QueenslandRail

Using OpenTrack to evaluate Rollingstock and Infrastructure Projects in Queensland Rail

PREPARED BY
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06 September 2019

David Lassen – Queensland Rail

Network Capability Manager

QueenslandRail

David Lassen

- Queensland Rail Since 1985
- Started as a Nipper for a Bridge Gang
- Moved to Train Control
- Introduced to timetable planning system
- Capture Proving and Mtrain, written in Fortans running on DOS
- Timetable design for 11 years
- Moved to below rail assets in Network
- Created Network Capability 10 years ago
- Introduced OpenTrack and OpenPowerNet user for 8 years

Rolingstock Upgrade

How can we help you?

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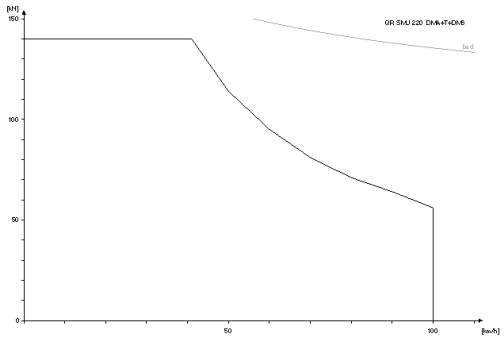
New Traction Package Proposal

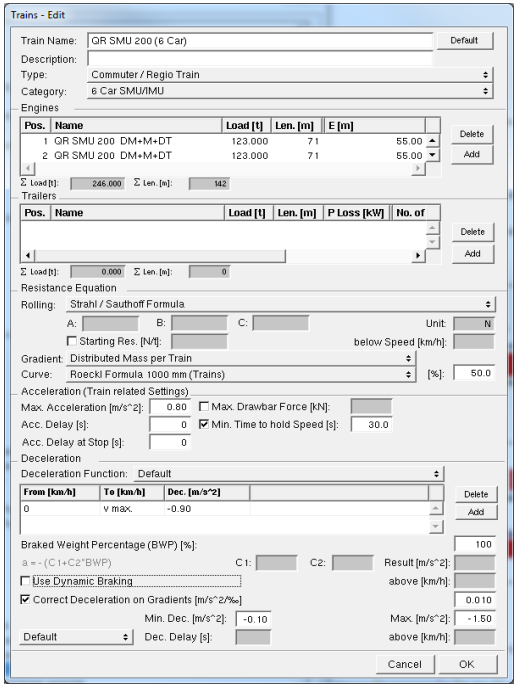
SMU200

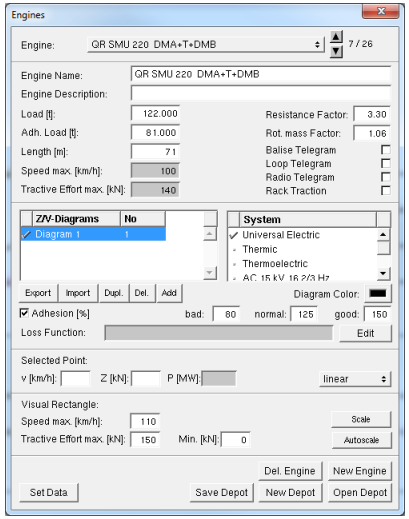
- Vehicle Details

Constructed -1994-1995
Maximum speed - 100 km/h
Braking system - Blended Regenerative electric and electro-pneumatic
Fleet 201 – 212, Twelve 3 car vehicles

Current OpenTrack Configuration







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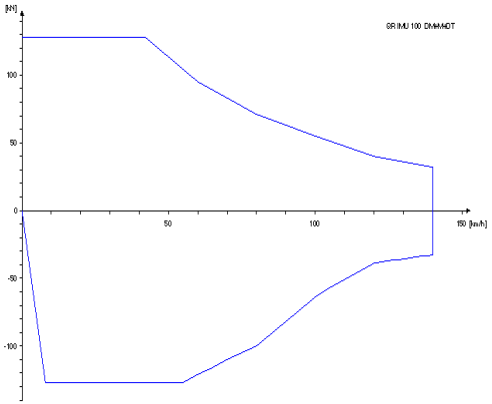
New Traction Package Proposal

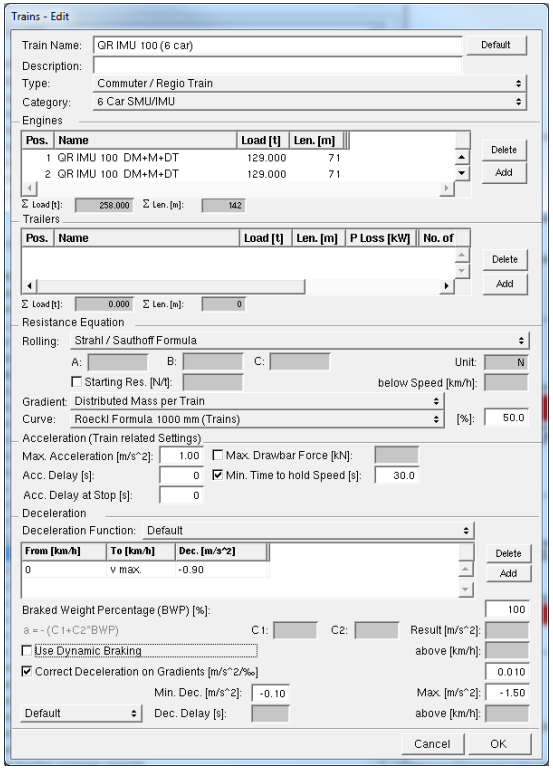
IMU100

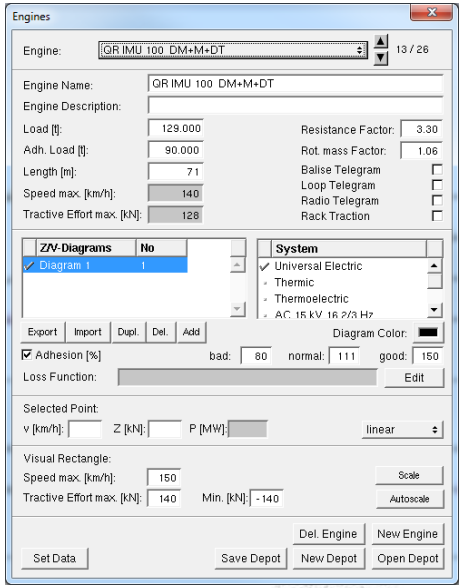
- Vehicle Details

Constructed -1993-1997
Maximum speed - 140 km/h
Braking system - Blended Regenerative electric and electro-pneumatic
Fleet 101 – 110, Ten 3 car vehicles

Current OpenTrack Configuration







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Initial Proposal

Data Request

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Initial proposal

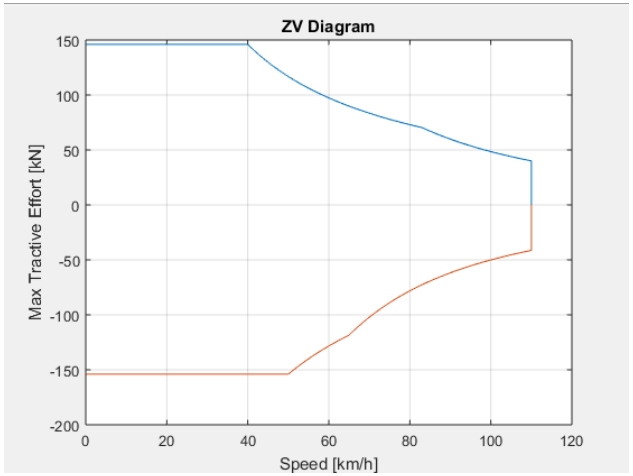
Data requests

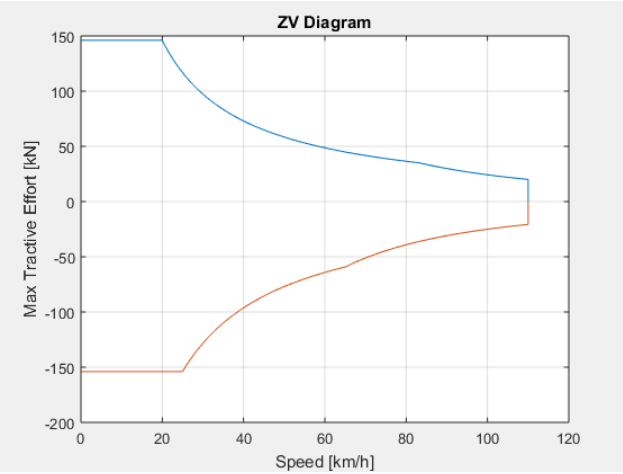
Rollingstock approached us for track data for the vendor
We asked why?
A tentative answer, The vendor wants to run some simulations
We asked what is the vendor looking for?
The vendor just wants some Speed, Times and Energy data.
We said we can supply the Vs, Ms, TT and TSVP files if the vendor supplies the rollingstock data.

Initial proposal

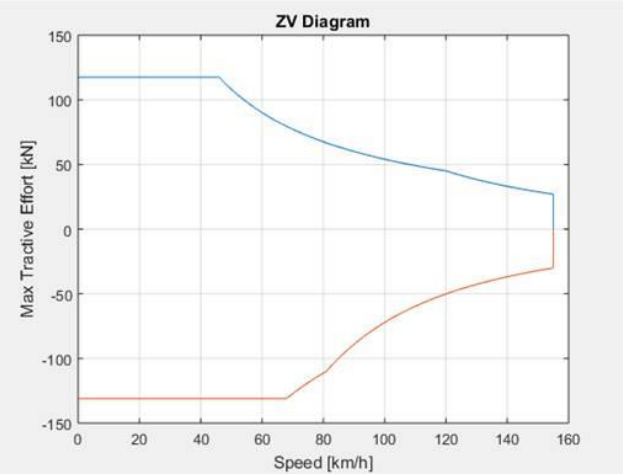
Data Supplied

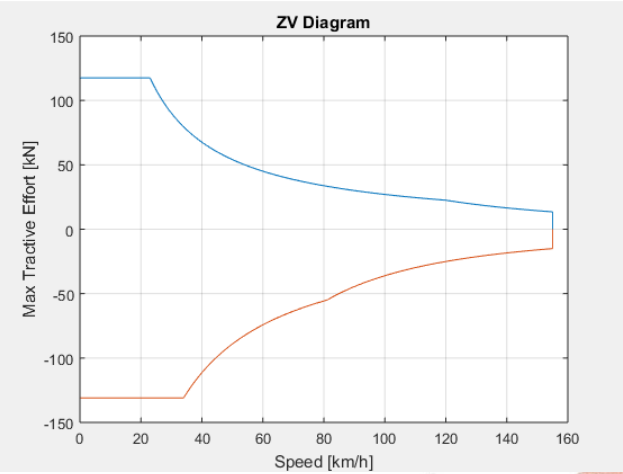
New Tractive and Braking effort curves for SMU200





New Tractive and Braking effort curves for IMU100





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Initial proposal

Simulation Request

Can you please let me know if 14 working days after receipt of the TE and BE data in format you can work with, is sufficient to run the SMU200/IMU100 class service time tables to confirm whether there are any OTR issues with full performance and 75% of full performance (6-cars only)? Please let me know.

The Process

1. Convert the Fig files to OpenTrack Z/V import files(MatLab)
2. Talk to Timetable Planners to get Master Template Services.
    a. 26 template services delivered in RailMl file
    b. Prepare 26 Itineraries for OpenTrack Master Network
3. Build 4 New Engines
    1. IMU100 – Full Performance.
    2. IMU100 – 75% Performance 1 line converter in operation.
    3. SMU200 – Full Performance
    4. SMU200 – 75% Performance 1 line converter in operation.
4. Build 8 New Trains
    1. QR IMU 100 (3 car) Traction package upgrade
    2. QR IMU 100 (3 car) Traction package upgrade 1LC
    3. QR IMU 100 (6 car) Traction Package Upgrade
    4. QR IMU 100 (6 car) Traction Package Upgrade 3LC
    5. QR SMU 200 (3 Car)traction package upgrade
    6. QR SMU 200 (3 Car)traction package upgrade 1LC
    7. QR SMU 200 (6 Car) traction package upgrade
    8. QR SMU 200 (6 Car) traction package upgrade 3LC

Initial proposal

Simulation Request

The Process

5. Assign fleet to Master Template services, IMU fleet to regional lines
6. Simulate
7. Outputs

Simulation

Outputs

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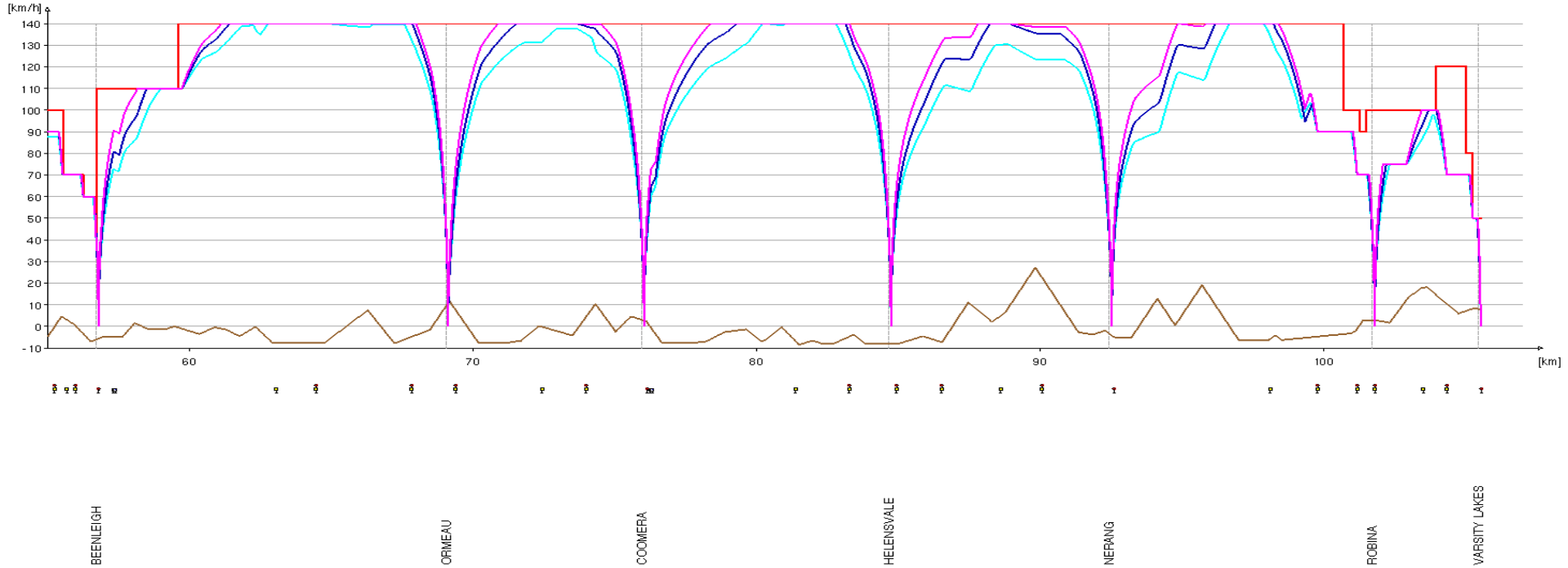
Simulation

Outputs

Speed Distance Performance
IMU 100 Regional Line
Magenta – Current Configuration
Blue – New Configuration Full Performance
Cyan – New Configuration Reduced Performance

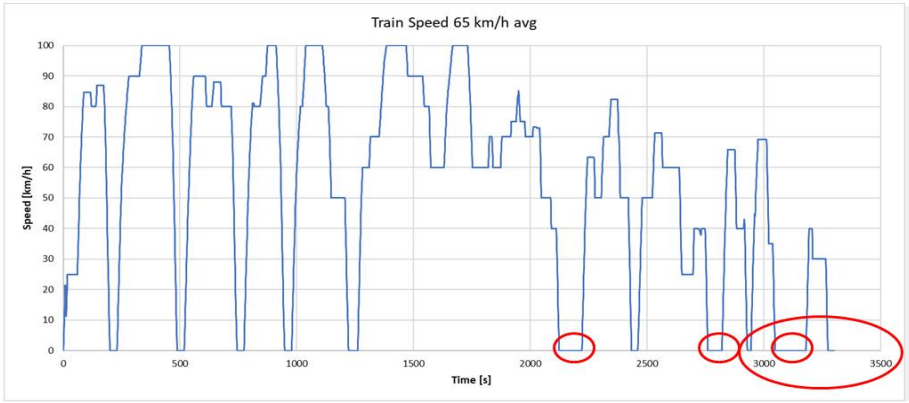


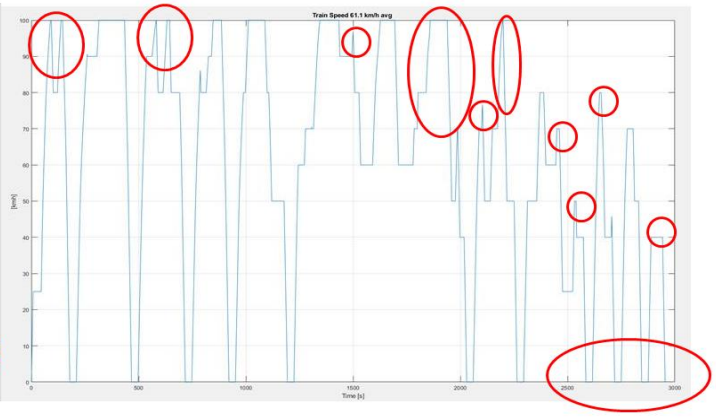
Simulation

Outputs

Result findings
Current IMU Trains are to light, 30 tonne difference.
Similar problem with the SMU200.
New Configuration compliant with Master Train Plans
Sharing of outputs with vendors to enable validation

Vendor Outputs from data shared from OpenTrack





Vendor utilised the Vs, Ms, TSVP and IVT outputs to evaluate and model their requirements.

Both teams working on the same page, for different contractual requirements. This enabling is achieved by sharing uncomplicated data.

Infrastructure Proposal

Wacol Yard redevelopment

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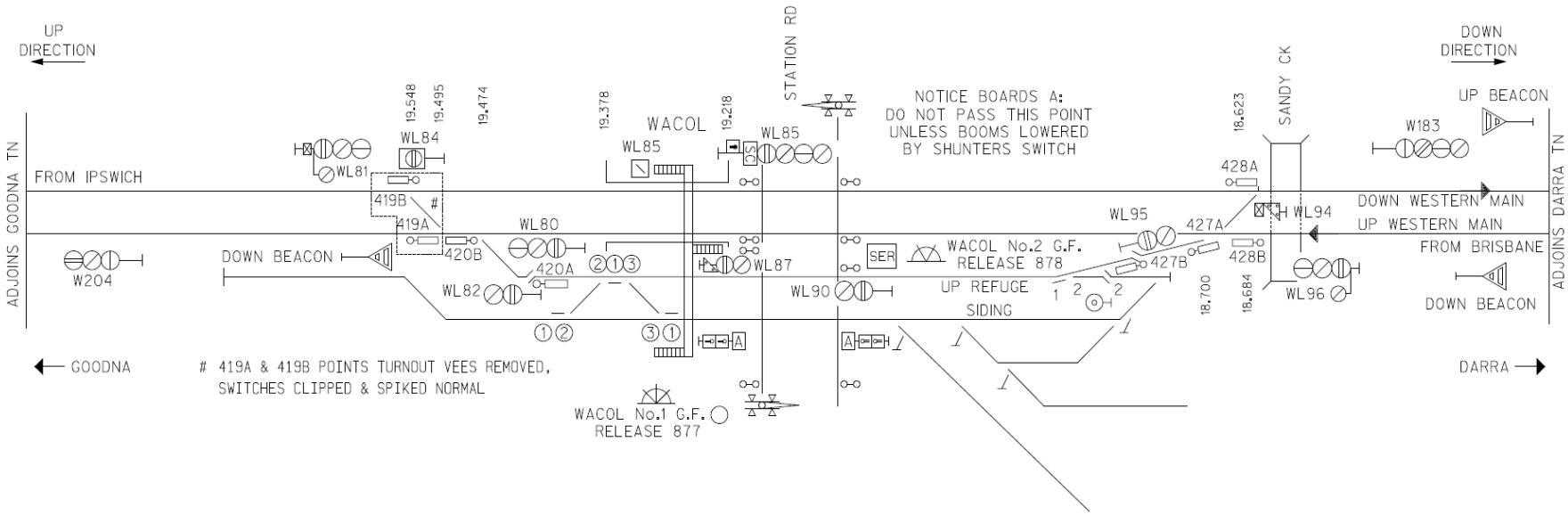
Wacol Re-signalling Project

Simulation Request

Redesign the old yard for use by rail infrastructure work trains
Ballast, Sleeper, Spoil trains and empty consist storage
Braking deficiency in current signal design



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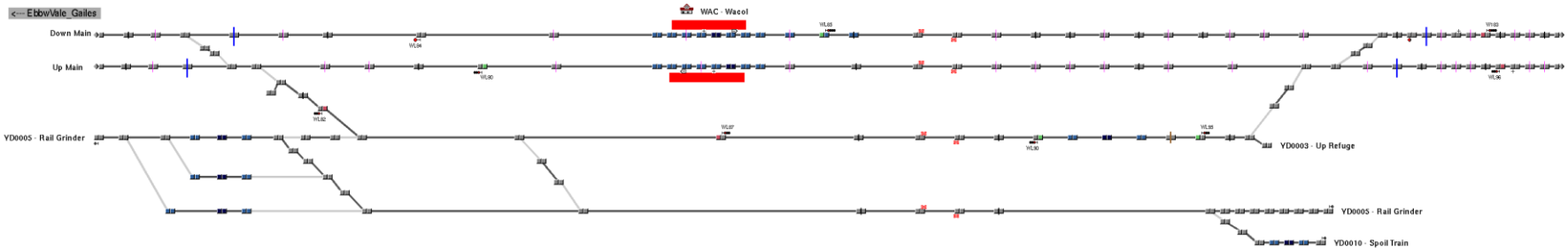
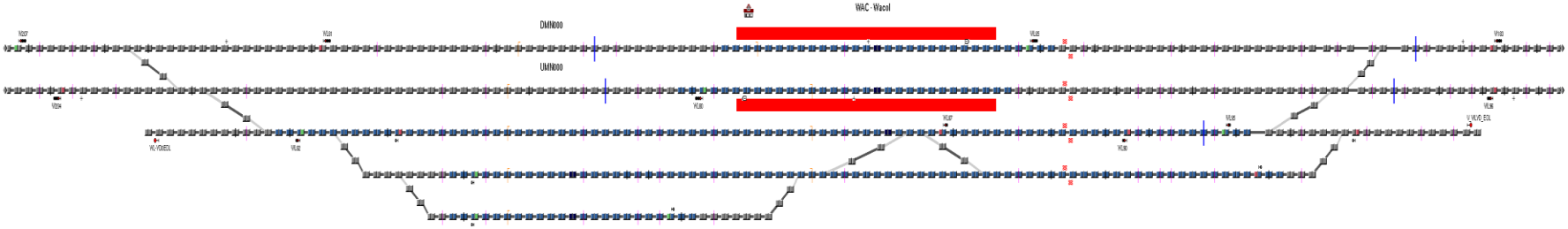
Wacol Re-signalling Project

Current OpenTrack document



Proposed OpenTrack document



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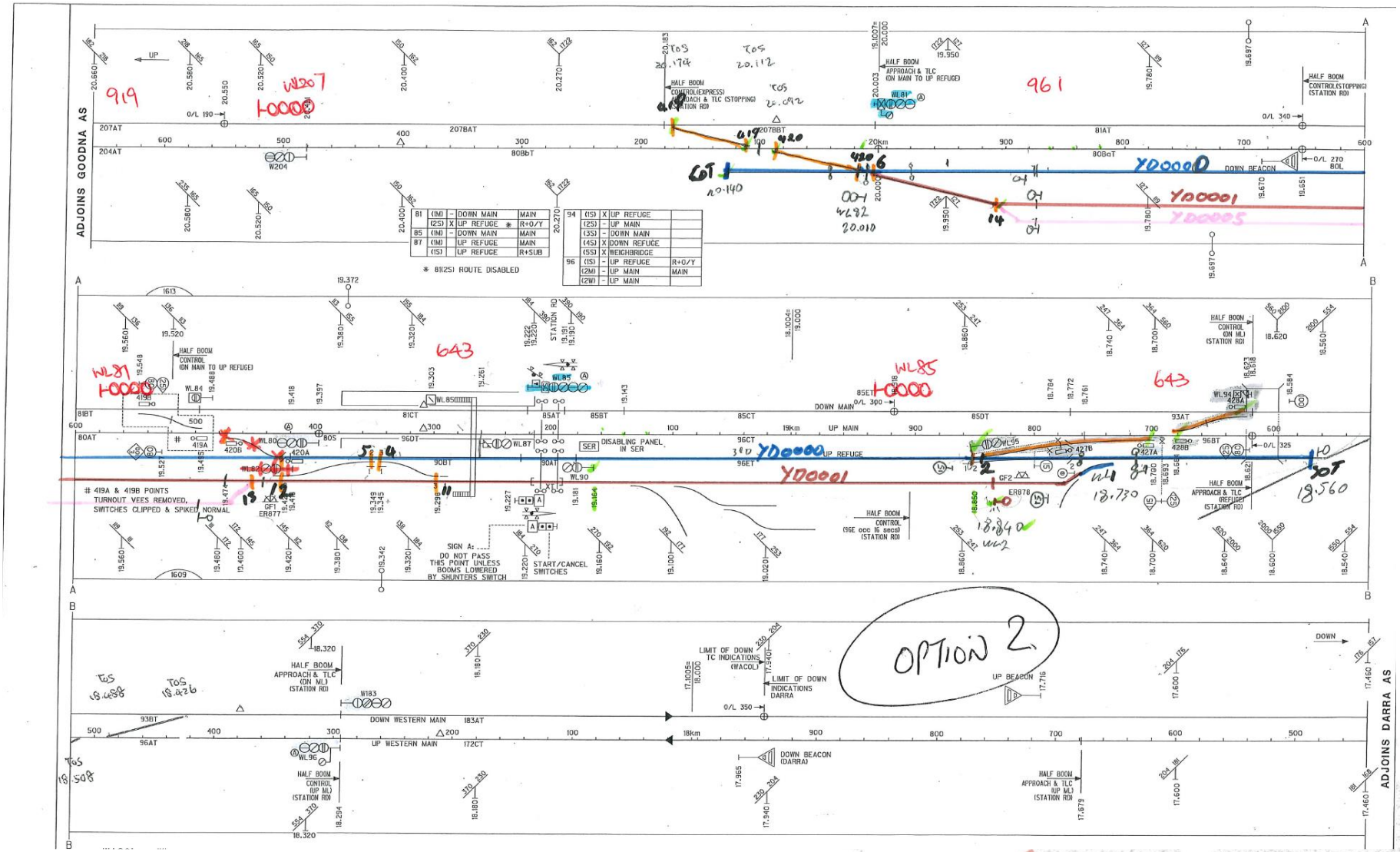
Wacol Re-signalling Project

Documents Supplied



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Wacol Re-signalling Project

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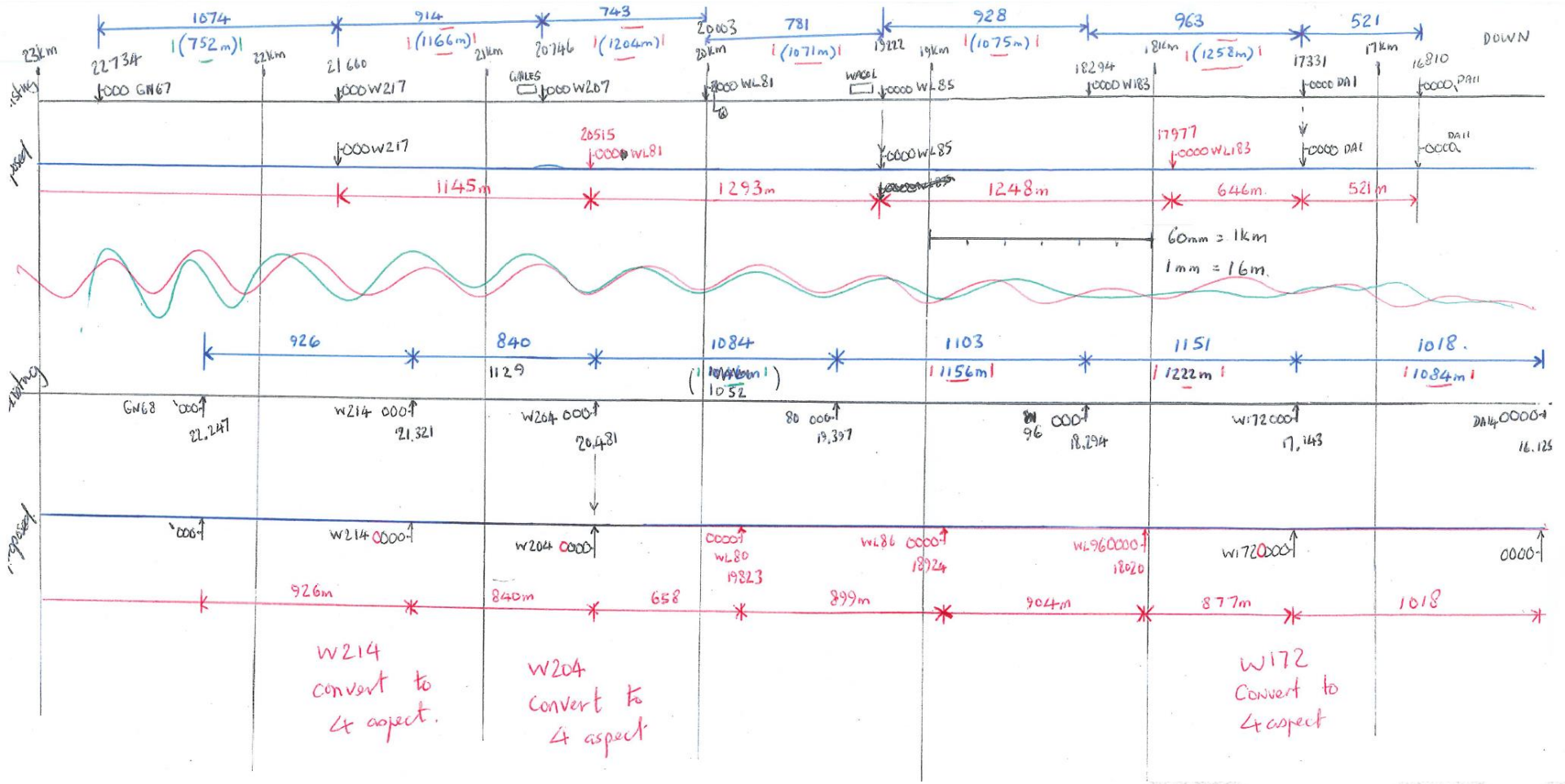

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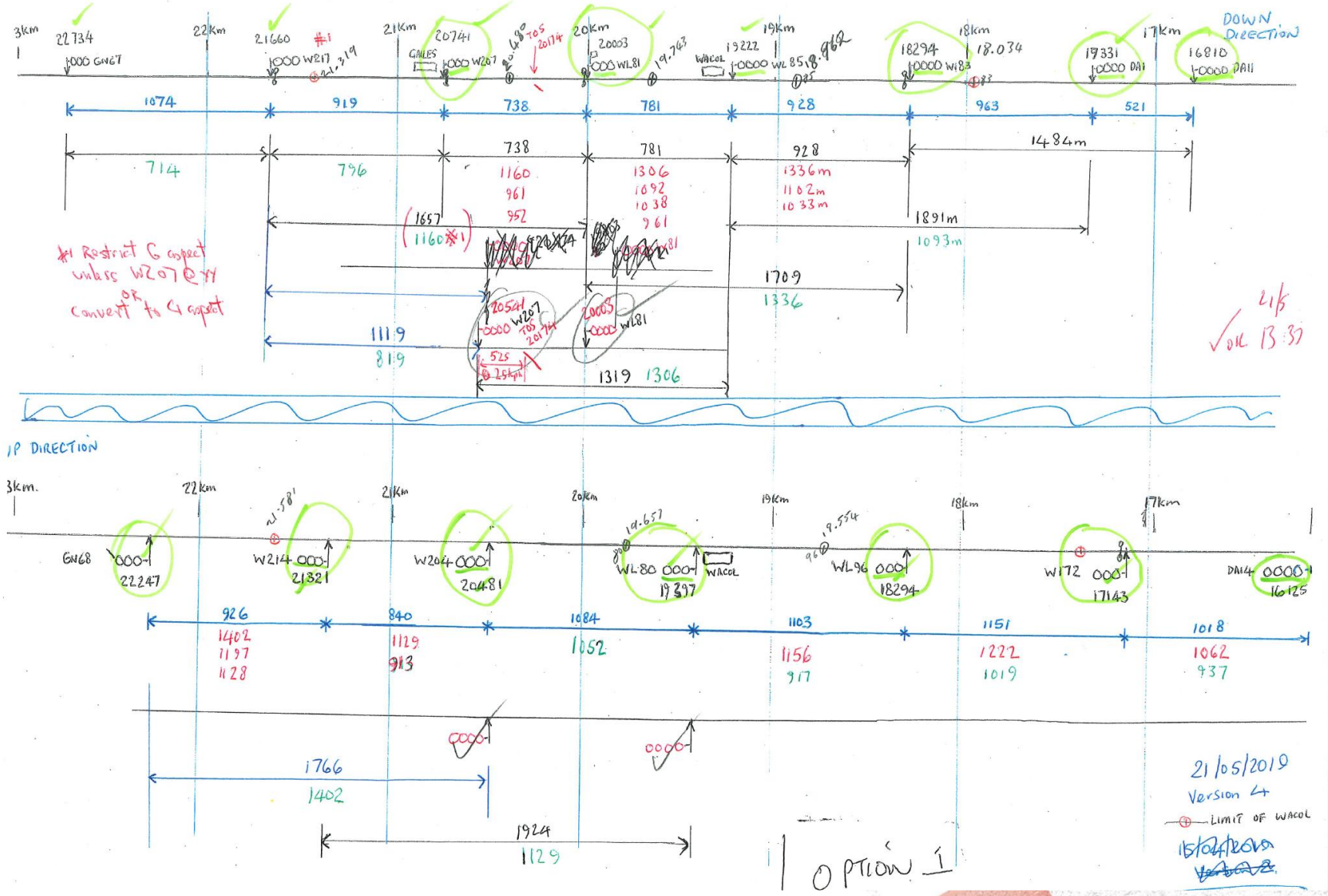
Wacol Re-signalling Project

Documents Supplied



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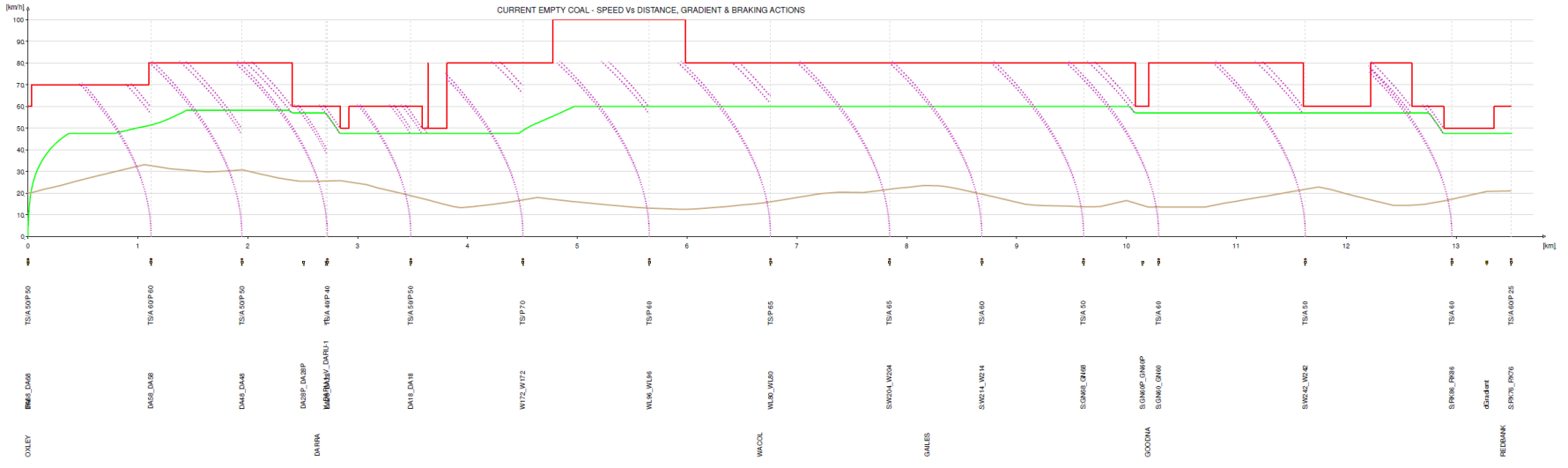
Wacol Re-signalling Project

Outputs from Simulation – Current State



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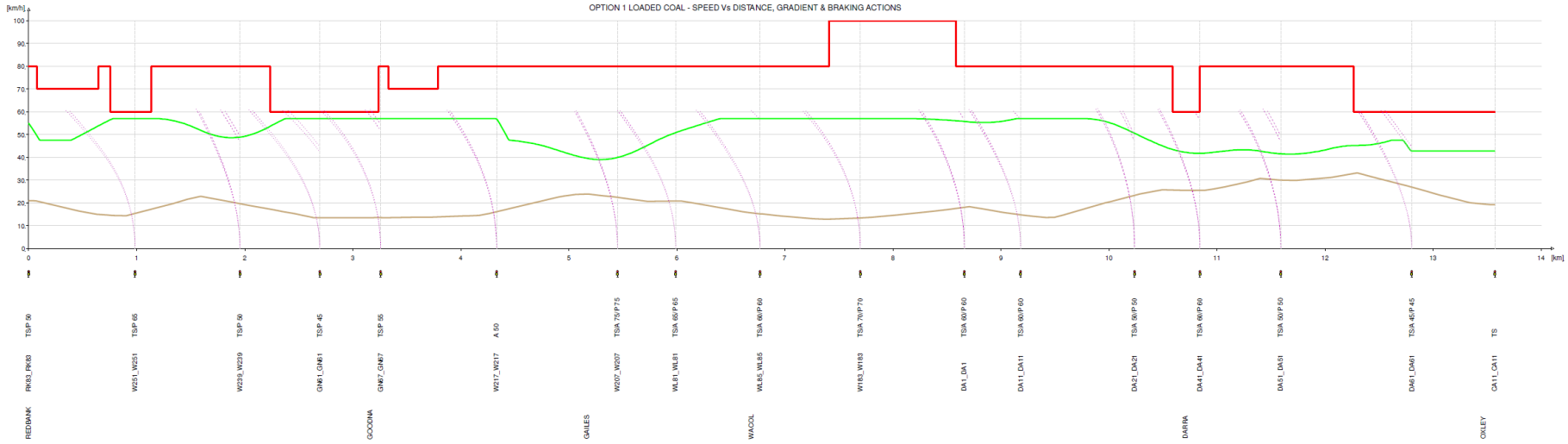
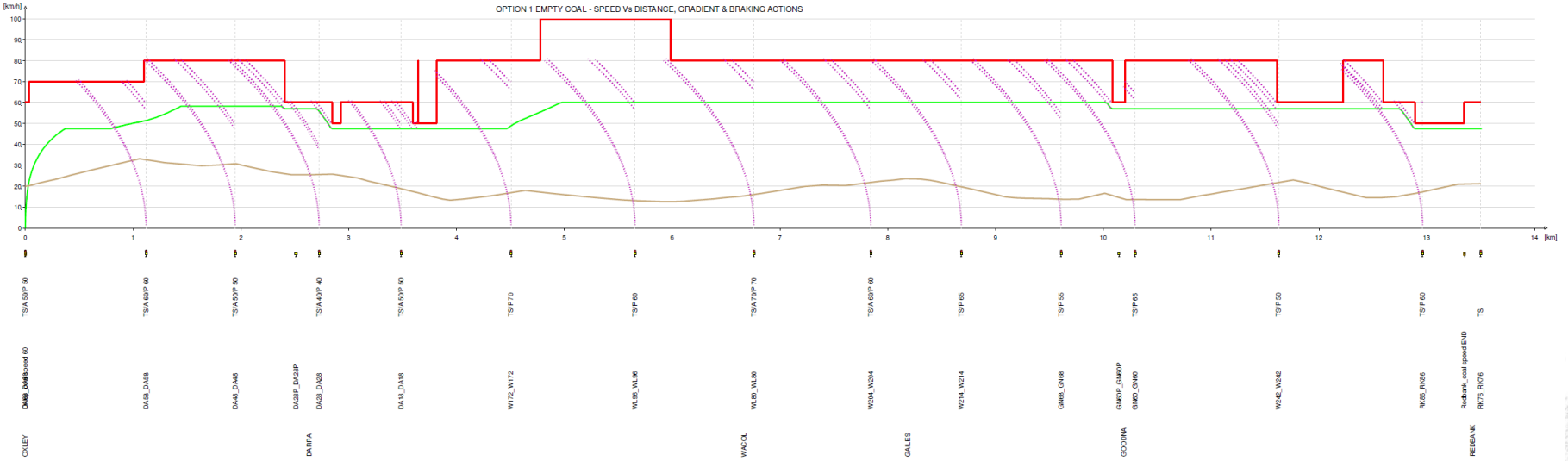
Outputs from Simulation – Option 1





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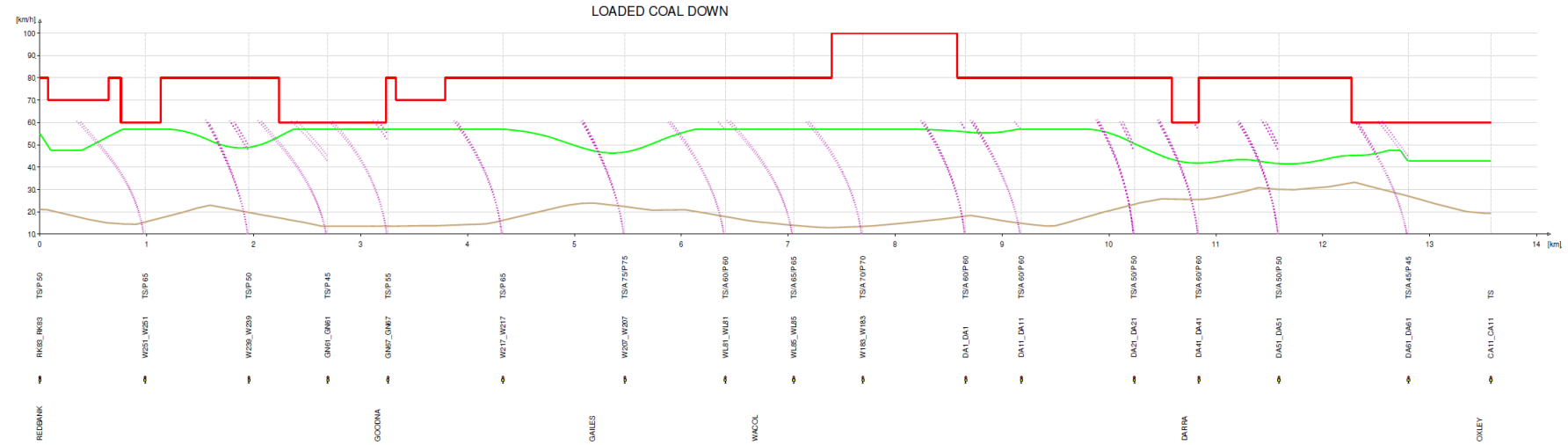
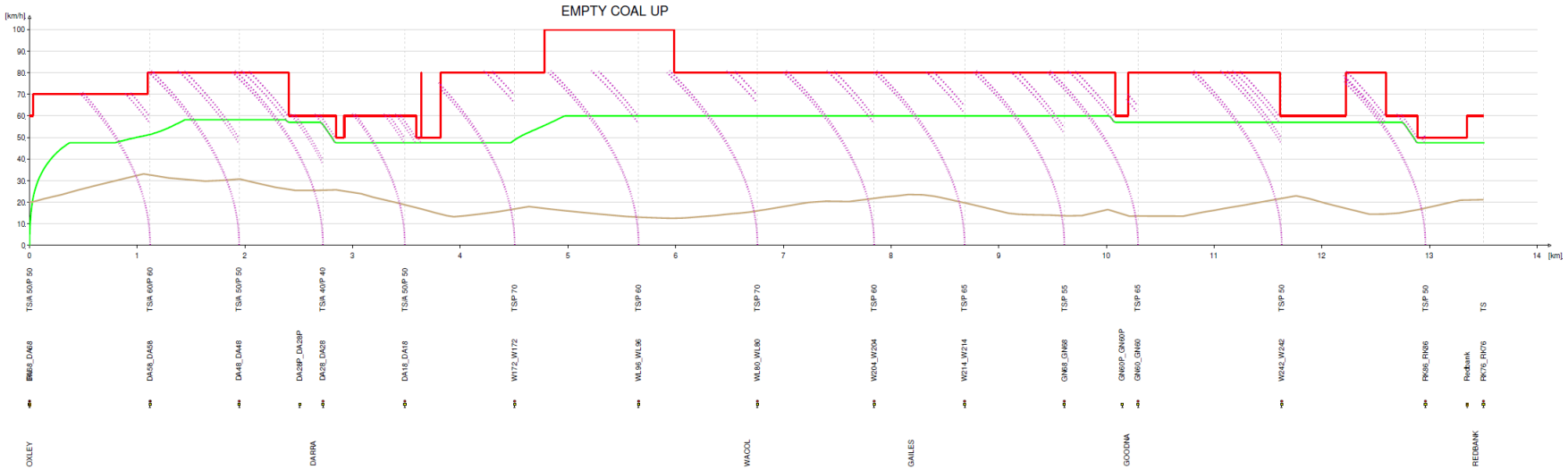
Outputs from Simulation – Option 2





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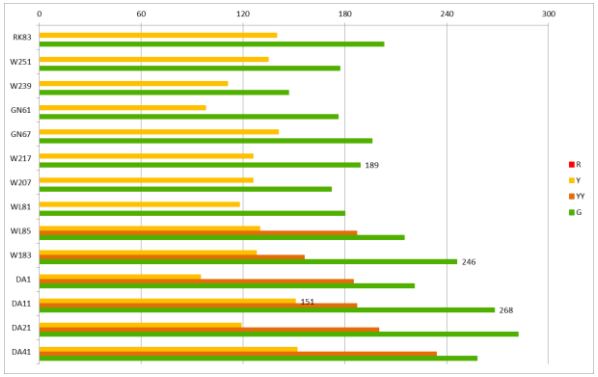
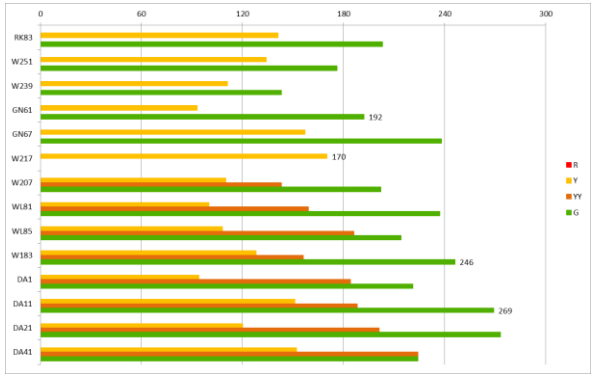
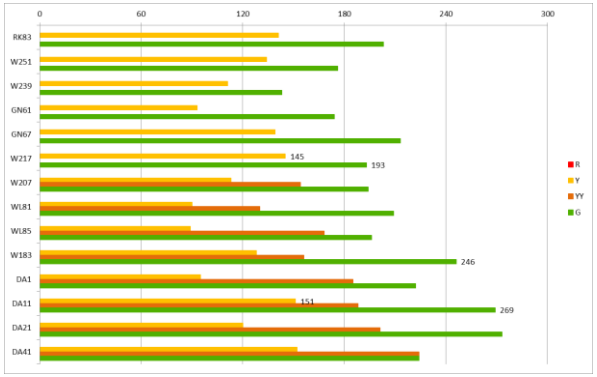
Outputs from Simulation – Headway

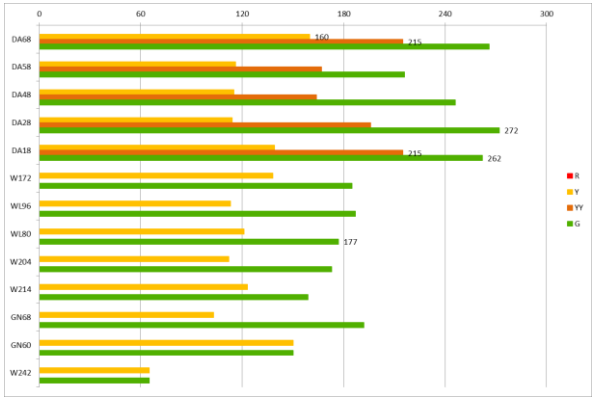
Loaded Coal Down Main – Current, Option 1 & 2

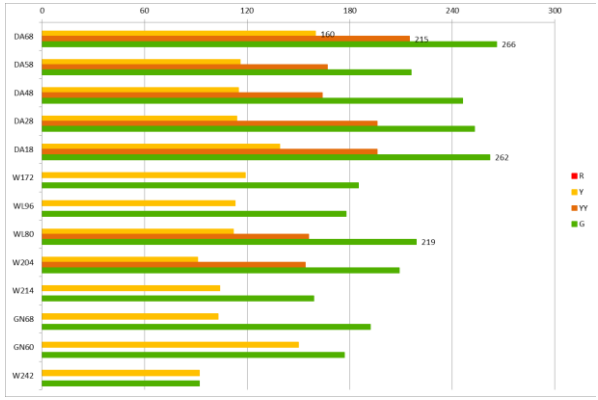


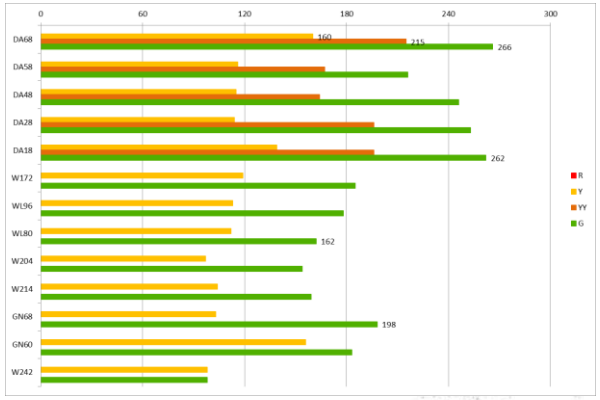




Empty Coal Up Main – Current, Option 1 & 2







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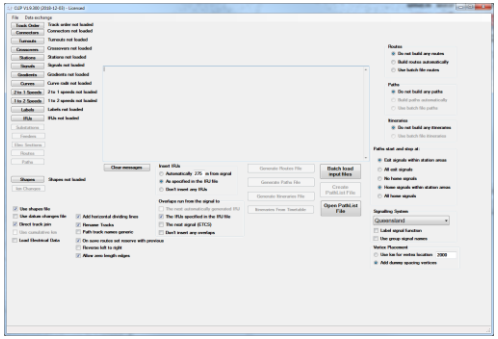
Wacol Re-signalling Project

Outcomes from Simulation

Project did not proceed
Re-signalling exceeded budget allowed for whole project.
Operators did not know how they wanted to use the yard.

The 2019 Queensland Rail Suite

CLIP



OpenTrack

OPENTRACK RAILWAY TECHNOLOGY

TRENO

TRENO

OpenPowerNet

Thankyou for your attention

Questions?

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