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DESIGNING UNIT TRAIN SERVICE FOR FREIGHT RAILROAD ASSET AND CAPACITY PLANNING

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WHAT IS UNIT TRAIN?

WHAT IS UNIT TRAIN?

- Known as bulk train or block train as well
- A train dedicated to move one commodity from origin directly to destination
- No assembling or disassembling trains
- Coal, grain, crude oil, ethanol, etc.
- No train schedule

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WHY ARE UNIT TRAINS SPECIAL?

- Network Capacity team provides crew planning and budget planning based on future traffic forecast.
- A holistic train file is required to run network traffic simulation using Operating Plan Developer (OPD).
- Manual addition of unit trains to the train file is not a viable alternative.
- Therefore, we need a tool to create unit trains and their schedule.

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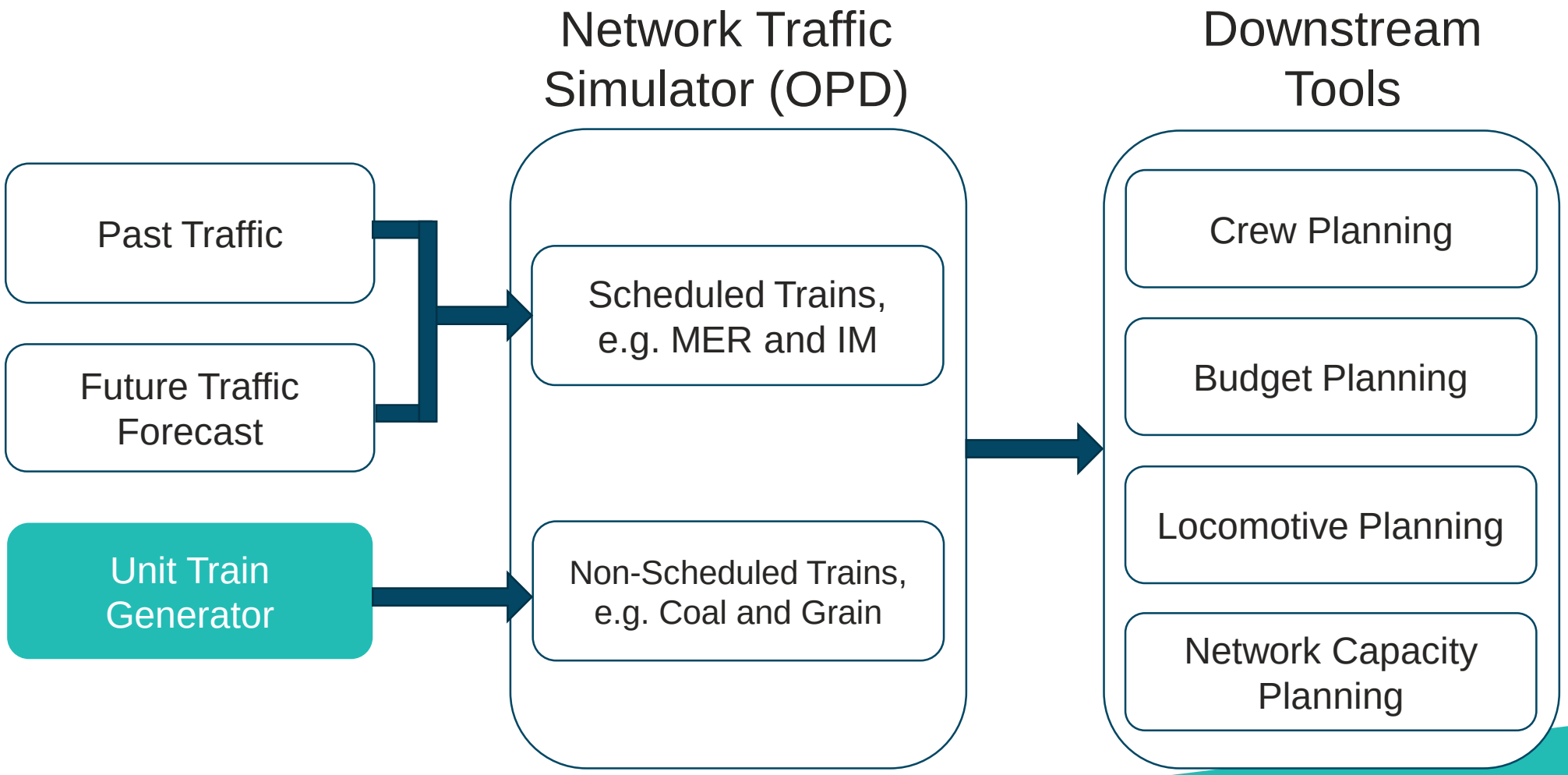
DATA FLOW DIAGRAM



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UNIT TRAIN GENERATOR OVERVIEW

UNIT TRAIN GENERATOR

- Goal: Generate unit trains and their schedule
- Benefits
  - Automate the process and avoid manual data entry via spreadsheets
  - Create a holistic train file quickly
  - Shorten the turnaround time of future strategic studies
  - Upload the train Information into Operating Plan Developer
- Two models
  - Phase 1: Model based on past traffic
  - Phase 2: Model based on future traffic forecast

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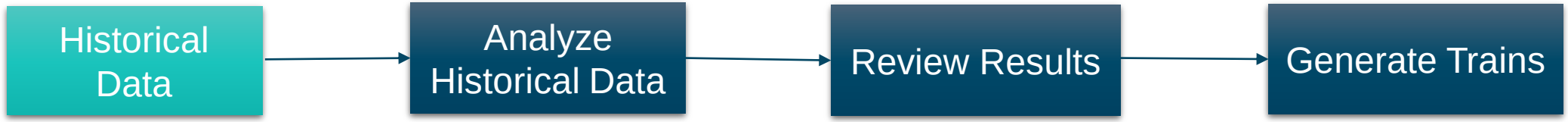
PHASE 1: PAST TRAFFIC MODEL



Historical unit traffic available in NS data warehouse

Analyze historical movements of unit trains and create train starts for the target date range

Customize trains toward desired patterns

Generate train starts and their schedule

Data Source

Data Processing

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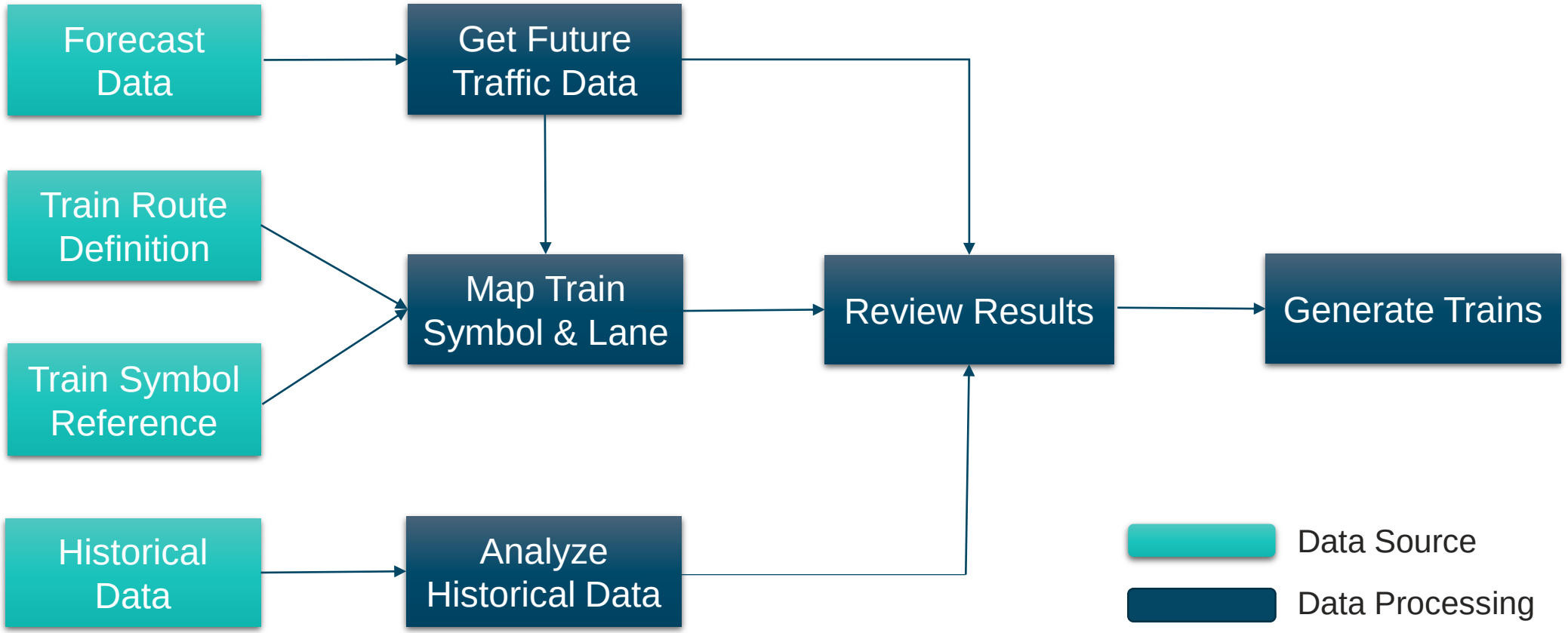
PHASE 2: FUTURE TRAFFIC MODEL



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PHASE 2: FUTURE TRAFFIC MODEL

Get Future Traffic Data	Download lane level data of traffic forecast
Map Train Symbol & Lane	Find a train symbol based on traffic lane from train route definition or train symbol reference
Analyze Historical Data	Process data for day of week and max train size obtained from historical movements
Review Results	Review train symbol mapping, train size and train routes
Generate Trains	Generate train starts for the mapped train symbol and associated forecast volume into Operating Plan Developer

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03

USE CASE

USE CASE

1. Let’s assume NS plans for a new business
2. It requires trains to serve this customer from an NS serving yard
3. Search trains which can serve this customer and find the closest train symbol
4. Calculate data statistic, e.g. day of week, train size, etc., using historical data for the train symbol found at Step 3
5. Get forecast volume for the customer
6. The model provides appropriate train start dates, train route, and train size based on the statistic and the volume.

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04

SUMMARY AND FUTURE PLAN

SUMMARY AND FUTURE PLAN

- Unit Train Generator is a tool to generate unit trains based on traffic and create a holistic train file.
- It helps Network Capacity team provide crew planning and budget planning based on future traffic forecast quickly.
- The past traffic model (Phase 1) was complete and in use.
- The future traffic model (Phase 2) is currently under development.

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THANK YOU