Policy Decision-Making Tool for Sustainable Mobility 3.0

Country Groups

Looking at country mobility performances, we noted that there are wide disparities. To assess where each country stands, we created country groups using the best performer as an upper bound and the bottom performer as a lower bound, clustering countries into four groups. This allows us to be more realistic by setting benchmarks with existing levels of performance, and it responds to the complexity of agreeing on quantitative targets that are acceptable by the international transport community.

Clustering Countries. Countries were clustered into four groups based on their mobility performance. The groups are defined with equal intervals dividing performance into equal size ranges. Group A includes all countries with the best mobility performances, while group D clusters the bottom performers. Countries in each of the four groups may have different characteristics, but they are likely to face similar mobility challenges. These similarities are the main reason why they are grouped together.

For example, the best-performing country in the world on transport efficiency has an LPI of 4.2. This will be used to set the upper bound or realistic target for the efficiency goal, instead of 5. The LPI for the worst-performing country is 1.9. This will be used as the lower bound. After excluding the outliers, we clustered all countries in the world into 4 groups. To do so, we divided the range set by the upper and lower bound, 1.9-4.2, into four equal groups: all countries that have an LPI between 3.6 and 4.2 are categorized as A countries (this group of countries is the most advanced on the efficiency front); all countries with an LPI of 3.1-3.6 are categorized as group B; and those with an LPI between 2.5-3.1, and 1.9-2.5 are categorized as C and D, respectively.

For each indicator, the thresholds used to cluster countries are shown in Table 1.

Table 1: Country Group Thresholds by Policy Goal (sub-goal)

Policy Goal (sub-goal)	Principal indicator	Country Group Thresholds			
		D	C	B	A
Universal Access (rural)	Rural access index (percentage)	0 - 40	40 - 60	60 - 80	80 - 100
Universal Access (urban)	Rapid transit to resident ratio (km/million)	0 - 10	10 - 20	20 - 30	30 - max
Universal Access (gender)	Workers in transport who are female (percentage)	0 - 8	8 - 16	16 - 23	23 - 31
Efficiency	Logistic Performance Index (Value 0-5)	1.9 - 2.5	2.5 - 3.1	3.1 - 3.6	3.6 - 4.2
Safety	Mortality caused by road traffic injury (per 100,000)	27 - 36	18 -27	9 - 18	0 - 9
Green Mobility (GHG emissions)	Transport-related GHG emissions per capita	2.3 - max	1.5 - 2.3	0.8 - 1.5	0 - 0.8
Green Mobility (Air Pollution)	PM 2.5. air pollution annual exposure	46 - max	32 - 46	18 - 32	0 - 18

Note: For the calculation of the country group thresholds for Universal Access (rural), Universal Access (urban), Green Mobility (GHG Emissions), and Green Mobility (Air Pollution), we have excluded outliers.

These thresholds were determined using the following criteria:

- Universal Access (rural). For the indicator RAI, the range of the country group intervals is calculated between 20% and 100% (best performer). Any country below 20% in the RAI is considered at an unsustainable level and an outlier, hence mapped directly into Group D.

- Universal Access (urban). For the indicator *rapid transit to resident ratio (RTR)*, the range of the country group intervals is calculated between the minimum and 40 km of rapid transit per million residents. Any country above the 40 km threshold is considered at a sustainable level and an outlier, hence directly mapped into group A.

- Universal Access (gender). For the indicator *workers in transport who are female*, country groups are defined with equal intervals based on the observed range of the indicator.

- Efficiency. For the indicator *logistics performance index (LPI)*, country groups are defined with equal intervals based on the observed range of the indicator.

- Safety. For the indicator *Mortality caused by road traffic injury,* country groups are calculated between the minimum and 36 fatalities caused by road traffic injury per 100,000 people. Any country above the 36 deaths threshold is considered unsustainable, and an outlier, hence mapped directly to group D.

- Green Mobility (GHG Emissions). For the indicator *transport-related GHG emissions per capita*, the range of the country group intervals is between the minimum (best performer) and 3 tons of annual transport-related GHG emissions per capita. Any country above the 3-ton threshold is at an unsustainable level and an outlier, hence mapped directly into group D.

- Green Mobility (Air Pollution). For the indicator *PM 2.5. air pollution annual exposure*, the range of the country group intervals is between the minimum and 60 micrograms per c.u. meter. Any country above the 60 micrograms threshold is at an unsustainable level and an outlier, hence mapped directly into group D.

Data limitations. Data availability is a serious constraint to this effort. For example, on rural access, the SDG indicator for target 9.1.1 is the Rural Access Index (RAI). The World Bank is the custodian agency for this indicator and revised the methodology based on the same concept formulated in 2006 but using emerging advanced technologies and datasets in 2016. The original 2006 Rural Access Index leveraged a household survey methodology. While the World Bank's proposed new methodology is technically more reliable and operationally more relevant, it requires detailed road network data to calculate the index. Since the currently available data is estimated based on the household survey record data last collected in the early 2000s which is significantly outdated. The current module uses a more recent estimate based on an alternative geospatial methodology developed by Azavea, which is different from the Bank's recommended method as a principal indicator and has several caveats (see known limitations section on https://rai.azavea.com/) but is considered to reflect the more recent circumstances in the rural access and only for roads.

The rapid transit to resident ratio is the best proxy for public transport accessibility but is not available for most cities. We use the percentage of female employment in transport to measure gender due to the lack of data on women and girls as transport users. Safety is measured by the number of road traffic deaths, but it ignores other modes of transportation. Efficiency is measured by the logistics performance index (LPI)—a proxy for freight, but not for passengers. While not perfect, these indicators are the best available measures so far to proxy the policy goals and Sustainable Mobility. Investment in the development of new indicators and data collection and harmonization is urgently required.