RISSB Product Proposal (and Prioritisation)

RISSB
RAIL INDUSTRY SAFETY AND STANDARDS BOARD
ABN: 58 105 001 465

Primary information	
Type of product being suggested:	Guideline
Title of product being suggested:	Track Centreline Construction and Management Guideline
Date of suggestion:	14/02/19
Reason for suggestion:	**Observed deficiency/opportunity in the industry;** The rail industry is currently seeing a significant rise in; – capital construction projects across Australia; – increase in mobile delivered maintenance management; – safety and signalling systems utilising mobile and spatial data. A shift from traditional km post/ basecode location toward GPS derived location offers significant opportunities in efficiency, location certainty, productivity and safety however these all rely on a defined construction, management and change management process for centreline data. **Regulatory focus/Safety systems** There have been isolated incidents within certain rail operators/infrastructure maintainers/contractors that have been attributed to occupation of track that was not adequately protected. In doing so safety products such as 4tel's Electronic Track Worker have been developed to use gps centreline and asset location to provide verifiable protection for train control, track staff and contractors. It is anticipated that this spatial information will be the backbone of further mobile safety, maintenance and track management solutions in the future. **Operations Uniformity** Centreline data has the potential to be integrated into a national spatial network allowing contractors, third parties and operators to speak a uniform locational language regardless of boundary. It also allows systems such as Train Control Reports, project work packages and access requests to be determined via spatial queries of a uniform network similar to that of the Level Crossing Management system (ALCAM).
Railway discipline area:	Infrastructure

Objective:
The objective of this guideline is to provide a uniform national approach to the construction, classification, and management of verified track centreline in defining spatial location across linear assets.
Scope:
Coordinate system – Recommendation on coordinate system to define centreline. RISSB currently has a product that

makes these recommendations for assets and could be adapted to include centreline.

General data structure

- General principles that should be applied during to the construction of a controlled centreline.
  - Eg, centrelines are constructed from turnout to turnout, etc.

Topology rules

- Topology rules allow you to define the spatial relationships that meet the needs of your data model

Method of Derivation (Classification)

- Hierarchy of methods of centreline derivation from most controlled spatially to least. Recommended:
  - Design Construction Alignment
  - As built/As constructed alignment
  - GNSS/IMU survey with post-processed survey control (e.g., lidar survey with bentley rail track verification)
  - Raw GNSS/IMU output
  - Other GPS derived centreline

Simplification algorithm

- Outlines the industry accepted methodologies of simplifying point dense centrelines to manageable polylines for management.

Attribute requirements

- Attributes that should be stored against a centreline such as method of derivation (classification), spatial accuracy, name/organisation constructing centreline, date of construction, simplifications used and tolerances, etc.

Hazard identification:

1	Ambiguity in spatial location derived from km/basecode derivation	6	
2	Certainty of track location for track workers (ie. Works conducted in safe zone)	7	
3	Clear knowledge of the location for emergency response providers such as medical, fires and rail incident in an event where they are engaged.	8	
4		9	
5		10	

Definitions

i A ***Guideline*** is a set of informative guidance. It is not normative but informative.

A ***Code of Practice*** is a set of descriptions. It is the "how" one can meet a higher-level requirement (either of a Standard, or a piece of Legislation). It is normative, but by its nature can contain several options about how to achieve compliance with the higher-level requirement. It can also have some informative guidance within it if it is more practical than writing a separate guideline.

A ***Standard*** is a set of requirements only. It is the "what" must be done to be claim compliance to the standard. It is normative. It can also contain optional and/or supplementary requirements, but they still should be worded as requirements.

Benefits:

Safety

Benefits (Safety)

Accurate GPS-based location information has the potential to improve track worker safety significantly by providing accurate and specific coordinates for identification of workgroups and clear deployment of track protection.

- From an emergency response perspective, accurate coordinates provide for faster emergency response particularly in remote locations, where workgroups could be positioned at any location between signals / points.
- Standardised centreline data locations can provide a single platform of communication for multiple track workers, and by using accurate and standard terms further improves safety critical communications in the rail corridor.
- Centreline location allows for clearly defined sections of track for instances where track workers are required during possessions. Realtime notification of these instances can be shared amongst track owner and operators. This allows for a clear communications protocol between all stakeholders.
- Reporting of poor track condition by the rail operator in real time will allow for a more rapid turn around of assessment of track and consequential remediation/repair

Interoperability / harmonisation

The system will be interchangeable between the different Australian track owners which in turn will allow for a streamlining of data and information exchange between all stakeholders.

Financial

Cost savings that may be realised from the centreline system is a more efficient and rapid handover of a possession of track to live by real time notification. This would allow track control to oversee the run of train services in a more efficient manner.

Impacts:

Clear scope and plan of delivery for survey component required for all stakeholders

Definitions

ii ***Interoperability*** is the ability of a process, system or a product to work with other process, systems or products (aka compatible systems through managed interfaces).

iii ***Harmonisation*** - the act of bringing into agreement so as to work effectively together (aka uniformity of systems).