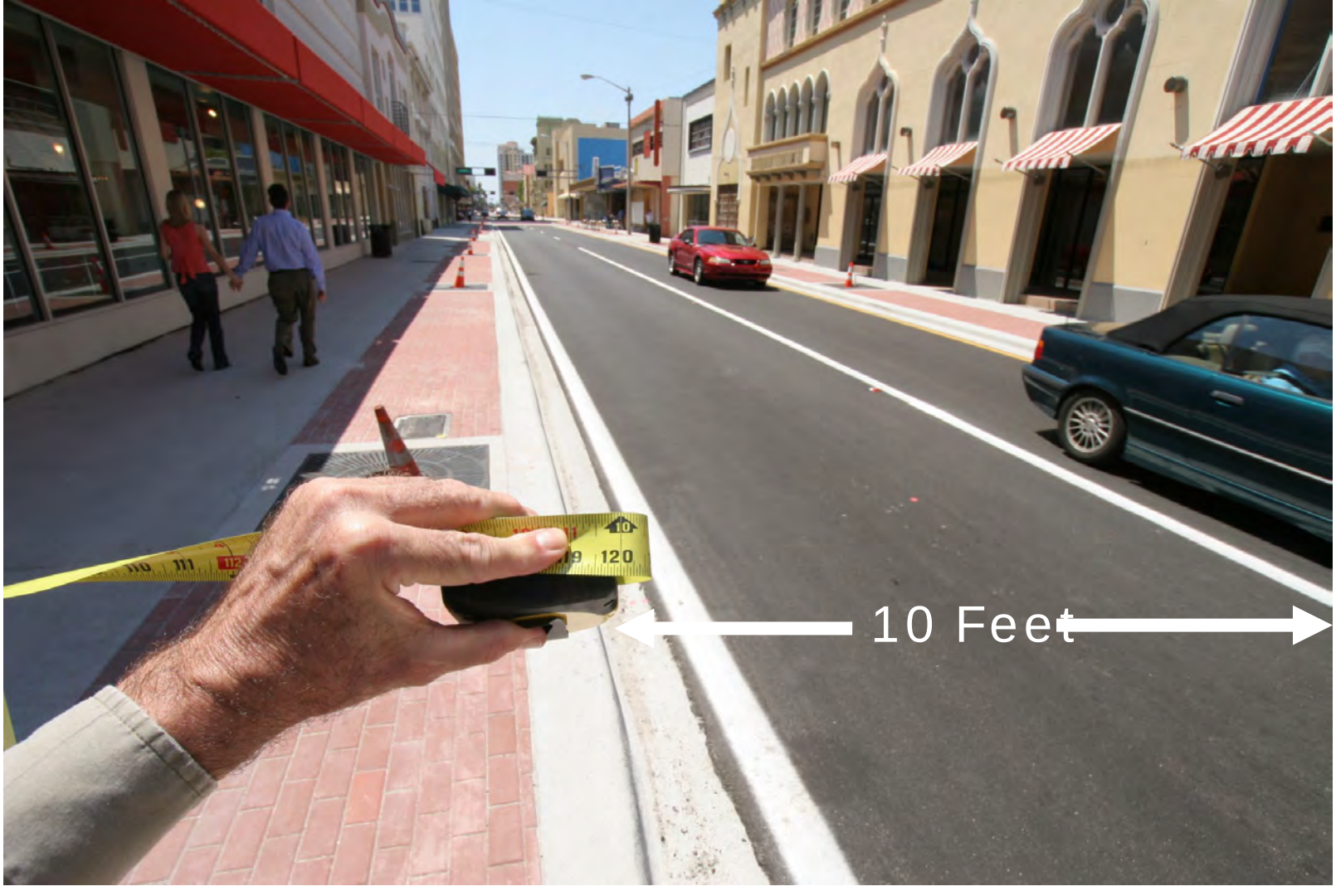
Courtesy, Oregon DOT

Mountain View, CA

For a short period during area road construction, Kirkland's Lake Washington Boulevard picked up additional traffic and was successfully carrying 30,000 AADT. This four- lane to three-lane conversion has been very successful. Note how much easier it is for motorists to enter and exit driveways. Added border width provides motorists safer conditions. Caution, this 30,000 AADT figure is real for one portion of this roadway but may be beyond the comfort range of many towns. For a more comfortable number 20-23,000 is an achievable road diet in many areas.


Central Way
4-3 (Proposed)
18-20,000 ADT
Park Place is an important part of downtown retail. Its existing retail tenants provide needed local-serving businesses. It is important to preserve these uses that serve as key "anchors" in downtown.
Mass transit, transit riders, and a transit center are important parts of downtown Kirkland, both today and in the future.
...it is realistic to manage current and anticipated traffic volumes on Central Way and Lake Street in a way that better meets pedestrian needs while retaining cars needed to support a healthy retail environment.
Some properties need to redevelop at higher densities to make it economical to provide better retail space. The income from
feasible.
Lake Washington
4-3 Completed
21,000 ADT
Market

Efficiency



Olive Avenue, West Palm Beach, Florida – Former 3-lane, One-Way Ten-foot travel lanes


CLEMATIS
ONE WAY
20 Feet
Ten-foot travel lanes

Economic Benefits

"We believe that our communities are at the core of the economic turnaround, and that 'place' is the huge economic driver. The disheartening facts are that we continue to lose our college graduates at an alarming rate because we don't offer the kinds of places where they want to live. Almost half of them leave the state, and two thirds of those who do leave choose where to live first and then find a job. A recent internet posting reveals that nearly 40 percent of college graduates flee the state. It is time to reverse this trend, an by building to its town values, Lowell will re-anchor and grow key jobs.

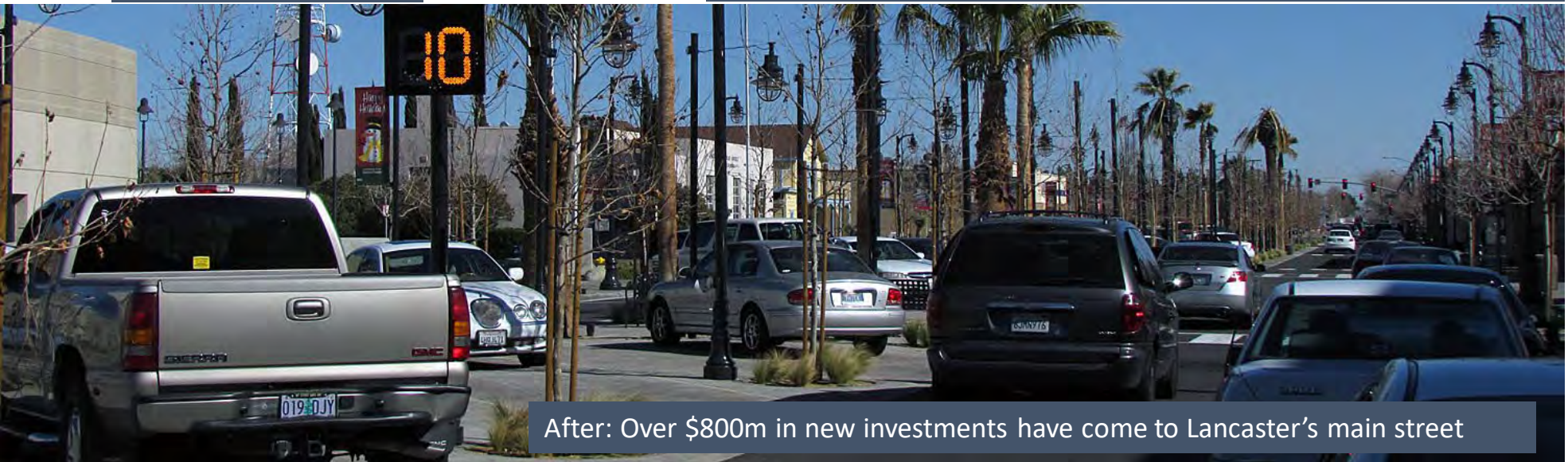
It's time to say, 'enough is enough,' and focus on what really matters: creating dynamic, walkable, sustainable communities and regions where people want to live. It's time to start talking about the importance of place as the economic development strategy that will create a positive, dynamic future for Michigan." Michigan Municipal League (MML)

The Economics of Place:

The Value of Building Communities Around People

Lancaster, CA

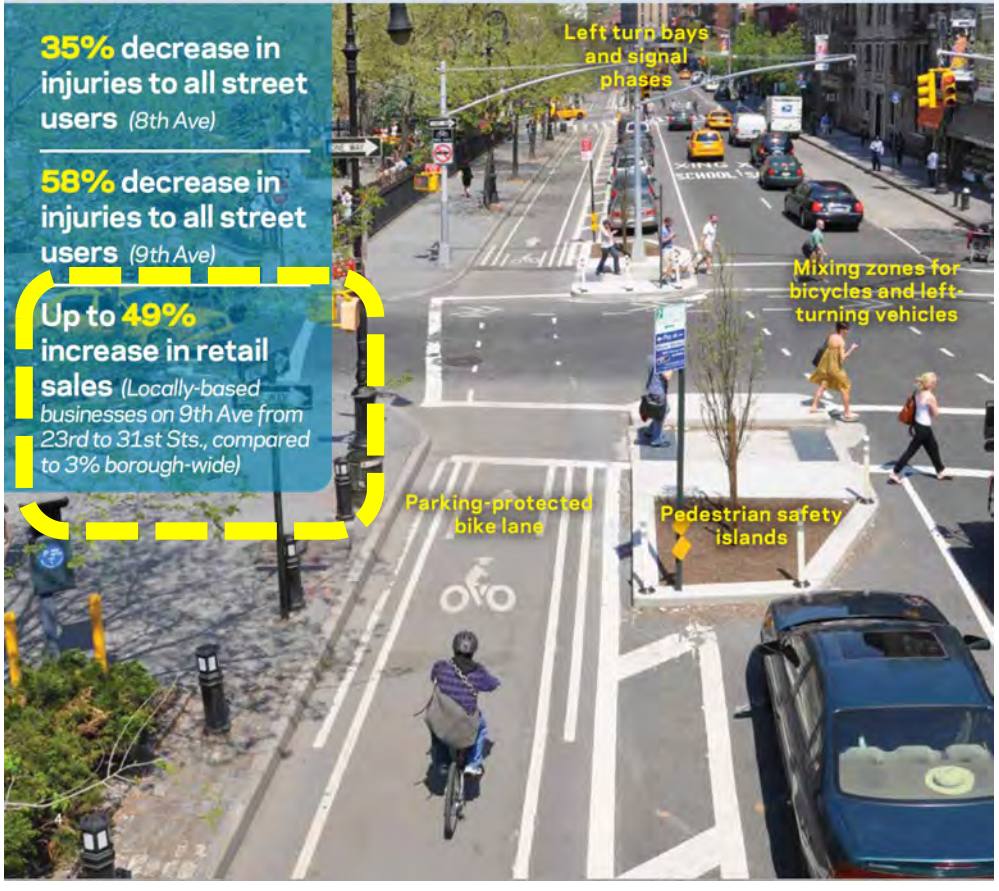
Before: Speeds were high, (40mph) walkability and investments low



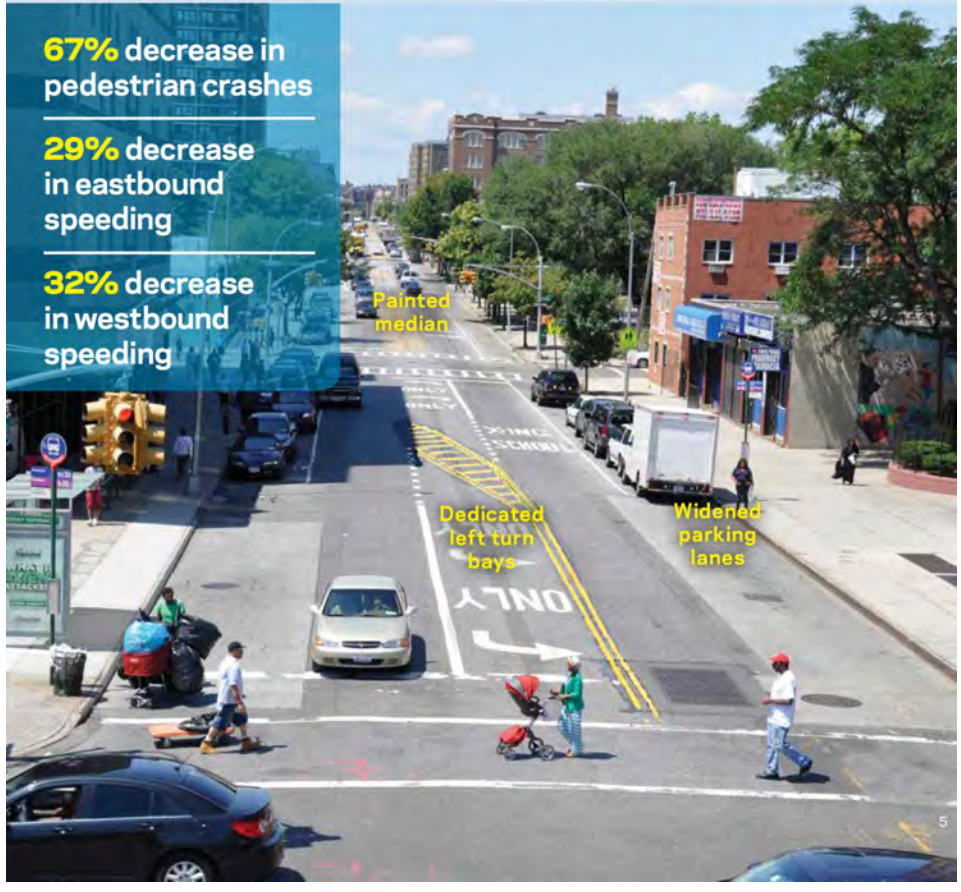
After: Over $800m in new investments have come to Lancaster's main street

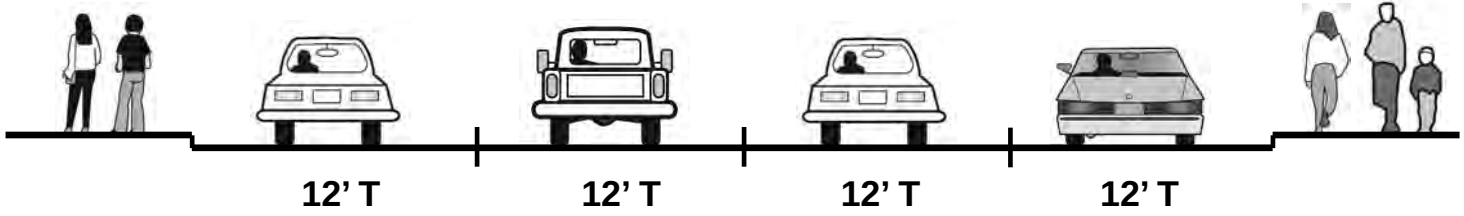
Lancaster, CA

First protected bicycle lane in the US:
8th and 9th Avenues (Manhattan)



Neighborhood traffic calming:
East 180th Street (Bronx)

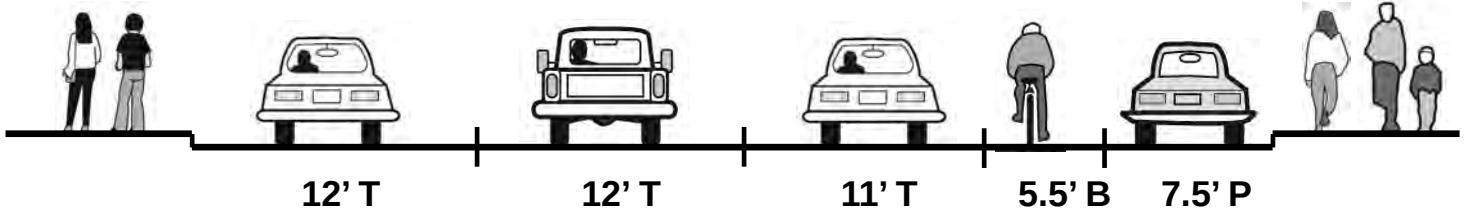




Typical one-way cross-section: Four 12’ travel lanes

Why? Because the space was there

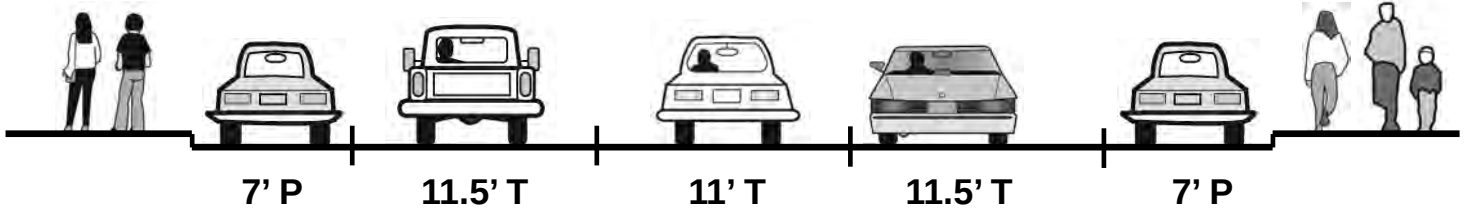
Courtesy of Oregon DOT



Possible scenario #1: Three travel lanes and…

Bike lane and parking on one side

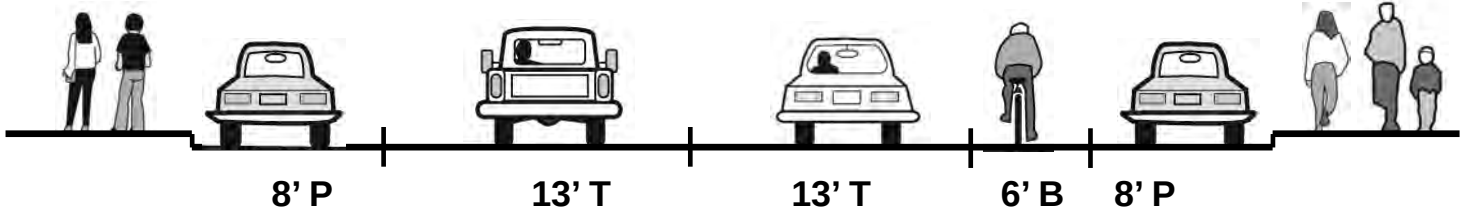
Courtesy of Oregon DOT



Possible scenario #2: Three travel lanes and…

Parking on both sides

Courtesy of Oregon DOT



Possible scenario #3: Two travel lanes and…

Bike lane and parking on both sides

Courtesy of Oregon DOT

UNIVERSITY PLACE, WA

Emergency Response and Freight

MANITOU SPRINGS, CO

Naples, Fl

SANTA CRUZ, CA

Intersection Tools

St George Street, Toronto, Ontario (4-2 Conversion)

18,000 AADT before and after

1800 vehicles
per hour
per lane

800 vehicles per hour
Per lane

Choose a ‘Roundabouts First’ Intersection Policy

Both intersections handle 25,000 vehicles per day

MAUI, HI

A two-lane road often reaches its peak capacity at or near 20,000 vehicles per day (VPD), but with a roundabout this can be extended to 25,000 to as high as 30,000 VPD. Thus, instead of widening an intersection or an entire road, costing mega-millions, roundabouts can keep the road to a human scale.

Streets Impact Health & Wellbeing

Conventional street engineering widens roads for vehicular efficiency. People walking and bicycling become discouraged, so more people end up driving. Crashes increase, due to increased load and added conflict points. Roadway sections can double or triple in price. Walking is engineered out of the environment.

Image: University of Hawaii, Hilo Campus
Photo vision: Todd Clements

Rebuilding the intersection to support walking and bicycling lowers speed and noise, shortens crossing times, moves more cars, reduces personal injury crashes by 70%, and eliminates delays for both people walking and driving. When the street honors development, development will honor the street.

HAMBURG, NY


KARATE

HAMBURG, NY

Before & After Example

ASHEVILLE, NC

Midblock Tools


DOWN WORKS
DOWN WORKS
BUCCI SALE

Z Crossings

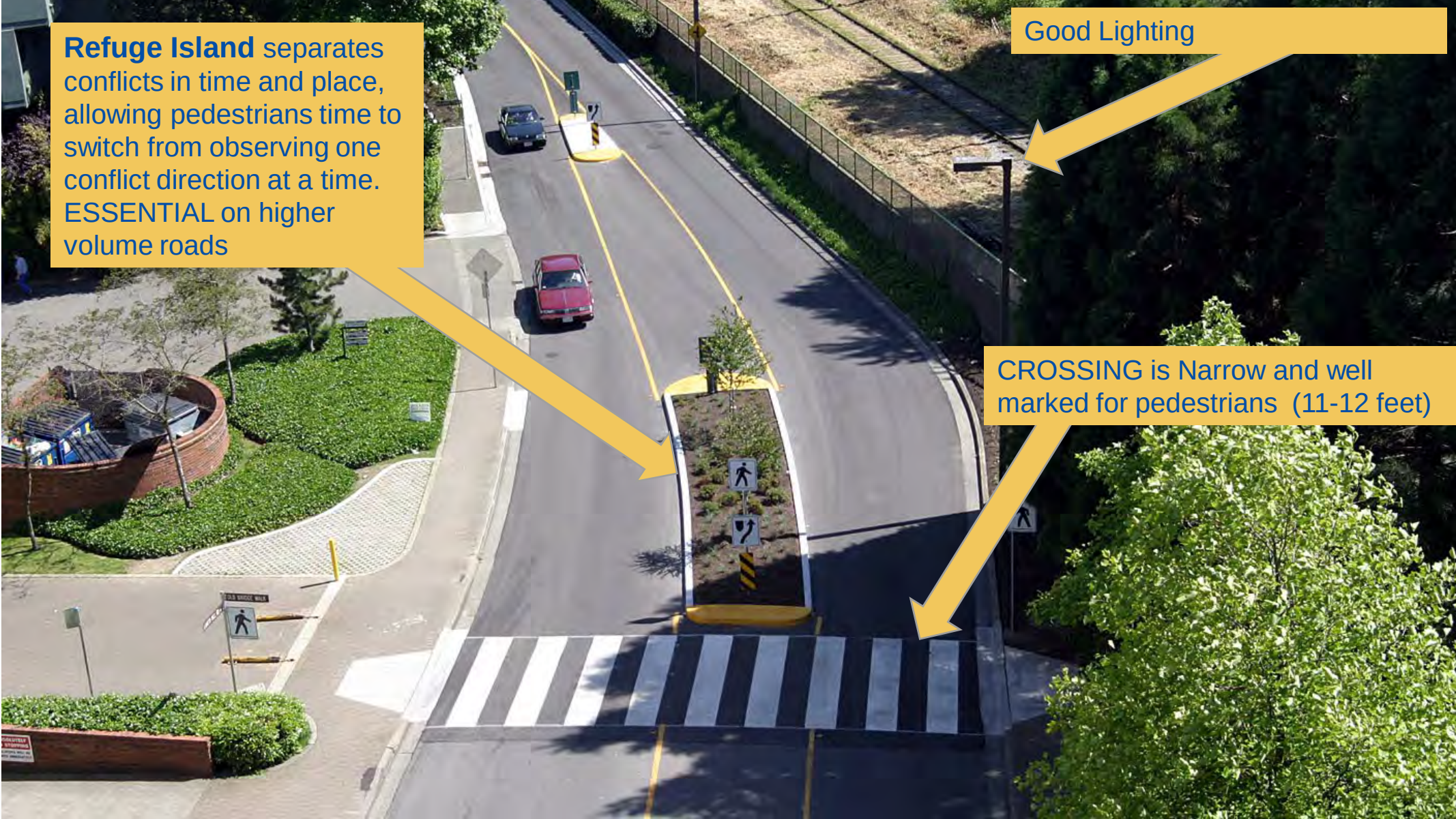
When sufficient space can be placed in the channel island it is possible to create an angle. The angled Z shape points pedestrians toward approaching cars, slows their movement and creates more storage space.

Image: Honolulu, Hawaii

A reduction in pedestrian crash risk when crossing two- and three-lane roads compared to roads with four or more lanes.

ASHEVILLE, NC


Vertical landscape features
help motorists to slow 200 feet out
Z CROSSING Skewed crossing helps pedestrians see motorists
Olympia, Washington (School Crossing) – Former 4-lane


Refuge Island separates conflicts in time and place, allowing pedestrians time to switch from observing one conflict direction at a time. ESSENTIAL on higher volume roads
Good Lighting
CROSSING is Narrow and well marked for pedestrians (11-12 feet)

Other Applications

Boulevard Streets

Consider new developments that will be built out in stages. This Castle Rock, Colorado development put in curbing for an eventual 4 lanes, but immediately installed bike lanes and a buffer to keep speeds low.

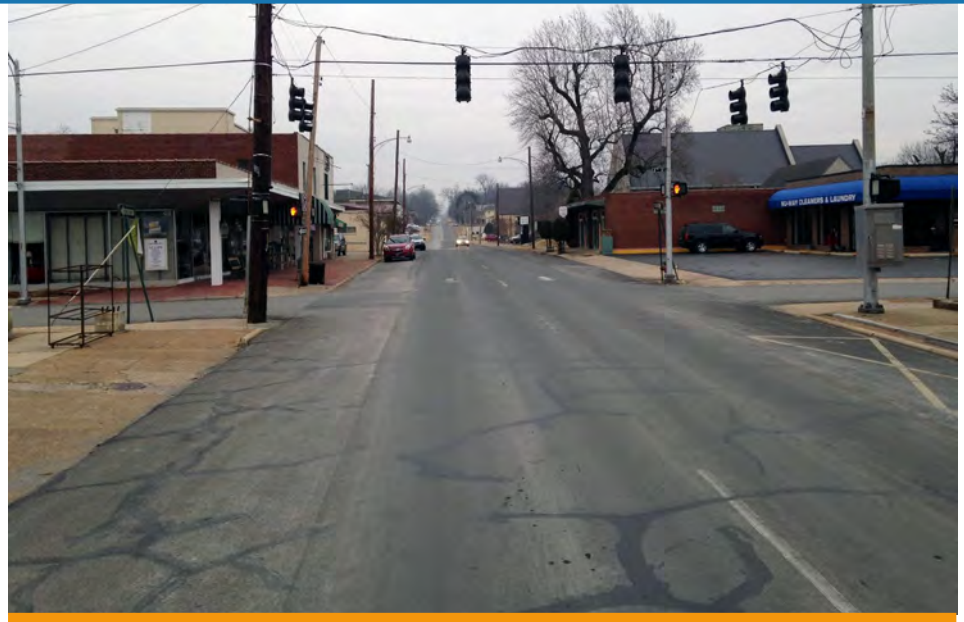
Clearwater, FL


STOP
15
MPH

Bridgeport, CA

One Way Streets

One-Lane One-Way Example, Batesville, Arkansas



Before

After

Batesville, Arkansas, had a failing downtown with a 2-lane one-way couplet. Speeds were high and there was no sense of place. After pondering going back to a two-way street, knowing they wanted low speeds and significant added parking, they kept the one-way operation, then converted one of the lanes to angled parking. The added effect of alternating the parking each block, creating a chicane at each intersection, brought the needed magic to the street. Stores are now doing well, and new investors are flowing into the remade street.

ONE-WAY STREETS

Many downtowns in North America made the mistake of converting safer, more accessible, two-way streets into one-way streets in order to move more traffic at higher speeds. Often speeds and crashes went up while yielding to pedestrians went down. Today, when one-way streets are still useful, it is often possible to convert one or more lanes into parking or bike lanes or both.

PORTLAND, OR

PORTLAND, OR

This area was recaptured from a 4th travel lane; the street took on a whole new life

PORTLAND, OR

Missoula Road, Missoula, MT

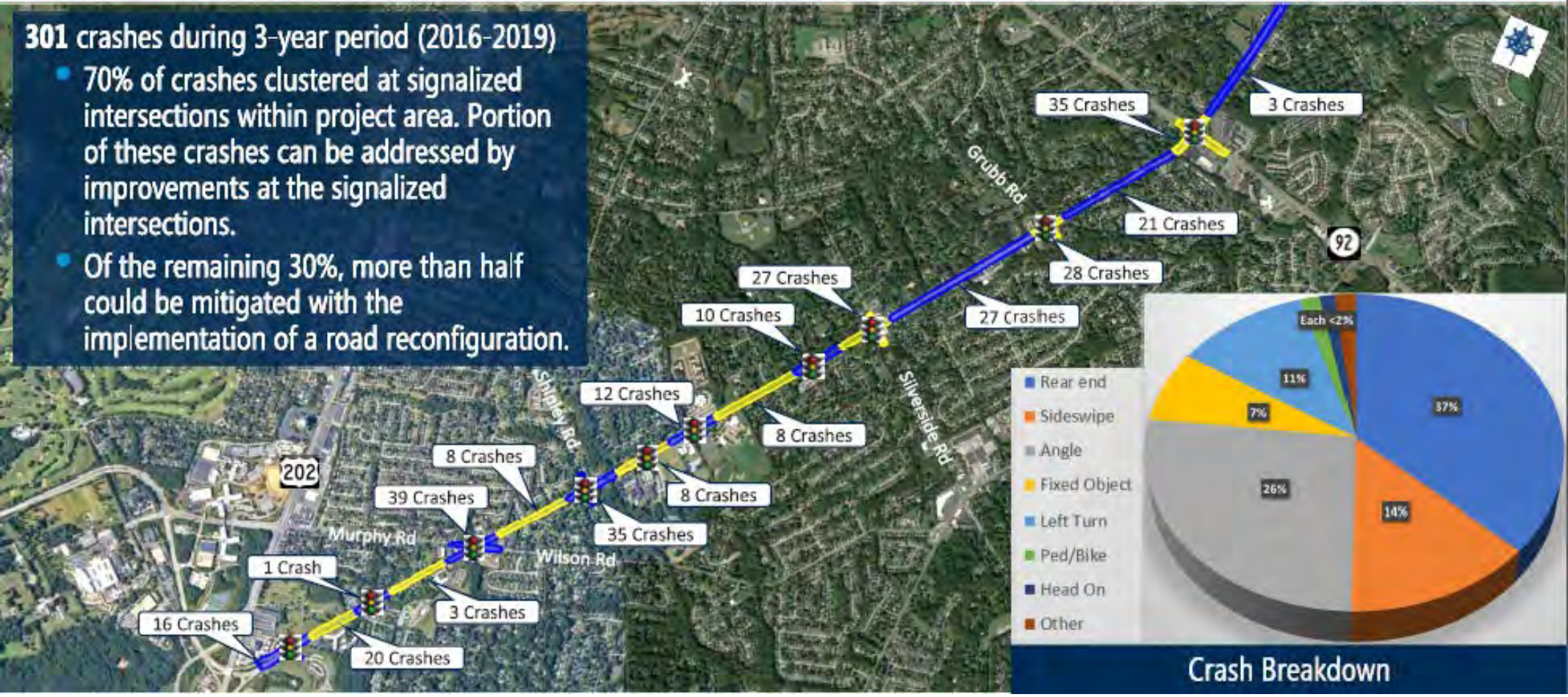
Engagement

DELDOT WANTS TO REDUCE THE NUMBER OF LANES ON FOULK ROAD (PHOTO BY DOUGH4872, FROM WIKIMEDIA)

Safety Impacts Along the Corridor

301 crashes during 3-year period (2016-2019)

- 70% of crashes clustered at signalized intersections within project area. Portion of these crashes can be addressed by improvements at the signalized intersections.
- Of the remaining 30%, more than half could be mitigated with the implementation of a road reconfiguration.



Crash Breakdown

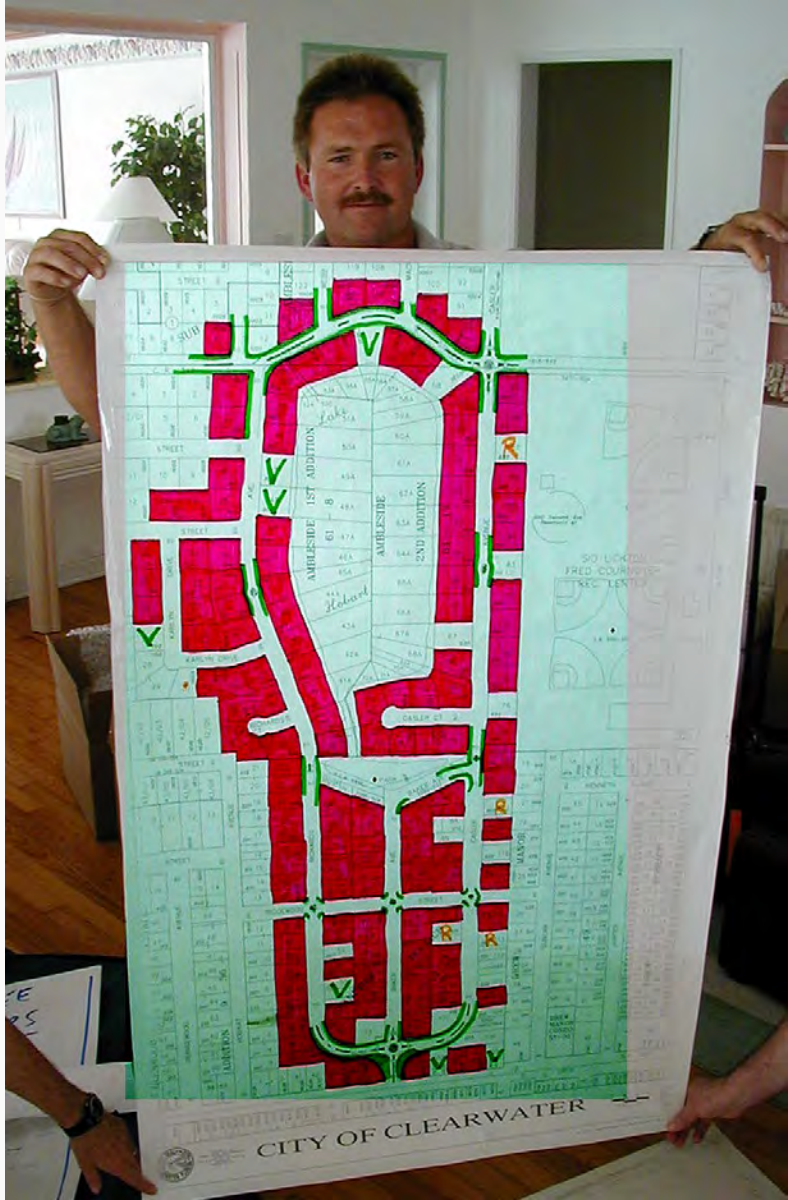
Grandview Terrace

Clearwater, Florida

99% Neighborhood Approval

Keys to success included:

- Finding a neighborhood champion
- Empowering the neighborhood
- Neighbors built their plan after becoming informed
- A small neighborhood group went door to door to get approval



Neighbors solving problems

Neighbors can best:

- Mobilize residents
- Define the problems
- Develop ownership
- Identify the best tools
- Identify the best locations
- Achieve support
- Monitor level of success

Avenue Quality Performance Levels

Average Daily Traffic (ADT)

Walkable Communities, Inc.

Well designed neighborhoods allow quality distribution of traffic. Good planning allows traffic volumes to stabilize in the "high performance" range. When land use patterns or other auto-dependency become extreme full capacity Avenues are uncomfortable but can maintain quality. Communities should avoid "Biggee Sizing" roads. With higher volumes quality is retained with extra measures.

Quality Level	Comfortable		High Performance		Approaching Full Capacity		
Volume	3,000	6,000	9,000	12,000	15,000	18,000	21,000
Gaps: Cars per minute each direction	3	5	7.5	10	12.5	15	18
Example Locations							
	Mill Creek Washington	Chico California	Santa Monica California	Greenville South Carolina	Mercer Island Washington	Seattle Washington	Orlando Florida
Observations and Likely Treatments	**Gaps:** Frequent **Controls:** Rare **Crossings:** Informal **Delays:** Very Rare **Parking:** Preserve Sight Lines **Bike Lanes:** YES	**Gaps:** Frequent **Controls:** Rare **Crossings:** Informal or markings **Delays:** Rare **Parking:** Preserve Sight Lines **Bike Lanes:** YES	**Gaps:** Convenient **Controls:** Roundabouts or Four Way **Crossings:** Markings **Delays:** Occassional **Parking:** Preserve Sight Lines **Bike Lanes:** YES	**Gaps:** Common **Controls:** Roundabouts or Four Way **Crossings:** Medians and Bulbouts **Delays:** Moderate **Parking:** Inset **Bike Lanes:** YES	**Gaps:** Most hours **Controls:** Roundabouts or Signals **Crossings:** Medians and Bulbouts **Delays:** Common **Parking:** Inset **Bike Lanes:** YES	**Gaps:** Infrequent **Controls:** Roundabouts or Signals **Crossings:** Medians and Bulbouts **Delays:** Many hours **Parking:** Inset **Bike Lanes:** YES	**Gaps:** Steady Traffic **Controls:** Roundabouts or Signals **Crossings:** Medians and Bulbouts **Delays:** Expected **Parking:** Inset **Bike Lanes:** YES

Note: Photos depict likely features or conditions, not actual peak ADT's.

Road Diets --

7 or 5 lanes to 4, Plus Median

Average Daily Traffic (ADT)

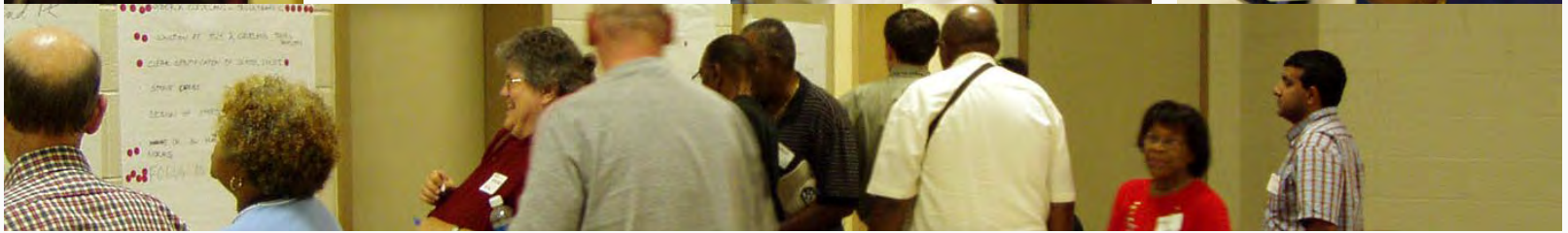
Boulevards are essential workhorses for managing traffic. They are generally not needed until volumes exceed 18-23,000 vehicles. Avoid five or seven lane roads. Access controls improve carrying capacity 30%, while reducing injury crashes 50-70%. Boulevards require more than crosswalks. Either crossing islands, full medians or medians with signals are needed. Parking is inset on higher volume Boulevards.

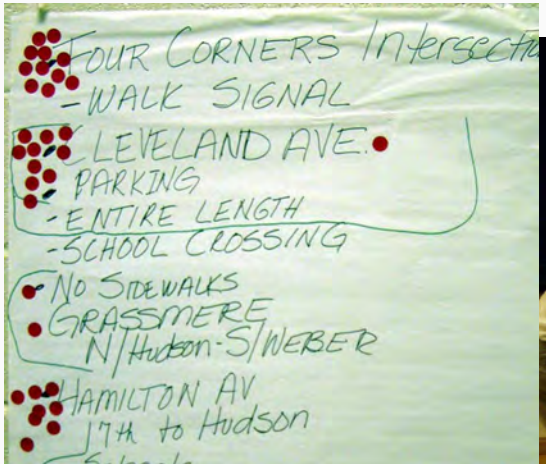
Quality Level	Comfortable	High Performance	Approaching Full Capacity
	Crossing Islands Needed	Medians Recommended	Medians Essential
Volume	18,000	24,000	30,000	36,000	42,000	48,000
Cars per minute both directions	15	20	25	30	35	40
Example Locations	 San Francisco California	 Bellevue Washington	 Winter Park Florida	 Del Mar California	 Los Angeles California	 Bellevue Washington
Access	Moderate	Moderate	Partial Median controlled	Full Median controlled	Full Median controlled	Full Median controlled
Controls:	Roundabouts or Signals	Roundabouts or Signals	Roundabouts or Signals	Roundabouts or Signals	Roundabouts or Signals	Roundabouts or Signals
Crossings:	Medians	Medians	Medians and Bulbouts	Medians and Bulbouts	Medians and Bulbouts	Medians and Bulbouts
Delays:	Limited	Moderate				

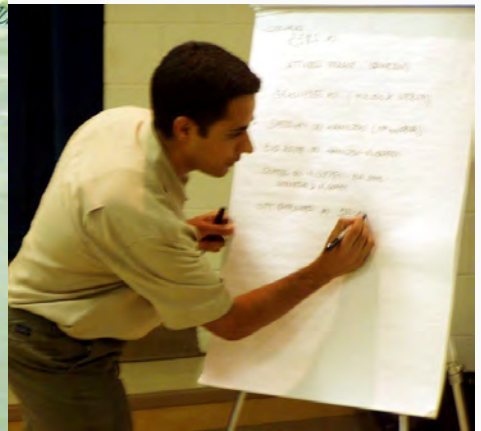
Note: Photos depict likely features or conditions, not actual peak ADT's.

rvations and
y Treatments

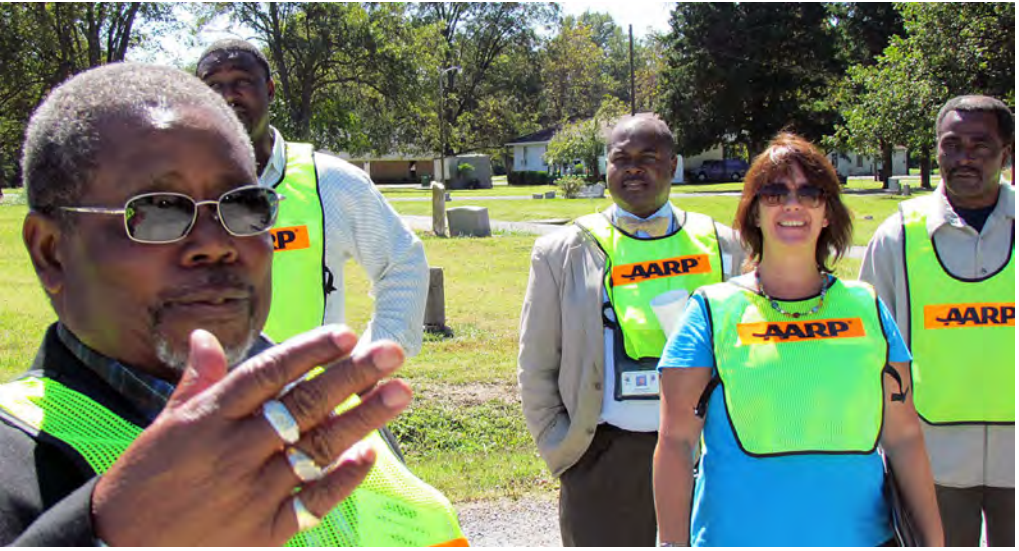
Neighbors Working Together







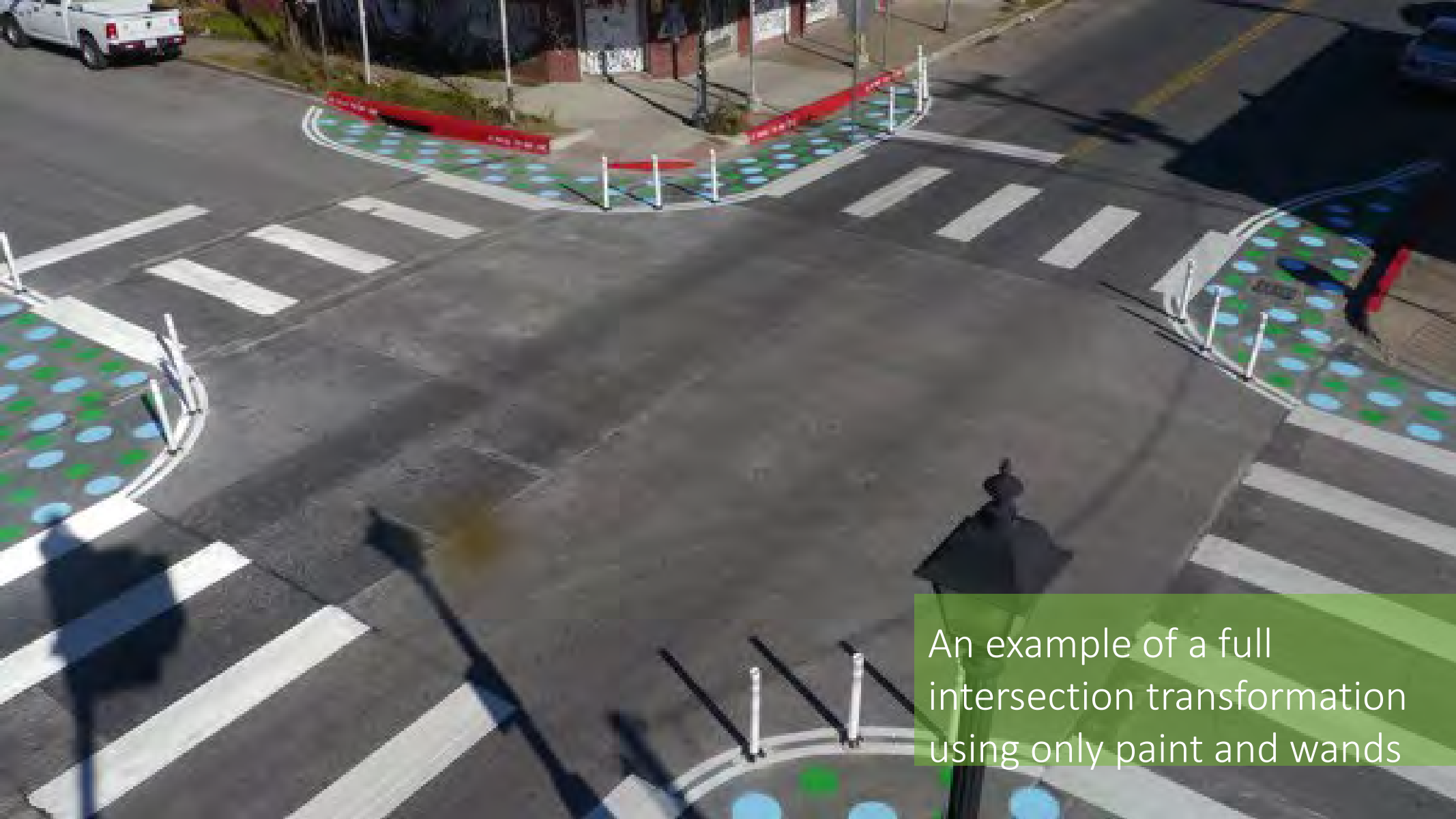

AARP


AARP


Mound Bayou, Mississippi

Tactical Urbanism

A painted curb extension



An example of a full intersection transformation using only paint and wands

Seattle’s pavement to parks program has proven a success. They place treatments for a full year, then almost always get neighbors to. Move to permanent change.


Seattle is up to 25 road diets

A typical Seattle road diet is 4-3 lanes, + bike lanes


A benefit to a road diet is the creation of a wider buffer between motorists and pedestrians

VENICE, FL

VICTORIA, BC

HONOLULU, HI

HONOLULU, HI

A full-size bus in a ten-foot lane with a road diet (Honolulu, HI)

HONOLULU, HI

SEQUIM, WA

Road Diet Conversion to Protected Bike Lanes

Missoula, MT

EDGEWATER, FL

East Lansing, FL

HONOLULU, HI

San Francisco, CA

Road Diet, Ft Lauderdale By-The-Sea, Florida

Best Practices

South Beach, Miami, Florida

Espanola Way, circa 1995

Appropriate side streets could be selected for conversion to people-only streets for certain hours a day, or for events and weekends. During such hours, the street is packed with social life and related entertainment.

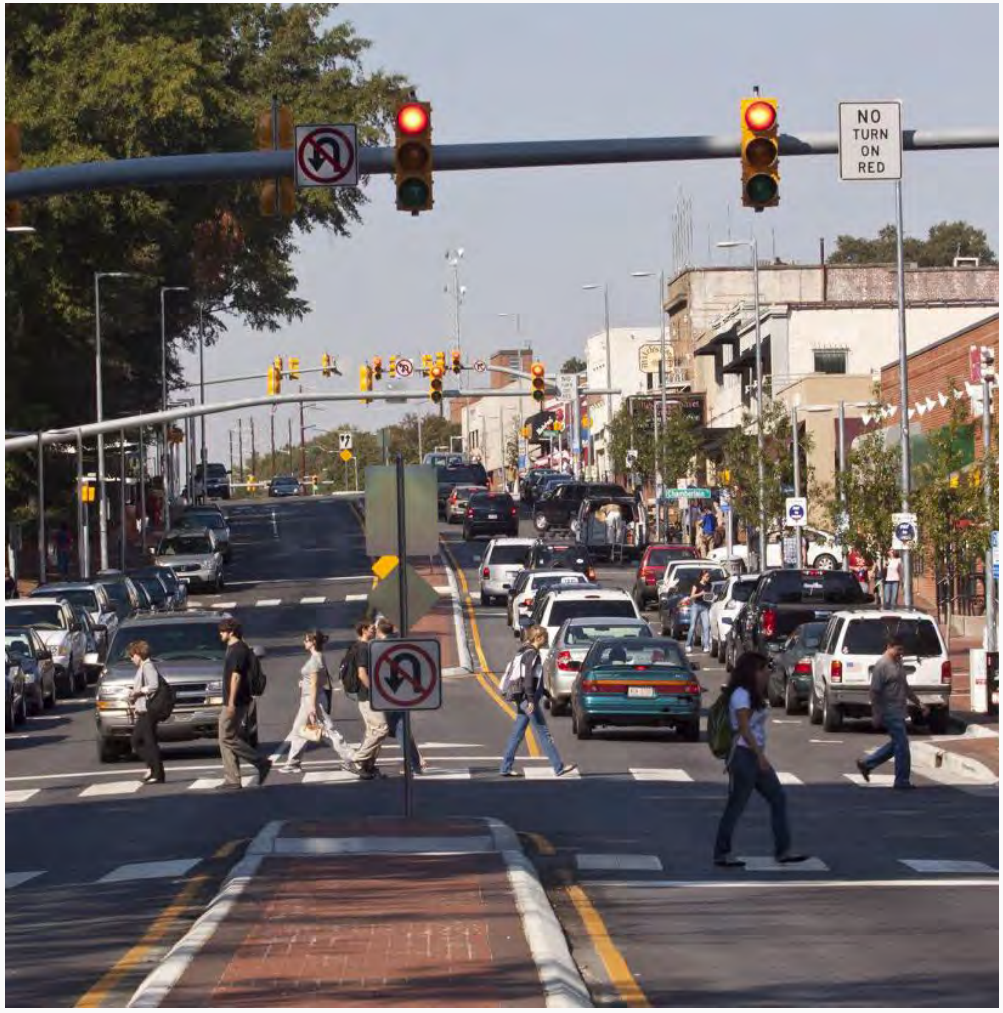
Espanola Way today

Manitou Springs, Colorado

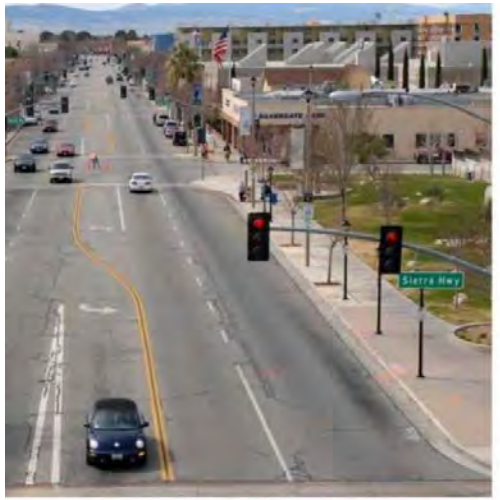
At the request of the business community this mountain town reduced their main street travel lanes from four to three. In a unique move, the town scored out its new third lane, colorized the asphalt and re-laid it. This action reduced the apparent width of the travel lanes, bringing down speeds and making the downtown more people friendly. Yielding rates went up. Now, motorists drive an average speed of 20mph.

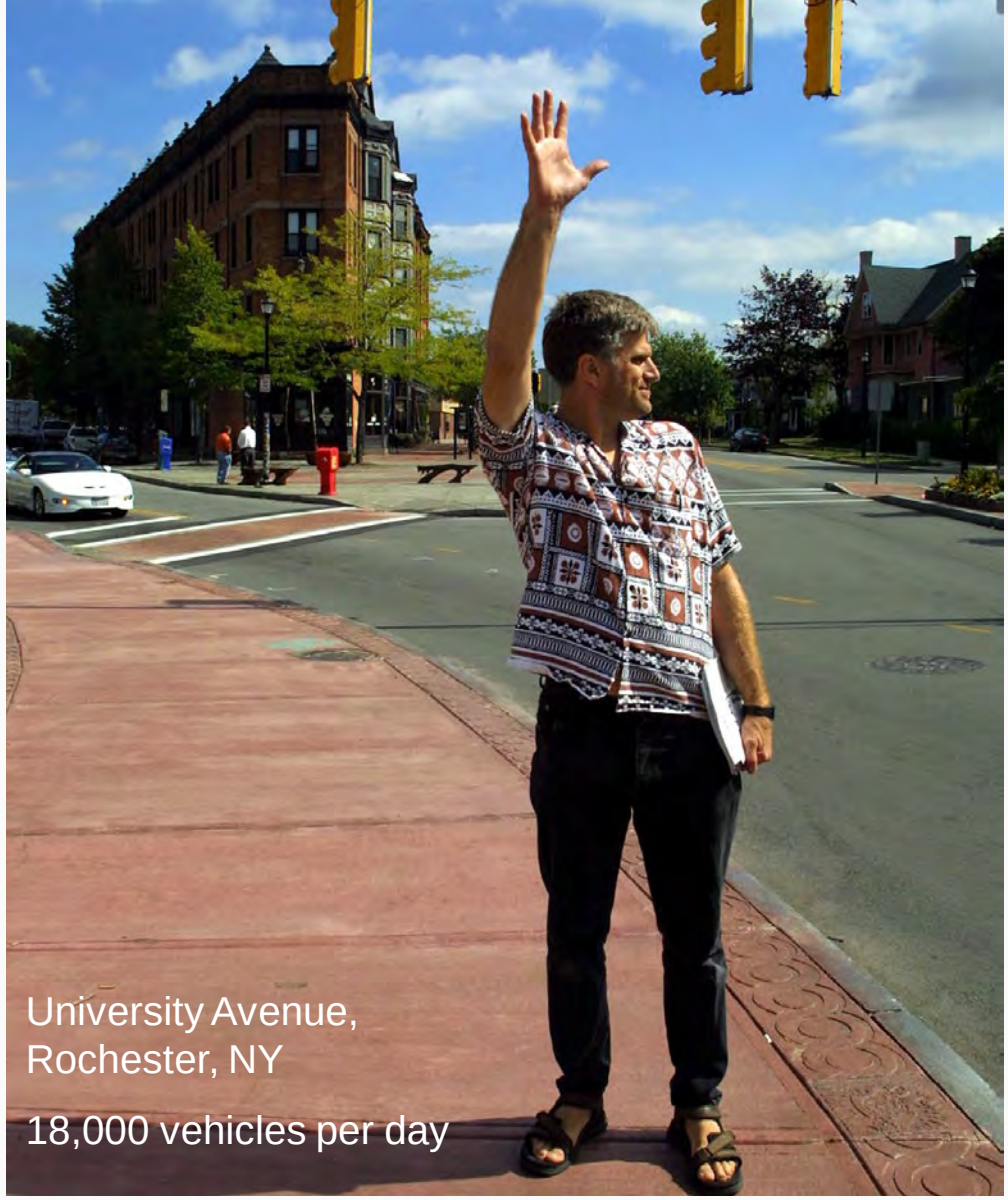
Nina Szlosberg

Hillsborough Street, Raleigh, NC (4-2 Conversion)



Lancaster Blvd, Lancaster, California





Community Leaders

Leaders often emerge when poor decisions are made

Doug Rice reacted to his county's desire to widen this road to six lanes. Impacts would have affected many of the city's best homes and public space.

After bringing together a leadership group, they were able to have the 4-lane road rebuilt as a 2-lane road, creating a 2-mile long Art Walk, which started a major neighborhood revitalization.

Narrowed from 4 to 2 lanes


WRITERS & BOOKS

Video References

1. This 2-minute video shows how bike lanes can be built without clogging up traffic (Jeff Speck/Spencer Boomhower)
2. Road Diet, Designing a Safer Speed (VOX)
3. Road Diets: A Proven Safety Countermeasure (FHWA)
4. STEP Road Diets (FHWA)

References

Discussion

BLUE ZONES™

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