

Infrastructure Cost Model

Rail Research UK Workshop

The Infrastructure Cost Model

- What is it?
 - model for estimating the costs of operating, maintaining and renewing the network for different levels of usage
- What is it for?
 - our strategic business planning tool
 - long-term business plans and periodic review cost submissions
 - optioneering for HLOS
- Where are we?
 - Version 1 complete and used to produce the ISBP in June and subsequent cost analysis
 - developing plans for Version 2 and beyond

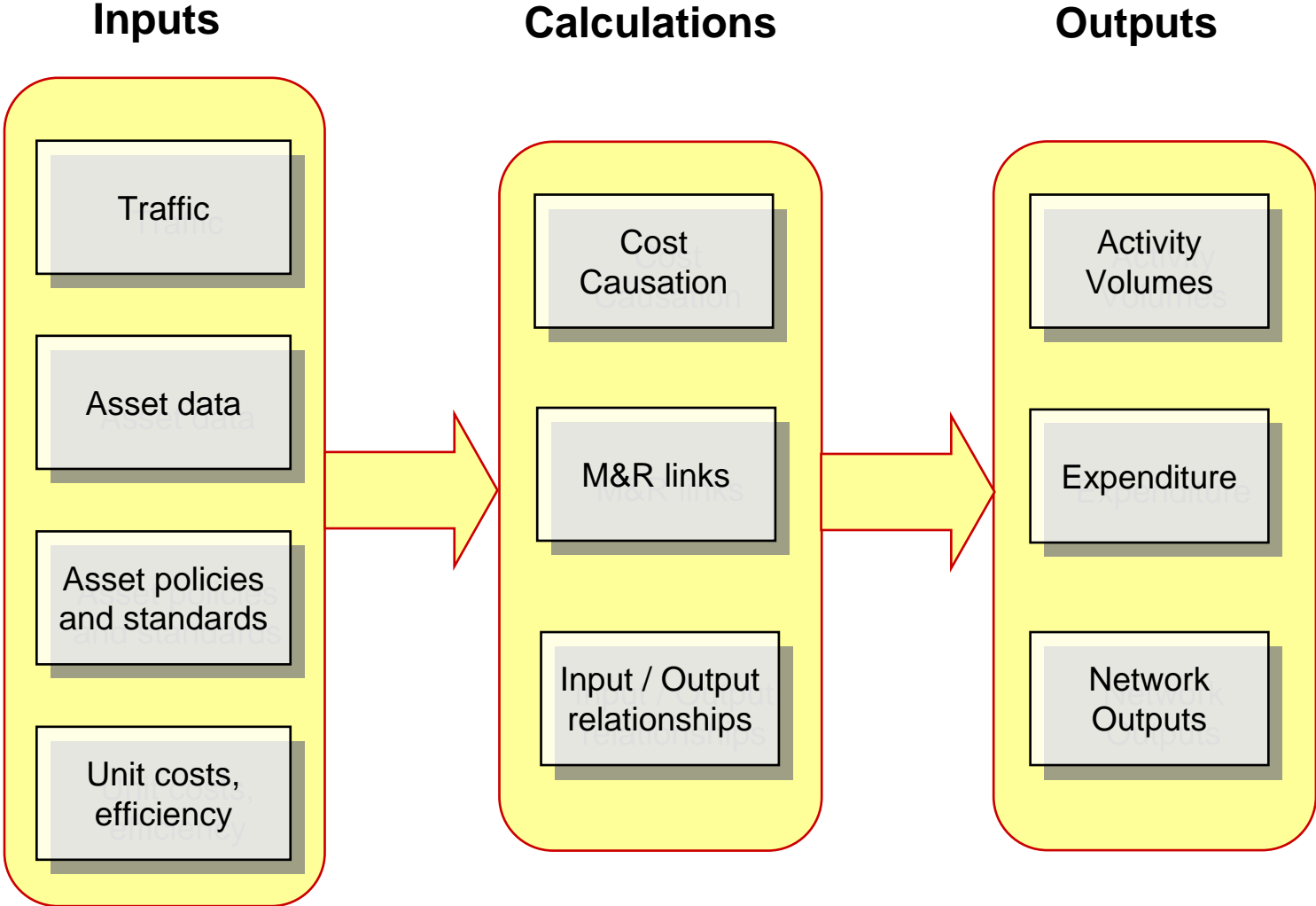
What the model does

- Forecasts activity, expenditure and outputs for different levels of usage
 - long-term, up to 40 years
- Detailed disaggregation - 300 strategic route segments
- Integrates our forecasting capability into a single model
 - covers all assets and all categories of expenditure
 - maps all costs to common network definition
- Provides a transparent and flexible tool for analysis
 - key assumptions visible – clear how the outputs are arrived at
 - all key inputs can be varied

What the model does not do

- Forecast requirement for capacity enhancements
 - look-up table of pre-defined schemes only
- Forecast specific activity / work sites
 - strategic tool for identifying volumes, not precise timing of specific jobs
- Optimise activity to meet a budget constraint or output target
 - a tool for investigation but not automated optimisation
- Calculate access charges
 - a tool for informing debate about usage costs and charges

Simple overview



Model inputs

- Traffic
 - trains, tonnage & equiv tonnage by SRS, base and forecast growth
- Asset data
 - asset type, location, volume, age, capability ... influences on costs
- Asset management policies / standards
 - asset lives, intervention thresholds, inspection frequencies etc
- Unit costs
 - base unit costs of activities and efficiency improvement profiles
- Other factors
 - e.g. delivery capacity constraints, prioritisation
- All underpinned by common network segmentation
 - all asset data mapped against these segments

Model outputs

- Outputs
 - activity volumes, expenditure, network output measures
 - annual projections for CP4 and 5, control period averages thereafter
- Network segmentation
 - output can be viewed at various levels
 - England and Wales / Scotland
 - 26 strategic routes, 300 strategic route segments
 - not all outputs disaggregated to same level
 - distinguish between attributable and allocated costs
- Output measures
 - key asset stewardship measures
 - other condition indicators: average asset age or residual life

Operating costs

- Based on 2006/07 budget
 - detailed breakdown by function and cost category
- Apply reference efficiency assumptions
 - differentiate between signalling staff and other opex
 - exclude pensions, insurance or non-controllables
- Allocation of costs to SRS
 - signalling costs linked to boxes and area of control
 - simple metrics (e.g. train km) for other costs (listed in doc)
- Future submissions will apply efficiency profiles in greater detail
 - real staff costs, staff numbers, other costs

Maintenance

- Focus on estimating volumes and costs of key activities
 - e.g. about 20 track activities modelled in detail, based on cost drivers
 - expected volumes of activity and/or expected labour input
 - routine activities at defined frequencies
 - forecast failure rates for reactive activity
- Mark-ups for each asset to cover other direct activities
- Factor to cover indirect costs / area overheads
- Cost profile for some elements – e.g. Civils inspections
- Total aligned with 2008/09 network budget

Renewals – modelling approaches

Variety of approaches to forecasting long-term renewal volumes

- dependent on nature of assets and availability of data

Approach	Description	Examples
Workbank	Detailed assessment of timing of renewal of specific assets.	Major signalling renewals GSM-R/FTN project
Service life	Expected service life based on measure of usage – e.g tonnage.	Track components – cumulative tonnage
Age – profile	Expected asset life where age data is reliable. Age is proxy for condition / degradation mechanism.	Electrification switchgear Telecoms – telephone concentrators
Age – steady state	Expected asset life but no reliable age data – therefore assume constant annual renewal rate	Conductor rail Platforms
Cost profile	Use historic expenditure profile where specific activity difficult to predict	Signalling supply points Minor lineside buildings

What next?

- Application of version 1 of model
 - variability of costs for variable charges
 - costs of freight-only routes
- Continuous improvement of modelling
 - Informed by AMCL audit and stakeholder feedback
 - next version in Summer 2007 to inform October SBP
 - improve maintenance and renewal trade-offs
 - input/output relationships
 - income module, develop charges functionality
- Integration with RUSs / route strategy development