Performance Indicators for Inland Waterways
PIANC INCOM WG 32

Dr. Reinhard Pfliegl (Austria Tech)
Martin Posset (BOKU, Vienna)
Reinhard Pfliegl

• AustriaTech – Federal Agency for Technological Measures Ltd.-Managing Director – 2005-today
• Via Donau – Deputy Managing Director responsible for RIS Development- 2000-2005
• Member TRB AW030- Inland Waterway Transport
• Member PIANC INCOM / PIANC ProCOM – 2003-2009
• Member of Committee 220 for Engineering Standards Austria 1995-
• Member of Board of Governors IEEE ITS Society 2007-2009
• Secretary of INA/PIANC (International Navigation Association) Section Austria
AustriaTech – Federal Agency for Technological Measures Ltd.

- **Agency of bmvit**
  For technology enabling via R&D projects on EU-level

- **Stimulation of new technology measures and deployment (AT/EU)**
  e.g. Telem. Master Plan

- **Telematic Support Infrastructure**
  operators, transport providers

- **Platform Intelligent Transport Systems**
  co-operation and networking
  ITS-AUSTRIA

- **Support for transport and technology know-how transfer**
Why Performance Indicators?
Why Performance Indicators?

• The need to improve acceptance of IWT in modern supply chains
• The need to show capacity, reliability and applicability for intermodal transports
• The need for comparability with other modes of transport
• Acceleration of advanced transport via IWT
Comparability of transport modes
How to achieve a neutral comparability?
Measure to Manage

“Measure everything that’s measurable and make everything measurable that’s measurable.”

“Things you cannot measure, you cannot control.”

“What you cannot measure, you cannot manage.”

… to enable a common understanding of performance indicators within the inland waterway transportation industry…
PIFIW

Performance Indicators for Inland Waterways

- Mobility and Reliability
  - AVG travel time (AVG = average)
  - Coefficient of variation of travel time

- Facilities and Infrastructure
  - Tons of cargo transported per year
  - Number of barges and weirs per 100 miles
  - Number of passengers transported per year related to total percent of vessels in good conditions
  - Number of barriers and weirs

- Long-term Transportation Cost Efficiency
  - Accident rates per TMT (ton-miles traveled)
  - Tons of cargo transported per year
  - Number of accidents caused by security problems

- Cargo and Passengers
  - Capacity of transportation per year
  - Capacity of transportation per years of usage
  - Number of accidents caused by security problems

- Safety and Security
  - Number of job opportunities created by transportation
  - Economic growth approximation resulted from transportation
  - Tons of mobile source emissions
  - Number of people affected by noise produced by vehicles per TMT (TMT ton-miles traveled)

- Economic Development
  - Number of passengers transported per year related to total

- Environmen-
  - Availability of river information systems
  - Usage of satellite navigation

- ICT
  - Vehicles costs

(see: Jin, M. / Wang, H. / Walden, C., T.: System Performance Measures for Intermodal Transportation with a Case Study and Industrial Application)
WHY are performance indicators important

Conventional Logistics

- **Operational Components**
  - Transport, Warehousing, Handling
- **Special Components**
  - Order picking, Just-in-Time, Finsihing
- **Disposition Components**
  - Management, Efficient Consumer Response

added value by additional services and components

PAST

FUTURE

Cutting-edge Logistics

- **Customer Focus**
  - Transport, Warehousing, Handling
- **Overall Service**
  - Order picking, Just-in-Time, Finsihing
- **Industry Focus**
  - Management, Efficient Cunsumer Response, Supply
- **Management of Interfaces in Engineering and Organization**
  - Standardization, Telematics, Supply Chain Management

fast, project-oriented, fully qualified

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revise the relevant benchmarks and/or data collection strategies accordingly

identify the crucial areas of performance in terms of desired results and means of achieving them

establish benchmarks for effectiveness, quality and efficiency

make appropriate changes to management structures, delivery mechanisms etc.

develop information systems to generate appropriate data

report on results and interpret the information to identify areas for improvement

Performance Management Cycle

What Why How Who ToDo
Some examples from other modes?
<table>
<thead>
<tr>
<th>Generic KPI's</th>
<th>1 Cargo received by forwarder as booked</th>
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<td>Satisfaction with road system</td>
<td>Descriptor of the long-term performance of the road programme Definition of the road system Monitored results for all components of the defined road system Categorisation of road users and their level of satisfaction Existence of a standard process to measure trends and changes Utilization of the indicator for strategic planning and resource allocation</td>
</tr>
<tr>
<td>Average road user costs</td>
<td>Changes and trends in cost levels Assessing benefits of policy changes Reasons for differences in costs between jurisdictions</td>
</tr>
<tr>
<td>Level of satisfaction regarding travel time and its reliability and quality of road-user information</td>
<td>Elements that contribute to this indicator Provide data for the targeting of strategy Impact on future strategy and performance</td>
</tr>
<tr>
<td>Protected and unprotected road-user risk</td>
<td>Specific data for the development of road safety programmes: AVG speed, drunk drivers, crash risk, ...</td>
</tr>
<tr>
<td>Environmental policy/programmes</td>
<td>Fulfilment of characteristics of ISO 14001 Initiation of environmental activities</td>
</tr>
<tr>
<td>Process in place of market research and customer feedback</td>
<td>Track and evaluate results of market research “Level of service decision”.</td>
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<td>Long-term programmes</td>
<td>Involvement of public in the development of long-term programmes Reporting of programme implementation.</td>
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<td>Allocation of resources to road infrastructure</td>
<td>Better understanding and identifying issues and areas where the improvement of systems and procedures is opportune for the particular circumstances.</td>
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## ORR key performance indicators

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<th>Description</th>
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<tr>
<td>Safety risk</td>
<td>Measures the risk per million train miles of a train accident.</td>
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<td>Train performance</td>
<td>Total number of minutes delay to all passenger and freight trains caused by the Network Rail*. Percentage of trains arriving at their destination within a specific lateness margin.</td>
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<tr>
<td>Passenger and freight delay</td>
<td>Delay per 100 train kilometre.</td>
</tr>
<tr>
<td>Network Rail delay minutes</td>
<td>Comparing Network Rail’s* delay to passenger trains.</td>
</tr>
<tr>
<td>Infrastructure assets – Asset failures</td>
<td>Total number of incidents causing train delay caused by the Network Rail*.</td>
</tr>
<tr>
<td>Infrastructure Assets – Assets stewardship–index routes ASI</td>
<td>Composite index that includes elements that do not necessarily cause train delay (track geometry).</td>
</tr>
<tr>
<td>Activity volumes</td>
<td>Comparable to ASI but differs in detail respects.</td>
</tr>
<tr>
<td>Financial efficiency index</td>
<td>Measure of the volume of the track renewal.</td>
</tr>
<tr>
<td>Expenditure variance</td>
<td>Index that shows changes in Network Rail’s* operating, maintenance and plain line expenditure.</td>
</tr>
<tr>
<td>Financing</td>
<td>Forecast expenditure on operations, maintenance and renewals against Network Rail’s budget expenditure.</td>
</tr>
<tr>
<td>Customer satisfaction</td>
<td>Net debt as a percentage of regulatory asset base.</td>
</tr>
<tr>
<td>Customer Accident Injury Rate</td>
<td>Gauging customer satisfaction both for passengers and freight operators.</td>
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## UPS Environmental and Social Indicators

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<th>UPS Environment Indicators</th>
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<td><strong>Retention rate</strong></td>
<td><strong>Fines as percentage of environment related agency inspections</strong></td>
</tr>
<tr>
<td>% Full-time employees retained annually.</td>
<td>Water consumption</td>
</tr>
<tr>
<td><strong>Employer of choice index</strong></td>
<td>Electricity, natural gas, propane, heating oil, gasoline and diesel expressed in gigajoules of energy.</td>
</tr>
<tr>
<td>Employee opinion survey of UPS performance.</td>
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<tr>
<td><strong>Charitable contribution</strong></td>
<td>Energy footprint</td>
</tr>
<tr>
<td>Charitable contribution as % of profit before interest taxes.</td>
<td>Electricity, natural gas, propane, heating oil, gasoline and diesel expressed in gigajoules of energy.</td>
</tr>
<tr>
<td><strong>Automotive accidents per 100,000 driver hours</strong></td>
<td>Ground network fuel efficiency</td>
</tr>
<tr>
<td>Total number of vehicular accidents.</td>
<td>Road, Rail and Air fuel consumption divided by total ground and air packages.</td>
</tr>
<tr>
<td><strong>Number of lost time injuries per 200,000 hours</strong></td>
<td>Global aircraft emissions</td>
</tr>
<tr>
<td>Lost work days form injury or illness.</td>
<td>Total emissions divided by max. structural payload capacity.</td>
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<tr>
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<td><strong>Percent of fleet that meets noise requirements</strong></td>
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<td>Cumulative noise as measured by effective perceived noise decibels.</td>
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<td><strong>Greenhouse gas emissions footprint expressed as CO₂ emissions</strong></td>
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<td>Stationary and mobile sources of energy.</td>
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Performance Indicators for Inland Waterway Transport
Terms of Reference (ToR)

- Reflect the critical success factors
- Improve the overall performance of IWN
- Set common definitions, standards, and measurements
- Encourage industry-wide adoption
- Increase attractiveness for users
- 6 technical and non-technical performance criterias
- Evaluation of the 6 elements
- Development of a list of criterias or indicators for each element to validate
- Determination of an assessment method to rank
WG 32 Members

• U.S.:
  ▪ William T. HARDER
• Austria:
  ▪ Gerhard GUSSMAGG
• Germany:
  ▪ Matthias KUSSNER
• Belgium:
  ▪ Jacques HACOURT
• Netherlands:
  ▪ Robert HEKKENBERG
  ▪ Wouter BIJMAN
• France:
  ▪ Benoit DELEU
• Spain:
  ▪ Francisco CAFFARENA
Timeline

- 1/06: Submission of TOR
- 9/06: Acceptance by PIANC EXCOM
- 1/07: Call for participation
- Q3/07: Start of preparatory work
- List of WG members
- Kick-off Louisville
- Q1/08: WG Meeting
- Intermed. Report
- 6/08: WG Meeting Beijing
- 12/08: Draft Report for Comment
- 3/09: Final review by WG
- 6/09: Final Report
Selection of PIIFIW

• **S P E C I F I C**
• **M E A S U R E A B L E**
• **A T T A I N A B L E**
• **R E A L I S T I C**
• **T I M E – S E N S I T I V E**

Thank You for Your Attention

Performance Indicators for Inland Waterways

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1180 Vienna, Austria
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manfred.gronalt@boku.ac.at
www.boku.ac.at
Introduction of all participants

Expectations?

Areas of interest?

Experiences?
Performance Indicators

Overview of application USACE point of view

presented by

Bill T. Harder
Lunch Break

Have a nice meal!
Performance Indicators for Inland Waterways

PIFIW  (Performance Indicators for Inland Waterways)

Dr. Reinhard Pfliegl  (Austria Tech)
Martin Posset  (BOKU, Vienna)
About Performance Indicators

- **What** is Performance Management
- **Why** is there a need for Performance Indicators
- **How** to select Performance Indicators
  - Management of Performance
- **Who** reports on Performance
- **ToDo** Conclusion & Outlook
“Measure everything that’s **measurable** and make everything measurable that’s measurable.”

“Things you cannot **measure**, you cannot **control**.”

“What you cannot **measure**, you cannot **manage**.”

…to enable a common understanding of performance indicators within the inland waterway transportation industry…

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Manage to Control

- **Identify an organization’s success**
  - Analyze whether customers and stakeholders needs are met
  - Make an organization understand its strengths and weaknesses
  - Help to understand one’s processes and improve them
  - Find out where problems, resources, bottlenecks exist and where it is necessary to make improvements
  - To make decisions and improvements are based on facts and not on intuition or emotions.
  - Confirm the impact of improvements

Function of PIFIW (PIFIW: Performance Indicators for Inland Waterways)

"doing the right things"
- efficiency
  - right products and services
  - right customers
  - "following the polar star"

"doing things right"
- effectivity
  - short lead time
  - reliability
  - quality of processes
  - "following the light of passing ships within the mist"

PIFIW performance indicators

"doing the right things right"

"following the light of passing ships within the mist"
Basis of decisionmaking

- Performance indicators enable organizations to monitor trends and actively counteract against undesirable development
- The competitive environment of business forces participants to have intelligent interfaces to their financial and operational key factors
- Long-term successful players must have a reference or measurement standard for internal and external comparison to ensure effective progression
- Liberalization, commercialization and globalization have increased business growth, complexity and competitiveness, driving the need for performance indicators
- Performance indicators and benchmarking, internally and against others, is used to gain insight into one’s own operations to improve efficiency
- Linking different processes between business units with performance goals and benchmarks helps to increase overall performance and strengthens the whole sector

Strengthening inland waterways
WHY are performance indicators important

Conventional Logistics

- **Operational Components**
  - Transport, Warehousing, Handling

- **Special Components**
  - Order picking, Just-in-Time, Finishing

- **Disposition Components**
  - Management, Efficient Consumer Response

Performance Indicators for Inland Waterways - PIFIW

PAST

FUTURE

Cutting-edge Logistics

- **Customer Focus**
  - Transport, Warehousing, Handling

- **Overall Service**
  - Order picking, Just-in-Time, Finishing

- **Industry Focus**
  - Management, Efficient Consumer Response, Supply

- **Management of Interfaces in Engineering and Organization**
  - Standardization, Telematics, Supply Chain Management

fast, project-oriented, fully qualified
Reasoning

- The importance of mobility to ease the movement of people and goods.
  - Enabling the accessibility of transportation facilities. Accessibility is strongly related to the use of transportation facilities.
  - Transportation has to be safe and reliable and so there is a need to figure out critical processes.
  - The transportation sector has a sustainable liability towards the preservation of the existing state of the environment.
  - Decision-making in the transportation sector is interwoven with participating populations. Public involvement is very important, especially in the sector of waterborne transportation.

(see: Jin, M. / Wang, H. / Walden, C., T. (2004): System Performance measures for intermodal transportation with a case study and industrial application)
Targets

Contribution to protection of ability to coordinate
Contribution to protection of reactivity
Contribution to protection of anticipation
Contribution to protection of adaptiveness
Protection of coordination
Protection of information supply
Support of goal achievement of the organisations' targets
Protection of rational decision-making

PERFORMANCE INDICATORS

What  Why  How  Who  ToDo


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Selection of PIFIW

• SPECIFIC
• MEASURABLE
• ATTAINABLE
• REALISTIC
• TIME – SENSITIVE

Performance Management

Performance Management Cycle

- identify the crucial areas of performance in terms of desired results and means of achieving them
- revise the relevant benchmarks and/or data collection strategies accordingly
- establish benchmarks for effectiveness, quality and efficiency
- develop information systems to generate appropriate data
- report on results and interpret the information to identify areas for improvement
- make appropriate changes to management structures, delivery mechanisms etc.

What  Why  How  Who  ToDo

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Do you have control over the entity?

Do you have significant influence?

Do you have influence?

Does it have significant impacts?

Does it have significant impacts?

Performance data

Disclosures on Management Approach

Narrative reporting on Issues and Dilemmas

Actors, Areas and Functions

PARTNERS AND CO-OPERATORS

OWNERS

TBD...

SUPPLIERS

TBD...

WATERWAY SERVICE USERS

TBD...

TBD...


What Why How Who ToDo
PIFIW

Mobility and Reliability
- AVG travel time (AVG = average)
- Coefficient of variation of travel time

Cargoes and Passengers
- Tons of cargo transported per year
- Number of passengers transported per year
- Coefficient of variation of travel time

Safety and Security
- Number of accidents per TMT/PMT
- Number of accidents caused by security problems

Facilities and Infrastructure
- Tons of mobile source emissions
- Number of job opportunities created by transportation

Long-term Transportation Cost Efficiency
- Capacity of transport (TMT ton-miles traveled)
- Number of job opportunities created by transportation

Economic Development
- Availability of river information systems
- Economic growth approximation resulted from transportation

Environ-ment
- Usage of satellite navigation systems
- Number of people affected by noise produced by vehicles per TMT (TMT ton-miles traveled)

Ports
- Years of usable transportation system
- Vehicle costs

ICT
- Number of job opportunities created by transportation
- Number of people affected by noise produced by vehicles per TMT (TMT ton-miles traveled)

(see: Jin, M. / Wang, H. / Walden, C., T.: System Performance Measures for Intermodal Transportation with a Case Study and Industrial Application)

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<th>Airfield Aircraft, Terminal Passenger, and Landside Transportation Processing Efficiency (engineering measure of throughput and levels of service)</th>
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<tr>
<td>• Total passengers (originating and connecting)</td>
<td>• Runway, taxiway, airfield design, layout and aircraft processing efficiency</td>
</tr>
<tr>
<td>• Total cargo (mail and freight)</td>
<td>• Airfield terminal area (ramp and gate areas) aircraft processing efficiency</td>
</tr>
<tr>
<td>• Total operations (commercial, commuter and military)</td>
<td>• Terminal passenger flows and processing efficiency</td>
</tr>
<tr>
<td>Physical Facilities</td>
<td>• Terminal curb and landside processing efficiency</td>
</tr>
<tr>
<td>• Number of airports</td>
<td></td>
</tr>
<tr>
<td>• Land area, runways, taxiways, apron</td>
<td></td>
</tr>
<tr>
<td>• Terminals, concourses, gates, ticket counter, security, and baggage</td>
<td></td>
</tr>
<tr>
<td>• Parking spaces</td>
<td></td>
</tr>
<tr>
<td>ACI Aeronautical Charges - Airfield</td>
<td>Aeronautical Related Charges - Terminal</td>
</tr>
<tr>
<td>• Landing and take-off fees</td>
<td>• Ticket counter space</td>
</tr>
<tr>
<td>• Aircraft apron, parking and gate fees</td>
<td>• Boarding gates and loading bridges</td>
</tr>
<tr>
<td>• Aircraft environmental fees</td>
<td>• Administrative office space</td>
</tr>
<tr>
<td>• Aircraft fueling fees and other ground handling fees</td>
<td>• Flight kitchens and services</td>
</tr>
<tr>
<td>ACI Non-Aeronautical Concession Revenues - Terminal</td>
<td>• Baggage processing/handling</td>
</tr>
<tr>
<td>• Retail/specialty retail</td>
<td>• Passenger lounges</td>
</tr>
<tr>
<td>• Food/beverage</td>
<td>• FIS, BIDS and CUTE fees</td>
</tr>
<tr>
<td>• News/gifts</td>
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</tr>
<tr>
<td>• Duty free/tax free</td>
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<td>• Advertising</td>
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<td>• Hotels</td>
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<td>ACI Operating and Maintenance Costs</td>
<td>Other Financials</td>
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<td>• Personnel costs (salaries &amp; benefits)</td>
<td>• Other non-operating revenues</td>
</tr>
<tr>
<td>• Soft costs/outourcing</td>
<td>• Cash flow and liquidity</td>
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<td>• Suppliers and materials</td>
<td>• Debt (bonds and loans)</td>
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<td>• Repairs and maintenance</td>
<td>• Return on equity and assets</td>
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<td>• Communications and utilities costs</td>
<td>• EBITA and net profit</td>
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<td>• Law enforcement and firefighting costs</td>
<td>• Capital expenditures and costs (actual and projected)</td>
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<td>• Other operating costs</td>
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<td>ACI Quality of Community Airline Service</td>
<td>Quality of Airport Facilities and Services (passenger satisfaction)</td>
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<tr>
<td>• Number of airlines</td>
<td>• Quality of experience coming to airport</td>
</tr>
<tr>
<td>• Airline routes and frequencies</td>
<td>• Quality of passenger processing (check-in, gate, customs and immigration and security)</td>
</tr>
<tr>
<td>• Aircraft types and fleet mix</td>
<td>• Quality of airport commercial services</td>
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<td>• Airline competition and airfares</td>
<td>• Quality of airport physical facilities</td>
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<td>Descriptor of the long-term performance of the road programme Definition of the road system Monitored results for all components of the defined road system Categorisation of road users and their level of satisfaction Existence of a standard process to measure trends and changes Utilization of the indicator for strategic planning and resource allocation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average road user costs</th>
<th>Changes and trends in cost levels Assessing benefits of policy changes Reasons for differences in costs between jurisdictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of satisfaction regarding travel time and its reliability and quality of road-user information</td>
<td>Elements that contribute to this indicator Provide data for the targeting of strategy Impact on future strategy and performance</td>
</tr>
<tr>
<td>Protected and unprotected road-user risk</td>
<td>Specific data for the development of road safety programmes AVG speed, drunk drivers, crash risk, ...</td>
</tr>
<tr>
<td>Environmental policy/programmes</td>
<td>Fulfilment of characteristics of ISO 14001 Initiation of environmental activities</td>
</tr>
<tr>
<td>Process in place of market research and customer feedback</td>
<td>Track and evaluate results of market research “Level of service decision”.</td>
</tr>
<tr>
<td>Long-term programmes</td>
<td>Involvement of public in the development of long-term programmes Reporting of programme implementation.</td>
</tr>
<tr>
<td>Allocation of resources to road infrastructure</td>
<td>Better understanding and identifying issues and areas where the improvement of systems and procedures is opportune for the particular circumstances.</td>
</tr>
<tr>
<td>ORR key performance indicators</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Safety risk</td>
<td>Measures the risk per million train miles of a train accident.</td>
</tr>
<tr>
<td>Train performance</td>
<td>Total number of minutes delay to all passenger and freight trains caused by the Network Rail*. Percentage of trains arriving at their destination within a specific lateness margin.</td>
</tr>
<tr>
<td>Passenger and freight delay</td>
<td>Delay per 100 train kilometre.</td>
</tr>
<tr>
<td>Network Rail delay minutes</td>
<td>Comparing Network Rail’s* delay to passenger trains.</td>
</tr>
<tr>
<td>Infrastructure assets – Asset failures</td>
<td>Total number of incidents causing train delay caused by the Network Rail*.</td>
</tr>
<tr>
<td>Infrastructure Assets – Assets stewardship – index routes ASI</td>
<td>Composite index that includes elements that do not necessarily cause train delay (track geometry).</td>
</tr>
<tr>
<td>Activity volumes</td>
<td>Comparable to ASI but differs in detail respects.</td>
</tr>
<tr>
<td>Financial efficiency index</td>
<td>Measure of the volume of the track renewal.</td>
</tr>
<tr>
<td>Expenditure variance</td>
<td>Index that shows changes in Network Rail’s* operating, maintenance and plain line expenditure.</td>
</tr>
<tr>
<td>Financing</td>
<td>Forecast expenditure on operations, maintenance and renewals against Network Rail’s budget expenditure.</td>
</tr>
<tr>
<td>Customer satisfaction</td>
<td>Net debt as a percentage of regulatory asset base.</td>
</tr>
<tr>
<td>Customer Accident Injury Rate</td>
<td>Gauging customer satisfaction both for passengers and freight operators.</td>
</tr>
</tbody>
</table>
## UPS Environmental and Social Indicators

### UPS Social Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retention rate</td>
<td>% Full-time employees retained annually.</td>
</tr>
<tr>
<td>Employer of choice index</td>
<td>Employee opinion survey of UPS performance.</td>
</tr>
<tr>
<td>Charitable contribution</td>
<td>Charitable contribution as % of profit before interest taxes.</td>
</tr>
<tr>
<td>Automotive accidents per 100,000 driver hours</td>
<td>Total number of vehicular accidents.</td>
</tr>
<tr>
<td>Number of lost time injuries per 200,000 hours</td>
<td>Lost work days form injury or illness.</td>
</tr>
</tbody>
</table>

### UPS Environment Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fines as percentage of environment-related agency inspections</td>
<td></td>
</tr>
<tr>
<td>Water consumption</td>
<td>Water used to wash vehicles in cubic metres.</td>
</tr>
<tr>
<td>Energy footprint</td>
<td>Electricity, natural gas, propane, heating oil, gasoline and diesel expressed in gigajoules of energy.</td>
</tr>
<tr>
<td>Ground network fuel efficiency</td>
<td>Road, Rail and Air fuel consumption divided by total ground and air packages.</td>
</tr>
<tr>
<td>Global aircraft emissions</td>
<td>Total emissions divided by max. structural payload capacity.</td>
</tr>
<tr>
<td>Percent of fleet that meets noise requirements</td>
<td>Cumulative noise as measured by effective perceived noise decibels.</td>
</tr>
<tr>
<td>Greenhouse gas emissions footprint expressed as CO₂ emissions</td>
<td>Stationary and mobile sources of energy.</td>
</tr>
</tbody>
</table>
**Vision**

- 2007 common understanding
- Identifying key objectives
- Designing measures
- System design

**Mission**

- Implementation of measures
- Use of measures to assess the implementation of strategy
- Use of measures to challenge strategic assumptions

**Todo**

1. Reviewing targets
2. Developing measures
3. Reviewing measures
4. Challenging strategy

(see: Bourne, M / Mills, J / Wilcox, M / Neely, A / Platts, K (2000): Designing, implementing and updating performance measurement systems)
Conclusion

• Measuring performance of processes to make them rateable because management of processes affects current and future performance

• Monitoring adverse impacts and guarding against negative effects

• Setting up performance indicators to structure information and analyse correlation of input, output, outcome and impact of operations

• There is a need for standardized and accepted instruments to analyse processes and performance and to measure and validate achievements

• Enabling a common understanding on how organizations can proactively improve their performance and ensure they can appropriately measure how well their performance measures up to their customer’s expectations

• Comparing the development of different organizations to enable benchmarking and comparison with other modes of transportation
THE RIGHT ORGANIZATION TO
WORK OUT WHAT’S REALLY IMPORTANT

Dr. Reinhard Pfiegl | 28/09/2007
Performance Indicators

$pi = wg^{32}$

performance indicators = working group 32

PIANC working group 32...

...the right organization to initiate

Dr. Reinhard Pfiegl | 28/09/2007
Discussion

Terms of Reference

Adaptation?

Extension?

Limitations?

Applications?
Further approach

- Election of chair person, secretary, other functions
- Content of work
- Schedule of work
- Contribution of partners
- Subgroups
- Next steps
- Best way to work
- Next meeting
- Location
Closing remarks
Have a nice evening!