

Inclement Weather, exploring the issue and concepts to address a known industry risk

The move from road builders to journey facilitators and how to minimise disruption



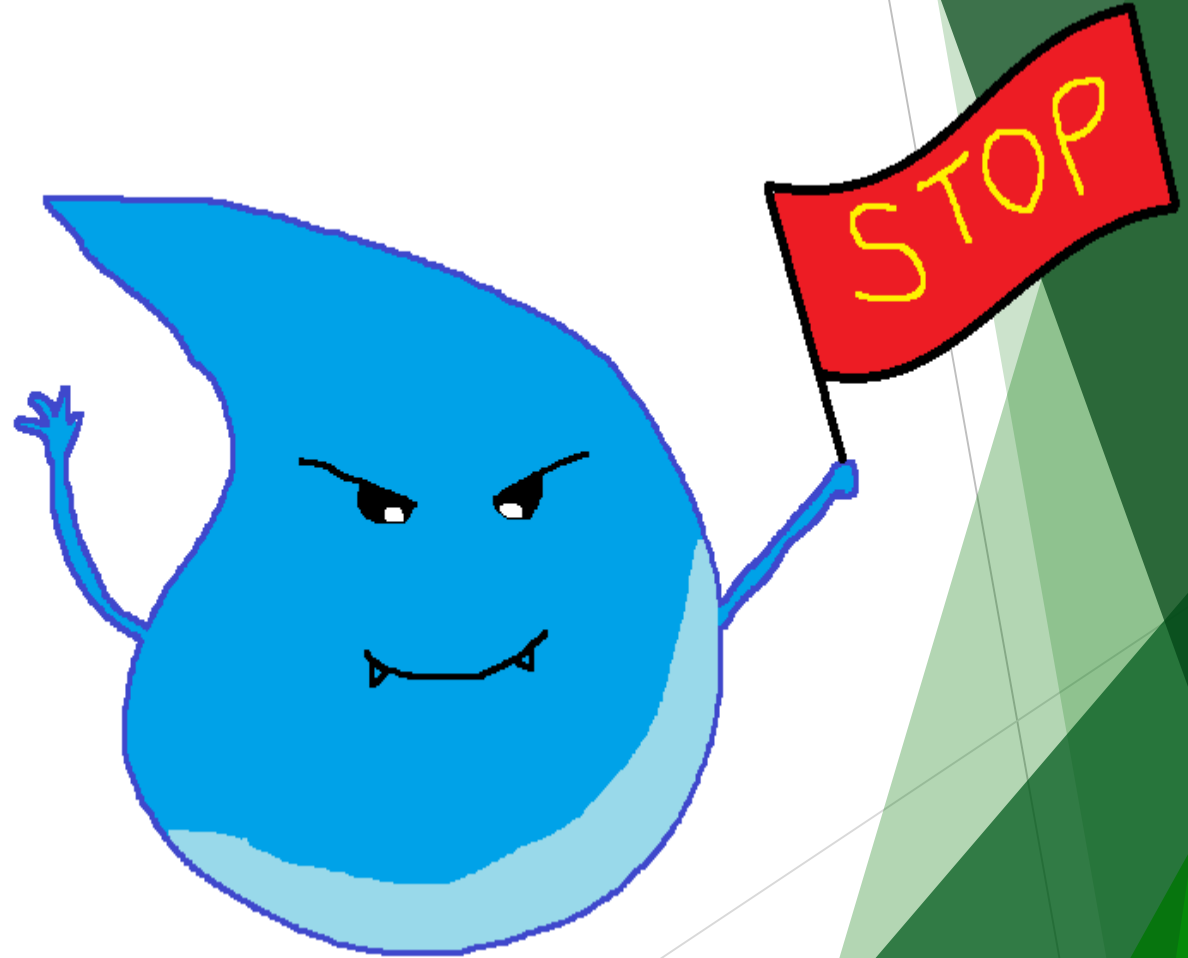
Presented by: Ben Lin

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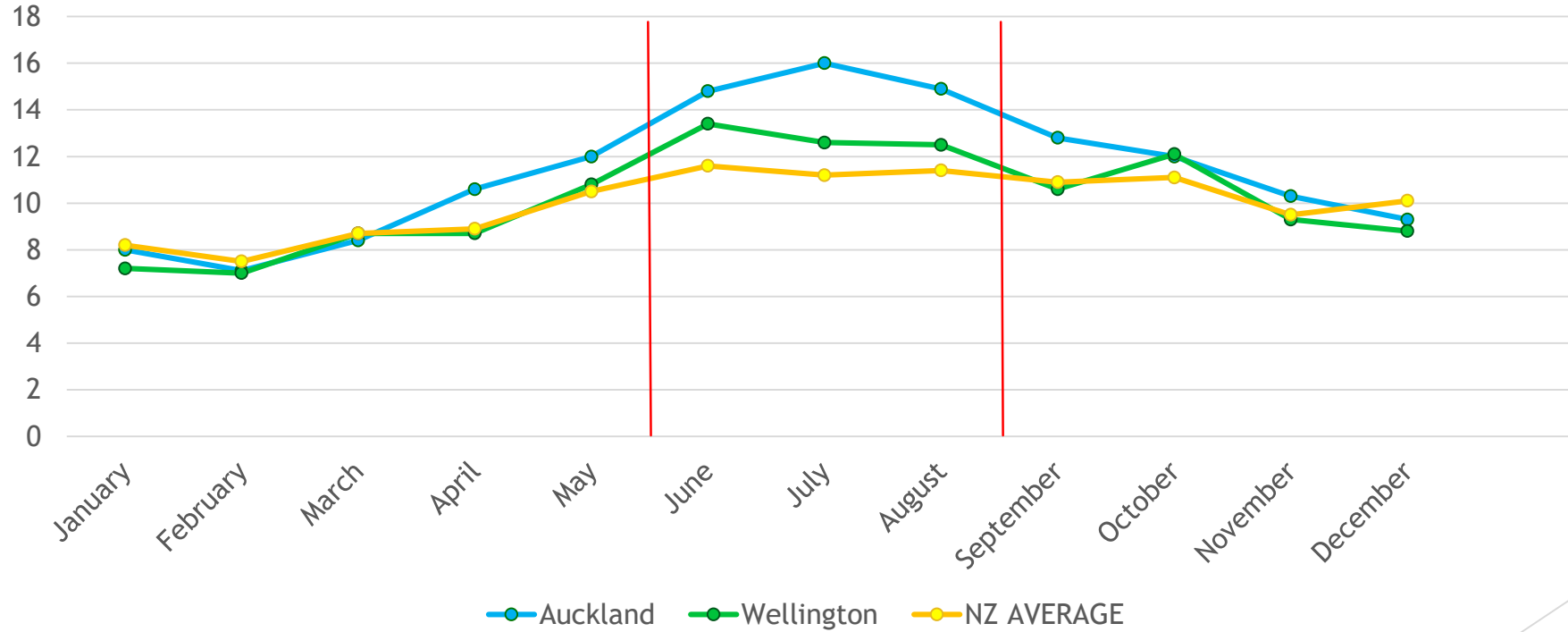
The Problem

- ▶ Wet weather
- ▶ Water entering permeable pavement layers
- ▶ Unpredictability



The Stats

Wet Days - Mean Number Of Days per month With 1mm Or More Of Rain 1981 - 2010



The Stats

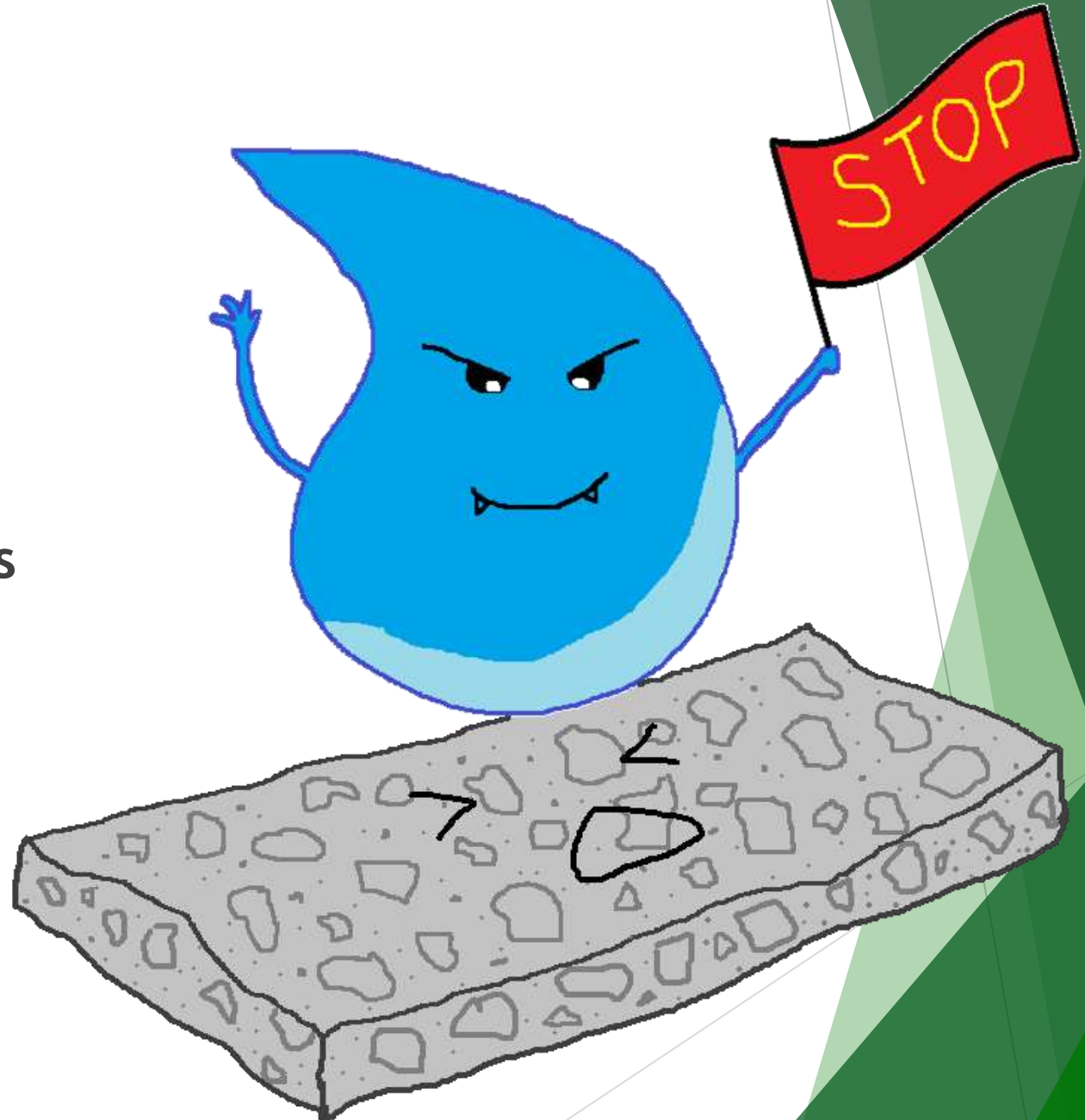
Days lost due to wet weather (average per month)

Capital Works	FY16 - FY17	FY17 - FY18
Nationwide	4.1	3.8
Auckland/Northland	3.2	2.6
Waikato / BOP	4.3	4.4
Central/Lower North Island	6.2	4.9
South Island	4.6	4.3

NOC Contracts	FY16 - FY17	FY17 - FY18
Nationwide	3.7	3.5
Auckland/Northland	4	6
Waikato / BOP	5	4
Central/Lower North Island	4	4
South Island	3	2

Impact

- ▶ Disruption
- ▶ Project Programme Effects
- ▶ Costs



Impact

- ▶ Disruption



- ▶ Commuters

- ▶ Social

- ▶ Environmental



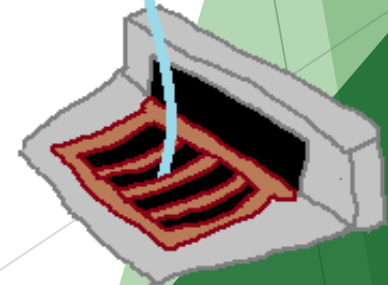
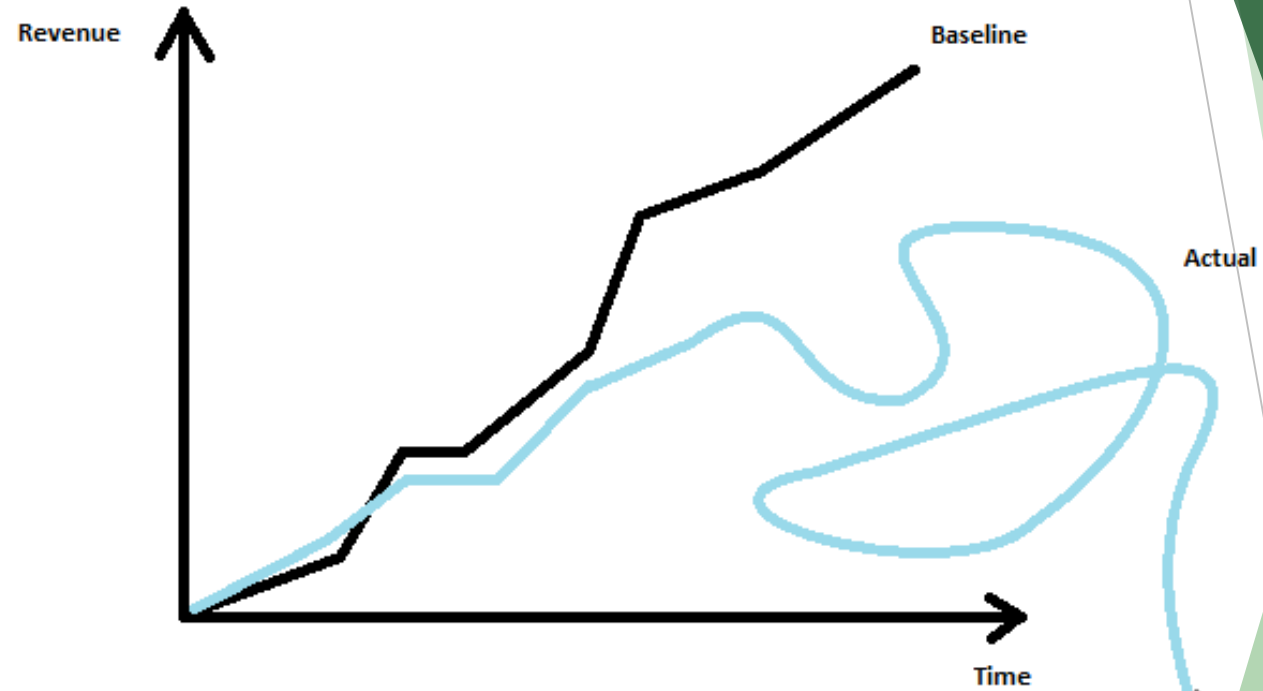
Wor



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Impact

- ▶ Project Delays
- ▶ Remedial work
- ▶ Compliance
- ▶ Reputation



Impact

- ▶ Cost
 - ▶ Rework

3 days lost per month due to wet weather

Time required to dry out basecourse

Time required to rework basecourse

Assume an additional 2 days lost = 108 days lost per year

Plant = PTR, Three-pin, Steel drum, Watercart, Vehicles

Labour = 3x operators

Overheads = Supervisor, Site Engineer, Project Engineer,
Project Manager

Material = ???

Testing

Impact

50.5km/hr to 56.8km/hr during weekdays
\$3.5m per day savings

Assume 40km travel per day

@50.5km/hr = 47.52 min

@56.8km/hr = 42.25 min

Difference of 5.27 min

$\$3.5\text{m} / 5.27\text{min} = \$663,981.48/\text{min}$

Assume 3km travel through road works

@100km/hr = 1.8 min

@80km/hr = 2.25min

Difference of 0.45min

$\$663,981.48/\text{min} \times 0.45\text{min} = \$298,791.67/\text{day}$

That's based on free flowing motorway speeds!

► Cost

► Rework

► Regional Economy

Impact

- ▶ **Cost**

- ▶ Rework

$\$298,791.67 \times 108 \text{ days}$

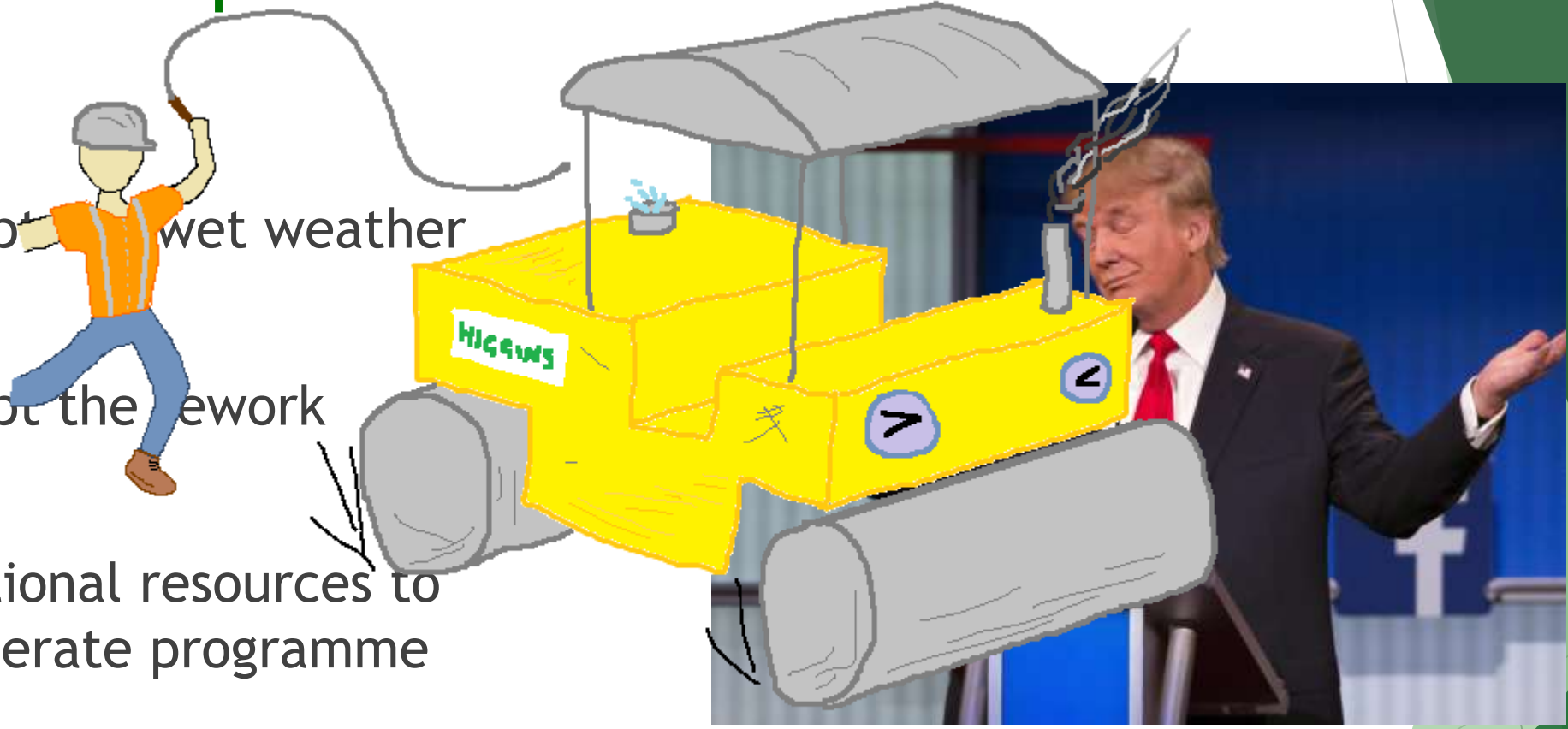
$= \$32,269,500 \text{ !!!}$

- ▶ Regional Economy



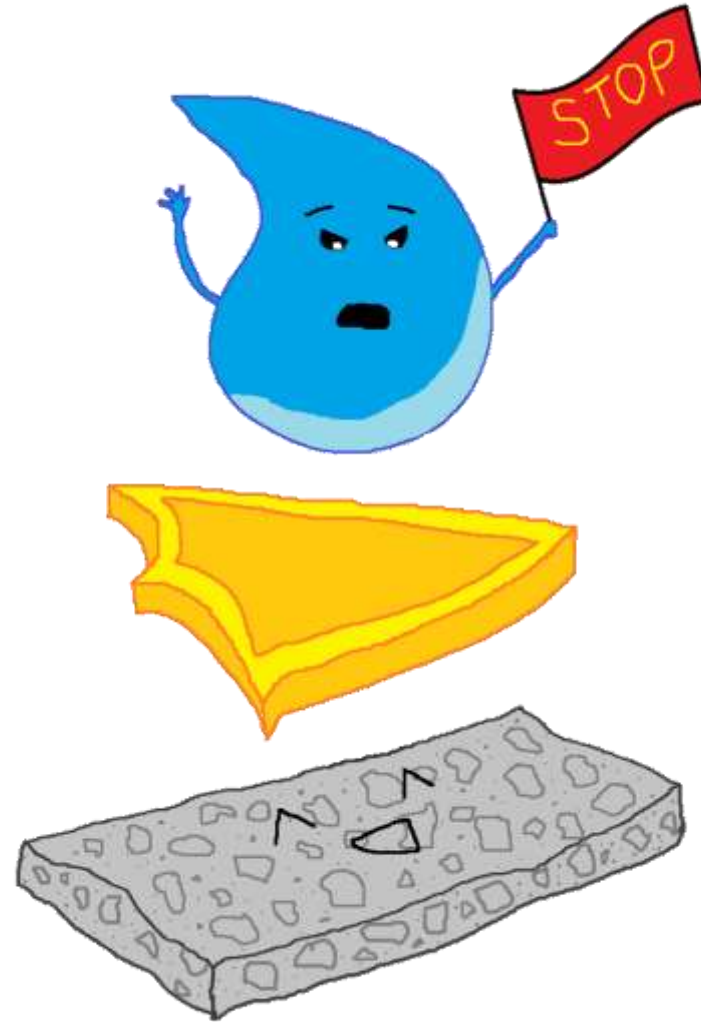
Normal response

- ▶ Accept wet weather
- ▶ Accept the new work
- ▶ Additional resources to accelerate programme



Concepts

- ▶ Prevent water rather than accept it as a norm
 - ▶ Protective cover over permeable pavement
 - ▶ Tent over workspace
 - ▶ Develop product to waterproof surface



Concepts

- ▶ Prevent water rather than accept it as a norm
 - ▶ Protective cover over permeable pavement
 - ▶ Tent over workspace
 - ▶ Develop product to waterproof surface
- ▶ Seasonal Reprogramming/Alternative Pavement Designs
 - ▶ Change Design based on weather conditions
 - ▶ Cement Treated Basecourse
 - ▶ Structural Asphalt



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This is a Real Issue



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Questions?



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