

The Role of the Highways and Street Lighting Professional in Making Roads Safer

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Safety

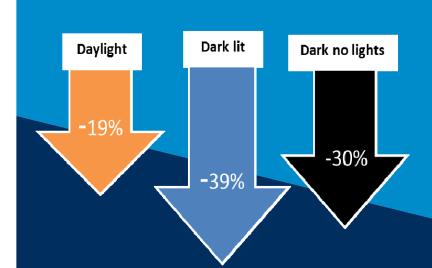
Our focus is always on providing a safer network for all road users and reducing the number of casualties

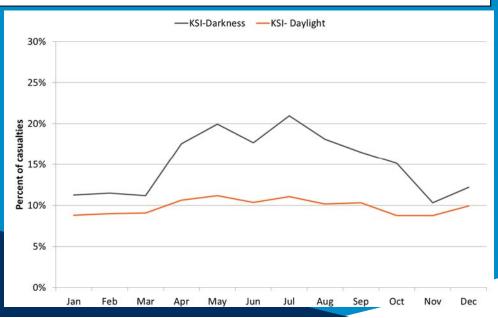


40%

Reduction in the number of people **killed or seriously injured** on the network













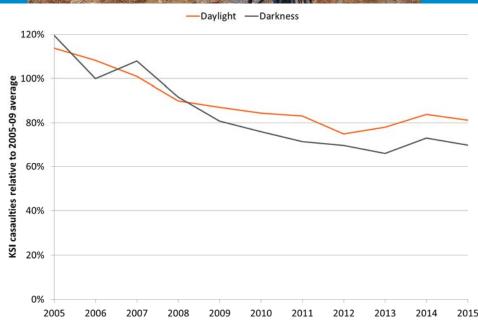


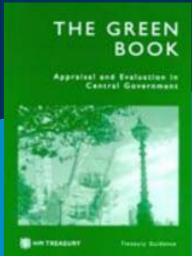


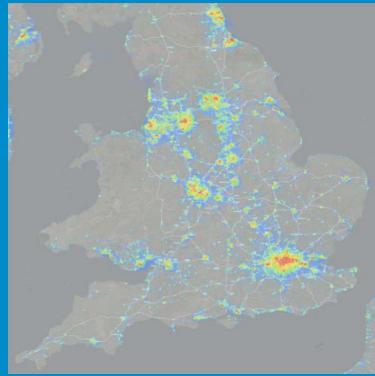














- Challenging Target
- Not expecting any (big) budget increase
- Old approach is running out of steam
- No new interventions
- Vehicle fleet churn slowing



• Making the Network safer by continuing to reduce the number of people killed or seriously injured on the Network. The target of a 40% reduction against the 2005–09 average baseline by the end of 2020 is a stretching one: the Company will need to work proactively to find innovative ways to improve safety.







TRIZ solution patterns And inventive principles

ABSTRACT PROBLEM



ABSTRACT SOLUTION





PROBLEM ANALYSIS



SPECIFIC PROBLEM

SPECIFIC SOLUTION



The Digital Challenge for Highways Management

Nic Cary

Head of Digital Transformation and Open Data
Department for Transport



Definition of digital

- It's about digital business transformation...
- What digital is not:
- a. all about websites
- b. IT
- What digital is:
- a. creates and operates services to meet user needs
- b. adopts new (relevant) ways of solving problems
- c. drives partnership and collaboration approach to creating value



GETDATA SHARE DATA IJSEDATA



- STATS19 (day & night)
- Link speed and flow data –
- Road surface condition
- DfT Road Collision in depth studies
- On-scene collision studies
- Highway England Fatals studies
- Link iRAP Highways England Control Centre C&C data
- 'Red' and 'Green' claims



Areas of interest (high night-time KSI occurrence):

- Pedestrians
- Loss of control type accidents
- Speeding, drinking and fatigue



TRIZ solution patterns
And inventive principles





ABSTRACT SOLUTION





PROBLEM ANALYSIS



SPECIFIC PROBLEM

SPECIFIC SOLUTION

Key factor: Pedestrians; Contributory factor: Failed to judge vehicle's path or speed

Ishikawa Diagram

Accepted behaviours

Safe People

Combined effect of medication / drugs

DRAFT TRANSPORT

Road geometry

No alternative transport Forgiving environment

Poor information design Limited safe runoffs Pedestrian routes



WP420 Identifying Safe System performance gaps

Cause

Safe Vehicles Safe Speeds Visibility Driving aids - faulty or misuse Lack of warning systems Reaction and response times Driving too fast/slow Incorrect use of vehicle features Dazzling headlights Speed limiter Drugs - prescription and recreational Lack of education Lighting Experience - young Inattention Visibility Distraction - within or outside vehicle Impairment Sight lines Lack of safe places to stop Hazard perception Fatigue Unexpected behaviour Segregated cycle lanes Reduced ability to control vehicle Complacency Pressure-time and in a rush Lane width

Micro sleeps

Careless behaviour

Effect

Dangerous Behaviours Fatigue

Driver/ rider was so tired that they could not drive effectively or were unable to perceive hazards.

Safe Roads and Road Sides



AVOIDING HIGH RISK SITUATIONS

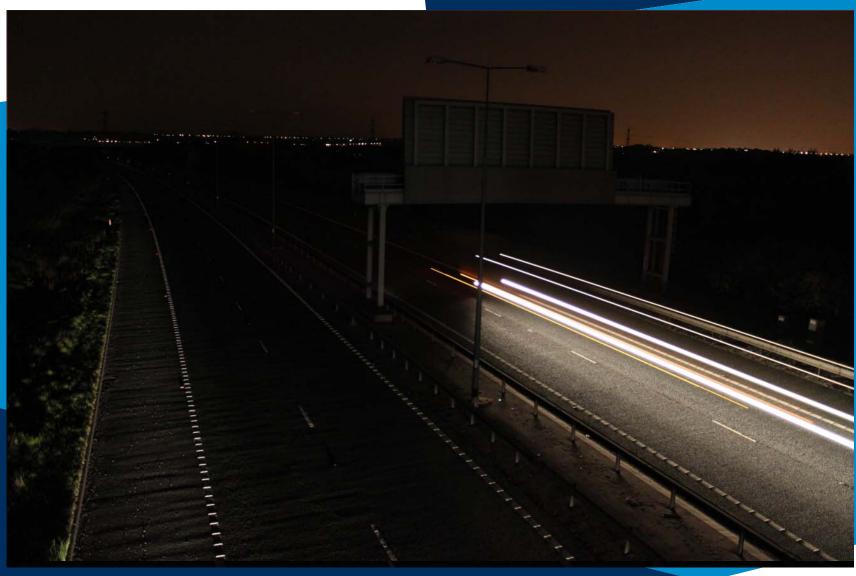
for Road Users



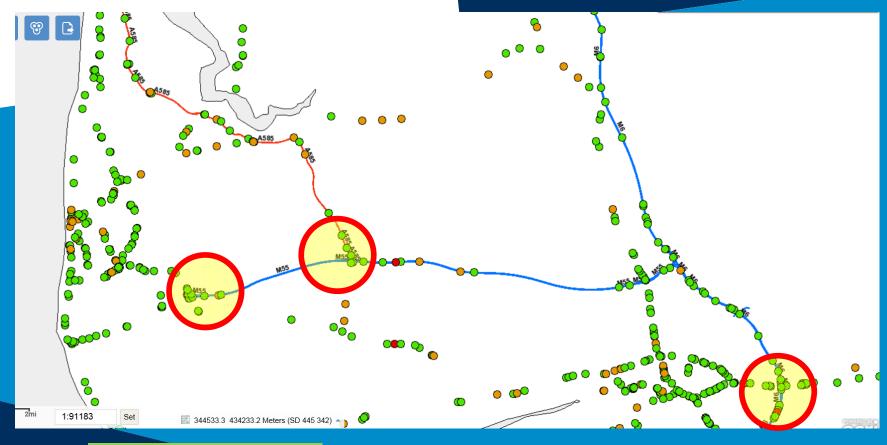
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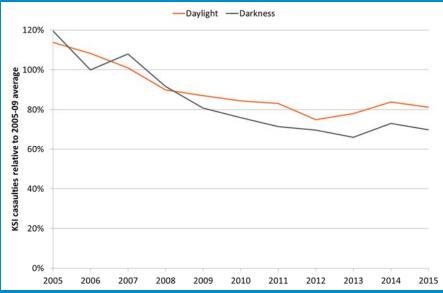
SPECIFIC PROBLEM



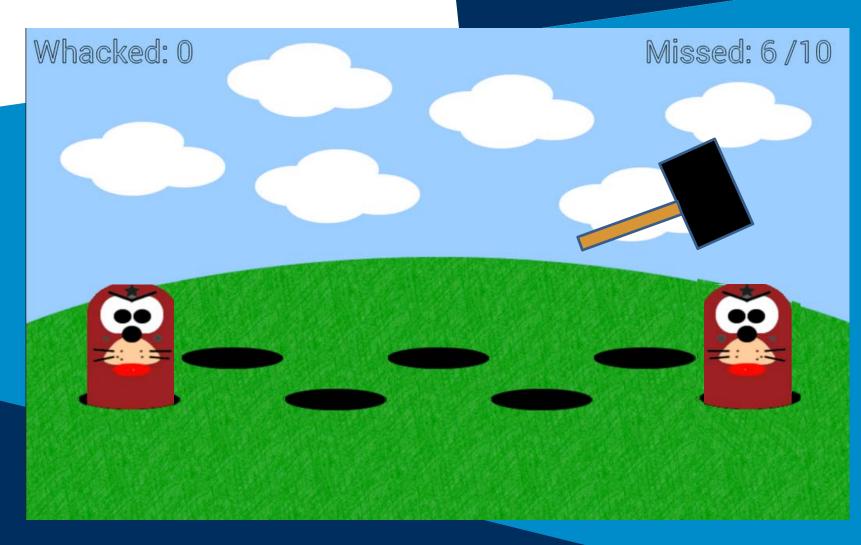
SPECIFIC SOLUTION







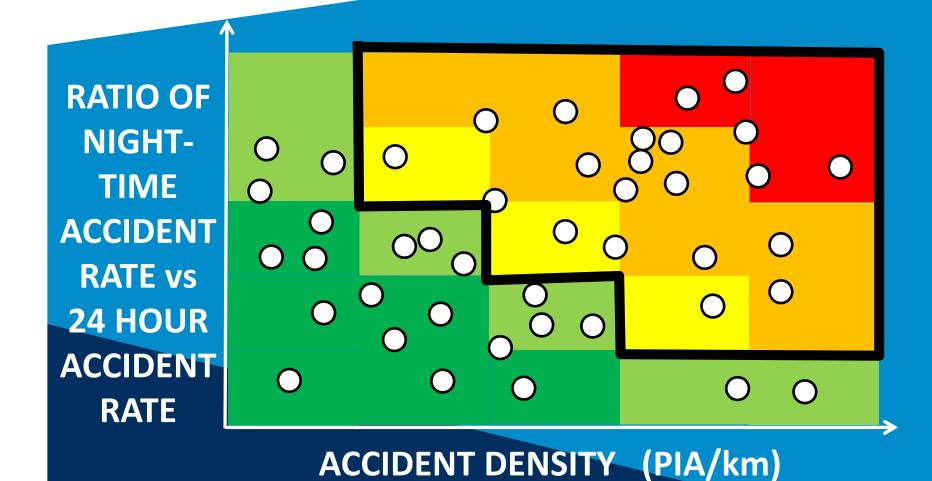




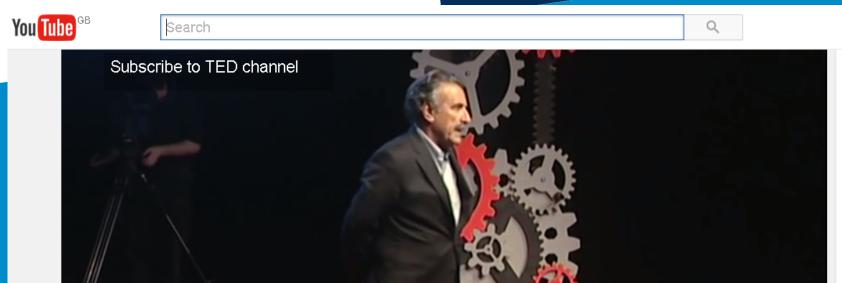


		103	102	101	110	108	107	109	104	105	106
	Road nvironment contributed	Slippery Road (due to weather)	Deposit on road (e.g oil, mud,	Poor or defective road surface	raised or slippery inspection	(e.g bend, hill, narrow carrageway)	road layout (e.g contraflow)	•	or marked signs or road markings	Defective traffic signals	calming (e.g speed cushions,
		201	202	203	204	205	206		gz		
	Vehicle Defects			•	•	•	•				
		308	306	302	301	307	310	305	304	309	303
ŀ	njudicious Action	Following too close	Exceeding speed limit	Give Way or Stop signs or markings	Disobeyed automatic traffic signal	Travelling too fast for conditions	entering road from pavement	Illegal turn or direction of travel	pedestrian crossing facility	venicle travelling along	Disobeyed double white lines
		405	406	403	408	409	401	402	404	407	410
Di	river / Rider Error or Reaction	Failed to look properly	other person's	poor turn or manoeuvre	Sudden braking	Swerved	Junction overshoot	restart (moving off at junction)	signal or misleading signal	to cyclist, horse or pedestrian	Loss of control
		501	502	508	503	509	510	505	504	507	506
	mpairment or Distraction	•	•	•	•	•	Distraction outside vehicle			Rider wearing dark clothing	•
		602	605	601	603	607	606	604			
	ehaviour or experience	Careless, reckless or in a hurry	Learner or inexperience d driver / rider	•	Nervous, uncertain or panic	•	Inexperience of driving on the left	Driving too slow for conditions or slow vehicle			
		701	703	706	707	708	705	710	702	704	709
	Vision Affected by	Stationary or parked vehicle(s)	Hoad layout (e.g bend, winding road,	Dazzling sun	Rain, sleet, snow or fog	spray from other vehicles	Dazzling headlights	Vehicle blind spot	vegetation	Buildings, Road signs, street	
		802	808	803	801	806	807	805	804	809	810
01	Pedestrian dy (Casualty r Uninjuired)	Failed to look properly	Careless, reckless or in a hurry	Failed to judge vehicle's path or speed	by stationary or parked	Impared by alcohol	Impaired by drugs (illicit or medicinal)	Dangerous action in carrigeway (e.g playing)	Wrong use of pedestrian crossing facility	Pesdestrian wearing dark clothing at night	Disability or illness, mental or physical
		901	902	903	904						999
	Specials Codes		•	Emergency vehicle on a call	venicle door opened or close						













Scheme Number	PIC per Annum Rate	PIC per MVKM Rate	KSI Ratio
2	+0.9	+0.90	-50%
15	-1.2	-0.06	-10%
16	+2.6	+0.08	+27%
17	-0.1	+0.01	-5%
18	-1.7	-0.03	-22%
19	-13.6	-0.03	+2%
20	-0.9	-0.10	-23%
21	-6.1	+0.02	-11%

Table 26: Summary of Impact of Road Lighting Strategy (FSO Schemes)



	SMART MWAY	MOTORWAY	DUAL CARR	SINGLE CARR	
				_	
ROAD ENVIRONMENT	26	-13	-29	-7	
VEHICLE DEFECT	-43	2	-25	85	
INJUDICIOUS ACTION	6	9	-13	2	
DRIVER ERROR	9	-6	-29	-19	
IMPAIRMENT OR DIST	-11	-18	-5	-18	
BEHAVIOUR OR EXP'C	-12	-1	-19	-11	
VISION AFFECTED	-5	-8	-34	-27	
PEDESTRIAN ONLY	-72	-64	-80	-86	
SPECIAL CODES	57	-22	-6	-13	



Rank	Cont	ributory factor	KSI	Killed	Seriously injured	Slightly injured	Total casualties		
1	405	Failed to look properly	491	47	444	4,958	5,449		
2	410	Loss of control	428	55	373	2,167	2,595		
3	406	Failed to judge other person's path or speed	r 389	31	358	4,593	4,982		
4	602	Careless, reckless or in a hurry	247	26	221	1,620	1,867		
5	403	Poor turn or manoeuvre	191	20	171	1,564	1,755		
6	503	Fatigue	169	17	152	759	928		
7	409	Swerved	159	20	139	889	1,048		
8	307	Travelling too fast for conditions	148	14	134	1,082	1,230		
9	408	Sudden braking	125	6	119	1,923	2,048		
10	306	Exceeding speed limit	111	20	91	375	486		
11	308	Following too close	109	6	103	2,235	2,344		
12	505	Illness or disability, mental or physica	al 108	15	93	305	413		
13	509	Distraction in vehicle	100	19	81	635	735		
14	501	Impaired by alcohol	100	7	93	351	451		
15	601	Aggressive driving	62	12	50	289	351		
16	605	Learner or inexperienced driver/rider	51	5	46	379	430		
17	502	Impaired by drugs (illicit or medicinal)) 36	9	27	64	100		
18	510	Distraction outside vehicle	29	3	26	261	290		
19	401	Junction overshoot	25	1	24	147	172		
20	404	Failed to signal or misleading signal	22	1	21	140	162		
Key (CF	groups	3):							
	Drive	r/Rider error or reaction	npairment or distraction	1	In	iudicious act	ion		

Driver/Rider error or reaction Behaviour or inexperience Impairment or distraction

Injudicious action



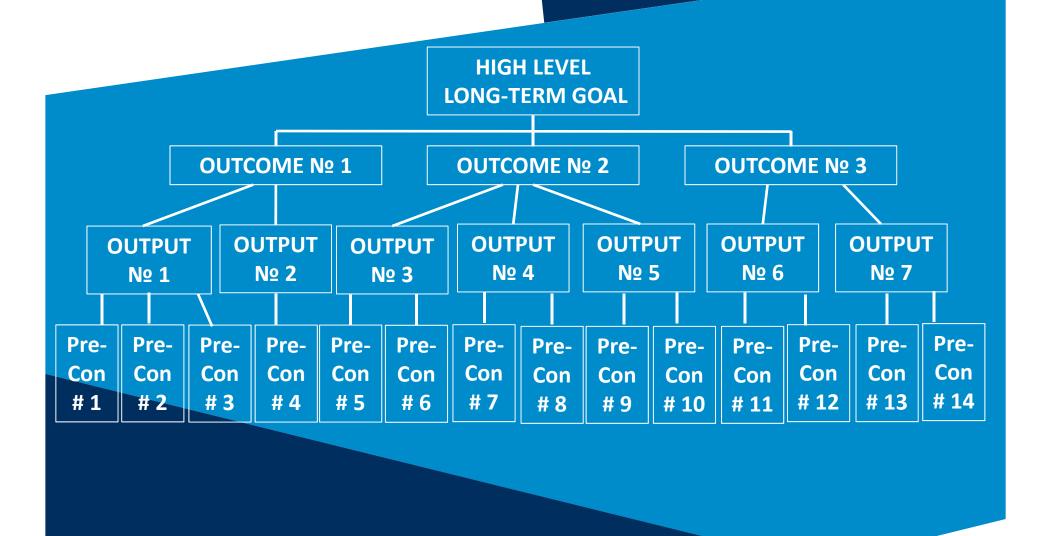
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BEHAVIOUR OR EXP'C	-12	-1	-19	-11
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	SMART MWAY	MOTORWAY	DUAL CARR	SINGLE CARR											
ROAD ENVIRONMENT	26	-13	-29	-7	Road Environment Contributed	103 Slippery Road (due to weather)	102 Deposit on road (e.g oil, mud.	101 Poor or defective road surface	110 raised or slippery inspection	108 (e.g bend, hill, narrow carrageway)	107 road layout (e.g contraflow)	109 Anin obje carriageway	104 or marked signs or road markings	105 Defective traffic signals	106 calming (e.g speed cushions,
VEHICLE DEFECT	-43	2	-25	85	Yehicle Defects	201 Tyre dal, defe or under milated	202 Definition	203 Def brak	204 Def Steam or suspension	205 Deformor mis mirrors	206 or p loat vehicle or				
INJUDICIOUS ACTION	6	9	-13	2	Injudicious Action	308 Following too close	306 Exceeding speed limit	302 Give Way or Stop signs or markings	301 Disobeyed automatic traffic signal		310 entering road from pavement	385 Illegal turn or direction of travel	304 pedestrian crossing facility	309 Venicle travelling along	303 Disobeyed double white lines
DRIVER ERROR	9	-6	-29	-19	Driver & Rider Error or Reaction		+406 Fall to luage other person's	poor turn or manoeuvre	408 Sudden braking 503	409 Swerved	Junction overshoot		signal or misleading signal	to cyclist, horse or pedestrian	Loss of control
IMPAIRMENT OR DIST	-11	-18	-5	-18	Impairment or Distraction	Implemy aloo	Impulby drugger it or measural)	Driving mobile one	Fal.	Distantin in vehicle	Distraction outside vehicle	disa men	Unconsted, defi eyesignt	Rider wearing dark clothing	disp light gh
BEHAVIOUR OR EXP'C	-12	-1	-19	-11	Behaviour or Inexperience	Careless,	Learner or	Age Pe drivi	Nervous, uncertain or panic	Unforced of with wehicle	Inexperience of driving on the left	Driving too			
VISION AFFECTED	-5	-8	-34	-27	Vision Affected by	701 Stationary or parked vehicle(s)	703 Hoad Tayout (e.g bend, winding road,	706 Dazzling sun	707 Rain, sleet, snow or fog	venicles	705 Dazzling headlights	710 Vehicle blind spot	702 vegetation	704 Buildings, Road signs, street	709 Visor of win on dirty
PEDESTRIAN ONLY	-72	-64	-80	-86	Pedestrian only (Casualty or Uninjuired)	Failed to look properly	808 Careless, reckless or ir a hurry	803 Failed to judge vehicle's path or speed	801 Crossing road marked by stationary or parked	806 Impared by alcohol	807 Impaired by drugs (illicit or medicinal)	B05 Dangerous action in carrigeway [e.q.playing]	804 Wrong use of pedestrian crossing facility	809 Pesdestrian wearing dark clothing at night	
SPECIAL CODES	57	-22	-6	-13	Specials Codes	901 Sto	902 Vehicou crime	903 Emergency vehicle on a call	904 Venicle door opened or close			100 posquiqi			999



The Theory of Change





SAFE ROADS

ROAD LIGHTING

STATS19 FACTOR

ROAD TYPE

SPATIALLY SPECIFIC

ACTIVE ROAD STUDS

STATS19 FACTOR

CREST OF HILL

SPATIALLY SPECIFIC



SCHEME COSTS



STATS19
DATA





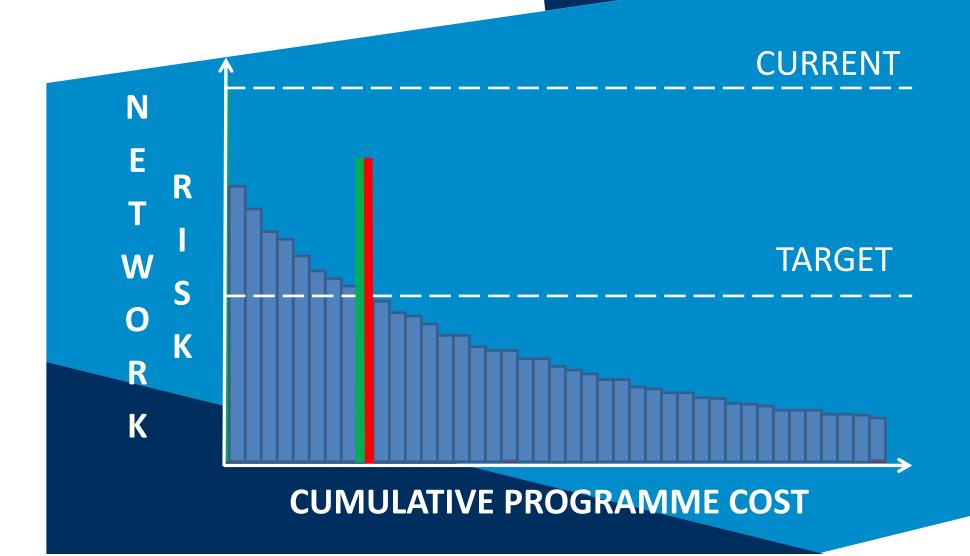




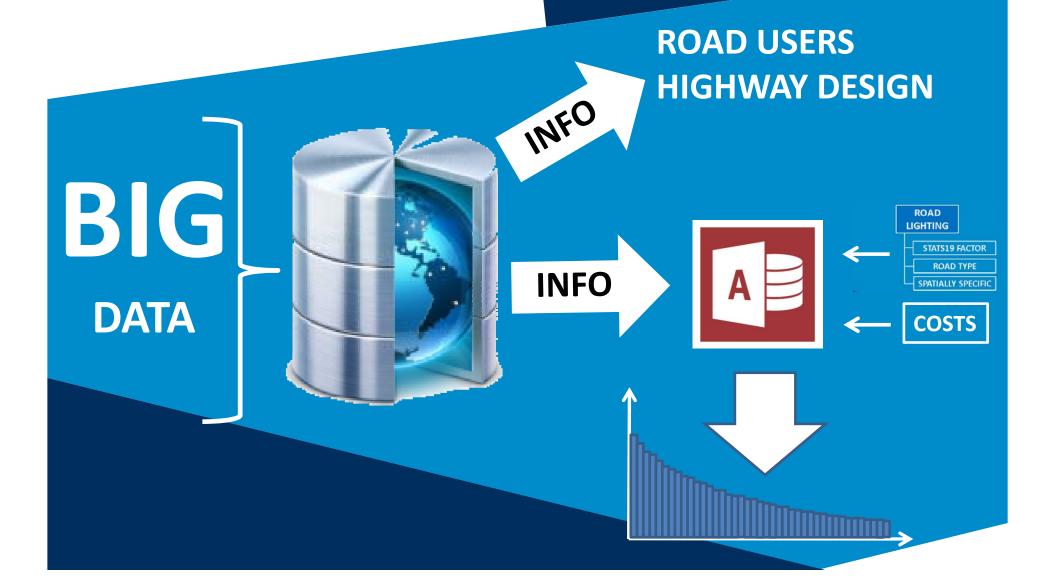
SPATIALLY SPECIFIC













THANK YOU

