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## Economic Commission for Europe

Inland Transport Committee

### Working Party on Rail Transport

**Seventy-fourth session**
Geneva, 18–20 November 2020
Item 12 of the provisional agenda
**Productivity in Rail Transport**

# Updated productivity questionnaire

### Note of the secretariat

## I. Mandate

This document sets out the updated questionnaire on productivity as requested in at the last session of the Working Party (ECE/TRANS/SC.2/230, para. 45).

## II. Productivity questionnaire details

*Rail productivity indicators – 2019*

**1. Note by the secretariat**

This questionnaire aims to collect rail productivity indicators, in line with the programme of work of the Working Party on Rail Transport (SC.2) to analyze the various elements of railway productivity growth, in particular in freight transport (ECE/TRANS/SC.2/2015/7, para. 4.6).

Please note that you can skip a question if you don't have the answer. In this case, proceed to the next page. Don't hesitate to contact Francesco Dionori if you have any question (francesco.dionori@un.org).

The deadline for submission is Saturday 31 August 2019, COB.

**2. Contact details**

Please enter your contact details:

First Name Last Name

Organisation/Company Country

Email Address

## 3. Labour productivity indicator (high-speed and passengers conventional rail)

Labour productivity is defined as output per unit of labour and is calculated by dividing output produced by a measure of the labour input used to produce the output (number of employees or labour hours). The first labour productivity indicator divides the kilometres of network in use for both high-speed and conventional rail by the total number of employees working in both railways undertakings and infrastructure manager(s).

Please indicate the values below:

Km of network in use
    value/year of data
Number of employees (excluding freight trains employees)
    value/year of data

Remarks:

Employees: excluding freight trains employees. The year of data used should be provided. Data for employees should include data of all Railways Undertakings (RU) if there are many and of the Infrastructure Manager (IM) if any.

Km of network in use: the year of data used should be provided. For the calculation of kilometres of network used both double and multiple track lines should be counted once.

## 4. Labour productivity indicator (freight trains)

Labour productivity is defined as output per unit of labour and is calculated by dividing output produced by a measure of the labour input used to produce the output (number of employees or labour hours). The second labour productivity indicator divides the net tonnes-kilometres of freight trains by the total number of employees working in freight railways undertakings only.

Please indicate the values below:

Net tonne-km
    value/year of data
Number of employees
    value/year of data

Remarks:

Net Tonne-km: the tonne-km should be declared in million tkm, for instance 115,000,000,000 tonnes per kilometres should be calculated in the indicator as 115,000 million tkm. The year of data used should be provided.

Employees: The year of data used should be provided. Data for employees should include data of freight Railways Undertakings (RU) only.

## 5. Labour productivity indicator (passengers trains, high speed and conventional)

Labour productivity is defined as output per unit of labour and is calculated by dividing output produced by a measure of the labour input used to produce the output (number of employees or labour hours). The third labour productivity indicator divides the passengers -kilometres of passengers' trains by the total number of employees working in passengers railways undertakings only.

Please indicate the values below:

Passenger-km
    value/year of data
Number of employees
    value/year of data

*Rail productivity indicators – 2019*

Remarks:

Passenger-km: the passenger-km should be declared in million pkm, for instance 80,000,000,000 passengers per kilometre should be calculated in the indicator as 80,000 million pkm. The year of data used should be provided.

Employees: The year of data used should be provided. Data for employees should include data of passengers Railways Undertakings (RU) only for both conventional and high-speed rail.

## 6. Productivity indicator of freight transport

Freight rail productivity is defined as output per unit of network and is calculated by dividing output produced by a measure of network used to travel (kilometres). The fourth productivity indicator divides the net tonne kilometres transported by freight trains by the total number of the kilometres of network in use.

Please indicate the values below:

Net tonne-km
value/year of data
Km of network
value/year of data

Remarks:

Net tonne-km: the tonne-km should be declared in million tkm, for instance 115,000,000,000 tonnes per kilometres should be calculated in the indicator as 115,000 million tkm. The year of data used should be provided.

Km of network in use: The year of data used should be provided. For the calculation of kilometres of network used both the double and multiple track lines should be counted once.

## 7. Productivity of passenger transport (high-speed – conventional rail)

Passengers rail productivity is defined as output per unit of network and is calculated by dividing output produced (number of passengers' kilometres) by a measure of network used to travel (kilometres). The fifth productivity indicator divides the passenger kilometres moved by conventional and high-speed trains by the total number of the kilometres of network in use.

Please indicate the values below:

Passenger-km
value/year of data
Km of network
value/year of data

Remarks:

Passenger-km: the passenger-km should be declared in million pkm, for instance 80,000,000,000 passengers per kilometre should be calculated in the indicator as 80,000 million pkm. The year of data used should be provided.

Km of network in use: The year of data used should be provided. For the calculation of kilometres of network used both the double and multiple track lines should be counted once.

## 8. Productivity of locomotives (Freight transport)

Productivity of locomotives for freight transport is defined as output per locomotive and is calculated by dividing output produced (net tonne kilometres) by the number of locomotives used for freight transport. The sixth productivity indicator divides the net

tonne kilometres transported by freight trains by the total number of locomotives used in freight transport.

Please indicate the values below:

Net tonne-km
value/year of data
Number of locomotives
value/year of data

Remarks:

Net tonne-km: the tonne – km should be declared in million tkm, for instance 115,000,000,000 tonnes per kilometres should be calculated in the indicator as 115,000 million tkm. The year of data used should be provided.

Locomotives: number of locomotives used for the transportation of freight.

## 9. Productivity of locomotives (Passengers transport: high-speed – conventional rail)

Productivity of locomotives for passengers transport is defined as output per locomotive and is calculated by dividing output produced (passengers kilometres) by the number of locomotives used for passengers transport. The seventh productivity indicator divides the passengers' kilometres moved by conventional and high-speed trains by the total number of locomotives used in passengers transport.

Please indicate the values below:

Passengers-km
value/year of data
Number of locomotives
value/year of data

Remarks:

Passenger-km: the passenger-km should be declared in million pkm, for instance 80,000,000,000 passengers per kilometre should be calculated in the indicator as 80,000 million pkm. The year of data used should be provided.

Locomotives: number of locomotives used for the transportation of passengers.

## 10. Productivity of wagons (freight transport)

Productivity of wagons for freight transport is defined as output per wagons and is calculated by dividing output produced (net tonne kilometres) by the number of wagons used for freight transport. The eight-productivity indicator divides the net tonne kilometres transported by freight trains by the total number of wagons used in freight transport.

Please indicate the values below:

Net tonne-km
value/year of data
Number of wagons
value/year of data

Remarks:

Net tonne-km: the tonne-km should be declared in million tkm, for instance 115,000,000,000 tonnes per kilometres should be calculated in the indicator as 115,000 million tkm. The year of data used should be provided.

Wagons: number of wagons used for the transportation of freight.

*Rail productivity indicators – 2019*

## 11. Productivity of wagons (Passengers transport: high-speed – conventional rail)

Productivity of wagons for passengers transport is defined as output per wagons and is calculated by dividing output produced (passengers kilometres) by the number of wagons used for passengers transport. The ninth productivity indicator divides the passengers' kilometres moved by conventional and high-speed trains by the total number of wagons used in passengers transport.

Please indicate the values below:

Passenger-km
    value/year of data
Number of wagons
    value/year of data

Remarks:

Passenger-km: the passenger-km should be declared in million pkm, for instance 80,000,000,000 passengers per kilometre should be calculated in the indicator as 80,000 million pkm. The year of data used should be provided.

Wagons: number of wagons used for the transportation of passengers.

## 12. Productivity of lines (freight transport)

Productivity of lines for freight transport is defined as output per kilometres of network and is calculated by dividing output produced (number of freight trains kilometres) by the kilometres of network used. The tenth productivity indicator divides the total travelling kilometres of freight trains by the total kilometres of network used.

Please indicate the values below:

Freight train-km
    value/year of data
Km of network
    value/year of data

Remarks:

Freight train-km: the freight train-km should be declared in million ftkm, for instance 115,000,000 freight train kilometres should be calculated in the indicator as 115 million ftkm. The year of data used should be provided.

Km of network in use: The year of data used should be provided. For the calculation of kilometres of network used both the double and multiple track lines should be counted once.

## 13. Productivity of lines (Passengers transport: high-speed – conventional rail)

Productivity of lines for passengers transport is defined as output per kilometres of network and is calculated by dividing output produced (number of passengers' trains kilometres) by the kilometres of network used. The eleventh productivity indicator divides the total travelling kilometres of passengers trains (conventional and high speed) by the total kilometres of network used.

Please indicate the values below:

Passenger train-km
    value/year of data
Km of network
    value/year of data

*Rail productivity indicators – 2019*

Remarks:

Passenger train-km: the passenger train-km should be declared in million ptkm, for instance 600,000,000 passenger train kilometres should be calculated in the indicator as 600 million ptkm. The year of data used should be provided.

Km of network in use: The year of data used should be provided. For the calculation of kilometres of network used both the double and multiple track lines should be counted once.

## 14. Energy consumption (for traction power)

The energy consumption indicator is defined as output per 1,000 gross tonne-km is calculated by dividing output produced (megajoules) by 1,000 gross tonne-kilometres. The twelfth productivity indicator divides the energy consumed for traction in mega joules by 1,000 gross tonne-kilometres.

Please indicate the values below:

Megajoules
    value/year of data
1,000 gross tonne-km
    value/year of data

## 15. Efficient service delivery (freight transport)

The efficient service delivery indicator for freight transport is defined as output per net tonne kilometres and is calculated by dividing output produced (annual turnover of freight rail undertaking) by net tonne kilometres moved. The thirteenth productivity indicator divides the annual turnover of freight rail undertaking by net tonne kilometres moved.

Please indicate the values below:

Price (US$)
    value/year of data
Net tonne-km
    value/year of data

Remarks:

US$: Indicates the annual turnover of Railways Undertakings for freight in Million US$.

Net tonne-km: the tonne-km should be declared in million tkm, for instance 115,000,000,000 tonnes per kilometres should be calculated in the indicator as 115,000 million tkm. The year of data used should be provided.

## 16. Efficient service delivery (passengers transport: conventional and high speed)

The efficient service delivery indicator for passenger transport is defined as output per passenger kilometres and is calculated by dividing output produced (annual turnover of rail undertaking for passengers) by passengers kilometres transported. The fourteenth productivity indicator divides the annual turnover of rail undertaking for passengers by passengers kilometres transported.

Please indicate the values below:

Price (US$)
    value/year of data
Passenger-km
    value/year of data

*Rail productivity indicators – 2019*

Remarks:

US$: Indicates the annual turnover of Railways Undertakings for passengers in million US$.

Passenger-km: the passenger-km should be declared in million pkm, for instance 80,000,000,000 passengers per kilometre should be calculated in the indicator as 80,000 million pkm. The year of data used should be provided.

**17. Service quality (freight transport speed)**

The indicator calculates the average speed, kilometres per hour, of freight trains operated during one year.

Please indicate the values below:

Average freight train speed (km/h)/Year of the data
Open-Ended Response/Open-Ended Response

Remarks:

Average speed: The average speed of freight trains is being calculated by adding the speeds of all freight trains operated during one year and dividing by the total number of freight trains operated during the same year.

**18. Service quality (passengers transport speed)**

The indicator calculates the average speed, kilometres per hour, of passenger trains operated during one year.

Please indicate the values below:

Average passengers train speed (km/h)/Year of the data
Open-Ended Response/Open-Ended Response

Remarks:

Average speed: The average speed of passenger trains is being calculated by adding the speeds of all passenger trains operated during one year and dividing by the total number of passengers trains operated during the same year.

**19. Service quality (freight transport delays)**

Significant lateness captures the percentage of freight trains that have caused significant disruption to at least some clients of cargo (i.e. lateness at final destination greater than 15 minutes). The seventeenth indicator calculates the percentage of freight trains with arrivals less than 15 minutes late.

Please indicate the values below:

Average freight train arrivals less than 15 minutes late/Year of the data
Open-Ended Response/Open-Ended Response

**20. Service quality (passengers transport delays)**

Significant lateness captures the percentage of passenger trains that have caused significant disruption to at least some passengers (i.e. lateness at final destination greater than 15 minutes). The eighteenth indicator calculates the percentage of passenger trains with arrivals less than 15 minutes late.

Please indicate the values below:

Average passenger train arrivals less than 15 minutes late/Year of the data
Open-Ended Response/Open-Ended Response

## 21. Safety (freight transport)

Safety of freight transport is defined as output per freight train kilometres and is calculated by dividing output produced (freight train accidents) by the total freight train kilometres of the year. The nineteenth productivity indicator divides the Freight Train accidents occurred in freight trains by the total freight train kilometres.

Please indicate the values below:

Freight Train accidents
    value/year of data
Freight train-km
    value/year of data

Remarks:

Freight train-km: the freight train-km should be declared in million ftkm, for instance 115,000,000 freight train kilometres should be calculated in the indicator as 115 million ftkm. The year of data used should be provided.

Freight Train Accidents: as freight train accidents are considered the “significant accidents” which means any accident involving at least one rail vehicle in motion, resulting in at least one killed or seriously injured person, or in significant damage to stock, track, other installations or environment, or extensive disruptions to traffic. Accidents in workshops, warehouses and depots are excluded.

## 22. Safety (passengers transport)

Safety in passengers transport is defined as output per passenger train kilometres and is calculated by dividing output produced (passenger train accidents) by the total passenger train kilometres of the year. The twentieth productivity indicator divides the passenger train accidents occurred in passenger trains by the total passenger train kilometres.

Please indicate the values below:

Passengers train accidents
    value/year of data
Passengers train-km
    value/year of data

Remarks:

Passenger train-km: the passenger train-km should be declared in million ptkm, for instance 600,000,000 passenger train kilometres should be calculated in the indicator as 600 million ptkm. The year of data used should be provided.

Passenger Train Accidents: as passenger train accidents are considered the “significant accidents” which means any accident involving at least one rail vehicle in motion, resulting in at least one killed or seriously injured person, or in significant damage to stock, track, other installations or environment, or extensive disruptions to traffic. Accidents in workshops, warehouses and depots are excluded.

## 23. Accessibility and network density

Accessibility and network density is defined as output per country’s total area ($km^2$) and is calculated by dividing output produced (kilometres of network) by the total area of a country in $km^2$.

Please indicate the values below:

Km of network
    value/year of data
Total area of country (in $km^2$)
    value/year of data

*Rail productivity indicators – 2019*

Remarks:

Km of network in use: The year of data used should be provided. For the calculation of kilometres of network used both the double and multiple track lines should be counted once.

### 24. Accessibility and GDP

The indicator calculates the accessibility of freight rail transport in the economy – or the contribution to the economy – by dividing the net tonne kilometres by country's GDP in US$.

Please indicate the values below:

Net tonne km
value/year of data
US$ GDP (billion)
value/year of data

Remarks:

Net Tonne-km: the tonne-km should be declared in million tkm, for instance 115,000,000,000 tonnes per kilometres should be calculated in the indicator as 115,000 million tkm. The year of data used should be provided.

US$ GDP: The GDP of the country in US$. The GDP should be declared in the indicator in Billion US$

### 25. Accessibility of rail (freight)

The indicator calculates the degree of rail freight accessibility to the total freight transported by rail and trucks and is calculated by finding the percentage of rail net tonne kilometres to the total net tonne kilometres of the year transported by rail and trucks.

Please indicate the values below:

Rail net tonne-km (million tkm)
value/year of data
Truck net tonne-km (million tkm)
value/year of data

Remarks:

Net Tonne-km: the tonne-km should be declared in million tkm, for instance 115,000,000,000 tonnes per kilometres should be calculated in the indicator as 115,000 million tkm. The year of data used should be provided.

### 26. Environment quality (freight transport)

The environmental quality is defined as output per net tonne kilometres and is calculated by dividing output produced (kilojoules of energy) by the net tonne kilometres of the year. The twenty fifth productivity indicator divides the kilo joule of energy consumed by the freight trains by the total net tonne kilometres of the year.

Please indicate the values below:

Kilojoules of energy consumed by freight trains
value/year of data
Freight trains net tonne km (million tkm)
value/year of data

*Rail productivity indicators – 2019*

Remarks:

Net Tonne-km: the tonne-km should be declared in million tkm, for instance 115,000,000,000 tonnes per kilometres should be calculated in the indicator as 115,000 million tkm. The year of data used should be provided.

**27. Financial sustainability (% of costs covered from internal cash generation)**

The indicator calculates the profitability of railways by providing the percentage of costs (cost of operations of passengers and freight transport excluding any kind of investments) that was covered by the turnover of the company(ies) (Passengers and Freight operations excluding infrastructure managers).

Please indicate the values below:

Please indicate Real return on total gross assets (%)/Year of the data

Remarks:

Net Tonne-km: the tonne-km should be declared in million tkm, for instance 115,000,000,000 tonnes per kilometres should be calculated in the indicator as 115,000 million tkm. The year of data used should be provided.

**28. Management (ratio of turnover between passenger and freight)**

The indicator calculates the ratio of turnover between passengers' transportation and freight one.

Please indicate the values below

Please indicate the ratio of turnover in rail passenger traffic to turnover in rail

Freight traffic (%)/Year of the data
Good practice:
> 2.0 (Europe)

**29. Management (locomotives) – Locomotive availability (%)**

The indicator calculates locomotives availability by dividing the output (locomotives used in one year for both passengers and freight trains) by the total number of locomotives for both passengers and freight.

Please indicate the values below:

Please indicate the Locomotive availability (%)/Year of the data

Good practice:
90 (USA)

**30. Management (wagons) – Freight and passenger wagon availability (%)**

The indicator calculates wagons availability by dividing the output (wagons for freight and passengers used in one year) by the total number of wagons for both freight and passengers.

Please indicate the values below:

Wagons for freight and passengers used in one year
value/year of data
Total number of wagons for both freight and passengers
value/year of data
Good practice:
90 (USA)