CAPTAIN TOOL MAIN PRINCIPLE
(CAPacity Trade-offs Assessment model of railway INfrastructure)

User

Description of some part of railway infrastructure and its innovation

BLACK BOX

Visualisation of performance outcomes for current and future railway

[Diagram showing visualisation of performance outcomes]
CAPTAIN TOOL TYPICAL WORKFLOW

1. Create new Analysis
2. Create Section
3. Create Track
4. Describe Current Function of Track
5. Create/select Innovation for Track
6. Describe Future Function
7. Fulfil Capability Outcome questions for the Analysis
8. View visualisation of Performance Outcomes
DATA STRUCTURES

Function

Current Function

Function Decomposition Tree - Example

F1
  └── F1.1
  └── F1.2

F2
  └── F2.1
  │   └── F2.1.1
  │       └── F2.1.1 value
  │           └── F2.1.1 value
  └── F2.2

F3
  └── F3.1
    └── F3.1.1
      └── F3.1.1 value

Future Function

Innovation

Track has

F2.1.1

F3.1.1

F2.1.1 value

F3.1.1 value

F2.1.1 value

F3.1.1 value

F2.1.1 value

F3.1.1 value
USER ROLES

- user of the CTA tool
- standard user
- administrator

MAY

- Work with his own analyses
- Work with all analyses
- Administrate all users
- Edit function hierarchy
- Edit performance outcomes hierarchy
- Edit equations, dependencies, CLs a GLs

MAY in addition
USER INTERFACE

Main Navigation Principle

Screen with LIST → Detail of LIST item → Edit of LIST item / new item → Detail of SUBLIST item (if any SUBLIST) → ET CETERA
USER INTERFACE
Sign in screen

Sign in to Capacity Trade-Offs Assessment Tool

User

Password

Sign in  Register new user
Welcome Aaron

You can add a new Analysis or work with one of the previous analyses:

<table>
<thead>
<tr>
<th>Name</th>
<th>Country</th>
<th>Network</th>
<th>Route</th>
<th>Description</th>
<th>Targeted capacity increase</th>
<th>Created by</th>
<th>Date created</th>
<th>Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>First analysis</td>
<td>United Kingdom</td>
<td>London North Eastern</td>
<td>ECML</td>
<td>Increasing spare capacity on the East Coast Mainline (UK)</td>
<td>10%</td>
<td>Aaron Barrett</td>
<td>13/04/2017</td>
<td>Yes</td>
</tr>
<tr>
<td>Second analysis</td>
<td>United Kingdom</td>
<td>London North Eastern</td>
<td>ECML</td>
<td>Increasing spare capacity on the East Coast Mainline (UK)</td>
<td>20%</td>
<td>Aaron Barrett</td>
<td>13/04/2017</td>
<td>Yes</td>
</tr>
<tr>
<td>Third analysis</td>
<td>United Kingdom</td>
<td>London North Eastern</td>
<td>ECML</td>
<td>Increasing spare capacity on the East Coast Mainline (UK)</td>
<td>30%</td>
<td>Aaron Barrett</td>
<td>13/04/2017</td>
<td>Yes</td>
</tr>
</tbody>
</table>

View detail  Copy  Delete
### Analysis ‘First Analysis’ detail

**Username:** Aaron Barrett  
**Organisation:** TRL  
**Date Created:** 13/04/2017

**Name:** First Analysis  
**Country:** United Kingdom  
**Network:** London North Eastern  
**Route:** ECML

**Description:** Increasing spare capacity on the East Coast Mainline (UK)

**Targeted capacity:** Up to 10%

### Sections

<table>
<thead>
<tr>
<th>Name</th>
<th>Status</th>
<th>Tracks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-B</td>
<td>Incomplete</td>
<td>2</td>
</tr>
<tr>
<td>B-C</td>
<td>Complete</td>
<td>4</td>
</tr>
</tbody>
</table>

### Innovations

<table>
<thead>
<tr>
<th>Name</th>
<th>Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation One</td>
<td>Yes</td>
</tr>
<tr>
<td>Innovation Two</td>
<td>No</td>
</tr>
</tbody>
</table>

[Chart]  
[Capability home]  
[Edit]  
[OK]
Analysis edit

Username: Aaron Barrett
Organisation: TRL
Date Created: 13/04/2017

Name: First Analysis
Country: United Kingdom
Network: London North Eastern
Route: ECML

Description:
Increasing spare capacity on the East Coast Mainline (UK)

What is the target for capacity increase on the route?
Up to 10%

Cancel   OK
'First Analysis' Section ‘A-B’ detail

Name: A-B
Status: Incomplete

<table>
<thead>
<tr>
<th>Name</th>
<th>Current Function</th>
<th>Future Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>With Current Function</td>
<td>Innovation One</td>
</tr>
<tr>
<td>2</td>
<td>With Current Function</td>
<td>Innovation Two</td>
</tr>
</tbody>
</table>

Add new Track

Edit OK
Spider Diagram

- Capacity
- Resilience
- Affordability
- Automation
- Adaptability

Spider Diagram can be used as well as for subgoals

A – bound to Analysis
T – bound to some of Track of the Analysis

Diagram for Cost

Cost Visualisation

Infrastructure

Rolling Stock