



**Recover and Thrive:**  
Regulating Mobility in a Disrupted World

Webinar, June 17<sup>th</sup> 2020



**Simon Dixon**, Global  
Transportation Leader |  
Deloitte UK



**Piyush Pandey**, Global  
Smart Cities Cyber Leader |  
Deloitte US



**Thomas Deloison**, Mobility  
Director | World Business Council  
for Sustainable Development  
(WBCSD)



**Rana Sen**, Transportation  
and Smart City Initiative  
Lead | Deloitte US



**Faye DiMassimo**, Senior Advisor  
to the Mayor for Transportation  
and Infrastructure, Metropolitan  
Government of Nashville and  
Davidson County



**Nadun Muthukumarana**, Lead  
Partner for Data Analytics in  
Government & Public Services |  
Deloitte UK



**Alex Schock**, Head of  
Programme Delivery & Data |  
Network Rail, UK

# Enabling data-sharing: Emerging Principles for Transforming Urban Mobility

## Speakers:

**Piyush Pandey**

Global Smart Cities Cyber Leader |  
Deloitte US

**Thomas Deloison**

Mobility Director | World Business Council for  
Sustainable Development (WBCSD)

## Towards a Mobility Strategy Framework

### Speakers:

**Rana Sen**

Transportation and Smart City  
Initiative Lead | Deloitte US

**Faye DiMassimo**

Senior Advisor to the Mayor for Transportation  
and Infrastructure | Metropolitan Government of  
Nashville and Davidson County



- Performance driven mobility with trust at core of data
- Policy Management
- Infrastructure Management
- Operations Management including risk

## Data-driven Mobility Transformation

### Speakers:

**Nadun Muthukumarana**

Lead Partner for Data Analytics in  
Government & Public Services |  
Deloitte UK

**Alex Schock**

Head of Programme Delivery & Data |  
Network Rail, UK

# Alex Schock

Head of Programme Delivery  
Digital Transformation  
Intelligent Infrastructure



## **NetworkRail**



- The national rail operator of UK
- 18,000 miles of track with 22,000 trains running every day
- The national network operator responsible for network operation, asset management and timetable design

# Pre-Covid

Problems we are addressing

- Increase passenger satisfaction
- Increase asset availability and reliability
- Improve Performance & Capacity

# Post-Covid

Problems and opportunities

- Decision making without historic precedence
- Aligning maintenance with changing service levels during Covid
- Managing rapid and constant changes to the timetable



# Asset Criticality Waterloo to Clapham Junction

Asset.. (All) Asset.. (All) E.. (All) Asset.. (All) Asset.. (All)

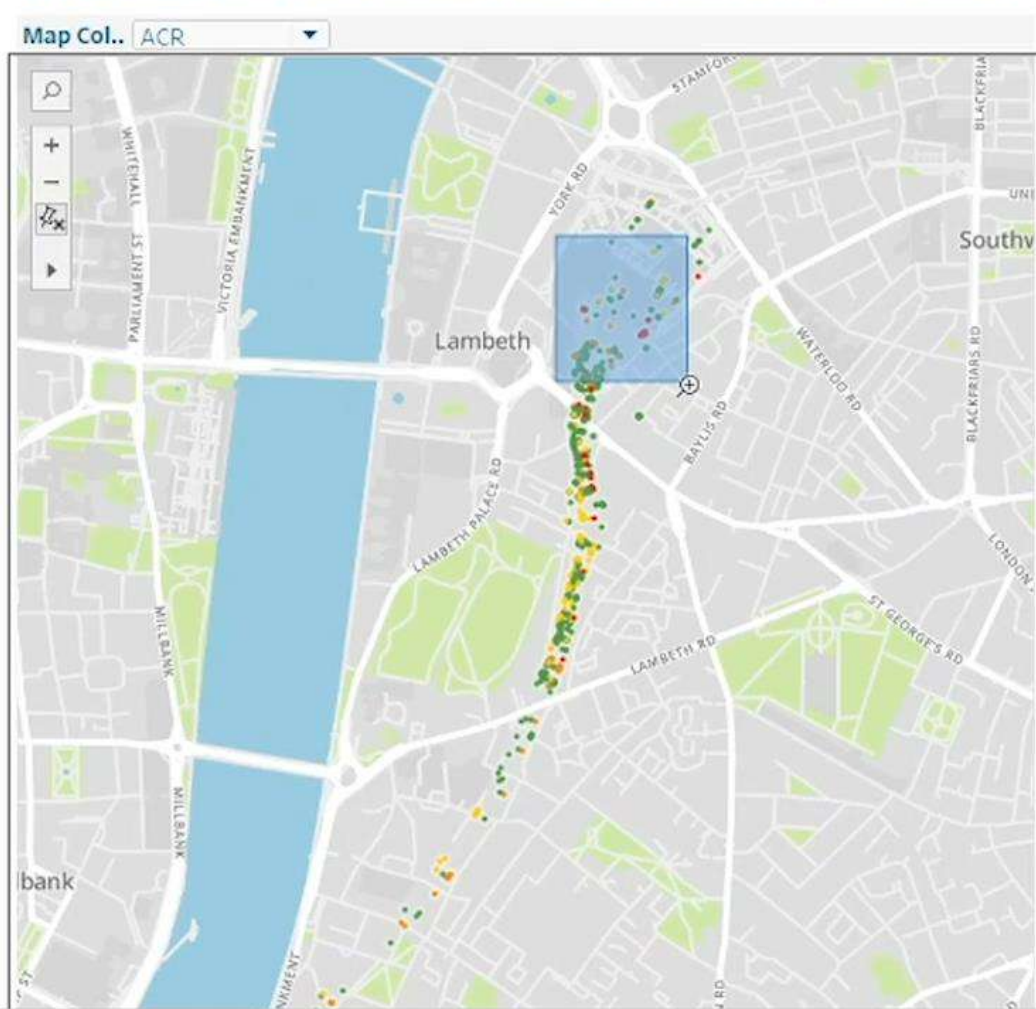
E.. (All) Trac.. (All) Start Yar.. 1 0 7901 End Yard.. 41 0 7901 Planned.. (All)

Per.. (All) Y.. (All) Mo.. (All) D.. 31/05/2016 0 25/05/2018 Last Maintena.. 01/01/2000 06/12/2018

Total Dela.. 0 0 3,624,497 Total Fai.. 0 0 90 Total Dela.. 0 0 26,609 Total Work O.. 0 0 396

**Asset Locations** Select an Asset or Group of Assets from the Map to filter the Dash..

**Asset Criticality Details** Select an Asset or group of Assets to show Failure/Work Order details below, and to highlight the Assets on the Map



Asset..	Asset..	Asset Type	Tr..	ELR	Berth	Star..	End..	Plan..	Train..	F..	Avg C..	Dela..	PP..	ACR
11250..	S&C	S&C - Fixed Diamond..	12..	B..	WI0..	437	455	075	120	1..	£129	2,047	1..	5.5
17911..	Signa..	Track Circuit/Ac 50 H..	21..	B..	WI1..	645	646	Unkn..	0	1..	£158	22,9..	1..	5.5
17912..	Signa..	Track Circuit/Ac 50 H..	12..	B..	WI0..	6814	6815	075	252	1..	£108	2,028	135	5.2
11216..	Signa..	Track Circuit/Ti21 An..	11..	B..	WI0..	5623	5624	100	242	1..	£114	1,663	525	5.2
11211..	Signa..	Track Circuit/Ti21 An..	22..	B..	WI0..	2681	2682	Unkn..	0	2..	£96	15,8..	909	5.2
17911..	Signa..	Track Circuit/Ac 50 H..	22..	B..	WI0..	983	984	075	260	1..	£95	1,787	126	5.2
11249..	S&C	S&C - Turnout	21..	B..	WI1..	6661	6713	Unkn..	0	1..	£96	1,992	254	5.2
17913..	Signa..	Track Circuit/Ac 50 H..	11..	B..	CM0..	4172	4173	Unkn..	0	2..	£94	5,916	460	5.2
11662..	Signa..	Equip Housing / Loca..	22..	B..	WI0..	609	609	Unkn..	0	1..	£111	1,284	224	5.1
17914..	Signa..	Track Circuit/Ac 50 H..	12..	B..	WI0..	487	488	075	120	1..	£182	712	127	5.1
18764..	Signa..	Track Circuit/Ti21 An..	11..	B..	CM0..	3118	4072	Unkn..	0	2..	£326	51	19	5.1
11195..	Signa..	POE - Point Machine	11..	B..	WI0..	5765	5765	100	242	1..	£96	1,933	122	5.1
17913..	Signa..	Track Circuit/Ac 50 H..	11..	B..	CM0..	5001	5002	Unkn..	0	1..	£87	2,587	114	5.1
17912..	Signa..	Track Circuit/Ac 50 H..	21..	B..	WI0..	809	810	075	204	1..	£94	1,454	176	5.1
11226..	Signa..	POE - Point Machine	21..	B..	WI0..	573	573	Unkn..	0	1..	£233	91	27	5.0
11250..	S&C	S&C - Turnout	36..	B..	WI0..	411	427	Unkn..	0	1..	£447	34	28	5.0
11250..	S&C	S&C - Turnout	22..	B..	WI0..	543	56	Unkn..	0	1..	£325	34	59	5.0
17911..	Signa..	Track Circuit/Ac 50 H..	12..	B..	WI0..	900	901	Unkn..	0	1..	£191	107	27	5.0
11233..	Signa..	POE - Hydraulic/Pneu..	21..	R..	WI0..	477	477	Unkn..	0	1..	£267	20	3	5.0
17911..	Signa..	Track Circuit/Ac 50 H..	21..	B..	WI0..	485	486	Unkn..	0	1..	£295	16	4	5.0

**ACR Score**

- Good
- Average
- Poor
- Very Poor

**ACR**

2.0 5.5

**Train Units p..**

0.00 263.53

**Delay per Inc..**

0 22,965

**FWI Score**

0.00 2.27

**PPM Score**

0 1,285

**Cost per Min..**

£0.00 £446.8

**Selected Asset Details** Select an Asset or group of Assets from the Table above or the Map to show Failure/Work Order details below

Failure Details

Failure..

1

Del..

£3,624,497



### 4. Select Scenario

Weather

Rain

- Average Temperature: 11.4°C
- 24H Minimum Temperature: 2°C
- 24H Maximum Temperature: 25°C
- Average Pressure: 992.38bar
- Average Humidity: 89.79m\*
- 24H Max Windspeed: 10km/h
- 24H Average Rain: 37.3mm

Crew

Number of Crew: 100

GO BACK VALIDATE

Simulation using environmental variables

### Recommended Alternative Timetables

#### Timetable 25

56 minutes delay saved

Identifying hot-spots in the proposed timetable

### Train Simulator

11/12/2016 10:16  
Speed: 3

Active Trains:

- Y5003 - MCRN - LEEDS
- Y5751 - MNCRVIC - HDRSFLD
- Y5204 - MNCRVIC - HDRSFLD
- Y5276 - HDRSFLD - MNCRVIC
- Y5279 - HDRSFLD - MNCRVIC

Y65798 (Class185)

Throttle: -100%  
Origin: HDRSFLD  
Destination: MNCRVIC  
Next Station: MNCRVIC

The physics engine simulates the behaviour of all vehicles in the real world



Simulation of crew availability

# Benefits Delivered

Customer Satisfaction

**1.6m**

more passenger journeys  
on time

Lower time  
for recovery

**18m**

minutes of delays  
avoided

Lower Asset OpEx

**£12.5m**

avoidable asset failure penalties  
between Waterloo to Clapham

