



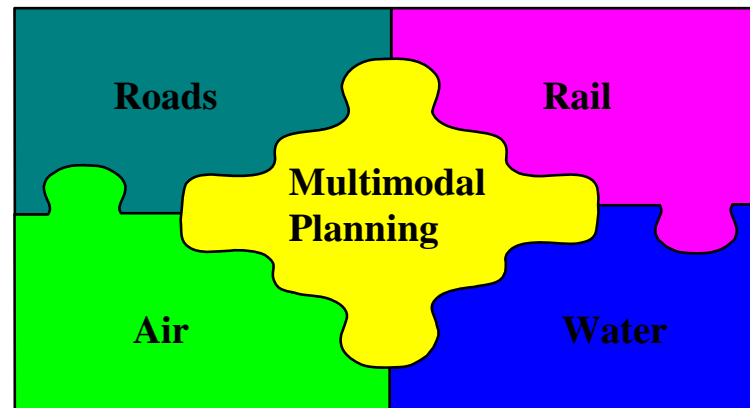
## The Evaluation of Road Projects and Plans Within an Integrated Multi-Modal Transport System

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## Background

**Appraisal has traditionally been limited to the assessment of single modes**



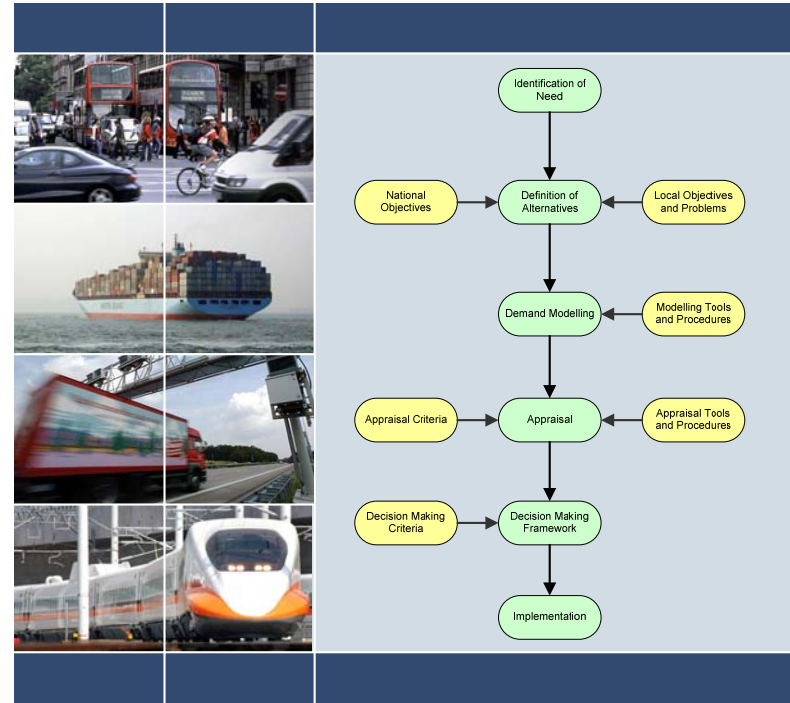
**There is a growing movement to consider multimodal solutions to transport problems and several countries have multimodal appraisal frameworks against which schemes can be assessed**

## Objectives

- Establish current practise and state of the art techniques
- Identify common themes
- Review strengths and weaknesses
- Review transferability of themes
- Establish a generic framework for multi-modal assessment
- Identify areas for further research and development

# Recommendations for Users in the Application of Multi-Modal Appraisal Systems

- Andy Clarke
- Jim March
- Kjell Ottar Sandvik
- Lennart Kallander
- Maxime Jebali
- Ian Melsom



# Methodology

## → Preliminary screening of PIARC countries

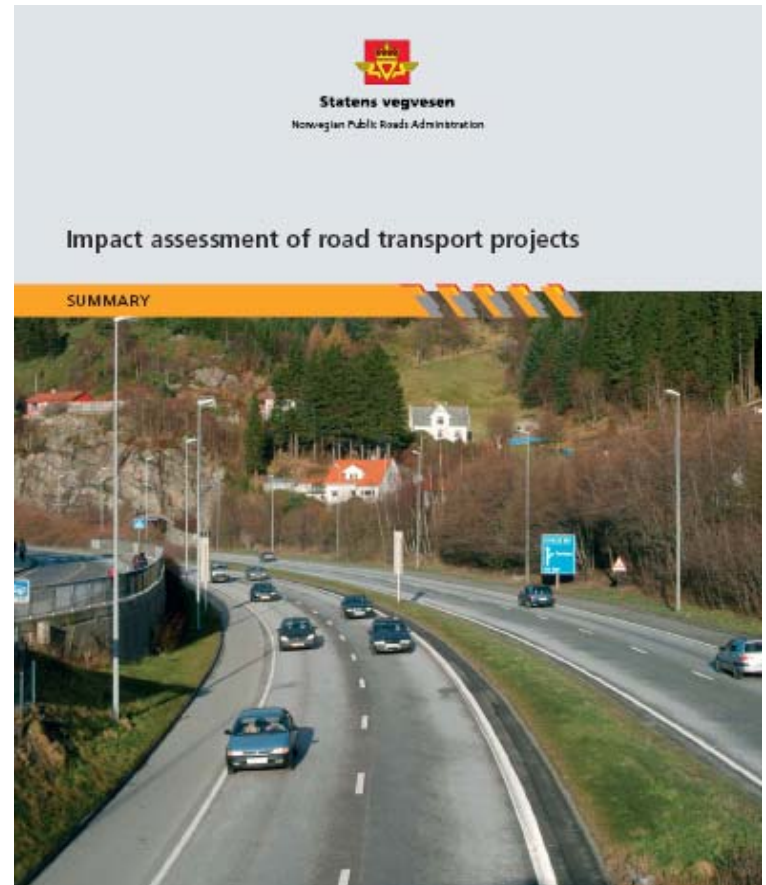
Argentina	Denmark	Latvia	Slovenia
Australia	Estonia	Lithuania	South Africa
Austria	Finland	Mexico	Spain
Bangladesh	France	Netherlands	Sweden
Belgium	Germany	New Zealand	Switzerland
Brazil	Hungary	Norway	Thailand
Canada	India	Poland	United Kingdom
Chile	Ireland	Portugal	United States
China	Italy	Russian Fed	World Bank
Czech Rep	Japan	Slovakia	DFID

## → Questionnaire to shortlist of 40 countries

## → Case Studies of five of the most advanced systems: UK, USA, France, Norway, Sweden

# Current Status

- The review has illustrated the growing importance of multimodal appraisal
- Over half of the sample have guidance under development
- Used at strategic and project levels
- Focus on impacts on the economy, environment and safety



# Common Themes

- Definition of Objectives and Problems
- Definition and Screening of Alternatives
- Involving the Public
- Forecasting Traffic Demand
- Assessment Criteria
- Appraisal Methodology
- Decision Making Framework

Definition of Objectives and Problems

Definition and Screening of Alternatives

Involving the Public

Forecasting Traffic Demand Using Models

Assessment Criteria to Measure Project Impacts

Appraisal Methodology to Quantify Costs and Benefits

Decision Making Framework to Compare Costs and Benefits

# Scope

Country	National	Regional	Sub Regional	Corridor	Project
England	x	✓✓✓	✓✓✓	✓✓✓	✓✓✓
France	x	x	x	✓✓✓	✓✓✓
Norway	x	x	x	✓✓	✓✓
Sweden	✓	✓	x	✓✓✓	✓✓✓
USA	✓✓	✓✓	✓✓	✓✓	✓✓



# Objectives

Country	Environment	Safety	Economic Efficiency	Accessibility	Regional Development	Integration
England	✓	✓	✓	✓	✓	✓
France	✓	✓	✓	✓	✓	✓
Norway	✓	✓	✓	✓	✓	✓
Sweden	✓	✓	✓	✓	✓	x
USA	✓	✓	✓	✓	x	✓

# Demand Forecasting

Country	National	Regional	Sub-Regional	Corridor	Project
England	None mandatory. Most common are proprietary SATURN, CONTRAM & VISUM network models with increasing use of VISSIM & PARAMICS micro simulation models at project level.				
France	Bespoke MODEV model for passengers and freight and all applications.				
Norway	Bespoke EFFEKT mandatory for simple projects. Otherwise proprietary models as applicable: CONTRAM/EMME/CUBE/TRIPS/VOYAGER				
Sweden	Bespoke SAMPERS (EMME/2 based) model for passengers and SAMGOODS for freight (STAN based). Bespoke EVA for simple road projects. Allow the use of other established models.				
USA	Bespoke Intermodal Transportation Inventory Cost model for freight. Most common proprietary models for passengers include CUBE, VOYAGER, TRANSCAD, EMME/2, VISSIM, VISUM.				

# Assessment Criteria

Country	Environment	Accidents	Economic Efficiency	Employment	Transport quality
England	✓	✓	✓	✓	
France	✓	✓	✓		
Norway	✓	✓	✓		
Sweden	✓	✓	✓		✓
USA	✓	✓	✓		

# Quantification of Costs and Benefits

Country	Model	Scope
England	TUBA	Used at all levels of assessment
France	TRANSCAD	Used at all levels of assessment
Norway	TUBM PTM EFFEKT	Used at all levels of assessment
Sweden	Samkalk EVA	Samkalk can be used at all levels of assessment down to major projects. EVA is more common on project level.
USA	STEAM HERS	Used at project or corridor level of assessment Used at national and State levels

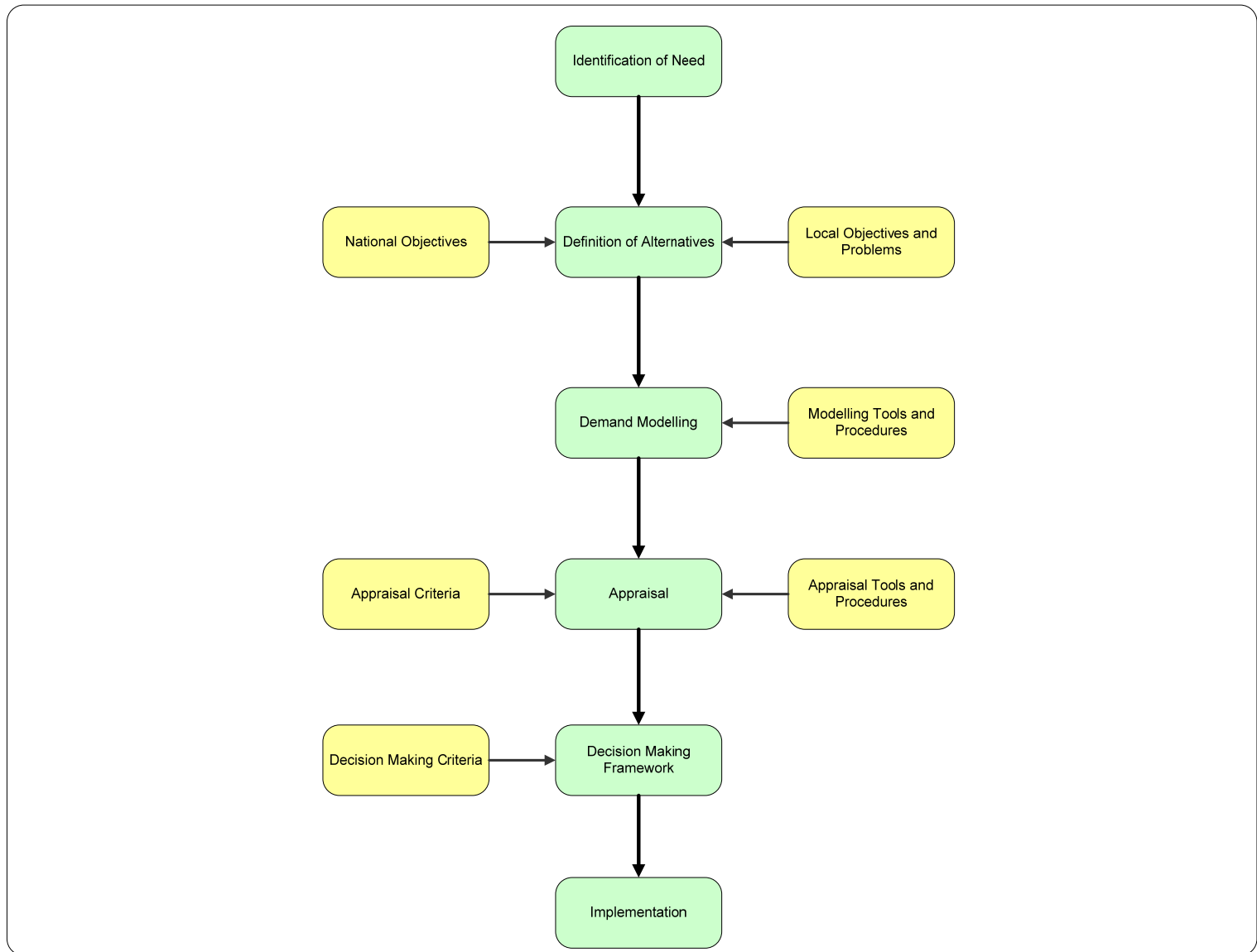
# Decision Making Framework

<b>Country</b>	<b>Framework</b>
England	Appraisal Summary Table – One page un-weighted tabular presentation of assessment against 21 criteria. Supported by Value for Money report.
France	Formal presentation of monetised impacts. No formal presentation of non monetised impacts.
Norway	Formal framework.
Sweden	Short paper which contains a description of the project, the CBA-calculation, the analysis of the goal performance, a description of measures not quantified in monetary terms and an Effect Profile – a table with assessment against the six subsidiary goals of the transport policy.
USA	For federally-funded projects environmental impact statement (EIS) that evaluates broad environmental, community, and land use impacts of project alternatives. Benefit-cost analysis is not required in EIS, but is often conducted for major projects.

## Transferability to Developing Countries

<b>Common Theme</b>	<b>Transferable</b>
Objectives	Yes, with some adaptation
Alternatives	Yes, with some adaptation
Demand Forecasting	Not easily
Assessment Criteria	Yes, with some limitations
Quantification of Costs and Benefits	Not easily
Decision Making Framework	Yes, with some adaptation

# Generic Framework



## Conclusions

- Emerging consensus on approach in developed countries
- 22 (mainly developed) countries have or are developing systems
- Very little systematic application in transitional and developing countries
- Approach readily transferable but tools not
- Demand forecasting and analysis tools used in developed countries are complex and costly



# Ramifications

- Limited multi-modal planning especially in developing countries
- But, multi-modal investment is needed at an early stage in the development cycle
- No implementation of multi-modal solutions
- Costly retroactive implementation of multi-modal solutions



# Recommendations for Further Work

- Simpler demand forecasting solution
- Simple multi-modal cost benefit analysis model
- Generic guidelines
- Encourage multi-modal appraisal in transitional and developing countries

