

Safe Systems Transportation

SAFETY COMPARISON BETWEEN THE U.S./NETHERLANDS

AND

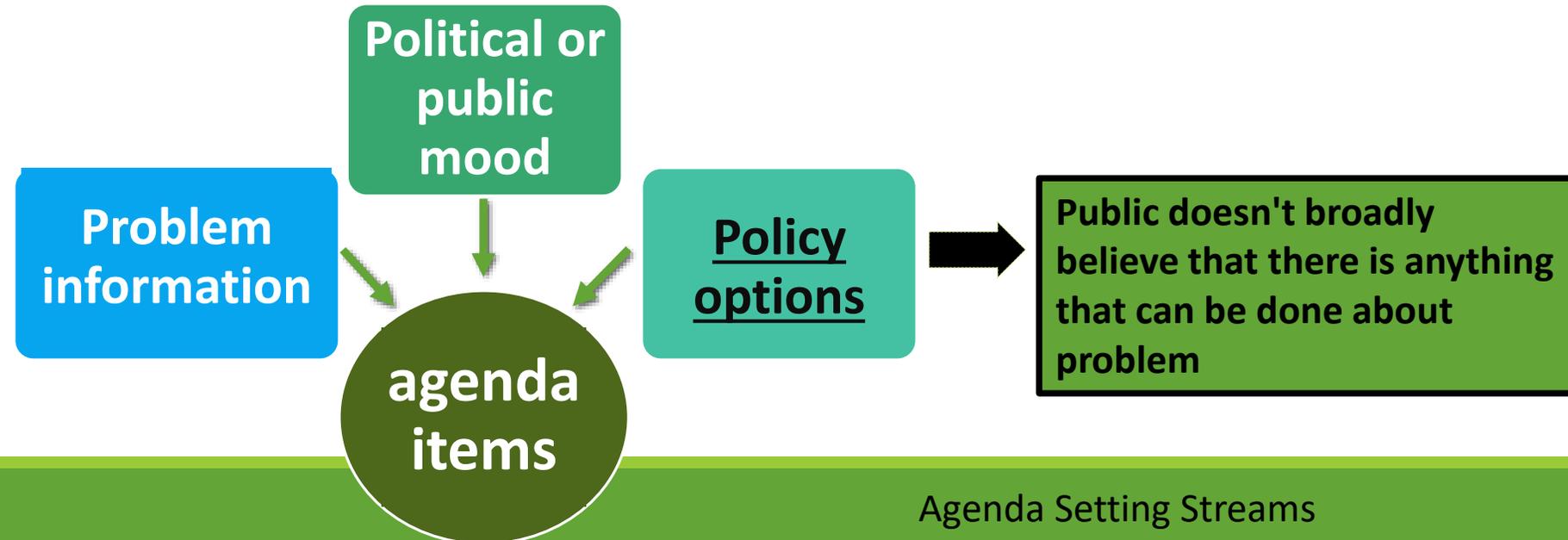
OPPORTUNITIES FOR AUSTIN

Presentation Overview

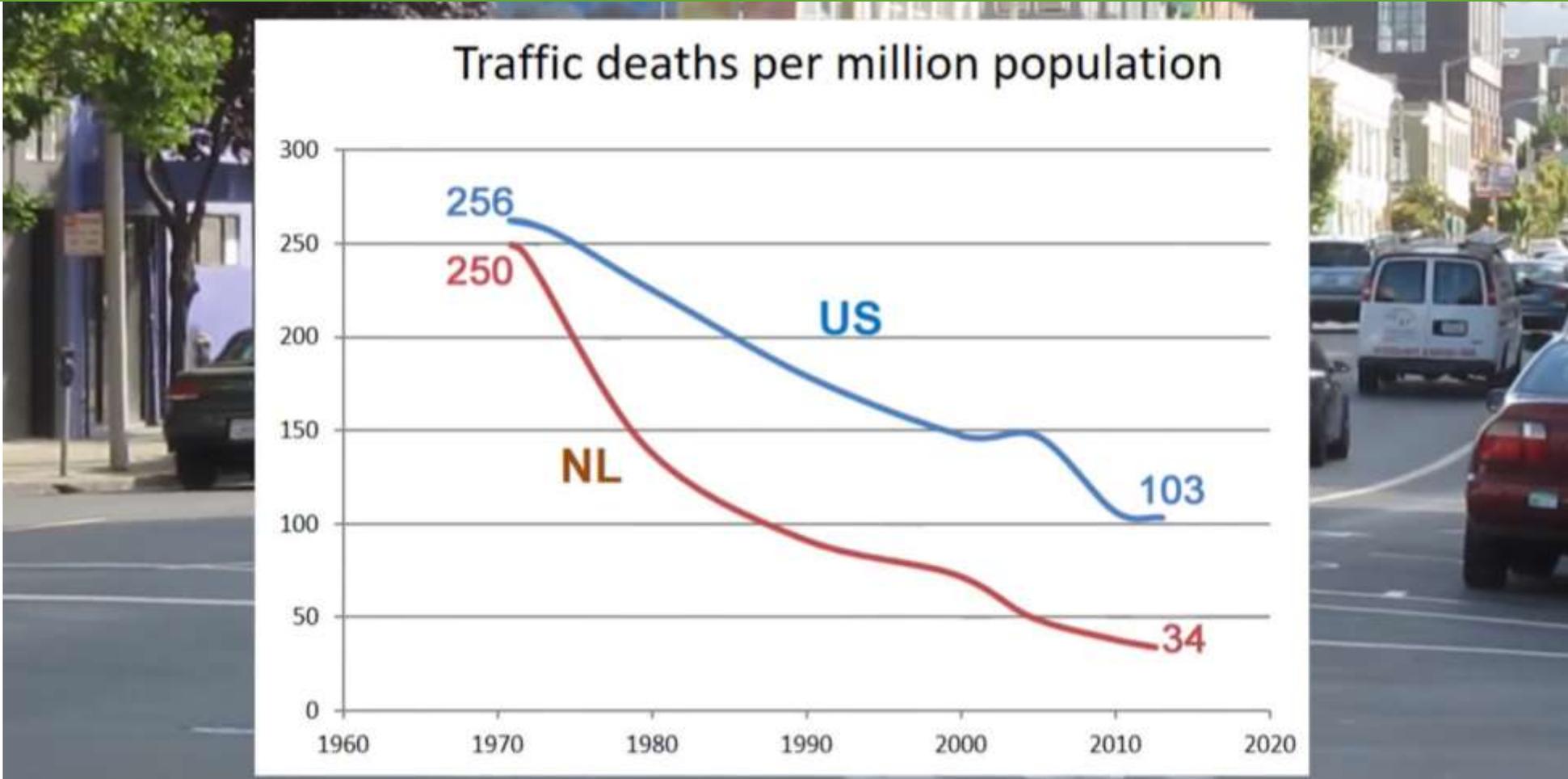
- Background: Transportation safety policy problem in US
- Alternative approach: Transportation systems approach (Vision Zero and Safe Systems)
- Opportunities for Austin
- Adaptation Urbanism: tying together active transport and climate resilience

Policy Context

- 40,100 road fatalities in 2017 up from 30,057 in 2013
- About 110 fatalities per day nationwide: equivalent to a Boeing 787 plane crash with no survivors every 3rd day
- If the US suffered a plane crash every 3 days, there be a national outcry for action
- Why is transport safety not a major policy issue?



International Experience: Transportation Safety Improvements Actionable

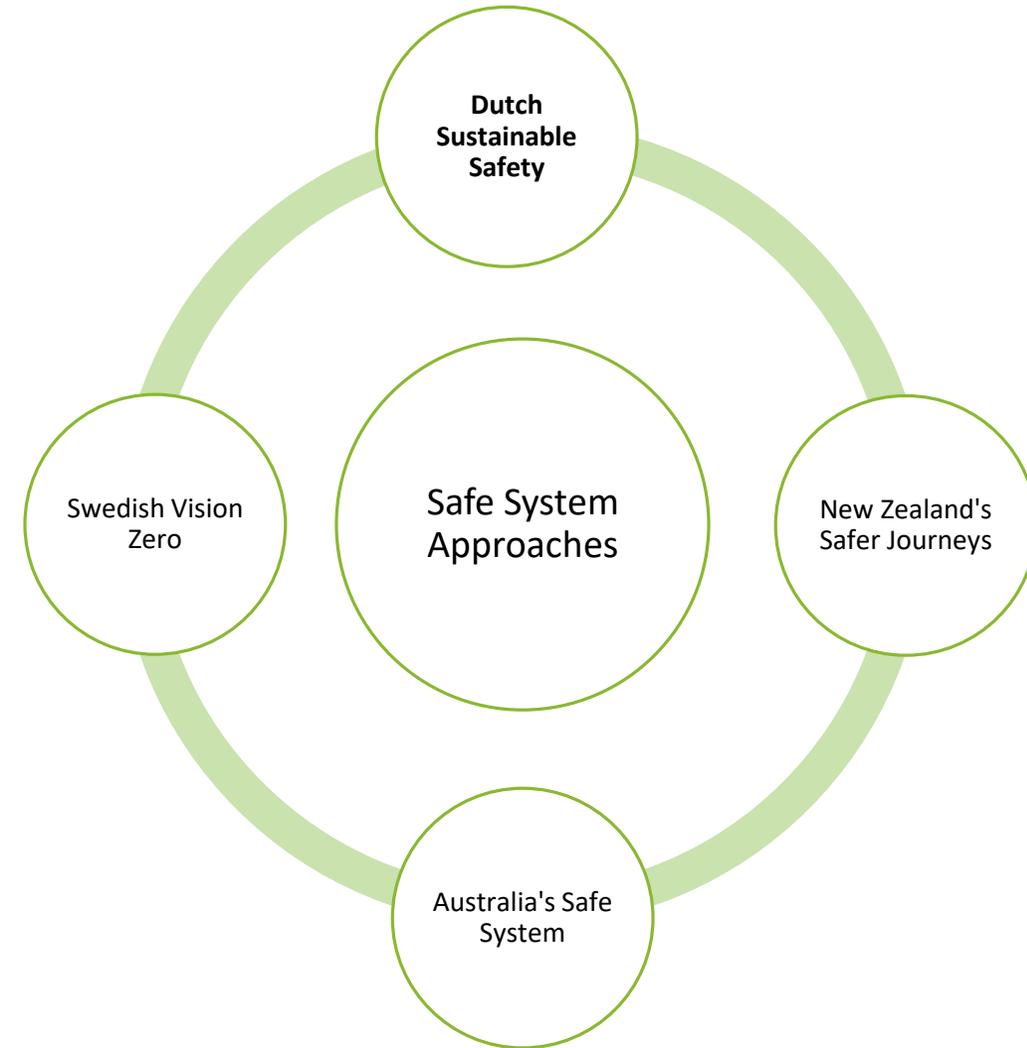


Peter Furth from Bicycle Dutch

“Currently, the Netherlands tops the world in having the lowest number of fatalities per inhabitant” (Wegman and Aarts 2006, p. 9).

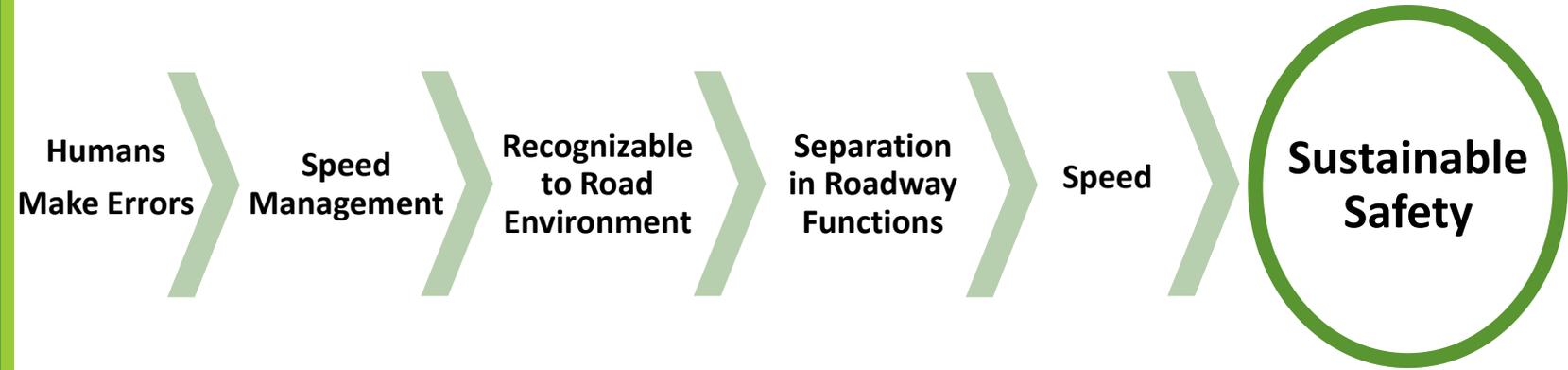
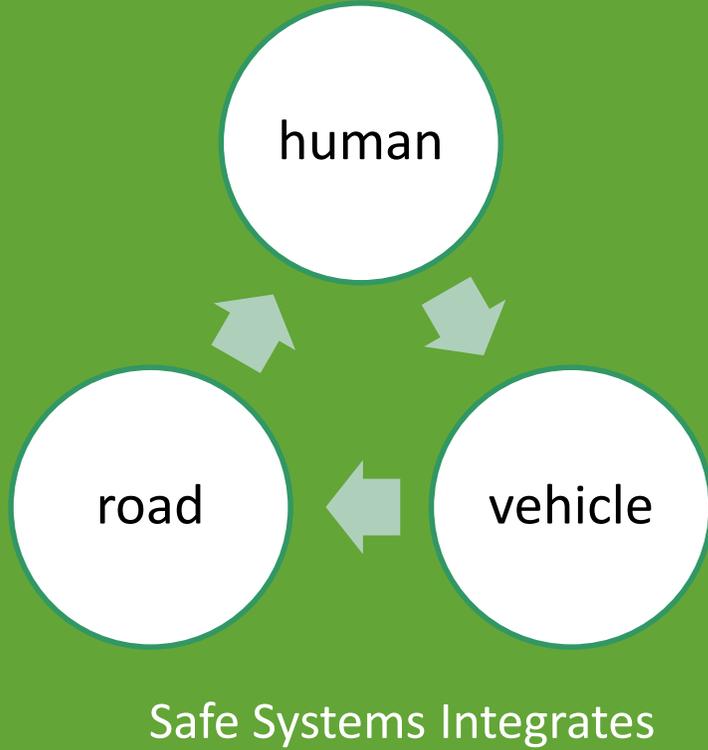
Safe Systems Approach

- **What?**
 - Traffic fatalities preventable if systematic approaches to design & safety implemented
- **Who?**
 - Starting in the 1990s with the Netherlands Sustainable Safety & Sweden's Vision Zero
- **How?**
 - *Road design*
 - *Human behaviors*



“... Humans make errors...”

Key Concept: Speed Management



“... to manage crash speed in such a way that severe injury is almost completely ruled out...”

The Physics of Safe Systems

- Dutch take physics of vulnerable road user crashes seriously
- Humans can only survive \underline{x} amount of momentum
- Safety Impact= 
- US doesn't take safety physics seriously
- Policy difference is seen fatality rates

HIT BY A VEHICLE
TRAVELING AT:
**20
MPH**
10%
DEATH RISK



HIT BY A VEHICLE
TRAVELING AT:
**30
MPH**
40%
DEATH RISK



HIT BY A VEHICLE
TRAVELING AT:
**40
MPH**
80%
DEATH RISK



Safe Systems in Two Sentences

“Vulnerable road users do not usually have a protective 'shell', and also the difference in mass between the colliding opponents is often an important factor. Vulnerable road users can be spared by limiting the driving speed of motorized vehicles and separating unequal road user types as much as possible”



Den Haag



Zwolle

Safe Systems/Vision Zero Policy

- Taking 2 sentences seriously requires:
 1. Separation of vulnerable road users from high speed traffic
 2. Speed management/traffic calming where there is mixed traffic (only in zones below 30 km or about 18 mph)
- So over 20 Years the Dutch:
 - a. Separated bicycle and ped. facilities where traffic is above 30 km
 - b. Created 30 Km Residential Zones in urban areas: 75 % of residential streets in Netherlands 30 km

Safe Systems Policy Action

- Dutch traffic system is based on these safety principles
- Policy result=
 - a. Provision of separated bicycle and pedestrian facilities where traffic is above 30 kmh
 - b. Provision of extensive 30 Km Residential Zones in urban areas: 75 % of residential streets in Netherlands 30 km

Safe Systems: 3 Major City Types of Bike Facilities

1. Low stress neighborhood street: low speed & selected traffic calming



“Bike boulevard” in Delft

Safe Systems: 3 Major City Types of Bike Facilities

2. Cycle track=physically separated space for bikes away from cars on higher speed roads



Cycle track in Delft

Safe Systems: 3 Major City Types of Bike Facilities

3. Bike lane only used only very rarely in Netherlands in low volume, lower speed roads; Use colorized lanes



Bike lane in Delft

Safe System In Practice

Aarts, 2006). *Table 2* shows the safe speeds for a number of road types and potential conflicts, where 'safe' means that 90% of the collisions that would occur at that speed, would have no serious injury.

	Safe speed
Roads on which conflicts between cars and unprotected road users can occur	30 km/h
Intersections with possible lateral conflicts between cars	50 km/h
Roads with possible head-on collisions between cars	70 km/h
Road on which head-on and lateral conflicts cannot occur	100 km/h

Table 2. Safe speeds for some road types and potential conflicts (adapted from Tingvall & Haworth, 1999).

Speed	2,000 ADT	4,000 ADT	6,000 ADT	8,000 ADT	10,000 ADT	12,000 ADT
12 mph (19 km and below)	mixed traffic with significant traffic calming	mixed traffic with significant traffic calming				
13 to 19 mph (20 to 30.5km)	mixed traffic with significant traffic calming	mixed traffic with significant traffic calming	bike lane	bike lane or cycle track	cycle track	cycle track
20 to 25 mph (32 to 39 km)	mixed traffic with significant traffic calming	bike lane	bike lane or cycle track	cycle track	cycle track	cycle track
26 to 31 mph (40 to 49 km)	bike lane or paved shoulder	bike lane, paved shoulder, or cycle track	cycle track	cycle track	cycle track	cycle track
above 31 mph (above 50 km)	Paved Shoulder or Cycle Track	Cycle track	cycle track	cycle track	cycle track	cycle track

Transportation Safety Problem in Texas



- Texas fatalities 2017: 3,722
- Texas fatalities per 100,000 population: 13.1
- Netherlands 2011: 661 fatalities
- Netherlands fatalities per 100,000 population: 4

What If We Designed Streets Like Kids Live Here?



Not A Rhetorical Question

If We Designed Streets Like Kids Live Here, Would Streets Look Like This?



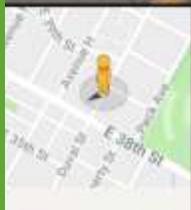
Mixing
cyclists/pedestrians/
cars at about
50Km/hour=40%
fatality risk for crash

My Child Does Live Near Here

If We Designed Streets For All Ages/Abilities, Would Intersections Look Like This?



Mixing
cyclists/cars/buses
at about
55Km/hour=greater
than 40% fatality
risk for crash



Confidence level diagram

<https://participate.melbourne.vic.gov.au/transportstrategy/cycling>



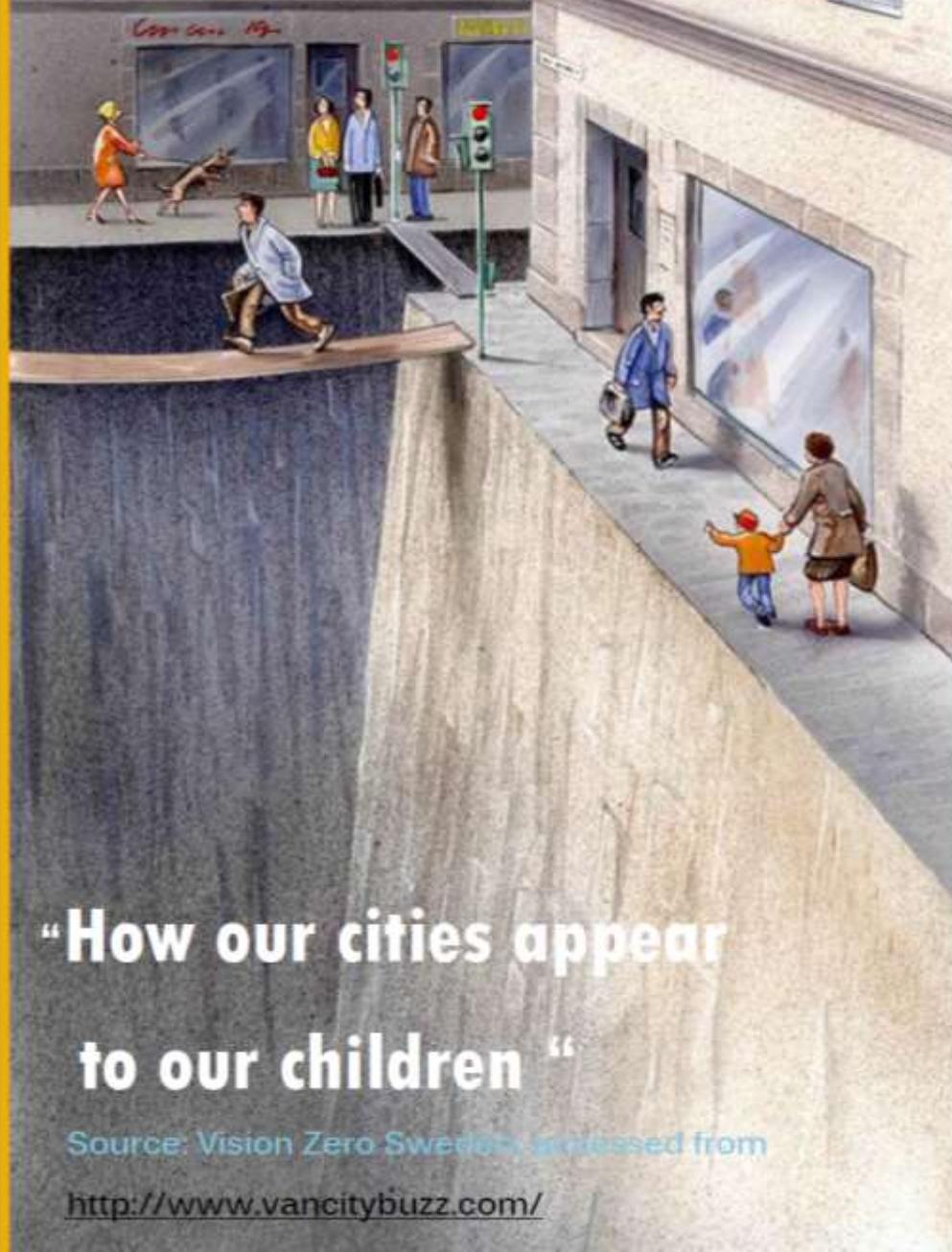
Unprotected intersection



16% confident to ride



Walking with Child in Austin (but without the sidewalks)



**“How our cities appear
to our children “**

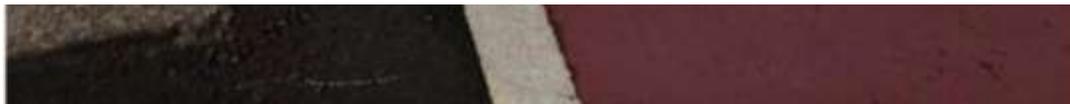
Source: Vision Zero Sweden, accessed from

<http://www.vancitybuzz.com/>

How Do We Make Faster Progress? Retrofit Now



Seattle officials report this “protected walking path” cost \$26,000 to construct. The full sidewalk is estimated at \$300,000.



Seattle DOT Director Dongho Chang calls this cheap-and-easy sidewalk trick a “protected walking lane.” Photo: Dongho Chang



Jen Malzer

@jen_malzer

Following

Today - a new adaptive sidewalk ! One week. No utility impacts or removed trees. Low cost. Slower traffic and mid day pedestrians. Thank you @seattledot for inspiring us!



1:31 PM - 31 Aug 2018

Adaptive sidewalks

An adaptive sidewalk is a way to provide a safe, dedicated space for pedestrians for crossing streets. They are used where there is no existing sidewalk or we cannot build a traditional one. They are intended for pedestrians, including people who use mobility scooters, wheelchairs, strollers or children under the age of 10 or 12 years.

Hey Y'all: Texas Can Innovate



Team Better Block
@TeamBetterBlock

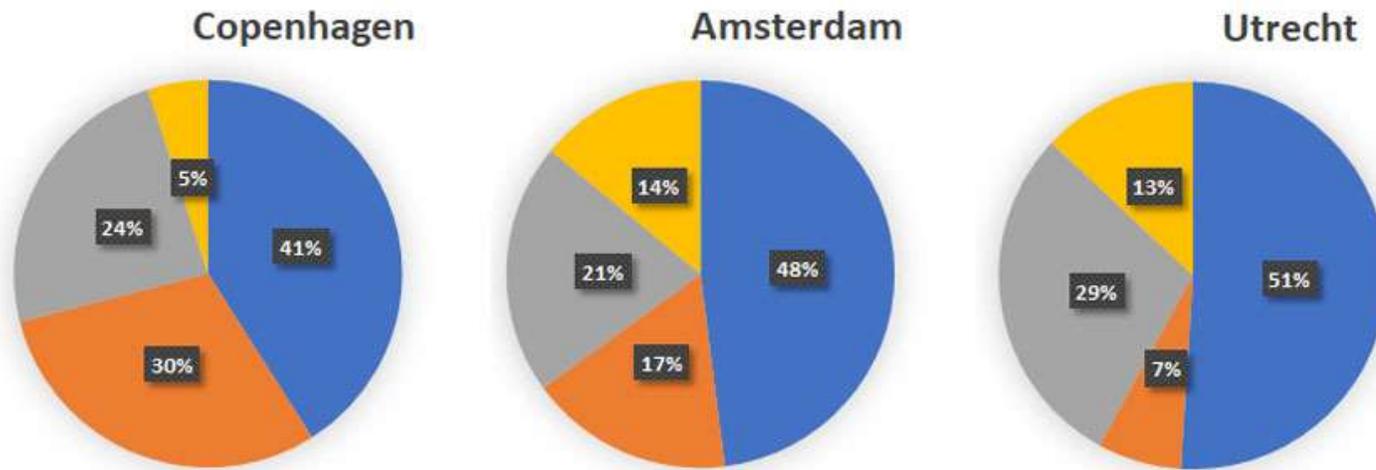
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#limitlesslane strikes again. #purple lane @PurpleClarence in #ftworth #freshKermit #freshbarney @completestreets @CityofFortWorth testing calming neighborhood streets and creating safe places for all

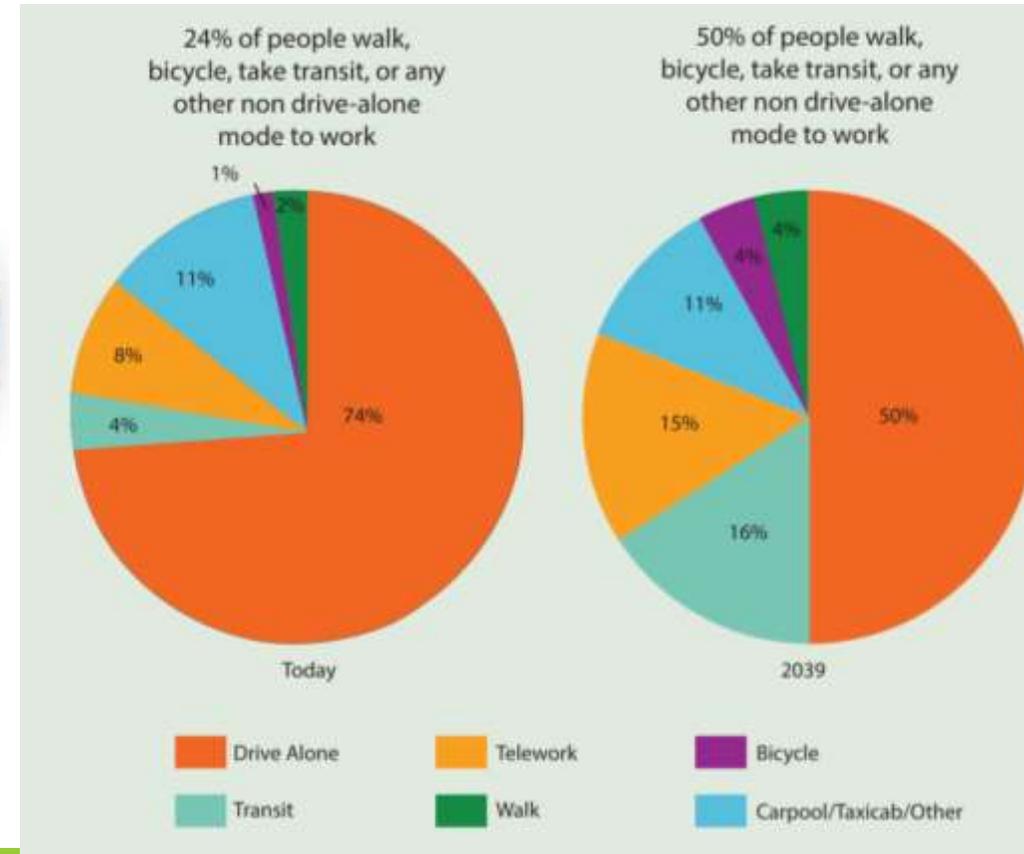
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Policy Recommendations

- Link Vision Zero street designs to biological limits of vulnerable users
- Systematize street designs to match Safe Systems/VZ principles
- Aim Higher: we can do better...



Modal share of cycling to work*



Austin SMP Modeshare Goals

Dutch Safe Systems in One Image: Safety and Freedom



“We believe that kids should be free in the Netherlands.”

**Dick van Veen
Mobycon**

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