

How to Develop a Pedestrian Safety Action Plan

Course Introduction

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Outcomes

At the end of this series, you will be able to:

- ⇒ **Develop and implement a Pedestrian Safety Action Plan addressing your specific issues, problems, needs and resources**
- ⇒ **Describe how pedestrians should be considered and provided for during the planning, design, work zone, maintenance, and operations phases.**
- ⇒ **Describe how human behavior affects the interaction between pedestrians and drivers**
- ⇒ **Identify good practices and effective solutions to enhance pedestrian safety and accessibility.**

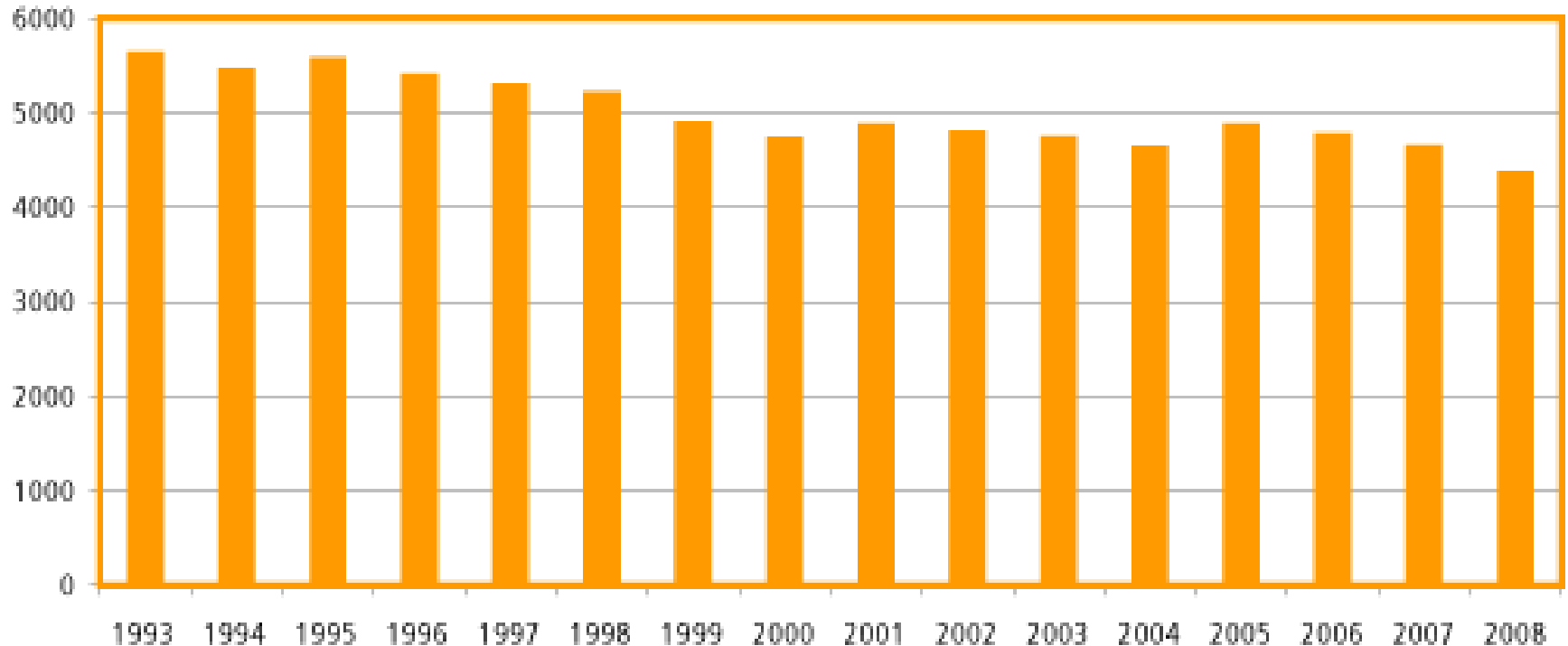
Series Overview

- ⇒ **The Big Picture – The “Why” and Planning Factors**
- ⇒ **Stakeholders**
- ⇒ **Data Collection**
- ⇒ **Data Analysis**
- ⇒ **Enforcement – Programs and Strategies**
- ⇒ **Education – Programs and Strategies**
- ⇒ **Engineering – Programs and Strategies**
- ⇒ **Funding**
- ⇒ **Policy Discussion: What potential policies and procedures are need to further enhance pedestrian safety and accessibility**

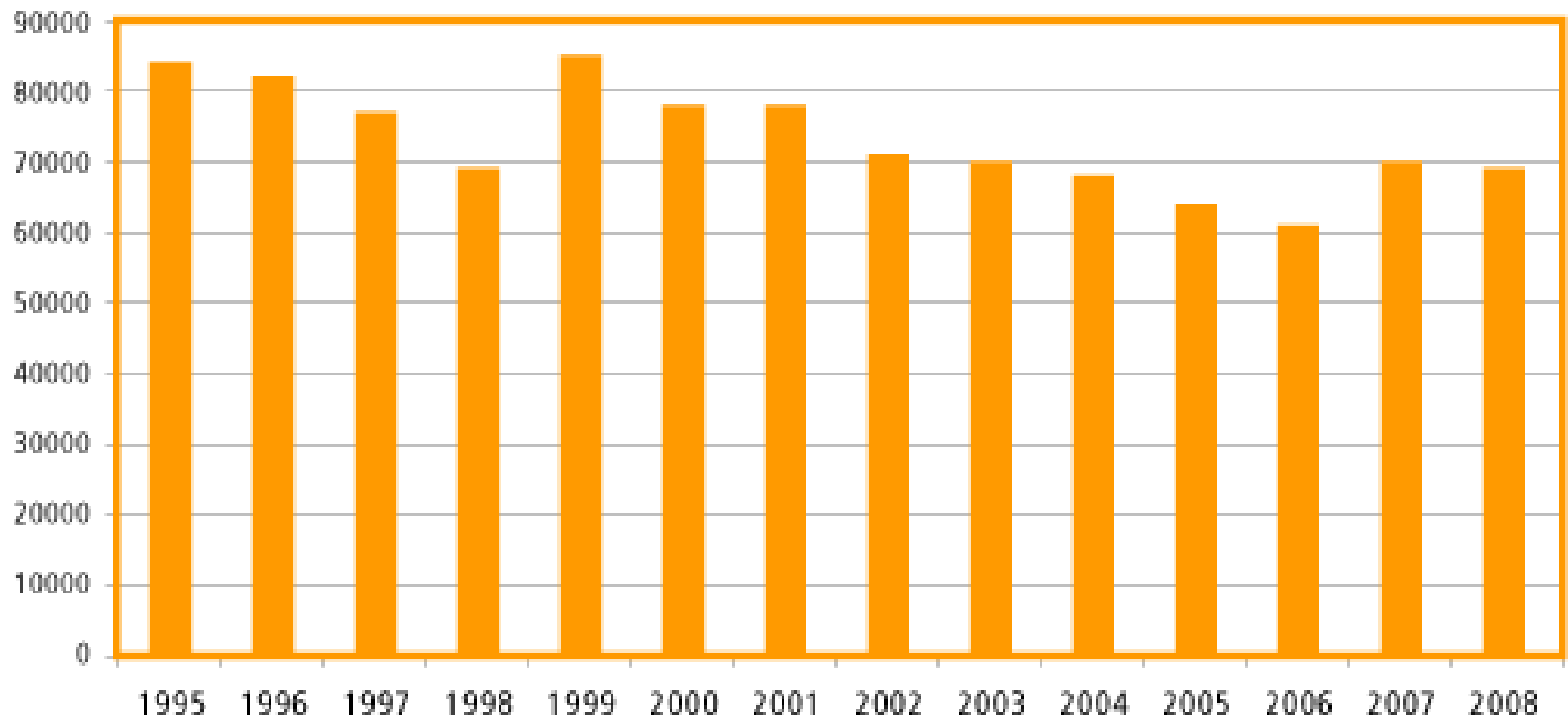
Overview of Pedestrian Safety Problem

- ⇒ Annually almost 5,000 pedestrians are killed in traffic crashes, representing about 12% of all traffic deaths.
- ⇒ Nearly 70,000 pedestrians are injured each year
- ⇒ Most crashes occur when the pedestrian crosses a road
- ⇒ Most fatalities and serious injuries occur on roads designed with little attention for pedestrian safety.
- ⇒ Pedestrians are rarely killed in walkable environments.

Pedestrian Fatalities by Year



Pedestrian Injuries by Year



Why is it important to accommodate pedestrian safety and accessibility?



Because we are all pedestrians

Why?



Because many people do not drive

Why?



Because other modes depend on walking

Why?



Because it's good for business – people walk into stores

Why?



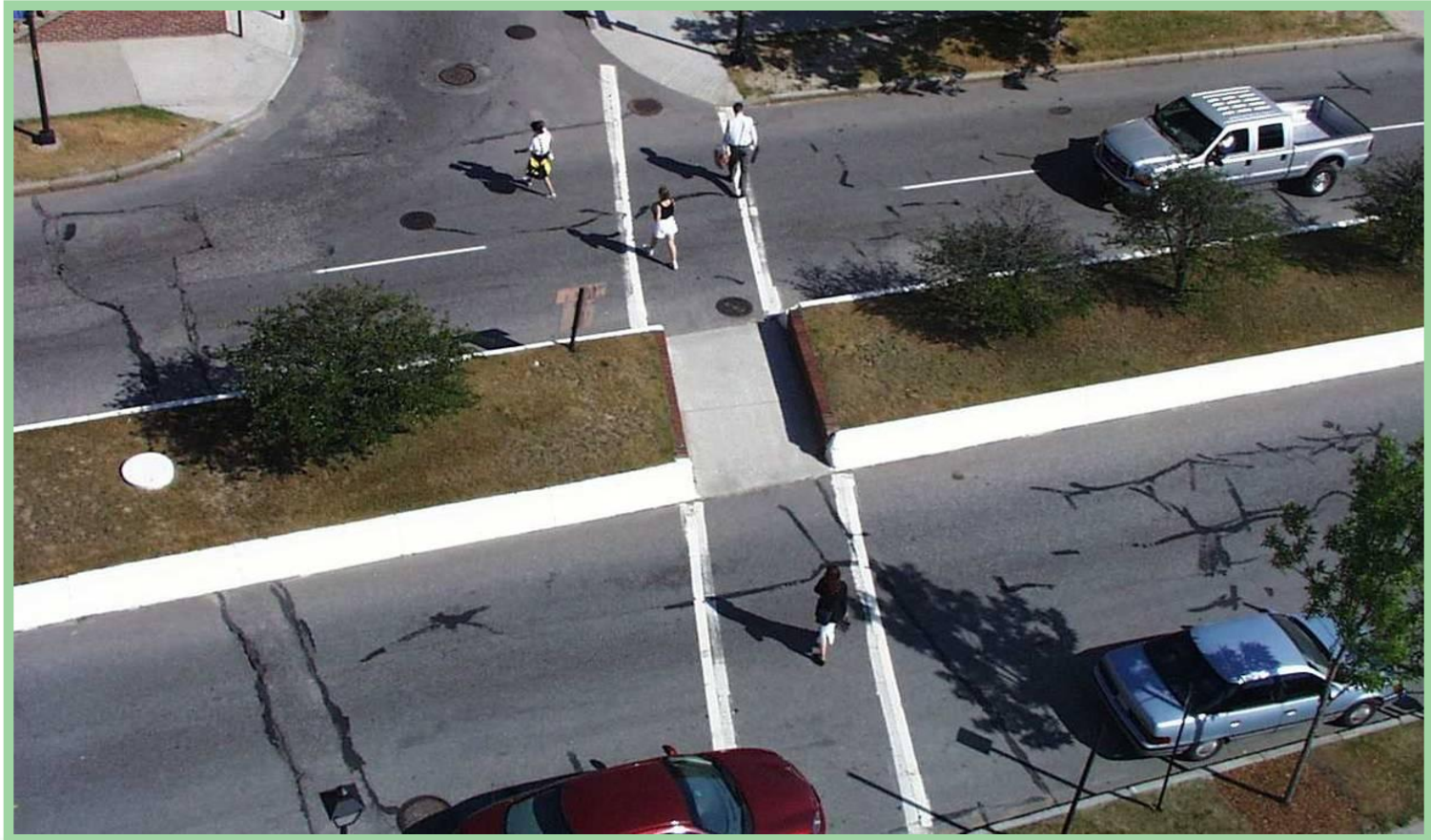
Because pedestrians use and belong on streets and highways

Why?



Because it's a healthy exercise

Why?



Because it will make roads safer for all road users

Why?



**AASHTO: “Because of the demands of vehicular traffic in congested areas, it is often extremely difficult to make adequate provisions for pedestrians. Yet this must be done, because pedestrians are the lifeblood of our urban areas...”
(1994 edition, page 97)**

Why?

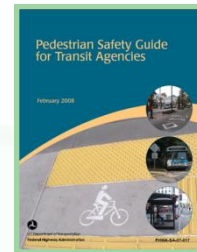
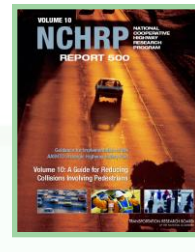
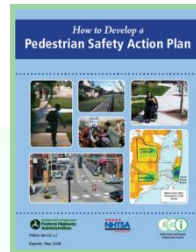
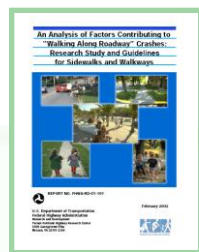
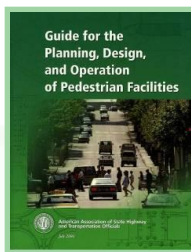
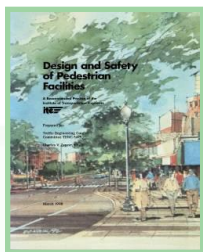
US Congressional Legislation/Policy of US DOT TEA-21 (1999):

- ⇒ “The non-motorized modes are an integral part of the mission of FHWA and a critical element of the local, regional, and national transportation system.”
- ⇒ “... mainstream bicycle and pedestrian projects into planning, design, and operation...”
- ⇒ “... bicycling and walking facilities will be incorporated into all transportation projects unless ‘exceptional circumstances’ exist.”

Because it's the LAW !!!

Resources

- ⇒ PBIC: www.walkinginfo.org
- ⇒ FHWA: safety.fhwa.dot.gov
- ⇒ NHTSA: nhtsa.dot.gov
- ⇒ ITE: www.ite.org
- ⇒ AASHTO/NCHRP: safety.transportation.org



Planning and street design elements that affect pedestrian safety:

- ⇒ Land use
- ⇒ Street connectivity
- ⇒ Access management
- ⇒ Site design
- ⇒ Level of Service

Land Use

Why do we have cities?



To minimize travel & maximize exchange (to be closer together)

How have we built our urban roadway system?

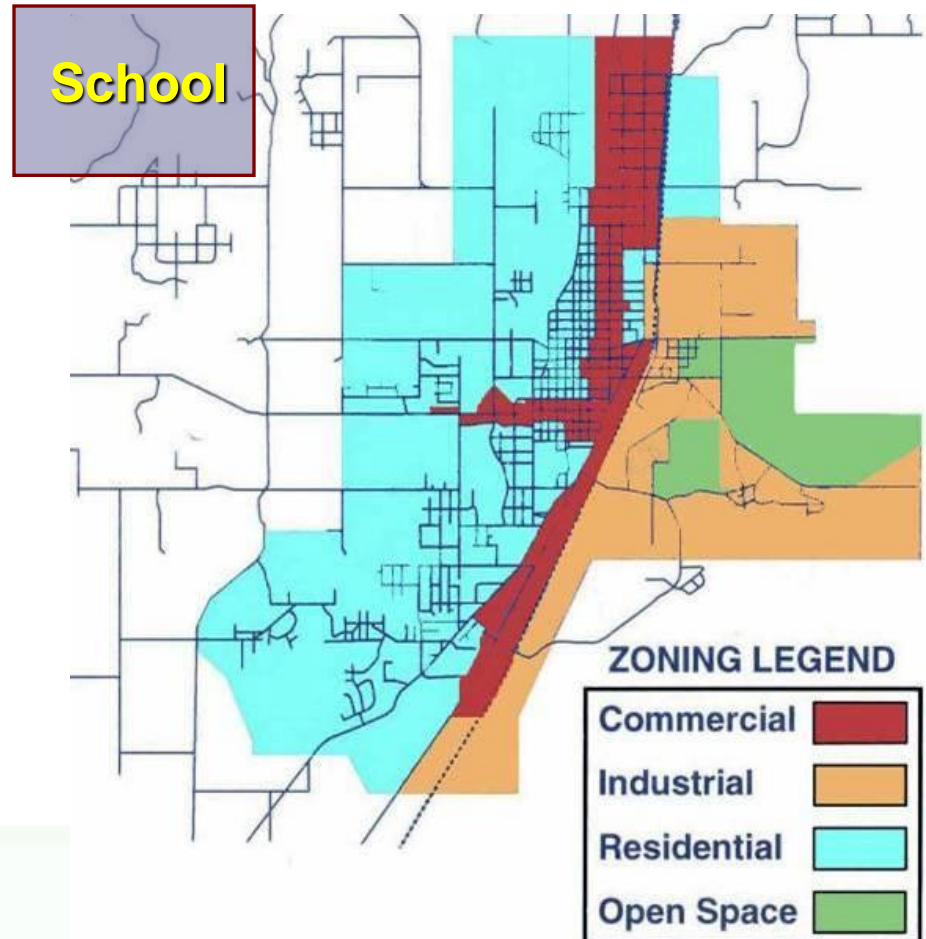


To facilitate travel over longer distances

Reducing travel demand is best achieved changing Land Use policies that bring destinations closer together

The problem:

- ⇒ Commercial activities concentrated in auto-dominated corridors.
- ⇒ Segregated land uses
- ⇒ Result: long travel distances, not conducive to walking



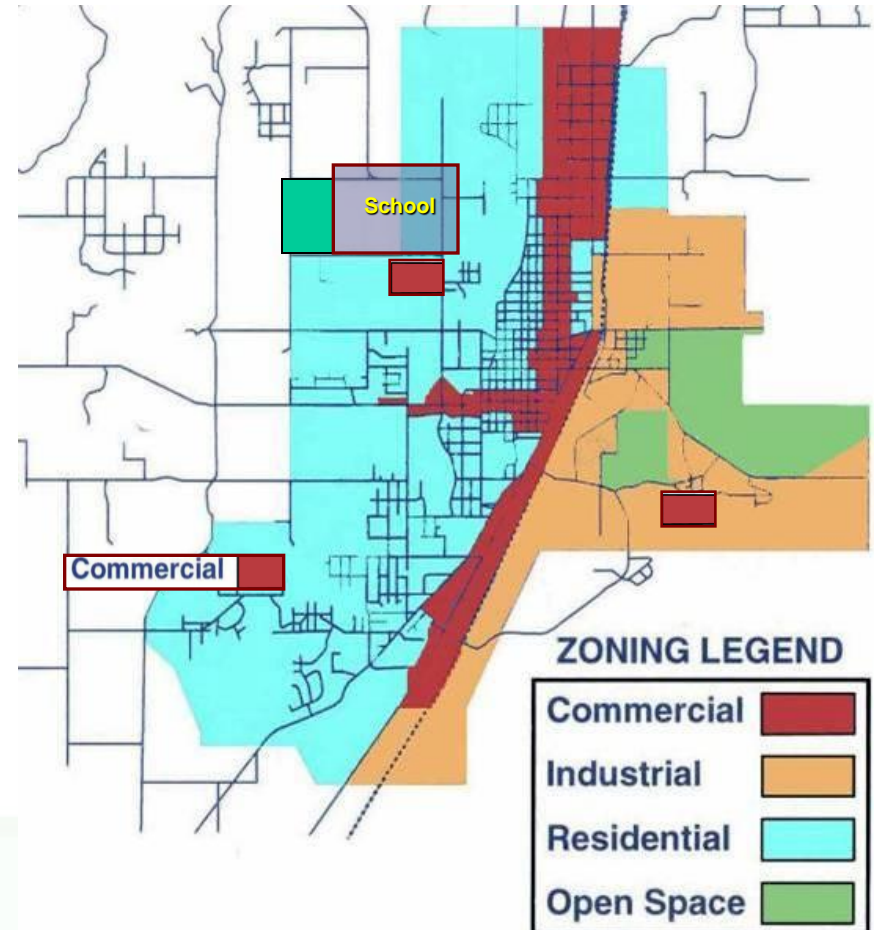
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Potential solutions?

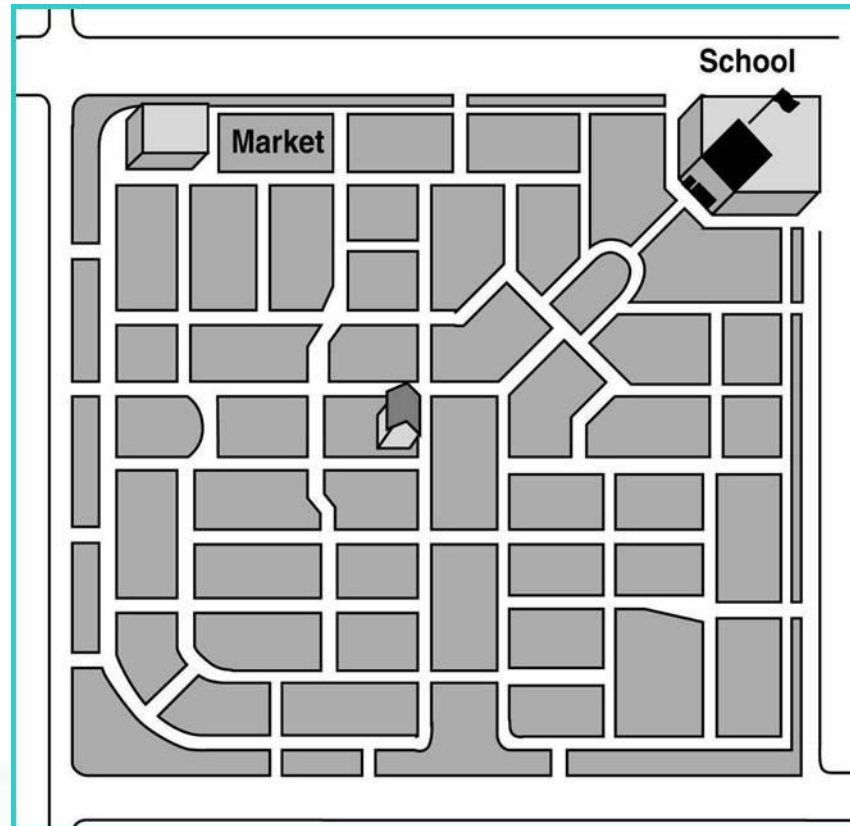
- ⇒ Allow small-scale retail in neighborhoods
- ⇒ Create neighborhood parks
- ⇒ Site school closer to residences & parks



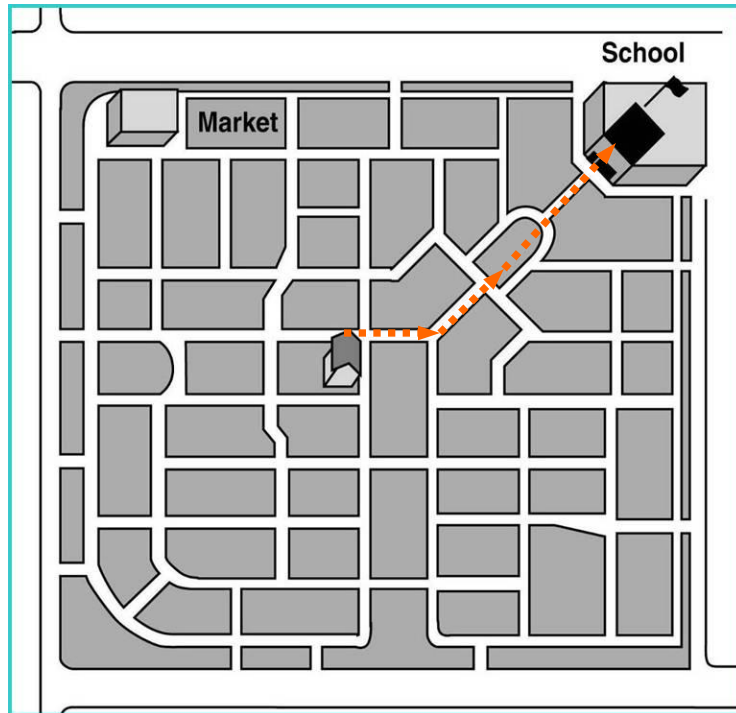


Neo-traditional development: destinations are close to residential areas

Street Connectivity

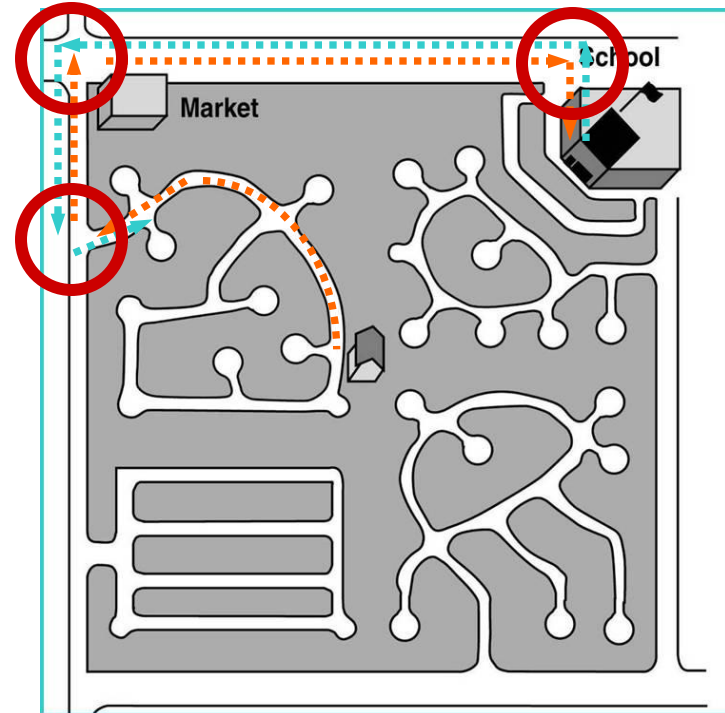


<- 1 mile square ->



Connected Streets

<- 1 mile square ->
3 left turns!



Lollipop pattern

Connectivity creates a pedestrian-friendly street system by:

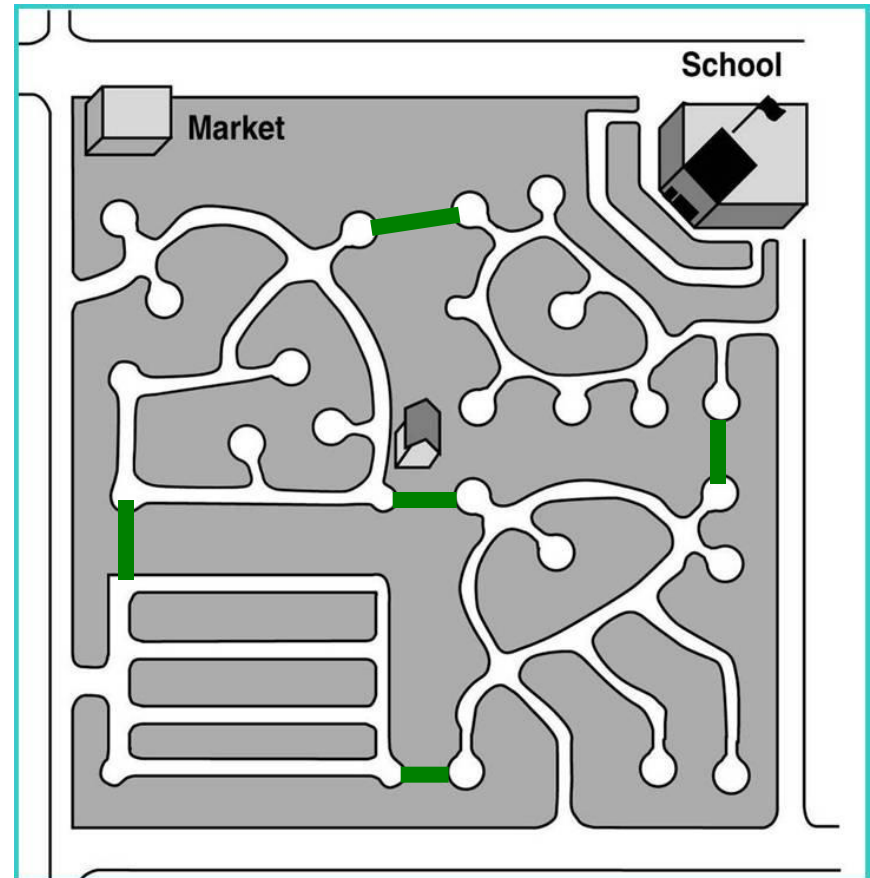
- ⇒ Reducing walking distances;
- ⇒ Offering more route choices, more quiet local streets;
- ⇒ Dispersing traffic – reducing reliance on arterials for all trips

Discussion

Can you increase connectivity with paths, greenways?

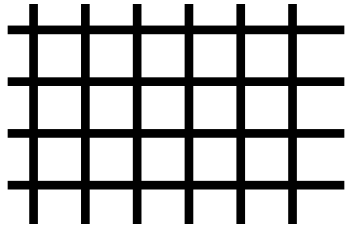
- ⇒ Reduces walking distances: **YES**
- ⇒ Offers more route choices: **YES**
- ⇒ Disperses traffic: **NO**

<- 1 mile square ->



Lollipop pattern

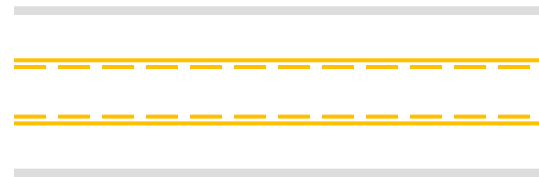
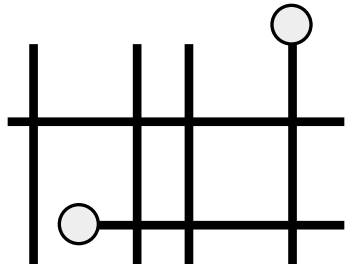
High Connectivity



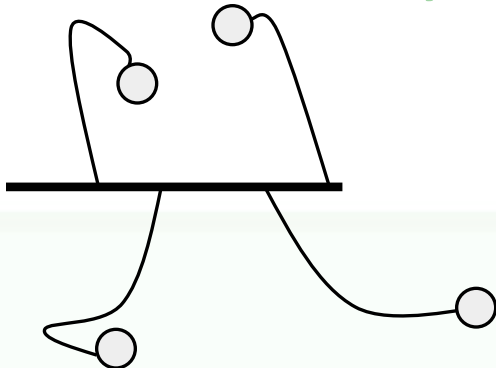
Travel Lanes Required



Moderate Connectivity

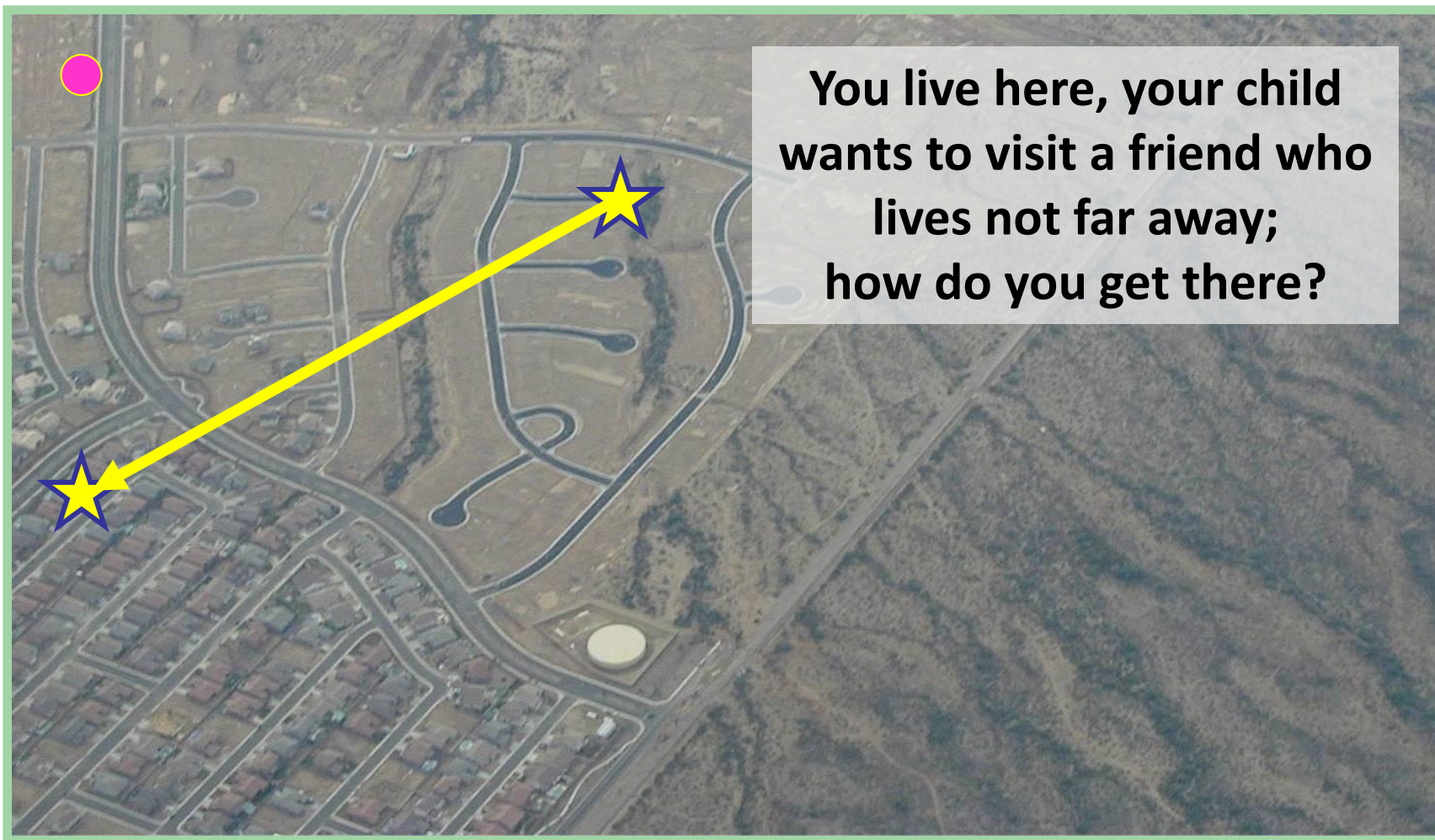


Low Connectivity





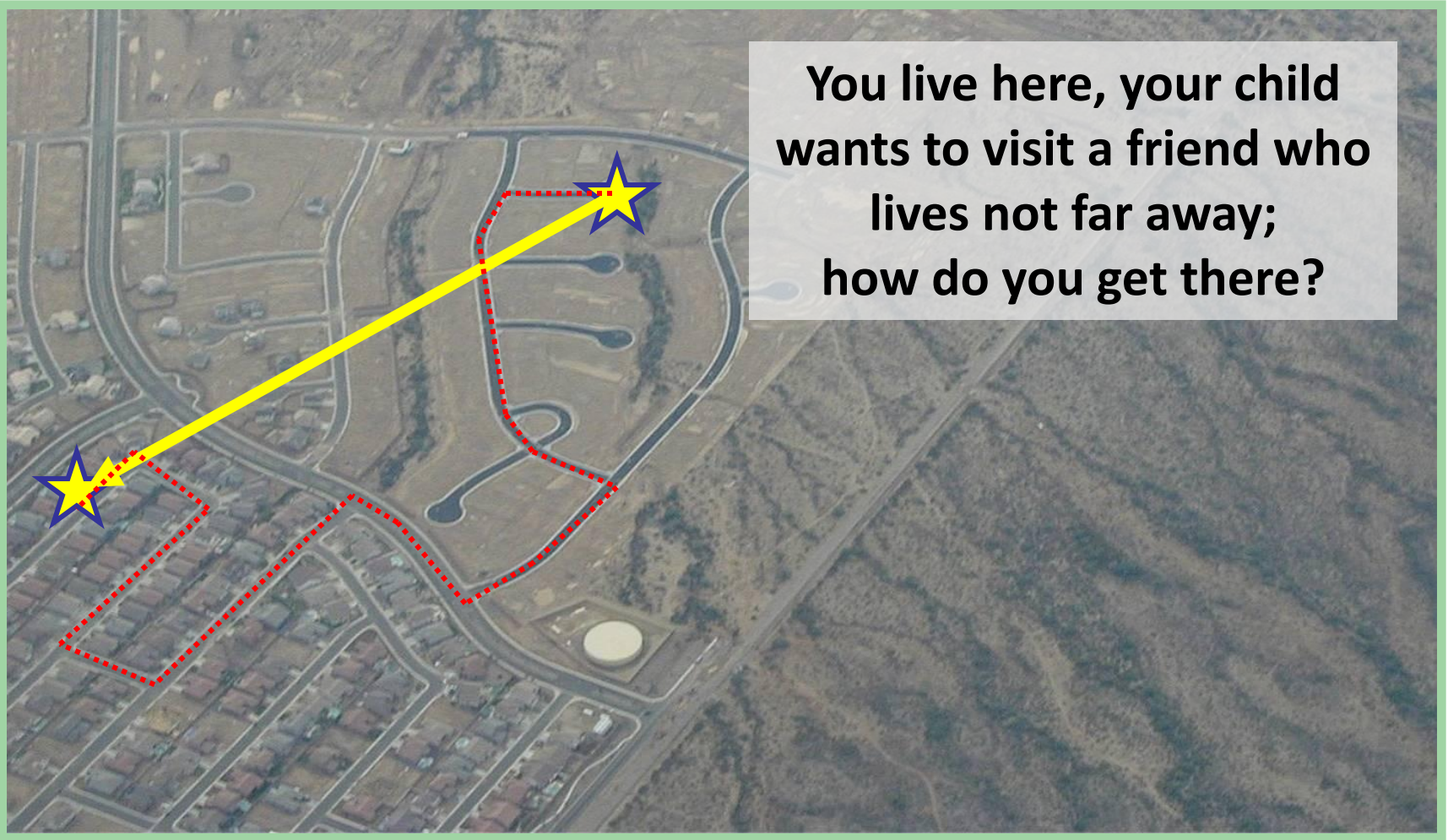
Lack of connectivity => few but large intersections



**You live here, your child
wants to visit a friend who
lives not far away;
how do you get there?**

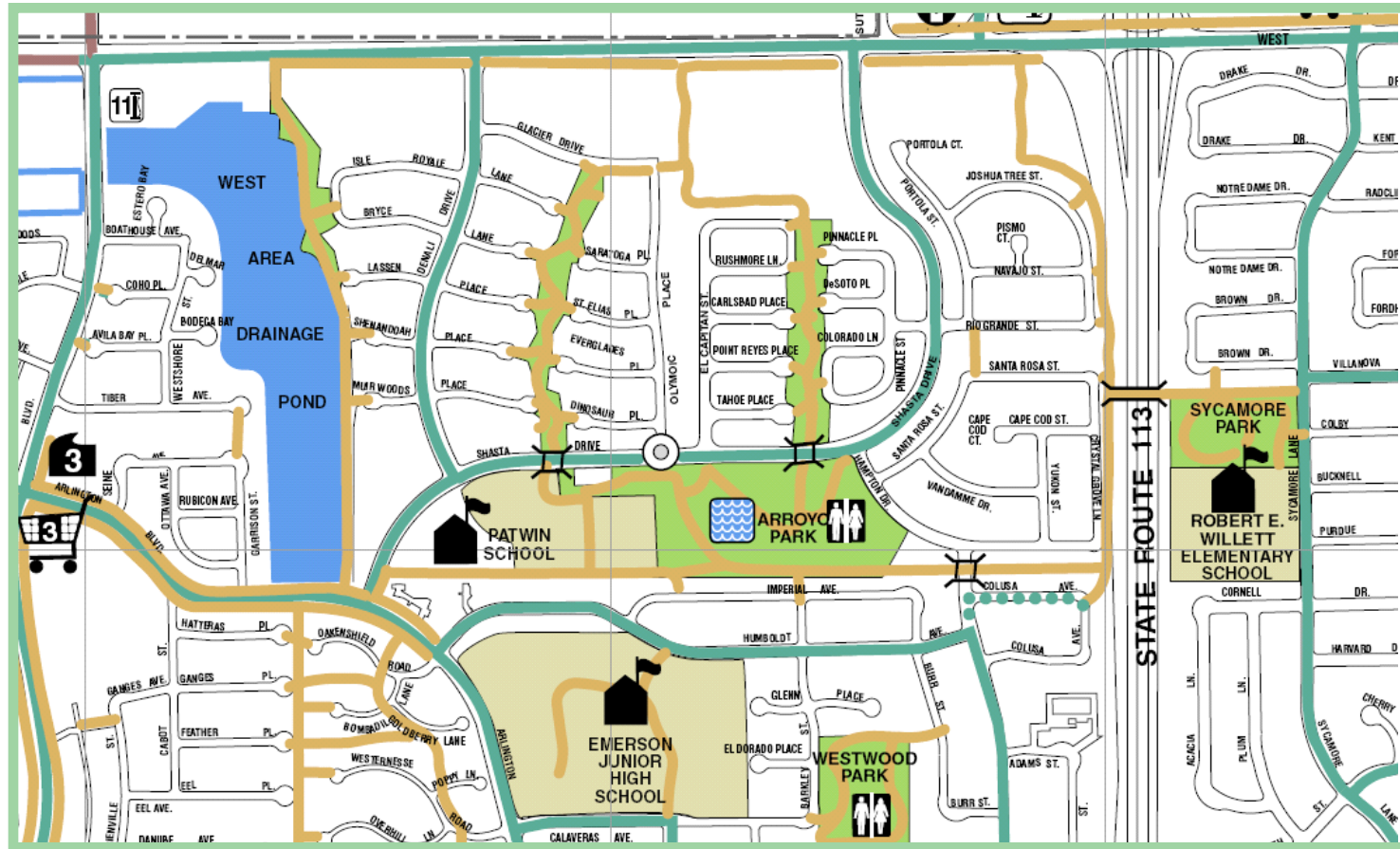
**Cul-de-sac patterns increase walking distances
& increase reliance on arterials**

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**Cul-de-sac patterns increase walking distances
& increase reliance on arterials**

Land Use & Connectivity



- ⇒ Schools next to parks.
- ⇒ Dedicate R.O.W. to link cul-de-sacs with linear parks

Access Management



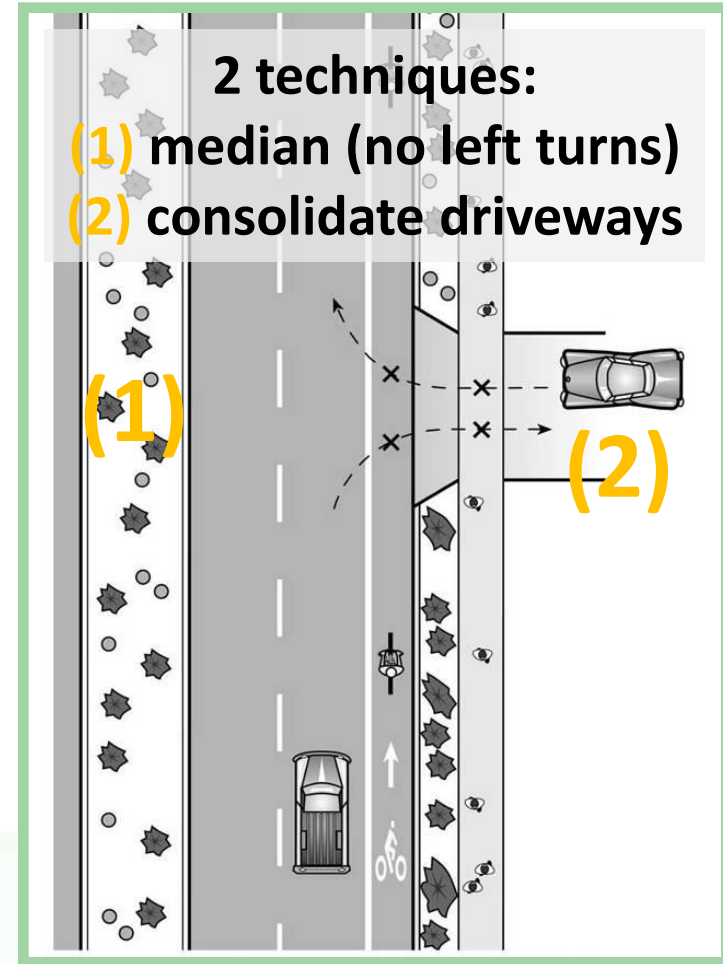
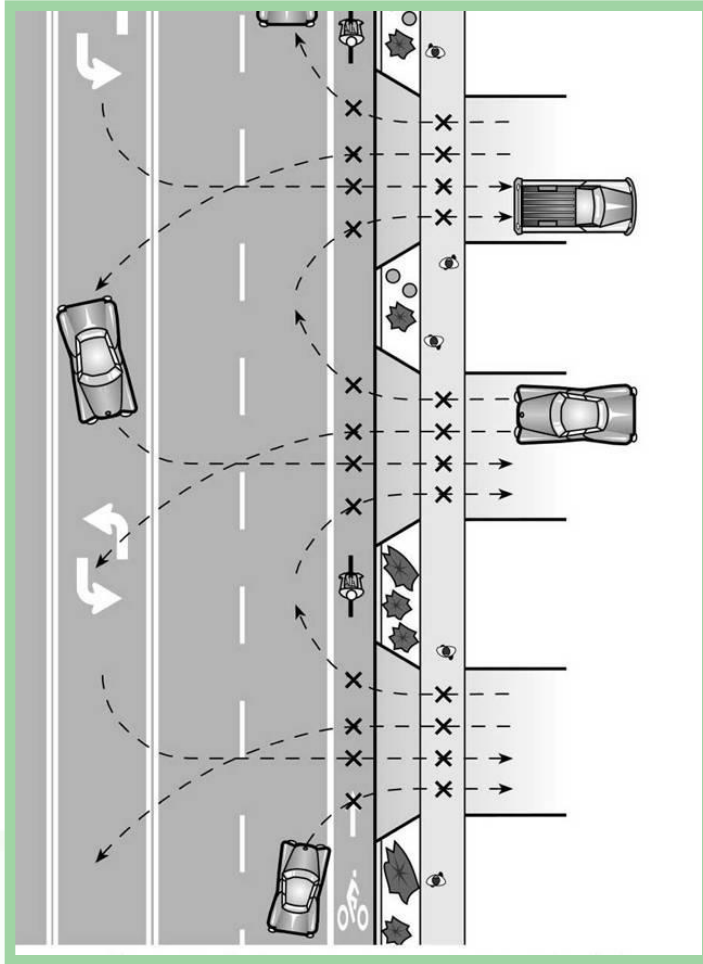
Every driveway is a potential conflict

Drivers and pedestrians must make choices:

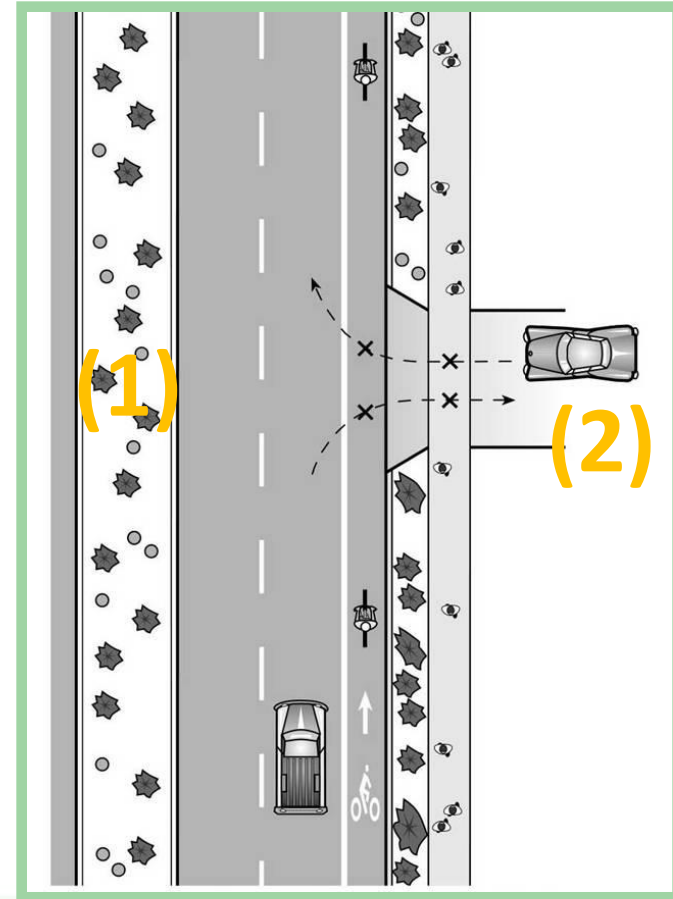
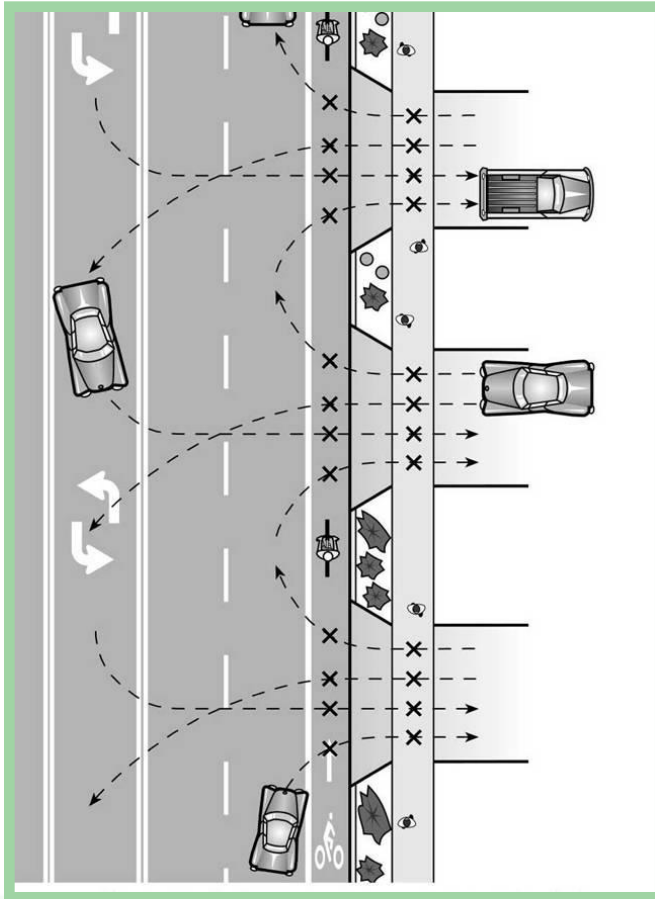


Walk in front or in back? Pull forward or back up?

Access Management => fewer conflicts at driveways

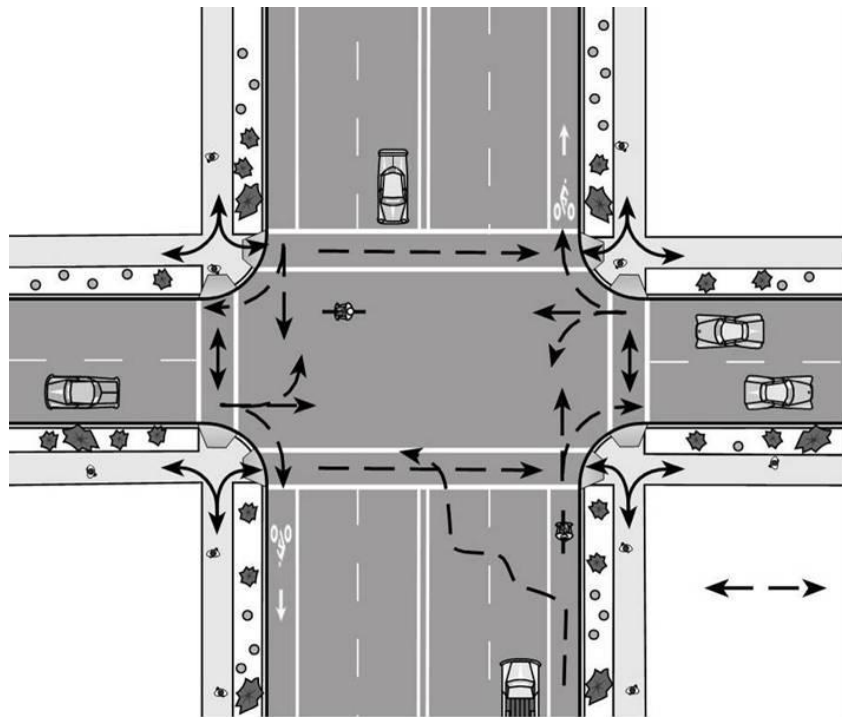


Which has greater crash reduction factor:

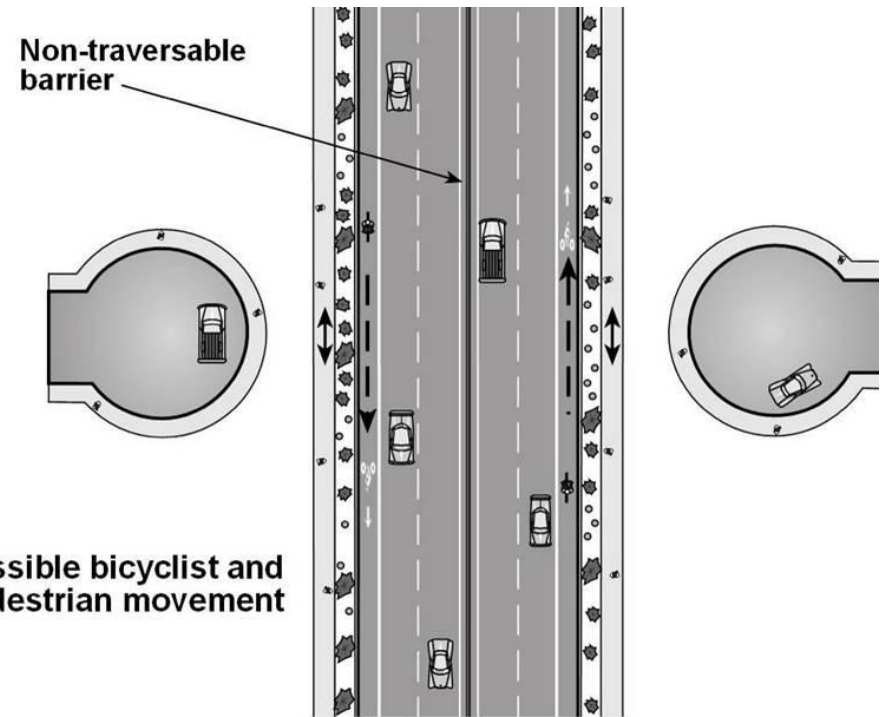


(1) Median (no left turns) or (2) consolidate driveways?

Severing public streets not a desirable access management technique

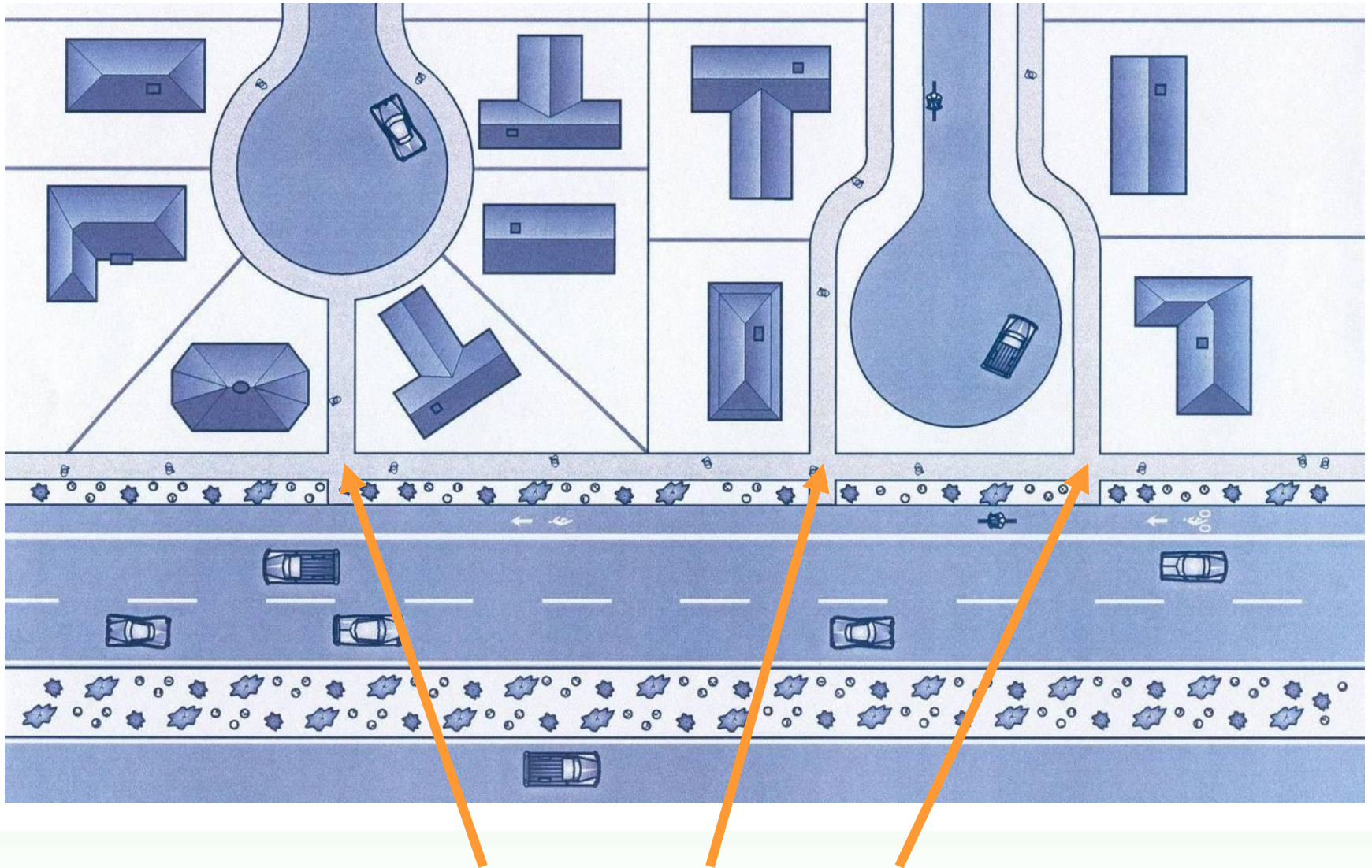


Available crossings and movements before access control



Available crossings and movements after access control

This limits people's ability to walk or bicycle



Connecting severed streets reestablishes walking routes

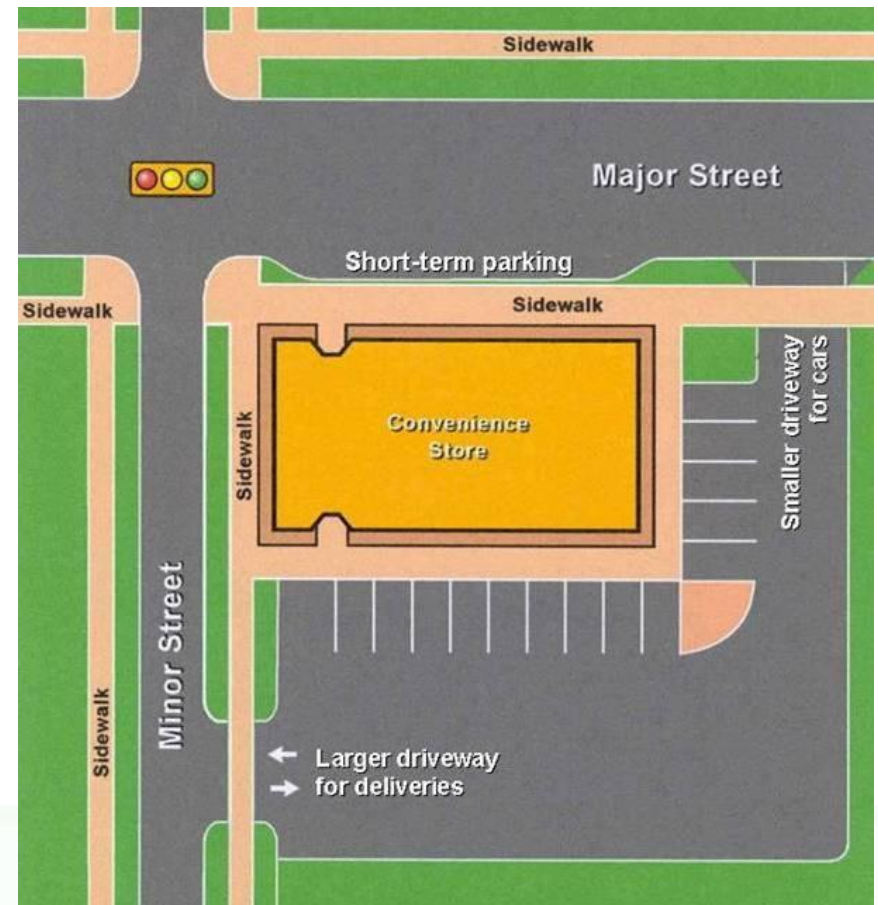


Severed street can be reconnected for pedestrians

Site Design

Bringing Buildings closer to the Street

Creates a street where drivers know to expect pedestrians





Parking between sidewalk and building is not pedestrian-friendly



Building at back of walk: pedestrian-oriented design



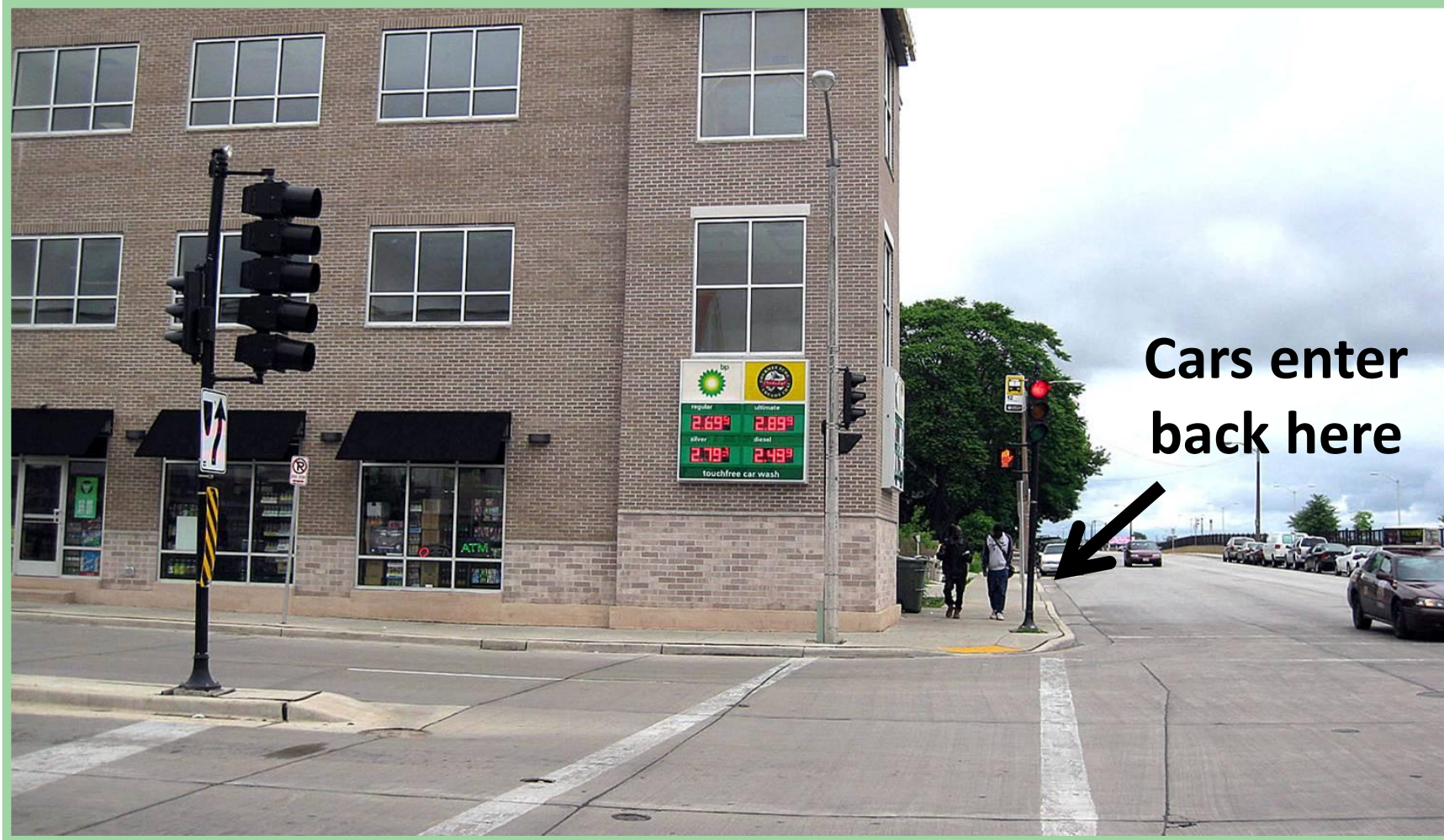
- ⇒ Fast food typically favors drive-thru over walk-ins
- ⇒ Pedestrians must cross drive-thru lane



Alternative design: Direct pedestrian access is provided with no vehicular conflicts



Parking and drive through are still provided



Even a gas station / convenience store can be built with pedestrian friendly design at back of walk



Pedway retrofitted from sidewalk to building through parking



**Same principles apply to large-scale developments:
Direct, safe & convenient access is provided**



Poor Design: Drivers use sidewalk for backing

Rethinking The Role of Urban Streets



A “complete street” accommodates many uses and provides for all purposes of a street:

- ⇒ Mobility (all modes)
- ⇒ Access to destinations
- ⇒ Thriving businesses
- ⇒ Beauty



Transforming a street



Narrow lanes; add bike lanes, median, trees, texture



Bring in buildings that face the street



More buildings: Infill



The street now has a life and is safer for pedestrians

These goals are achieved by local ordinances, which must be enforced.

They are beyond the scope of road designers, yet contribute greatly to the safety, comfort and aesthetics of the walking experience.

Do your local ordinances support pedestrian-oriented planning and design?

The impact of Level of Service (LOS) standards on street design and pedestrian safety

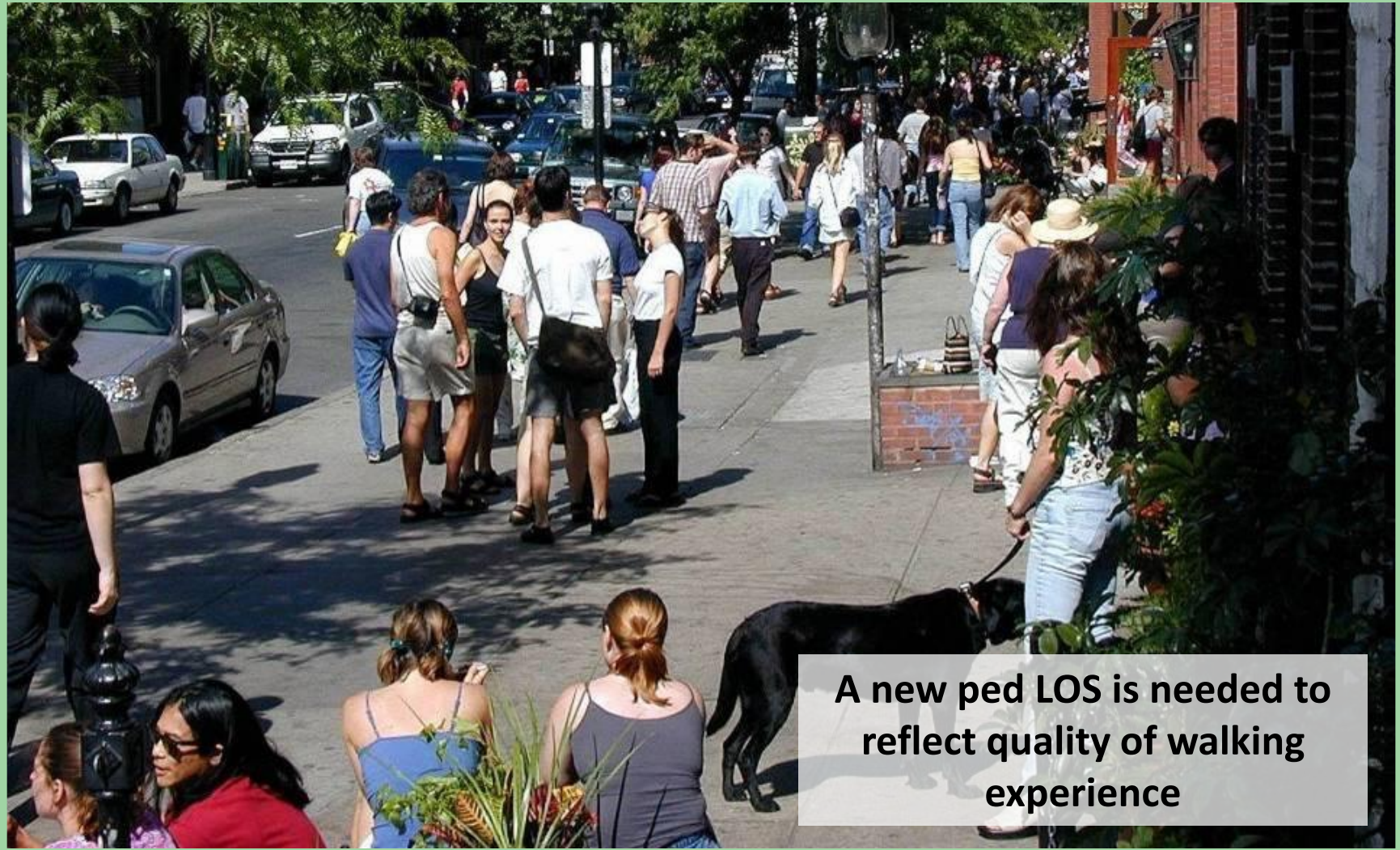


- ⇒ HCM says LOS = A; little traffic, no impediments
- ⇒ Result: very wide roads that reduce pedestrian safety



A new ped LOS is needed to reflect quality of walking experience

HCM says ped LOS = A; few people walking



HCM says ped LOS = F; too many peds!



Why are pedestrians at high risk on this street?
Multi-lane roadway, high speeds



Why are pedestrians are at low risk on this street?
Narrow roadway, low speeds, busy

What is the core safety issue?



Pedestrians and drivers must use the streets together

What does the driver see that says “slow down, watch for pedestrians”?

- ⇒ On-street parking
- ⇒ Narrow cross-section
- ⇒ Buildings close to street
- ⇒ Sidewalks
- ⇒ Crosswalk
- ⇒ People!



Reinventing the roadway:



Transform a 5-lane commercial strip to ...

...a safer road for everyone



⇒ Discussion 1: What changed?

⇒ Discussion 2: What didn't change?

Let's Recap

- ⇒ **Why is it important to accommodate pedestrian safety and accessibility?**
- ⇒ **How does the street environment influence drivers' and pedestrians' expectations and interactions?**
- ⇒ **Where is the information?**
- ⇒ **What planning factors influence pedestrian safety and accessibility?**

Questions