Road Asset Management in Sweden

Jaro Potucek
Vägverket, S-78187 Borlänge, Sweden
Tel.: +46-243-75833, E-mail: jaro.potucek@vv.se

Sweden and the Swedish Road Administration (SRA)

Sweden

- Land area: 450 000 km2
- Population: 9 million
- 2000 km north to south

Swedish roads

- 100 000 km state roads
- 40 000 km communal roads
- 300 000 km private roads
  (1/4 with state subsidies)

The Swedish Road Administration (SRA)

Tasks

- Management of state roads
- ”Responsibility” for road transport sector

Parliament & Government steer the SRA

- Transport-political Goals + Long-term Plan 2004-2015
- Annual directives: mainly money + reporting demands

Staff: HQ + 7 regions

Employees (excl result units) 2600

- Only road management (road works and consulting purchased)

Annual budget (2005)	**Million US$**
• Administration, Sector & Authority tasks	100
• Operations & Maintenance	950
• Investments (new roads & improvements)	750

Road Asset Management

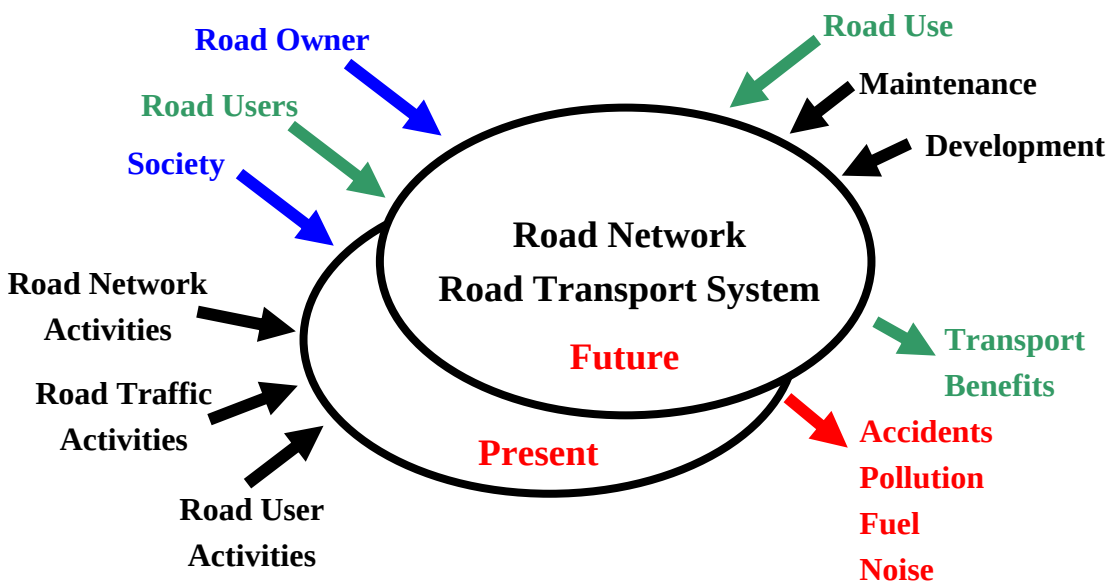
The value chain of the SRA:

Holistic approach -> Effectiveness/Efficiency -> Customer Benefits

The RAM within the SRA is defined as the **holistic approach**:

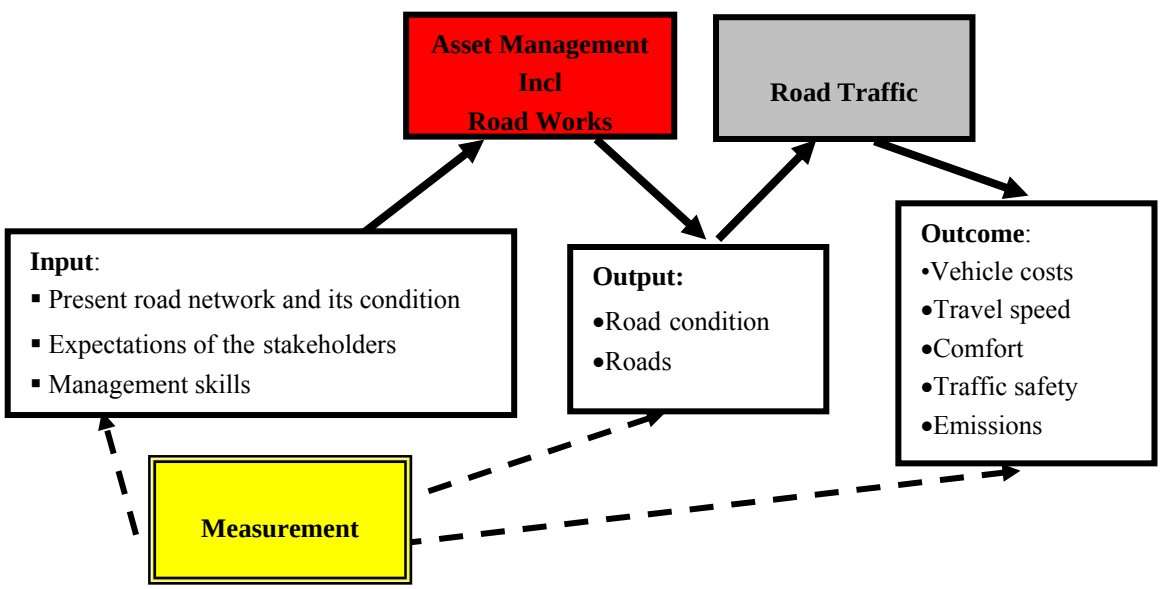
- An integrated, systematic, business improvement approach based upon evaluation of a road network from technical and functional perspective (preservation and use).
- Management of roads covering use, operation, maintenance and development through improvement or construction of new roads.

Perspectives of Road Asset Management



Task of the Asset Management

SRA:s goal is
for disponible input
deliver to the customers
best possible outcome
using Asset Management approach.



Road Network Management: Operations, Maintenance, Development

Road Network Management

Road operations:

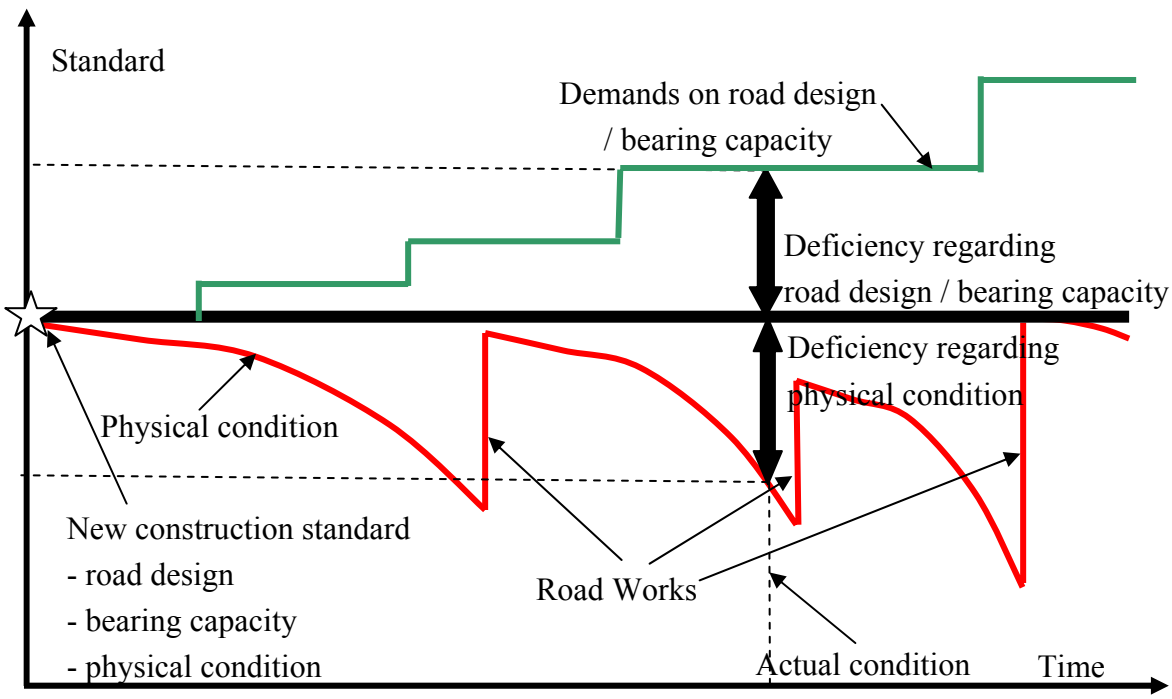
- Lifetime: < 1 year
- Objectives: suitable condition to present road users
- Measure: “operation condition compared to operation standard (yes/not)

Road maintenance:

- Lifetime: > 1 year
- Objectives: suitable condition to present and future road users (through controlled deterioration rate)
- Measure: maintenance backlog in monetary terms

Development

- Objective: permanent functional improvement of the road network



Condition Measures

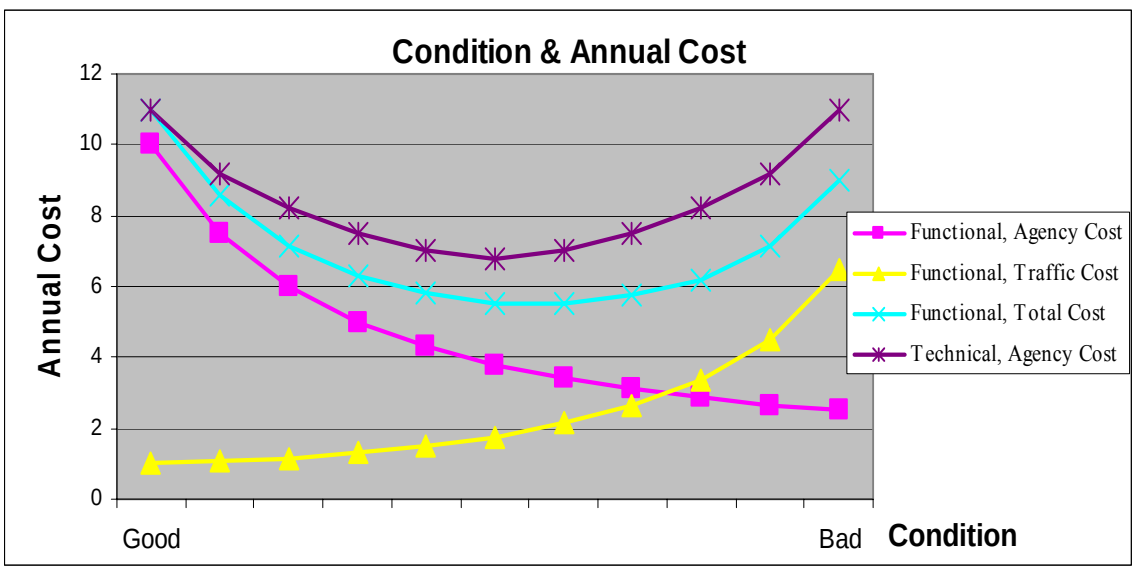
Goals and Measurements

- **"What gets measured gets done".**
- **"What doesn't get measured doesn't get done".**
- **We must monitor the progress towards our goals to achieve them.**

Objectives of Monitoring

- **Our position in respect to the goals to decide our future activities.**
- **Delivery of goals towards the stakeholders.**
- **Effectiveness/accountability (value for money) towards the stakeholders.**
- **Bench-marking of the effectiveness of individual units and contractors.**

Technical & Functional Condition Measures



Maintenance Standard & Backlog

Standard

Condition means actual state of the road network or component.

Standard means promised, aimed to or prescribed condition.

The standard is specified using condition variables

Standard is normally expressed as a set of trigger values for a number of condition variables.

If a trigger value is exceeded some road works should be performed.

Each standard has a corresponding annual cost.

The standard should be "balanced", meaning representing our idea about the best balance among the transport-political goals (= best resource allocation) and user groups.

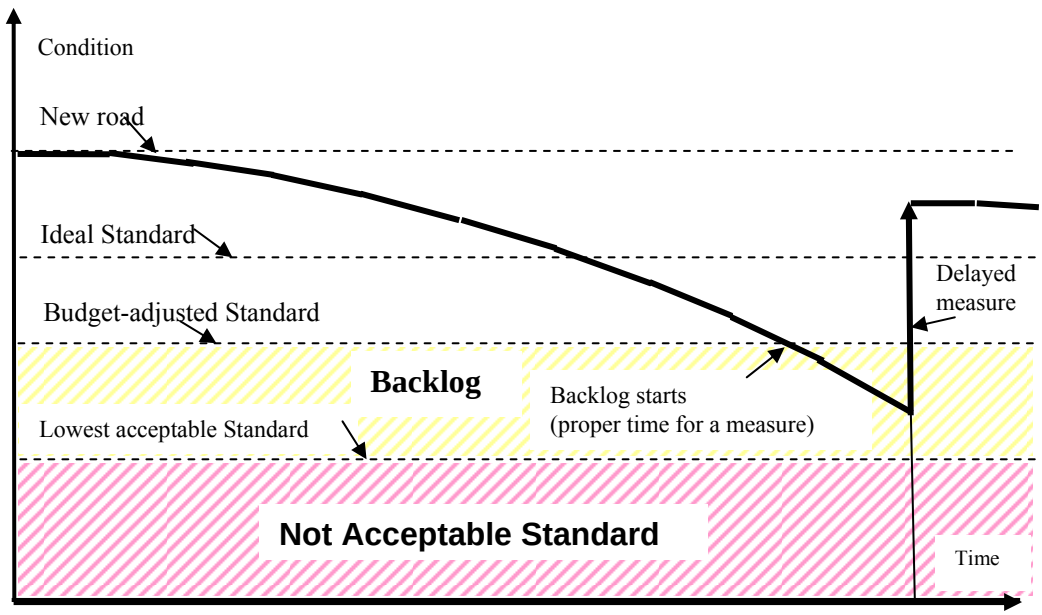
Backlog

Cost of optimal works required due to the maintenance standard.

It measures compliance to maintenance standard.

It estimates relative road capital value if condition distribution is "reasonable".

If a trigger value of the standard is passed but no works are performed a backlog occurs.



External and Internal Effectiveness

External Effectiveness: optimal mixture of different customer goals.
Internal Effectiveness (Efficiency): lowest long-term cost for the delivery.

The internal effectiveness measure will be used for:

- **Result reporting to the stakeholders**
- **Budget allocation**
- **Assessment of the goals for SRA:s regions**
- **Benchmarking between SRA:s regions**
- **Analysis of results of research and development**
- **Analysis of results of re-organisations**

The internal effectiveness of road maintenance is defined as

IE/Road Maintenance = Condition Improvement due to Maintenance / (Operations Costs – Cost-influencing factors)

Example (fictive values)

Internal effectiveness of road maintenance	**2004**	**2005**	**2006**
NK (Road deterioration cost) MSEK	2500	2500	2500
ΔESL (Increase of backlog) MSEK	530	510	440
UK (Maintenance cost) MSEK	1950	2010	2000
IE (Internal effectiveness) = (NK – ΔESL) / UK %	101	99	103
ΔIE		-2	4

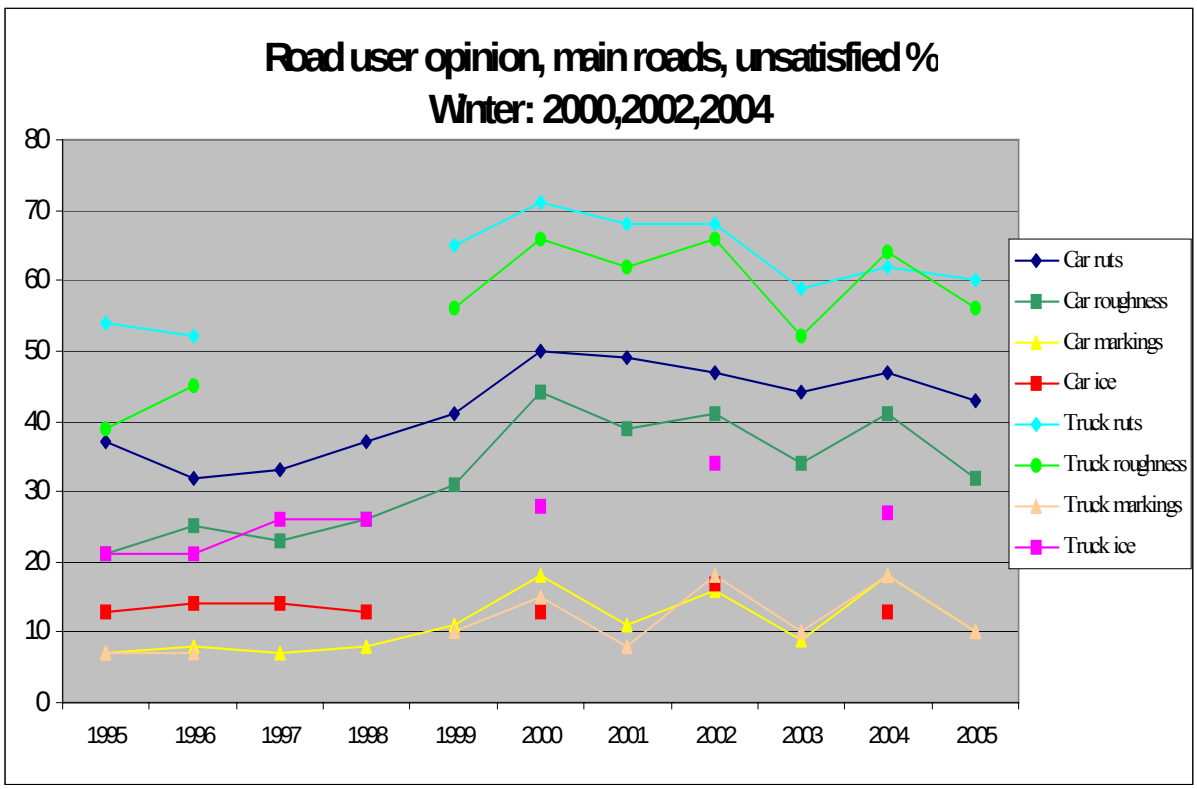
Cost-influencing factors

Following cost-influencing factors are used today:

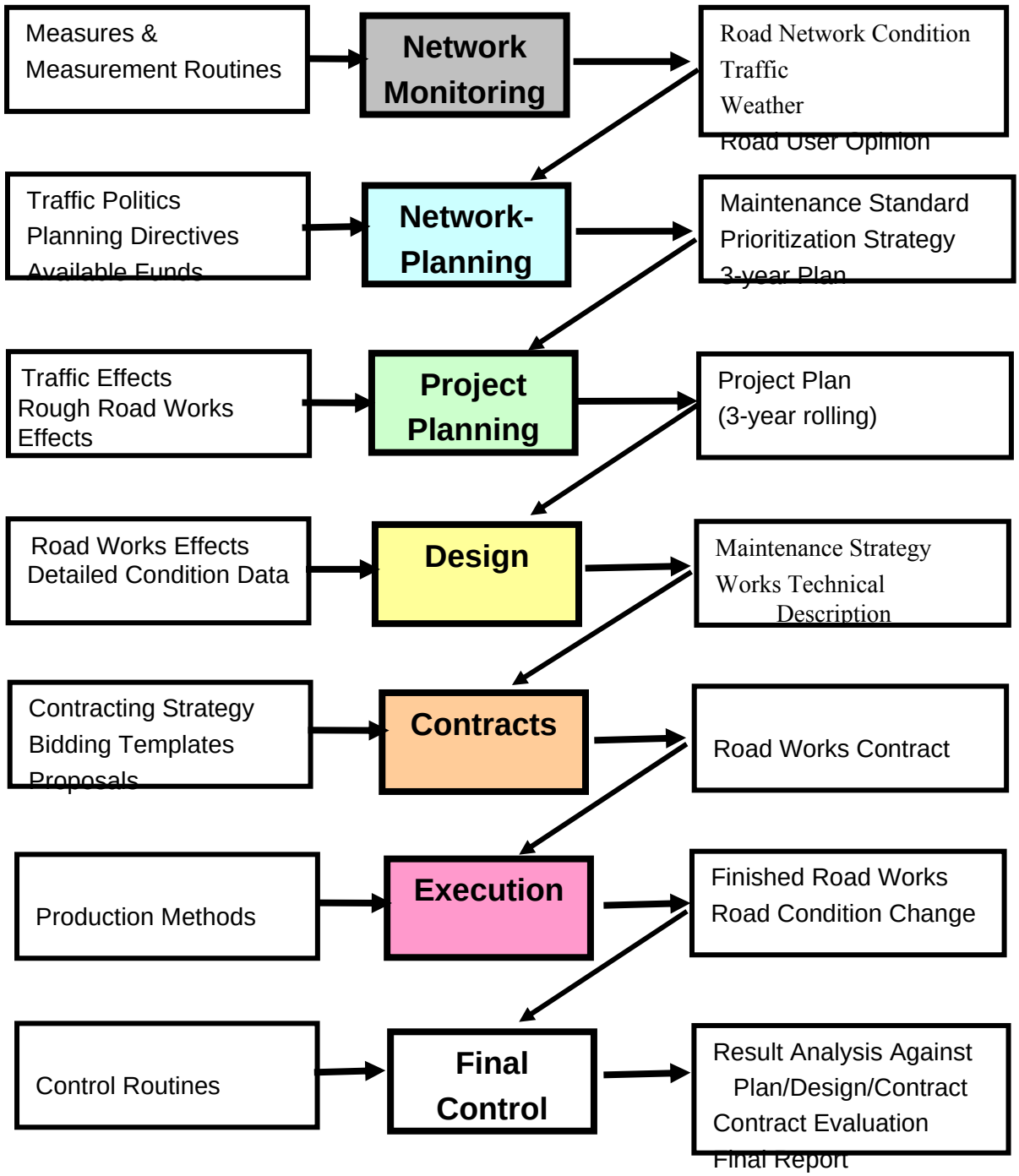
- **New or eliminated road network components** increases or decreases the maintained road network
- **Traffic growth** increases the deterioration rate
- **Synergy effects of road improvement** result in better road condition without maintenance works
- **Changed maintenance standard** determines amount of road works needed
- **Weather variations** has significant influence on deterioration rate and road works costs
- **Changed environmental demands for road works** usually make the road works costs higher
- **Changed traffic safety demands for road works** usually make the road works costs higher
- **Market situation** has significant influence on contract prices
- **Cost development of the input** determines how much of materials and services can be bought
- **Budget restrictions** means selection of suboptimal solutions
- **Internal effectiveness** determines the final result

Users and Residents

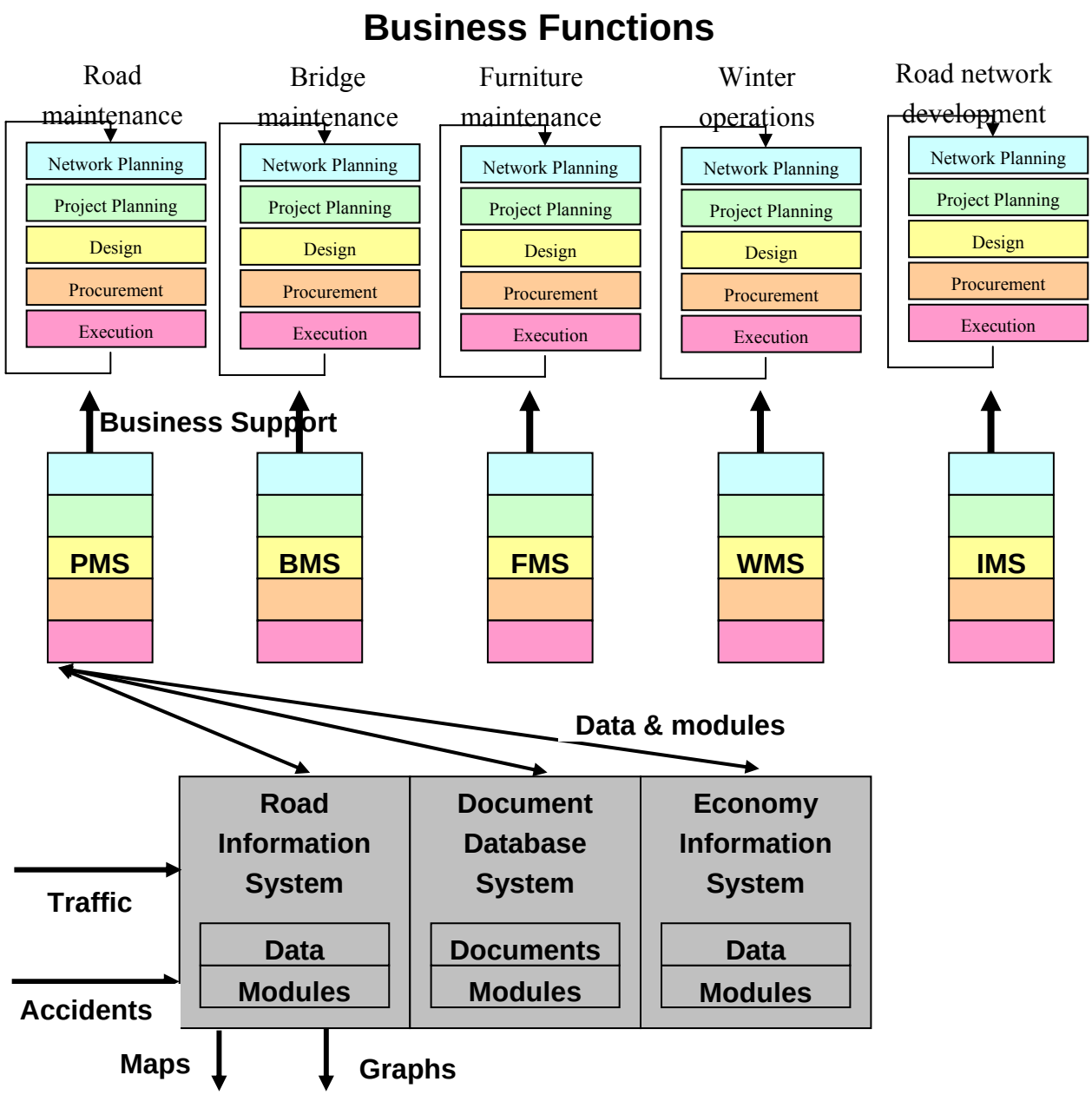
- Regular meetings and discussions with organizations
- Information about actual standards (e.g. leaflets)
- Road user opinion about operations and maintenance
- Satisfied Client Index regarding the SRA
- Traffic Effects (outcome) can be estimated using traffic effect models.



Business Process



Road Management System (RMS)



An example: Business-like communication with the government

Government demands

- The government owns both the road network and the SRA
- The transport-political goals stable, but changing interpretation
- Increasing demands & decreasing budgets & questioned credibility
- Demands on regular reports of development of road condition & SRA:s effectiveness

SRA:s answers based on Asset Management

- The challenge taken and accountability demonstrated!
- Interpretations of demands in measurable terms
- Securement of possible data sources and development of estimation methods.
- First estimates of measures delivered and their refinement will continue.

Specific results

- Pricing of demands: price tag on the demands from the government.
- Condition development control: Road network condition is monitored and planned.
- Effectiveness development control: Effectiveness development is monitored and planned.
- Analysis of results leading to research & development: More effective R&D.

Consequences

- Accountability and effectiveness: towards a more business-like relation
- Better balance between demands and budget: decreased budget variations
- Maintenance has higher priority than development: more stable funding
- Holistic view of road maintenace, its marketing and R&D: AM!