



Benchmarking trolleybus systems. Goals, approach and comparison indicators

UITP Trolleybus Workshop

2 October 2015

Benchmarking is a powerful tool that serves 3 major goals

Benchmarking Goals

Identify Potentials for Operational Improvements

Learn Best Practices to Develop Measures and Facilitate Changes

Collect Fact Base to oppose cost-cutting pressure of Authorities

- Areas where peer companies are not better are unlikely to have good potential and justify the efforts
- Areas where some peer companies are much better are of prime interest
- Besides efficiency gaps big difference with peer companies can be accounted for different business models. For instance labor productivity indicators can be significantly affected by outsourcing

- Unguided targeting may harm operations and cause the opposite effect eventually
- Best Practice analysis shows directions for improvements and reduces risks

- Being subsidized from regional budgets bus operators are being pushed by authorities to reduce personnel and other costs
- Benchmarking Comparison provides a good evidence to oppose unjustified cost reduction pressure

Benchmarking – comparison of key operational indicators of peer companies with the aim to reveal the potential for implementation of best practices

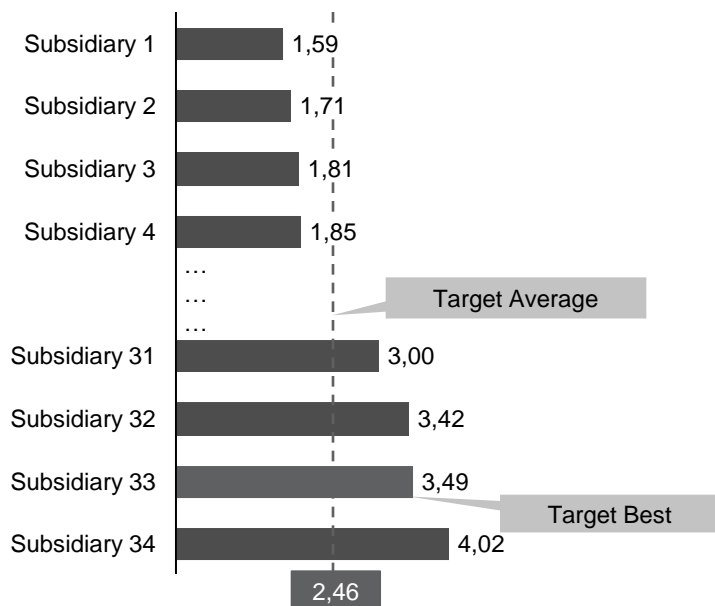
Benchmarking helps to identify areas with the most potential for improvements

*From Internal Benchmarking
for a Russian Bus Operator*

Big Potential for Improvements

Productivity of workers by subsidiaries

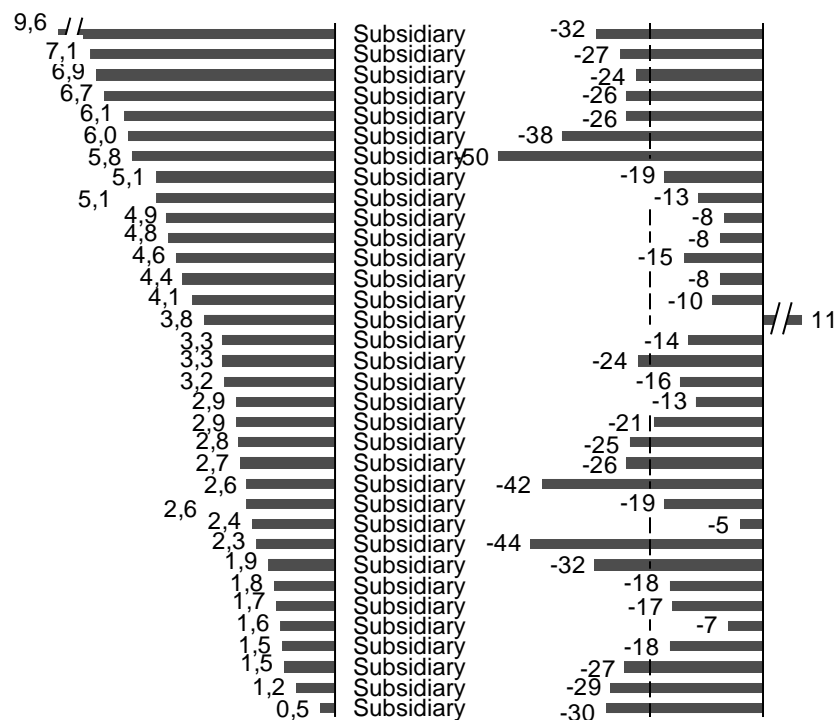
Vehicle-hours a year per worker¹, 000



1 – Total personnel minus drivers minus administrative staff

Low Potential for Improvements

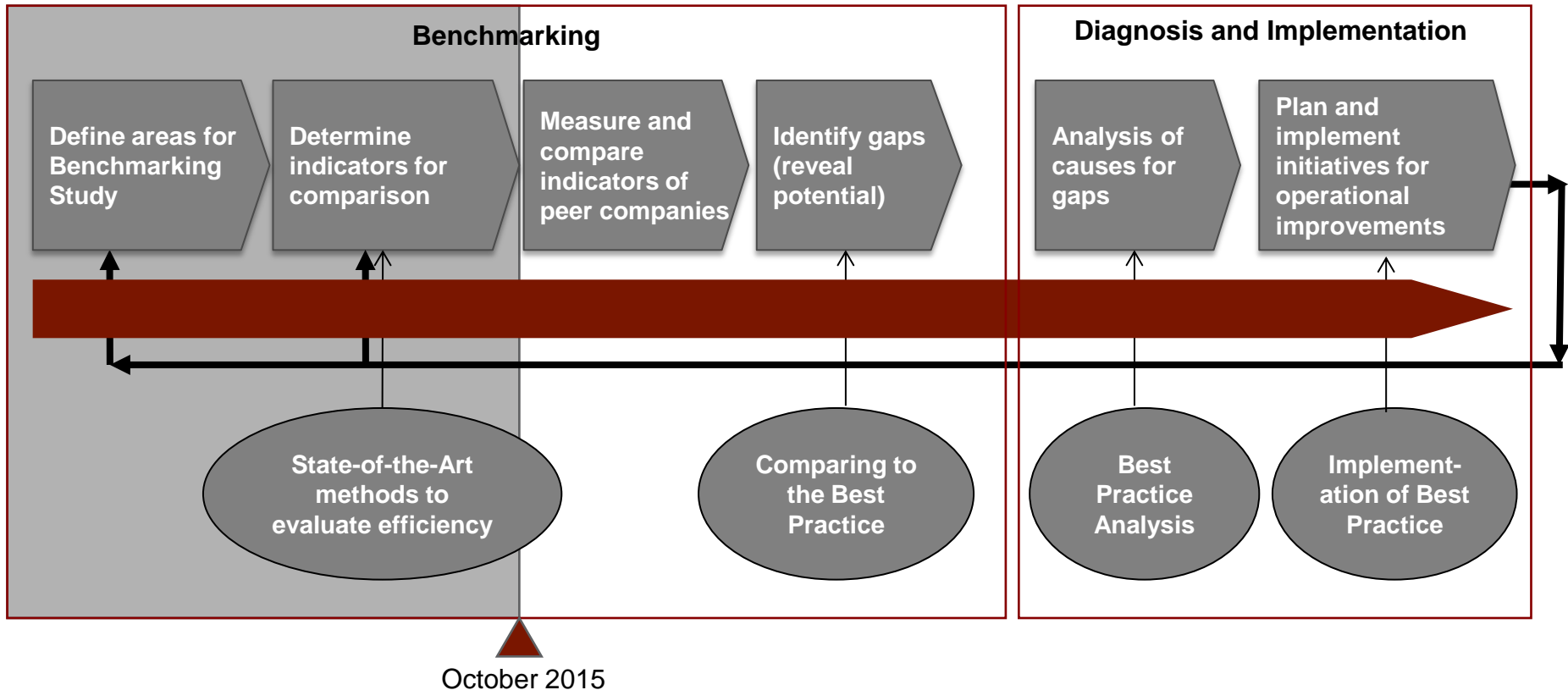
Correlation between rolling stock renewal and maintenance cost reduction, 2014 to 2013, %



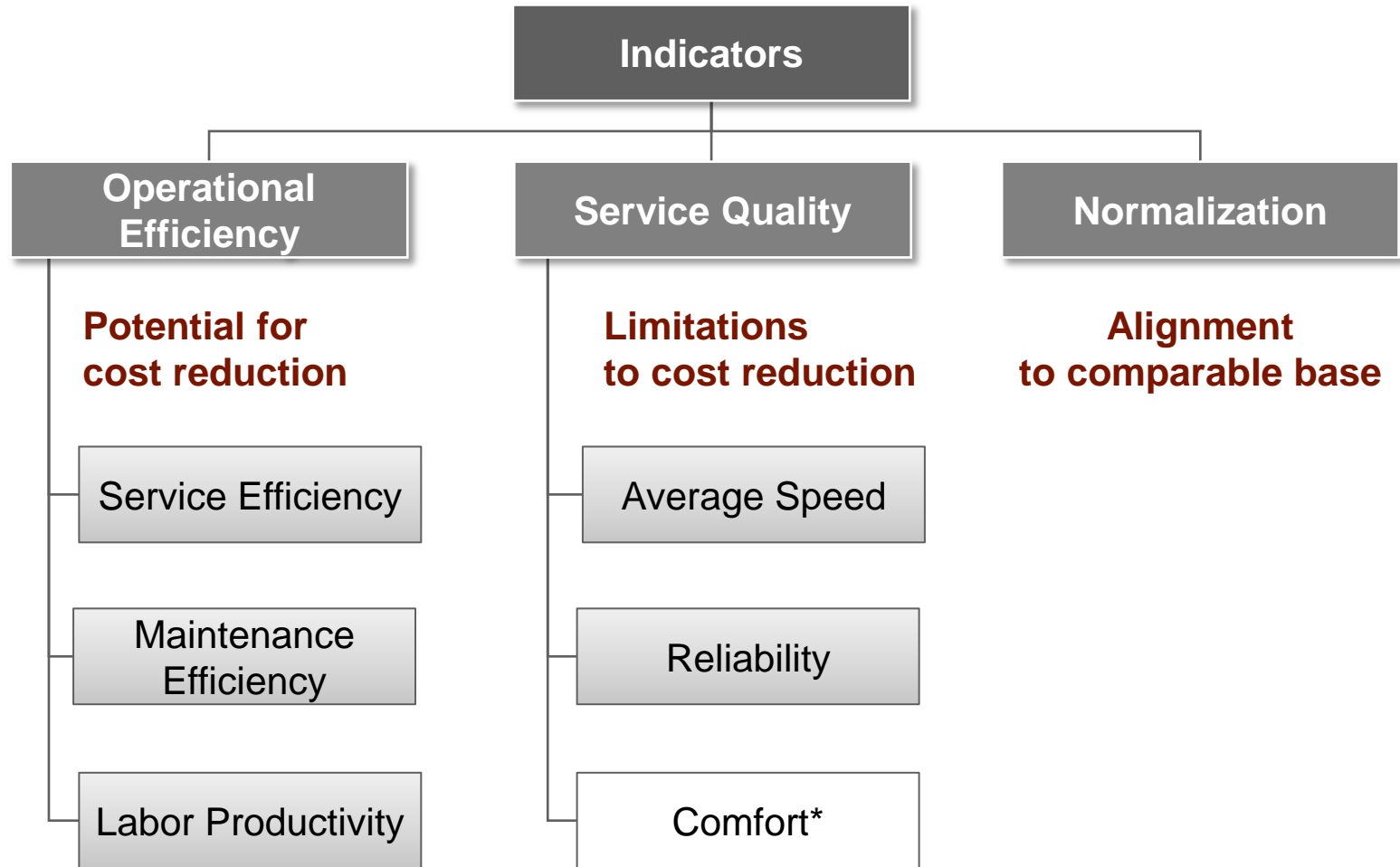
Note: The company name can not be disclosed for confidentiality reason

By October 2015 the list of indicators is ready and needs to be approved by all peers

Typical operation improvement process with the help of benchmarking

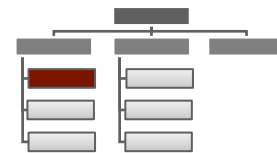


Public Transport Benchmarking uses 3 major group of indicators: 1) Operational Efficiency indicators; 2) Service Quality indicators; 3) Normalization indicators



* Comfort indicators not to be studied

Operational Efficiency Indicators (1)



Service Efficiency

INDICATORS

MEASUREMENT DIMENSIONS



Network efficiency

- revenue vehicle kilometers to total vehicle kilometers

- revenue vehicle hours to total vehicle hours



Capacity Use Rate

- passengers * avg. passenger trip length to revenue capacity kilometers



Energy Consumption Ratio

- energy consumed to vehicle kilometers

- energy consumed to capacity kilometers



Catenary- free Operation Ratio

- vehicle kilometers in autonomous mode to total vehicle kilometers

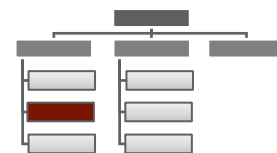


Pole jumps on driver's fault frequency

- pole jumps due to driver fault to total vehicle kilometers in catenary mode

Operational Efficiency Indicators (2)

Maintenance Efficiency



INDICATORS

MEASUREMENT DIMENSIONS



Vehicle Operation / Availability Ratio

- vehicles in operations to total vehicles

- vehicles in operations plus in reserve to total vehicles



Vehicle Breakdown Ratio

- revenue vehicle kilometers to total breakdowns



Catenary Breakdown Ratio

- vehicle kilometers in catenary mode to catenary breakdowns

- catenary breakdowns to total catenary length



Maintenance productivity

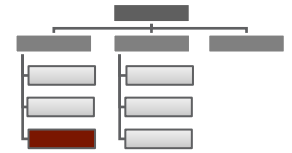
- hours of preventive maintenance / repair

- to vehicles in operations

- to total vehicle kilometers

- to total vehicle hours

- to catenary length



Labor Productivity

INDICATORS



Direct Labor productivity



Management Staff Ratios

MEASUREMENT DIMENSIONS

- passengers to drivers

- passengers to production staff

- drivers to vehicle hours

- maintenance staff to total production staff

- maintenance staff to vehicles

- administrative staff to production staff

- administrative staff to drivers

- headquarters staff to depot staff

Service Quality and Normalization Indicators

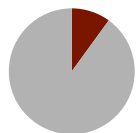


Service Quality

INDICATORS



Average commercial speed



Reliability

MEASUREMENT DIMENSIONS

actual revenue vehicle kilometers to actual revenue vehicle hours

trips performed to trips scheduled

trips performed on schedule to trips scheduled

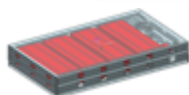
Normalization



Average commercial speed



Average weighted vehicle planning capacity



Share of vehicles with APU's



Workweek

actual revenue vehicle kilometers to actual revenue vehicle hours

revenue capacity kilometers to revenue vehicle kilometers

vehicles with APU's (> 5 km of autonomous mode) in operation to total vehicles in operation

hours in working week

Absenteeism rate

Strategy Partners facilitates the study on behalf of Mosgortrans



Next steps:

- Finalize and approve the list of benchmarking indicators
- Sign NDA's between participating companies
- Collect data