



# Safe Systems Approach to Road Safety

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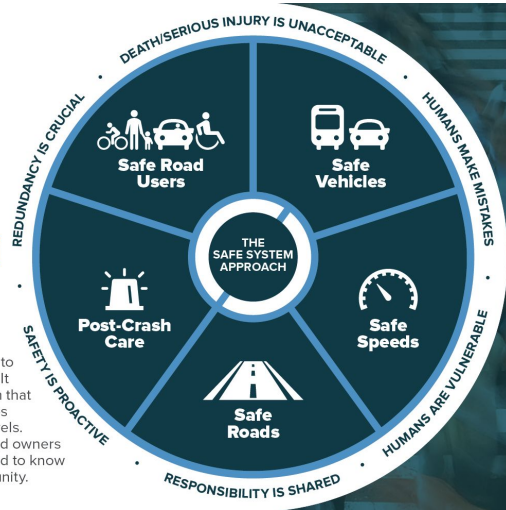
# The Safe Systems Approach

## THE SAFE SYSTEM APPROACH

### APPROACH

Zero is our goal. A Safe System is how we will get there.

Imagine a world where nobody has to die from vehicle crashes. The Safe System approach aims to eliminate fatal & serious injuries for all road users. It does so through a holistic view of the road system that first anticipates human mistakes and second keeps impact energy on the human body at tolerable levels. Safety is an ethical imperative of the designers and owners of the transportation system. Here's what you need to know to bring the Safe System approach to your community.



- The National Roadway Safety Strategy adopted in the United States in February 2022
- Safe Systems
  - Safer people
  - Safer roads
  - Safer vehicles
  - Safer speeds
  - Post-crash care



U.S. Department of Transportation  
Federal Highway Administration

FHWA-SA-20-015

Safe Roads for a Safer Future  
Investment in roadway safety saves lives

# Star Rating for Schools



# A Word about RSF

- **Roadway Safety Foundation**

- 501(c)3 in Washington, DC dedicated to promoting road design improvements, safe roadsides, and enhanced operating conditions
- Through cooperative agreement with FHWA, promotes usRAP as appropriate tool for data-driven safety analysis in Every Day Counts
- Part of global family of “RAPs” coordinated by iRAP, which manages the Star Rating for Schools application and database

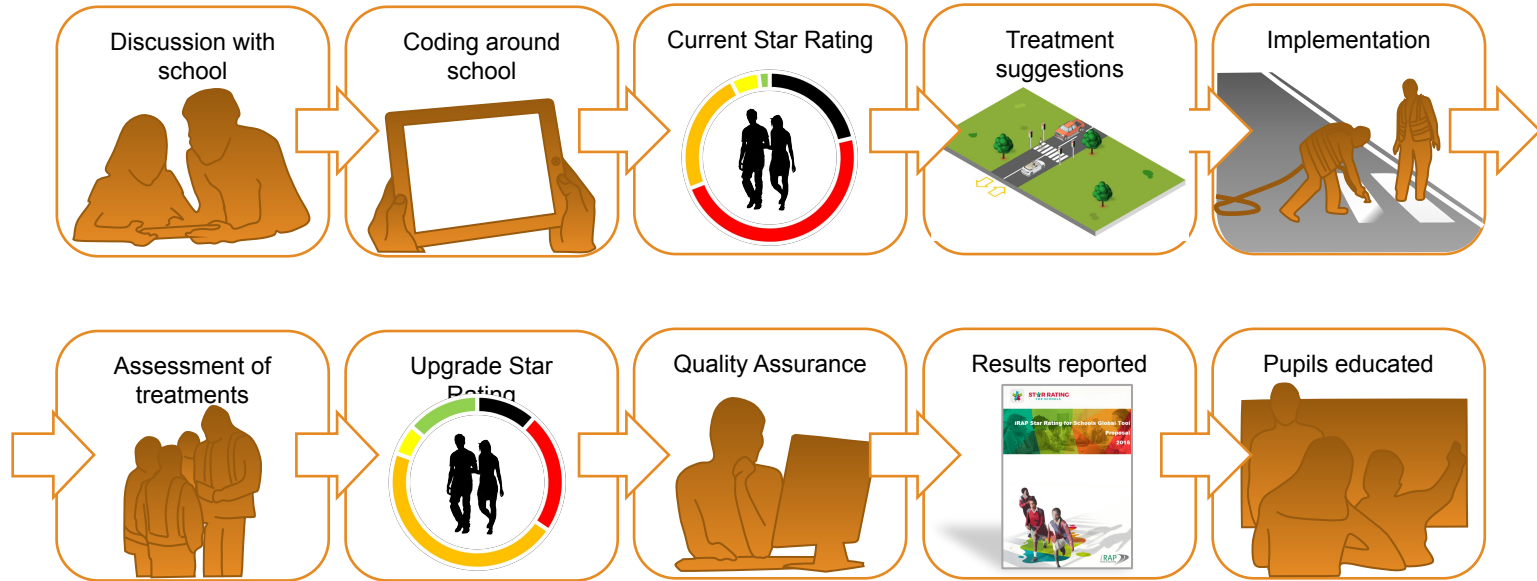


# Before We Start...


- **Imagine that...**

- You read a news item about somebody who was seriously injured falling off a balcony while at a party
  - Who/what gets blamed?
  - How sympathetic is the victim?
  - What actions do we demand in response?

# Star Rating for Schools



# Collecting Data



## Edit Location

George Wilson

Establish Location

Road environment   National Academy For Learning

Road environment

Road type

Road features

School zone

Sidewalks

Pedestrian crossing

Flow

Intersection of curves

Speeds

Road environment

Land use left

Land use right

Area type

Vehicle parking

Sight distance

Previous

Next

Undeveloped Residential Commercial Industrial Farming School


Undeveloped Residential Commercial Industrial Farming School

Rural Urban

None One side Two sides

Adequate Poor

# Collecting Data (continued)



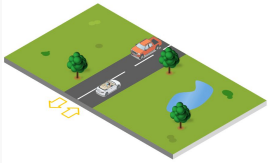
## Edit Location

George Wilson

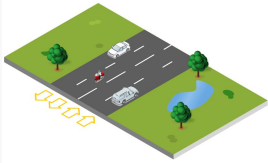
National Academy For Learning

- Establish Location
- Road environment
- Road type**
- Road features
- School zone
- Sidewalks
- Pedestrian crossing
- Flow
- Intersection/divides
- Speeds

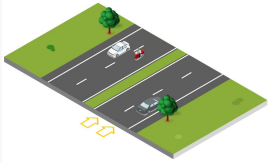
Which of these looks most like the road?



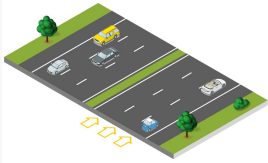
2 lanes undivided



4 lane undivided



2 lanes divided



4 lanes divided

Previous Refine detail Next




Roadway  
Safety  
FOUNDATION



# Collecting Data (continued)

The screenshot displays the 'Edit Location' interface for the STAR Rating for Schools. The top header is teal and contains the 'STAR RATING FOR SCHOOLS' logo on the left, the text 'Edit Location' in the center, and a notification bell and a user profile for 'George Wilson' on the right. Below the header, a grey bar shows the current location: 'National Academy For Learning'. The main content area is divided into two columns. The left column is a dark grey sidebar with a list of categories, each with a green checkmark and a horizontal line: 'Establish Location' (with a close icon), 'Road environment', 'Road type', 'Road features', 'School zone' (highlighted with a teal bar and a right arrow), 'Sidewalks', 'Pedestrian crossing', 'Flow', 'Intersection of curves', and 'Speeds'. The right column shows the selected category 'School zone waning' and 'School crossing supervisor'. Under 'School zone waning', there are four sign options: 'Flashing beacon' (a yellow flashing beacon sign), 'Signs or markings' (a triangular warning sign with a school and a red 'X'), 'No school zone' (a triangular warning sign with a school and a red 'X'), and 'No school' (a rectangular sign with a school and a red 'X'). Under 'School crossing supervisor', there are three sign options: 'Supervisor' (a rectangular sign with a school and a supervisor icon), 'No supervisor' (a rectangular sign with a school and a red 'X'), and 'No school' (a rectangular sign with a school and a red 'X'). At the bottom of the interface, there are two navigation buttons: 'Previous' with a left arrow and 'Next' with a right arrow.

# Collecting Data (continued)



## Edit Location

George Wilson

Establish Location

Road environment

Road type

Road features

School zone

Sidewalks

Pedestrian crossing

Flow

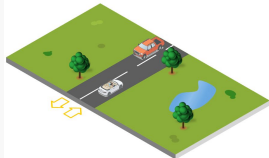
Intersections & curves

Speeds


### Intersections & curves

National Academy For Learning


Select if the road has either an intersection or curve



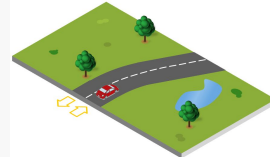
No intersection



Intersection



No curve

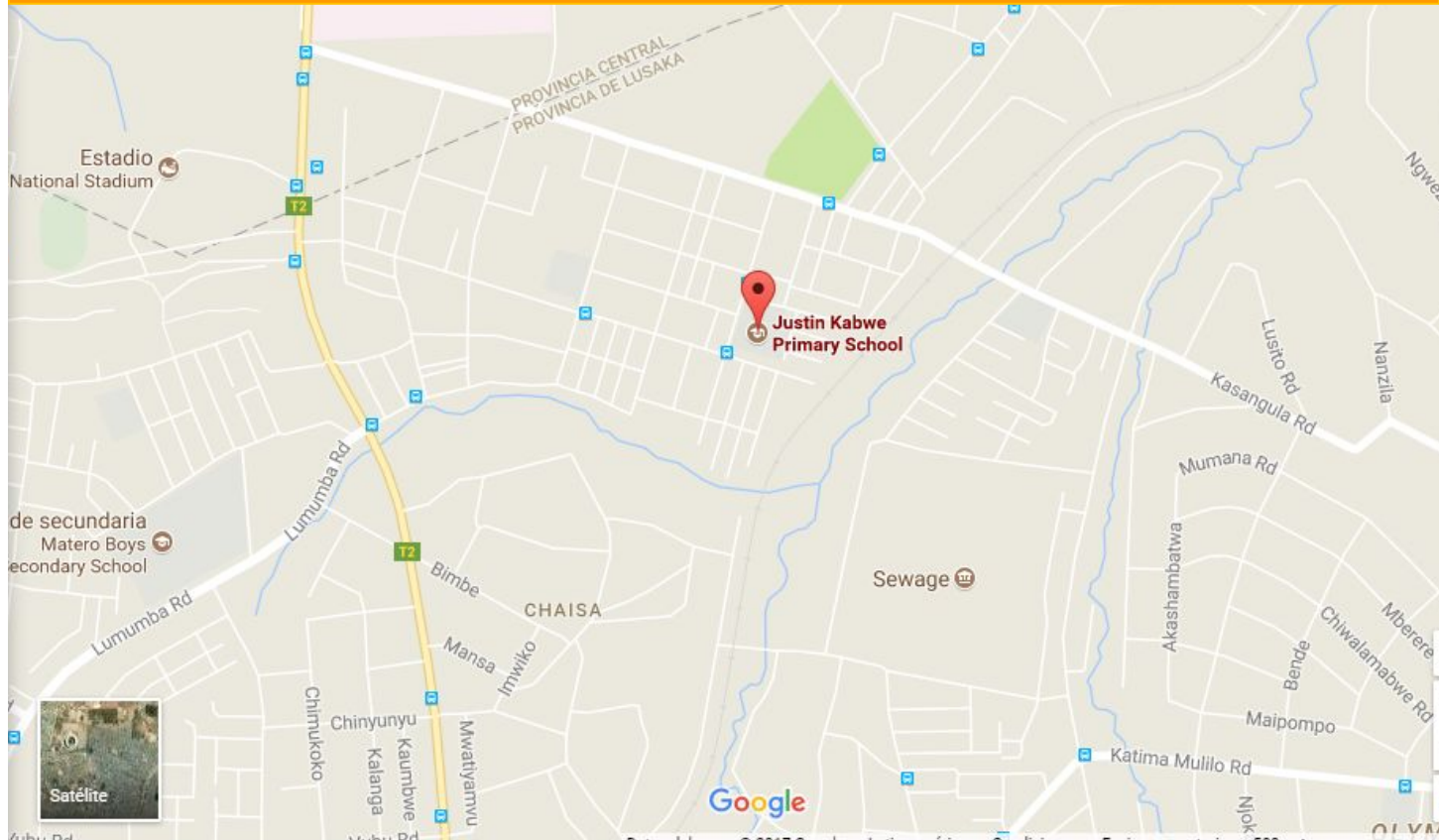


Curve

Previous Next



# CASE STUDY: Justin Kabwe Primary School, Lusaka, Zambia




## Points Assessed (see printouts)



**STAR RATING FOR SCHOOLS** Result

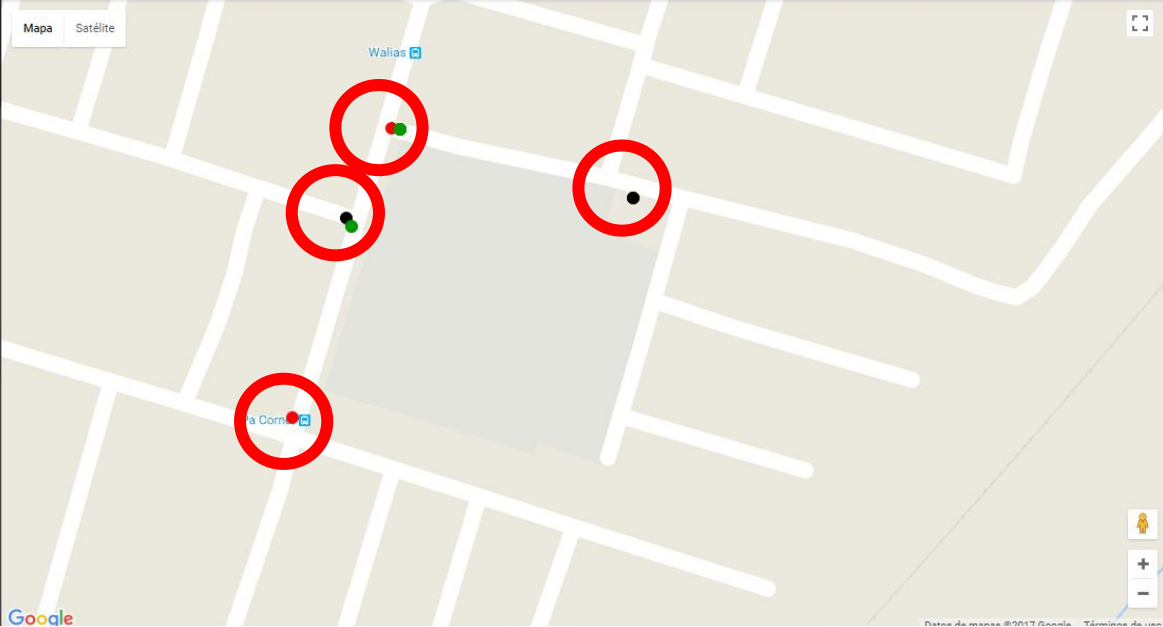
**JULIO URZUA**  
julio.urzua@irap.org  
[LOGOUT](#)

- Dashboard
- Schools
- Surveys
- Coding Data
- Results** >

**Filters** 

Start Date    End Date

Justin Kabwe ▾



Mapa    Satélite

Walias

La Cornu

Google

©2017 Google



Before



After



Roadway  
Safety  
FOUNDATION

DATA POINT  
(1) Intersection

SITUATION BEFORE

SITUATION AFTER

School on the left side  
Residential on right side  
side  
Urban area  
Vehicle parking  
No School zone warning  
No sidewalk left  
No sidewalk right  
Pedestrian fencing not present  
Speeds limit 50k/h  
Operating speed 60k/h

School on the left side  
Residential on right side  
Urban area  
No vehicle parking  
School zone warning  
Sidewalk 1 to 3 m away  
Sidewalk 0 to 1 m away  
Pedestrian fencing present  
Speeds limit 50k/h  
Operating speed 40k/h



Roadway  
Safety  
FOUNDATION

DATA POINT

(2) School entrance

SITUATION BEFORE

School on the left side  
Residential on right side  
Urban area  
Vehicle parking  
No School zone warning  
No sidewalk left  
No sidewalk right  
Pedestrian fencing not present  
Pedestrian crossing not present  
Speed management not present  
Speeds limit 50k/h  
Operating speed 60k/h

SITUATION AFTER

**School on the left side**  
**Residential on right side**  
**Urban area**  
**No vehicle parking**  
**School zone warning**  
**Sidewalk 0 to 1 m away**  
**Sidewalk 0 to 1 m away**  
**Pedestrian fencing present**  
**Pedestrian crossing present on the main road**  
**Raised pedestrian crossing**  
**Marked pedestrian crossing**  
**Speed management present**  
**Speeds limit 50k/h**  
**Operating speed 40k/h**







Roadway  
Safety  
FOUNDATION

COUNTERMEASURE	Current situation	Proposal 1	Proposal 2	Proposal 3	Proposal 4	Proposal 5
Paved Shoulder driver side	Not Present	Present	Present	Present	Present	Present
Paved Shoulder passenger side	Not Present	<b>Present</b>	Present	Present	Present	Present
Traffic calming	Not Present	Not Present	<b>Present</b>	Present	Present	Present
Operating speed	45km/h	45km/h	<b>35km/h</b>	35km/h	35km/h	35km/h
Delineation	Poor	Poor	Poor	<b>Adequate</b>	Adequate	Adequate
Center rumble strips	Not Present	Not Present	Not Present	<b>Present</b>	Present	Present
Pedestrian fencing	Not Present	Not Present	Not Present	<b>Present</b>	Present	Present
Pedestrian crossing facility	No facility	No facility	No facility	No facility	<b>Refuge only</b>	Refuge only
Side walk passenger side	Informal path	Informal path	Informal path	Informal path	Informal path	<b>Physical barrier</b>
Side walk driver side	None	None	None	None	None	<b>Physical barrier</b>
STAR RATING	★★★	★★★	★★★★	★★★★	★★★★	★★★★★
Star Rating Score	75.38	66.62	33.31	30.24	15.33	9.08



# SR4S & the Safe System Approach

- **Principles:**

- Death & serious injury unacceptable
  - *SR4S and all "RAPs" focus on fatal and serious-injury crash prevention, not property damage, and especially view injuries to children to be particularly unconscionable*
- Humans are vulnerable and make mistakes
  - *This is why the built environment needs to be as well-engineered as possible!*



# SR4S & the Safe System Approach

- **Principles:**

- Responsibility is shared
  - *Gets away from the “nut behind the wheel” blaming the end user and refocuses on planning, design, and operations – and involves community members!*
- Safety is proactive and redundancy is critical
  - *Star ratings are forward-looking based on risk models, and previous slides show how you can layer safety treatments!*



Website:  
[schools.irap.org](http://schools.irap.org)  
[Roadwaysafety.org](http://Roadwaysafety.org)

[brucehamilton@roadwaysafety.org](mailto:brucehamilton@roadwaysafety.org)

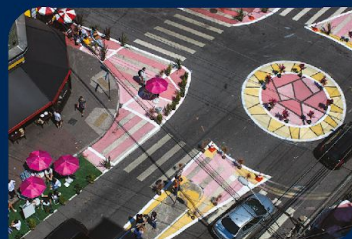




# SAFE SYSTEMS: STARTING WITH SCHOOLS

NATALIE DRAISIN

NORTH AMERICA DIRECTOR &  
UNITED NATIONS REPRESENTATIVE



A woman with long dark hair and glasses is speaking at a wooden podium. She is wearing a dark blue quilted jacket over a blue collared shirt. Her right hand is raised in a gesture. The podium has a white sign with the text '#SaveKidsLives' and 'with road safety'. In the background, there is a city street with buildings, a traffic light, and several people wearing yellow t-shirts.

**#SaveKidsLives**

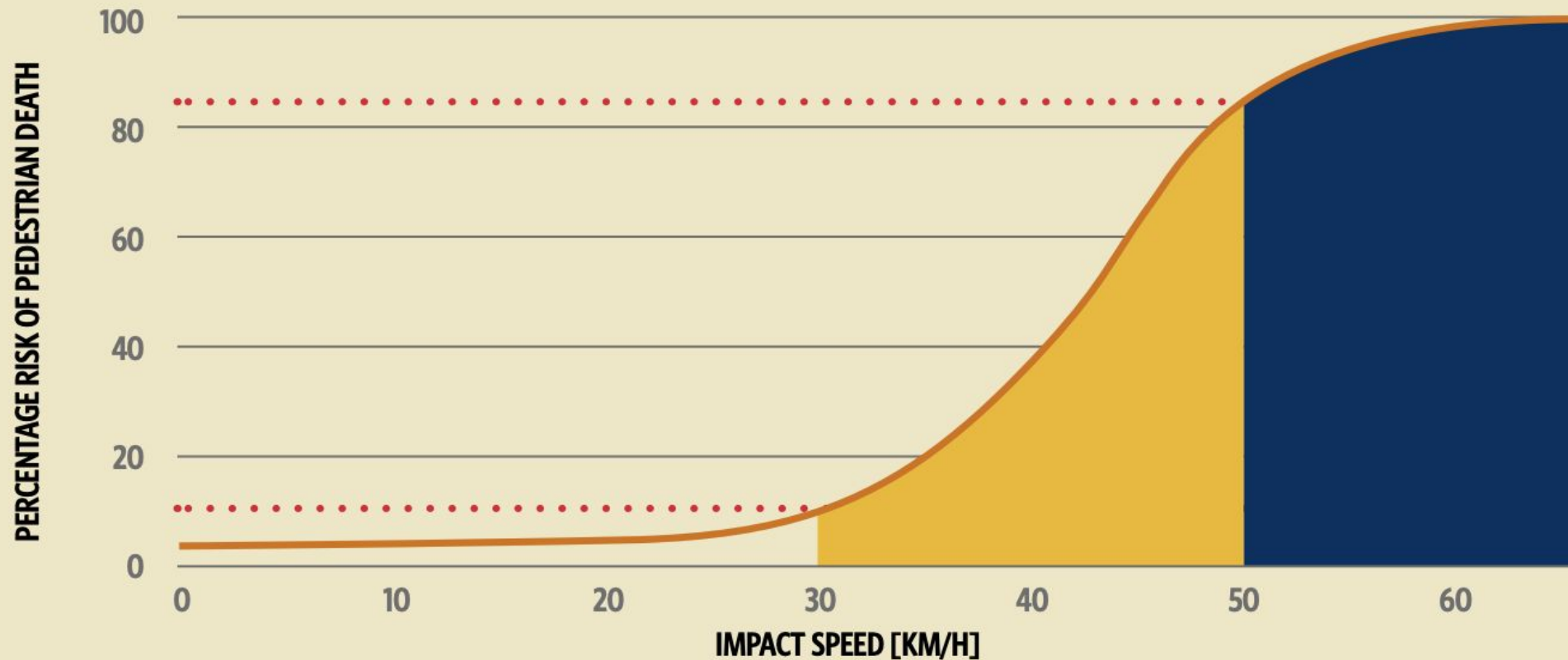
*with road safety*

# Domestic & international alignment





# THE RELATIONSHIP BETWEEN PEDESTRIAN SAFETY AND THE IMPACT SPEED OF VEHICLES



Based on crash data results, Tingvall and Haworth, 1999



# Vision Zero for Youth

- Prioritize safety improvements where kids walk or bike
- Rooted in Safe Routes to School
- Launched in 2016

[www.visionzeroforyouth.org](http://www.visionzeroforyouth.org)



**FOUNDATION**



# Safe system alignment

- Children are not responsible for unsafe environments
- Humans make mistakes, children are children
- Proactive, not reactive
- Includes children in planning process



FOUNDATION



# Seattle

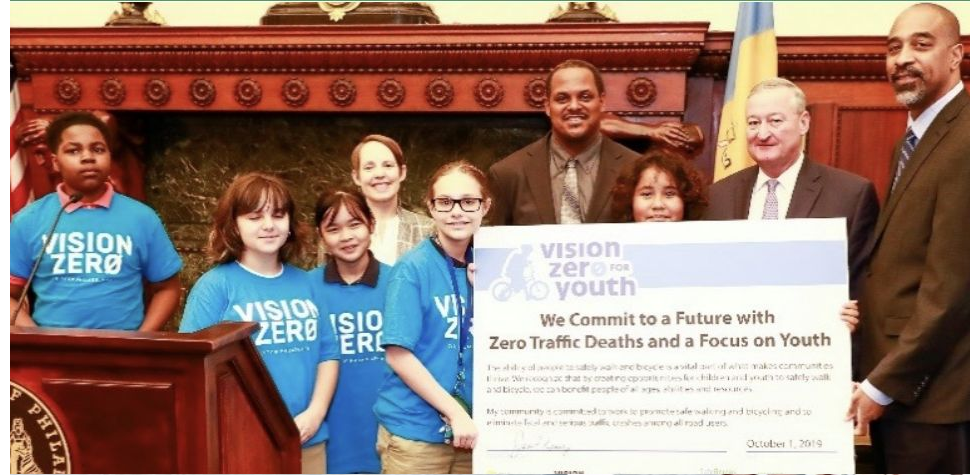
- School streets
- 20 mph non-arterials
- 25 mph arterials
- Speed cushions, road narrowing, protected bike lanes, etc
- Bike education: 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> grade

NACTO best practice



# Philadelphia

- Children walk in different places, at different times than adults
  - Stratify high injury networks: age & race
  - Proactively identify crash sites
- Focus on youth in Vision Zero





# Botogá, Colombia

- Walk & bike bus: 9,000+ students, 100+ schools
- “Plazoletas Bogotá:” 92,000 peds
- 20 mph school zones
- 350+ mile bike network

- City of 8 million: months with 0 child fatalities on roads
- Historically low fatalities

# Gia Lai, Vietnam

- All schools 3+ stars (most 5 stars)
- Speeding decreased by 15 mph

Scale to all school zones nationwide

All new national highway provincial roads and 75% of highway network = 3+ stars



**FOUNDATION**





# Mexico City & Monterrey, Mexico

- Design streets with students & community
- Ask even youngest children for opinion
- Public-private partnership



- Spread nationally & to Costa Rica
- Mobility law
- 21% decrease in road traffic fatalities



# Resources

- Build bridge between youth and leaders
- Case studies
- Guidance on integrating advocacy into high school Safe Routes to School programs
- Coming in August: Recommendations to engage youth to advance safety



**FOUNDATION**



# Leadership awards

- 20 mph
- Focus on school zones and nearby arterials
- Quick build improvements and School Streets
- Link to equity goals and climate plans



2023 Award: Lincoln, NE  
Source: Lincoln Transportation & Utilities

# Applications open this Fall!



[www.visionzeroforyouth.org/awards/us](http://www.visionzeroforyouth.org/awards/us)





# SAFE SYSTEMS APPROACH

Source: Dr. Matts-Ake Belin, Swedish  
Transport Administration, Vision Zero  
Academy



Source: Dr. Matts-Ake Belin, Swedish Transport Administration, Vision Zero Academy



# Traffic Conflict Technique Toolkit

Making the Journey to and from  
School Safer for Students



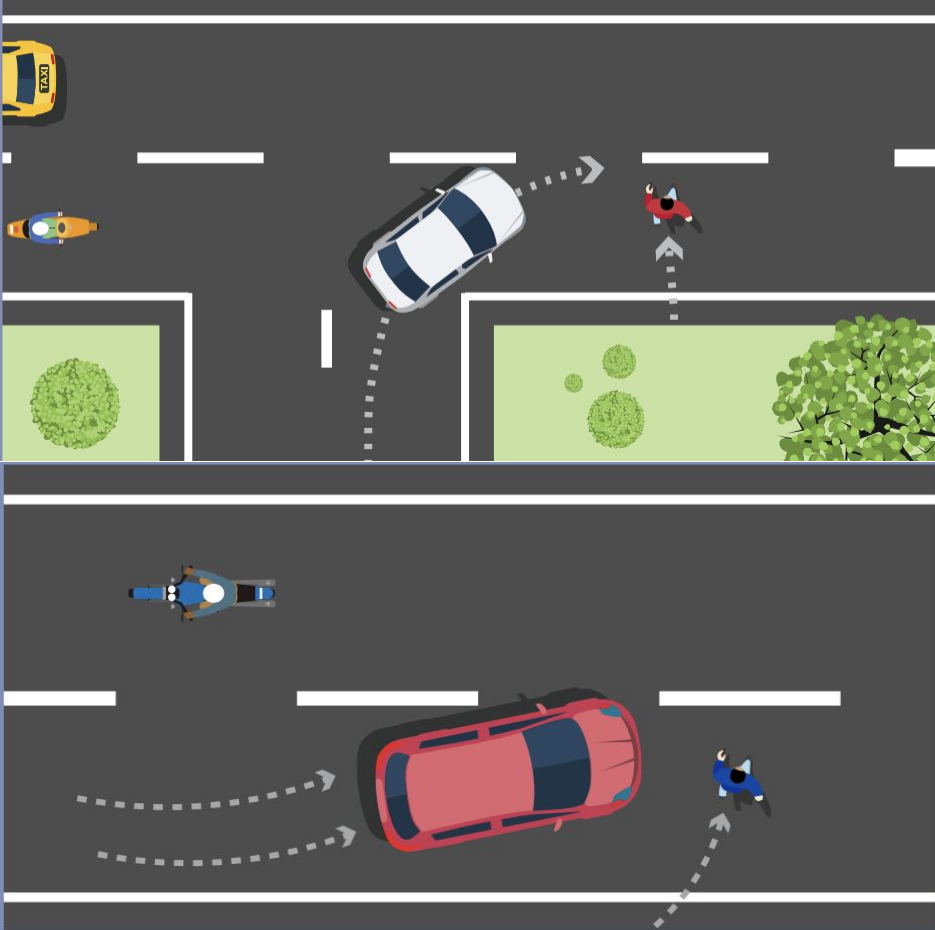
Toolkit: [childhealthinitiative.org](https://www.childhealthinitiative.org/media/791406/tct_toolkit_final_508.pdf)  
[https://www.childhealthinitiative.org/media/791406/tct\\_toolkit\\_final\\_508.pdf](https://www.childhealthinitiative.org/media/791406/tct_toolkit_final_508.pdf)

Webinar:  
<https://www.youtube.com/watch?v=JKuVImDBXJU>





# Traffic Conflict Technique Toolkit



- Free
- 5 methods based on your experience and resources
- 11 steps, 8 months
- Pre & post monitoring
- Includes data collection forms
- Video analysis optional



# Traffic Conflict Technique Steps

Determine road user risk by conducting a road safety assessment

Step 1

Decide which pedestrian-vehicle Traffic Conflict Technique method to use

Step 2

Conduct data collector training to ensure reliability, objectivity and consistency

Step 3

Prepare for data collection by obtaining approval(s) and selecting the data collection site

Step 4

Analyze and interpret data to inform road safety intervention selection and implementation

Step 7

Collect pre-intervention traffic conflict data

Step 6

Collect pedestrian and vehicle counts (pre-intervention) for a baseline road user count

Step 5

Select and implement road safety intervention(s) informed by the analyzed data

Step 8

Collect post-intervention traffic conflict data (after at least one month, and at the three month and six month mark)

Step 9

Analyze and interpret data to evaluate whether the road safety intervention is effective

Step 10

Disseminate findings to local road safety and school stakeholders

Step 11

# Traffic Conflict Technique Toolkit Results


	Method 1 (Ghana)		Method 2 (Vietnam)		Method 3 (Mexico)	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
<b>Road User Counts</b>	929 vehicles (average per peak hour)		6,202 vehicles (average per peak hour)		1,149 vehicles (afternoon peak hour)	
<b># traffic conflicts (4-hour period)</b>	80	62	390	96 <sup>10</sup>	147	35
<b>Traffic conflict rate (per hour per 1,000 vehicles)</b>	21.5	16.7	15.7	7.7	32.0	7.6
<b>95% CI</b>	(17.1, 26.8)	(12.8, 21.4)	(14.2, 17.4)	(6.3, 9.5)	(27.0, 37.6)	(5.3, 10.6)



**FIA FOUNDATION**



Source: CDC

- 
- Mexico: 70% decrease in conflicts among 9,000 students
    - Governor authorized use in 200 dangerous crossings
    - Mayor authorized it in 20 dangerous crossings
    - Updated transit operations and infrastructure guidelines
  - Costa Rica: Spanish version
    - 20 intersections and 5 tactical urbanism interventions
  - US: USDOT Safe Streets for All grant in East End District, Texas
    - How will you use the toolkit?

# Traffic Conflict Technique Toolkit Results





STAR RATINGS FOR SCHOOLS



TRAFFIC CONFLICT TECHNIQUE



STAR RATINGS FOR SCHOOLS



VISION ZERO FOR YOUTH

TRAFFIC CONFLICT TECHNIQUE

STAR RATINGS FOR SCHOOLS











CHILD HEALTH  
INITIATIVE TOOLKIT

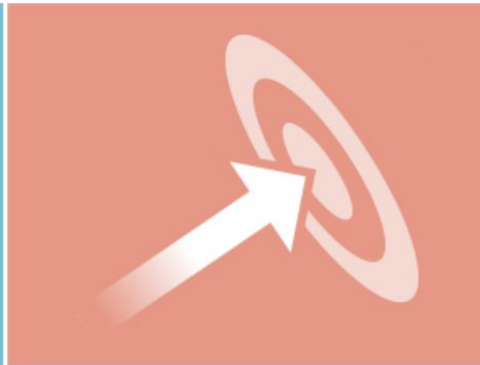
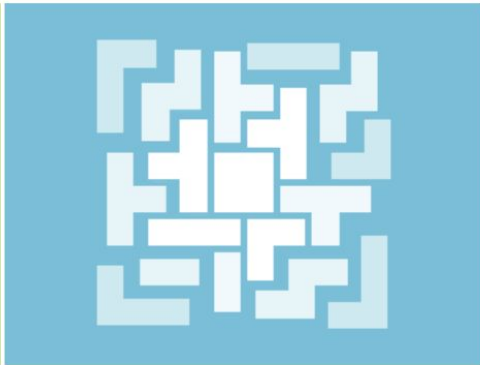


VISION ZERO FOR YOUTH



TRAFFIC CONFLICT TECHNIQUE

STAR RATINGS FOR SCHOOLS



**GATHERING DATA**

**DESIGN & IMPLEMENTATION**

**COALITION BUILDING**

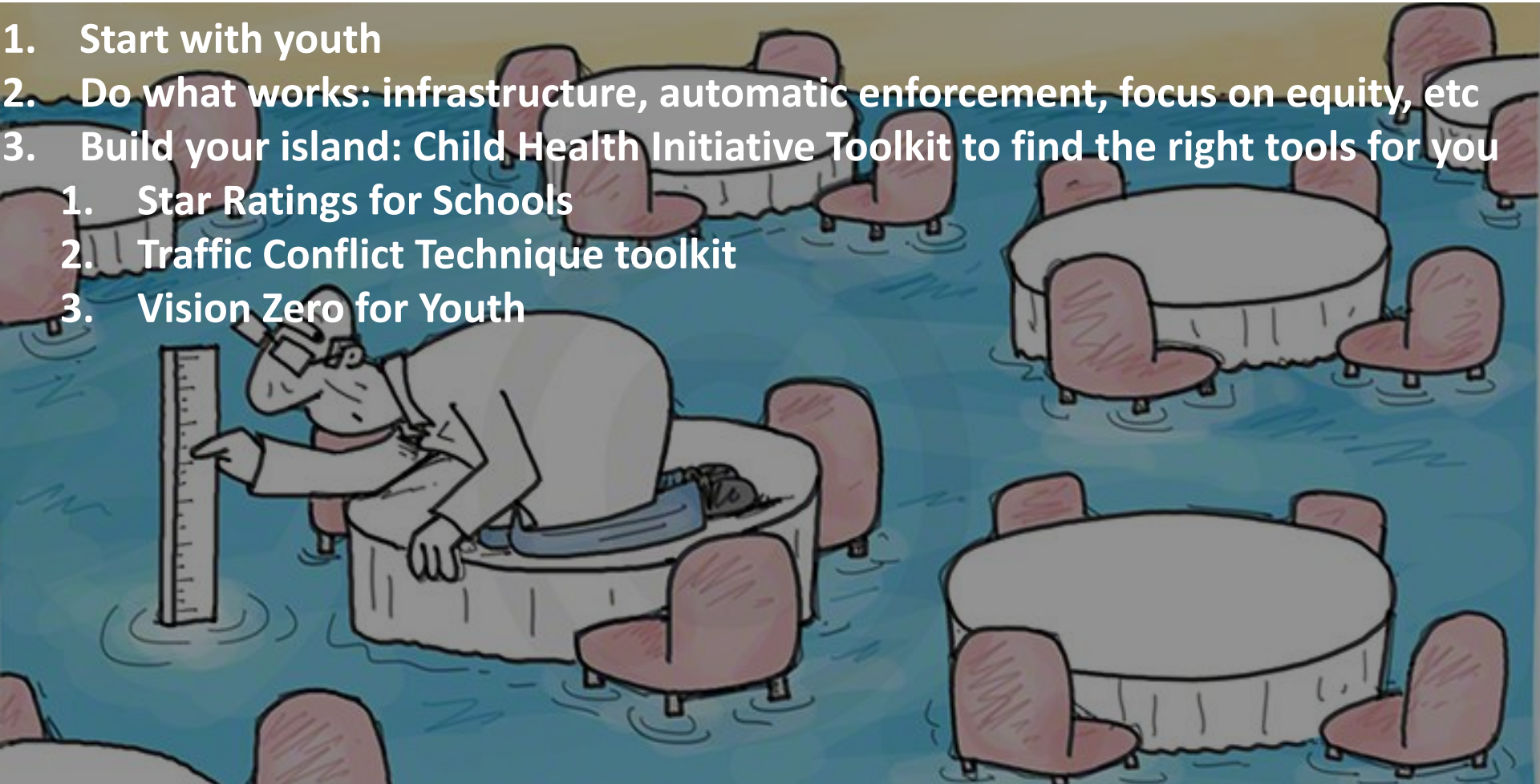
**SCALING UP IMPACT**



**GLOBAL TOOLKIT**

# FROM ISLANDS OF SUCCESS TO A SEA OF CHANGE

1. Start with youth
2. Do what works: infrastructure, automatic enforcement, focus on equity, etc
3. Build your island: Child Health Initiative Toolkit to find the right tools for you
  1. Star Ratings for Schools
  2. Traffic Conflict Technique toolkit
  3. Vision Zero for Youth





# Thank you

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& United Nations Representative  
FIA Foundation**

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[@Ndraisin](https://www.instagram.com/Ndraisin)**



Thank you.



SAFE  
KIDS  
WORLDWIDE.