Data analysis and digital tools: a step towards vision zero

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Who we are

Claudia Di Loreto, Associate, WSP claudia.diloreto@wsp.com

- Team Lead for Safety Audits (150+ RSAs), Member of SoRSA & CertComp
- Project manager of portfolio of Vision Zero projects

Jon Noble, Head of Digital for Local Government, WSP jon.noble@wsp.com

- Team Lead for Safety Audits (1000+ RSAs, 20 years), Member of SoRSA
- Project manager of large infrastructure projects & digital expert

- WSP Award for Innovation (Feb 2023)
- Shortlisted for the CIHT Road Safety Awards 2023

CROYDON www.croydon.gov.uk
City of Westminster
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THE ROYAL BOROUGH OF KENSINGTON AND CHELSEA
London Borough of Redbridge

Data analysis and digital tools:
a step towards vision zero

Today's presentation

- Vision Zero – Overview
- Vision Zero – Our approach
- Vision Zero – Our tools
- Lessons learned / future opportunities

Vision Zero – Overview

"Not all collisions are preventable, but serious and fatal injuries are."

Most Severe Injury Type	Casualty Severity
Deceased	Killed
Broken neck or back	Very Serious
Internal injuries	Very Serious
Multiple severe injuries, unconscious	Very Serious
Severe chest injury	Very Serious
Severe head injury, unconscious	Very Serious
Deep penetrating wound	Moderately Serious
Fractured pelvis or upper leg	Moderately Serious
Loss of arm or leg (or part)	Moderately Serious
Multiple severe injuries, conscious	Moderately Serious
Other chest injury, not bruising	Moderately Serious
Deep cuts, lacerations	Less Serious
Fractured arm, collarbone, hand	Less Serious
Fractured lower leg, ankle, foot	Less Serious
Other head injury	Less Serious

Bruising	Slight
Shallow cuts/lacerations/abrasions	Slight
Shock	Slight
Sprains and strains	Slight
Whiplash or neck pain	Slight

Impacts of KSIs

A *severe* collision can lead to **life-changing consequences** for an individual.

It can have a ripple effect, also impacting:
- family members
- friends
- colleagues
- employers
- etc.

A severe collision cause stress people in multiple ways:
- Physical burden
- Grief and other emotional responses
- Financial troubles

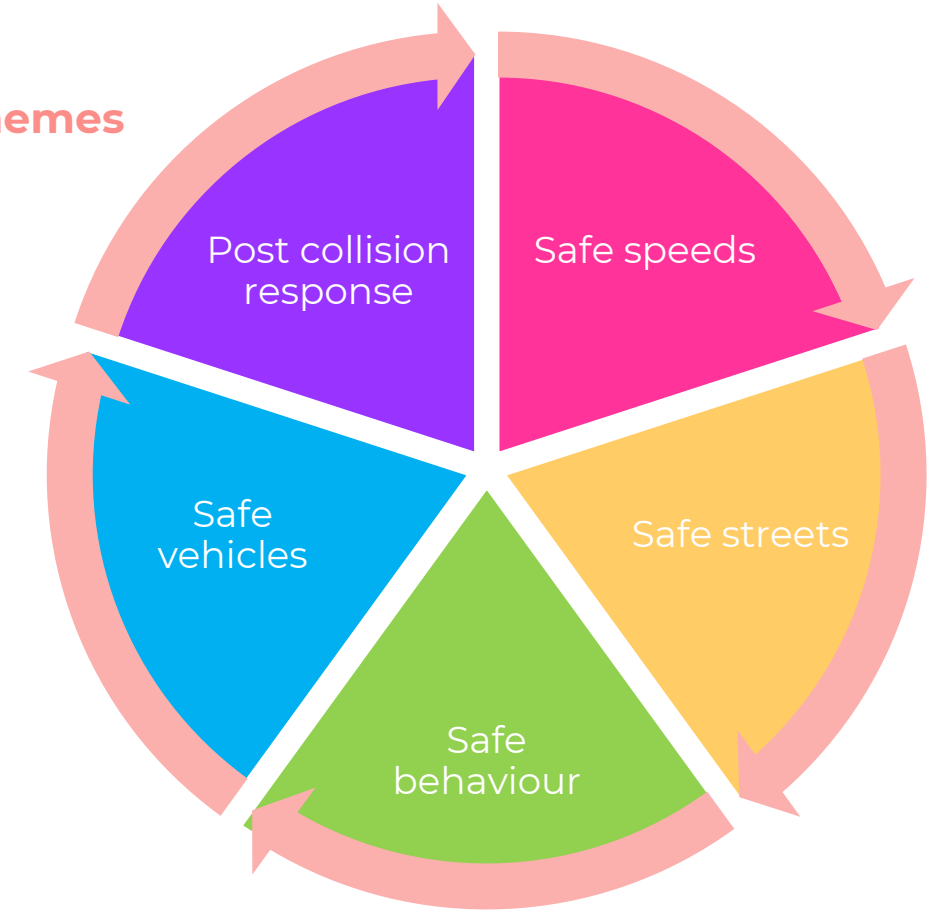
REEVES & MESTAYER ATTORNEYS

https://www.rmlawcall.com/how-severe-accident-injuries-impact-families

Vision Zero – Overview

"Not all collisions are preventable, but serious and fatal injuries are."

Safe Systems: themes



Strategy → **Policy & plans** → **Implementation** → **Monitoring**

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Vision Zero – Overview

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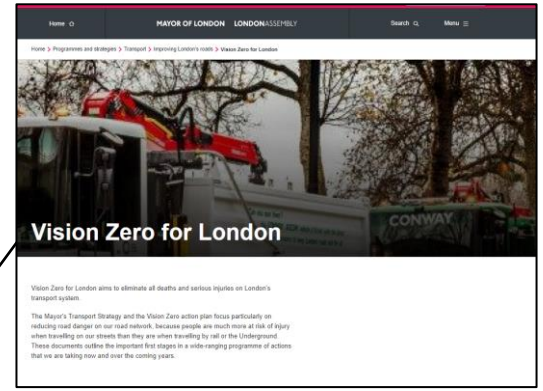

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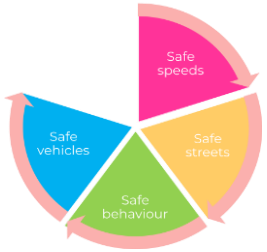
Vision Zero – Our approach

Inputs



Stakeholder workshops / expert knowledge

Collision data & other data sources

Tools

1. Collision dashboard

2. Strategic Action Plan

3. Cluster prioritisation tool

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Vision Zero – Our approach

Collision data & other data sources

Collect

- Collison data: STATS19 (4 separate excel files)
- Other national data: Census - Index multiple deprivation
- Local data: Schools

Clean

- Field titles often vary
- Some fields include characters that cause issues
- Dates are often be a problem
- Files can become corrupt as transferred

Store

- Cloud (Azure)
- SharePoint
- SQL Database

Analyse

- Power Bi is excellent for maps, charts & tables
- Excel provides good static data

Report

- Direct from Power Bi – requires Pro licence (or sending files)
- Excel enables auditing and simplifies the reporting process
- Static reports for externals

Software used: widely available Microsoft products so tools can easily be updated and shared

1. Collision dashboard

ArcGIS Power BI

2. Strategic Action Plan

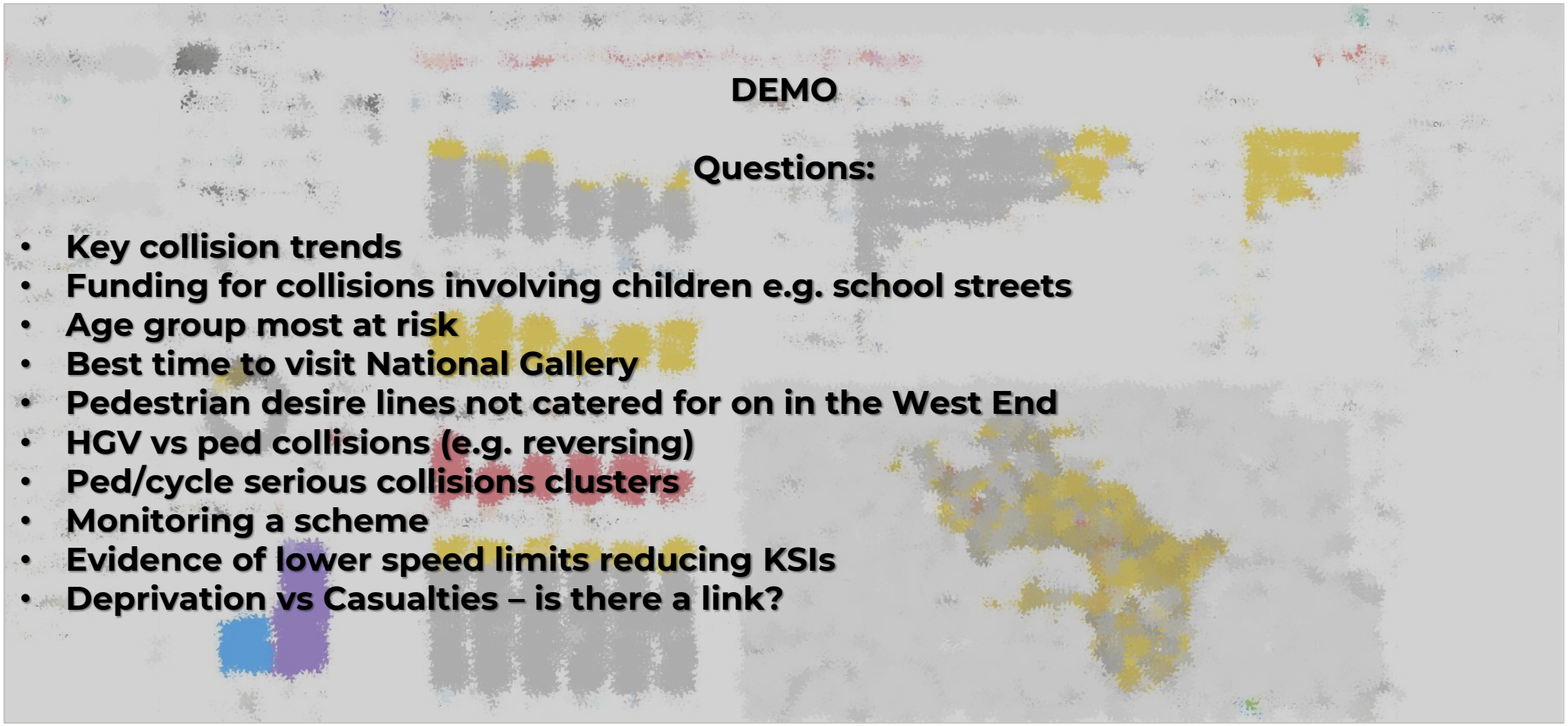
3. Cluster prioritisation tool

SQL Server ArcGIS

1. Collision dashboard

Vision Zero – Our Tools

- Analysis (borough/county wide, corridor & localised)
- Monitoring
- Reporting



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2. Strategic Action Plan

Vision Zero – Our Tools

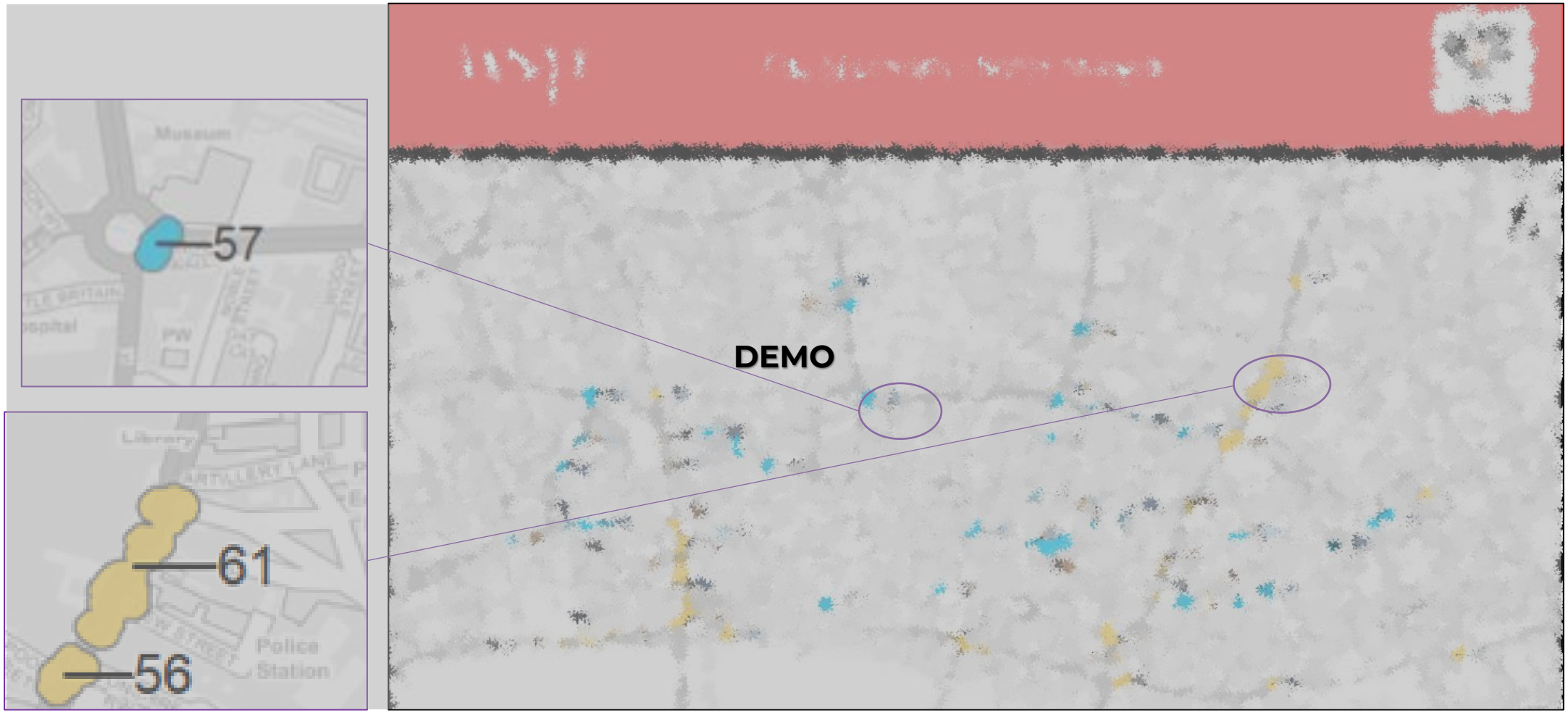
1. Define potential actions across the 5 Vision Zero themes
2. Record stakeholders
3. Score actions by their potential to reduce KSIs and their cost
4. Prioritise actions
5. Inform a strategy and make decisions

Vision Zero – Our Tools

3. Cluster prioritisation tool

Track and audit the decision making process

1. Define clusters in a “smart” way
2. Compare clusters to each other and to county/borough averages.
3. Data-led sifting exercise
4. Report detailed engineering assessment
5. Undertake a clear Benefit to Cost Ratio (BCR) & Prioritise clusters



Lessons learned / future opportunities

Key highway authority challenges

- Understanding local road safety issues
- Spending money efficiently
- Justifying and tracking decision-making
- Providing access to relevant information within the organisation

How our tools address these challenges

- Understand **complex collision data** to allow for statistical and spatial analysis and relate it to **other relevant datasets**
- **Clear outputs** which can be **understood by all** stakeholders involved and for different purposes (e.g. analysis, decision making, reporting both internal & external)
- **Reduce the time** needed to prepare, interrogate and analyse the data, and make decisions.
- **Spend money more effectively**, by prioritising interventions which have the best chance of contributing to Vision Zero
- Decision are **evidence-led** and based on **cost-benefit analysis**
- Ability to **rapidly respond to queries** with robust evidence when challenged
- Improved ability for **people with different roles within an organisation** to interrogate the data and get up to speed with a stream of work

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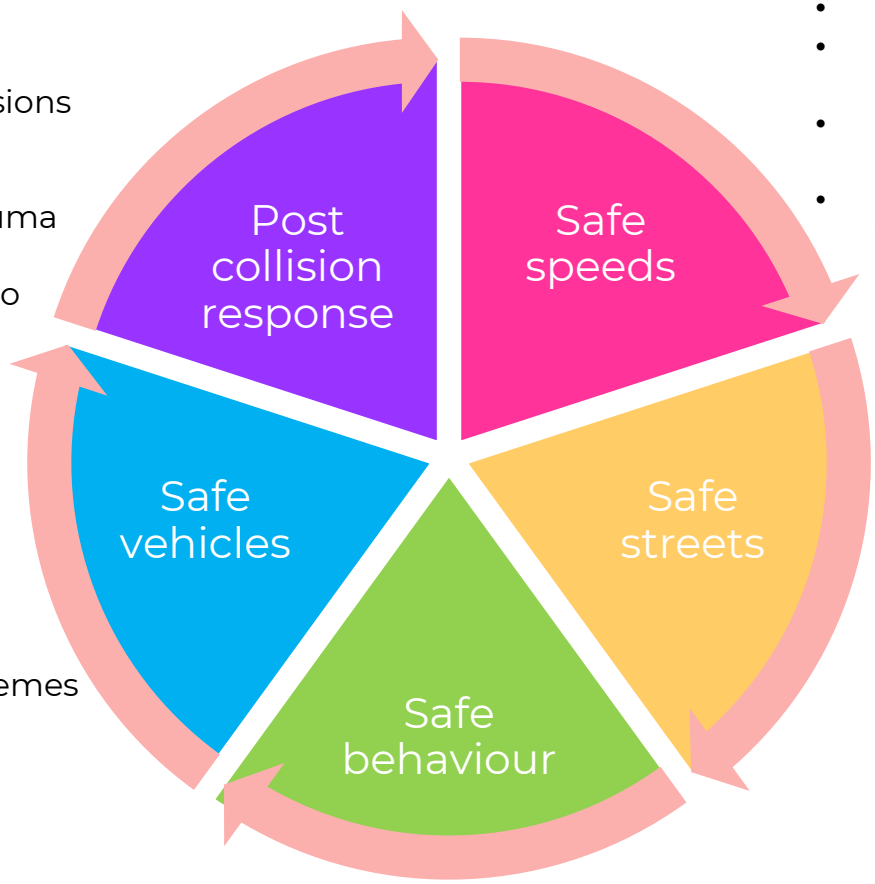
Lessons learned / future opportunities

Actions which can be applied widely

- Prioritise **emergency vehicles**
- **Investigate** and act on serious collisions
- Undertake further **data analysis** to understand risk on our streets
- **Support** those affected by road trauma
- Improve **data collection** to build understanding of key contributors to road danger



- **Lower** speed limits
- Keep promoting compliance through street **design**
- Identify locations where **speed limit compliance is poor**
- Explore Intelligent Speed Assistance & **Technology** Enforcement

- **Reduce** the number of motorised vehicles that pose a danger to others & encourage other modes
- Review **parking** provision
- Review **micro-mobility** roll-out
- Encourage **fleet accreditation** schemes
- Engage with **stakeholders** on safer buses and taxis
- Work with **vehicle manufacturers**
- Run **cycle maintenance** events
- **Collaborate** on connected and autonomous vehicles

- Maximise opportunities to improve road safety within non-safety related **existing & future projects**
- Build a Vision Zero **culture**
- Undertake collision data analysis and identify **mitigation schemes**
- **Collect and collate** more data
- Expand schemes targeted at most at risk road users
- **Engage** with user groups

- Promote and create safe driving **campaigns**
- Promote **training** for specific road users
- Target enforcement as relevant
- **Engage** with user groups

Lessons learned / future opportunities

What other datasets could we integrate in the tools?

- Traffic flows
- Air quality
- Asset management
- Lighting levels
- Incidents
- Emergency services data (e.g. time to get to the collision, hospital admissions)
- Live data (e.g. from vehicles, parking, smart cities)
- Cycle facilities
- Shared use areas
- Etc.

What other decision making process could the tools be adapted for?

- Low traffic neighbourhoods
- Active travel schemes
- Asset management
- School street schemes
- Workplace travel plans
- Etc.

CONCLUSION

Vision Zero roll-out

- Embed Vision Zero into **policy and strategy**
- Provide Vision Zero **guidance** for all design & build projects
- Roll out Vision Zero **training and awareness campaigns** within your organisation & outside of it
- Work in **partnership** with stakeholders
- **Develop tools** to help with analysis & decision making

How you could move forward to create Vision Zero tools

- What software/digital expertise do you have available in your organisation?
- What do you want to be able to do? E.g. analysis, scheme/action comparison, monitoring, reporting.
- What data is available/ useful to integrate with collision data?

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