Table 2.1. The Current Ambition policy scenario specification for urban passenger demand and mode choice

2020s	2030s	2040s
Economic instruments including carbon pricing, road pricing and parking pricing are gradually set up or enhanced worldwide.	Carbon pricing is implemented, and the carbon price reaches USD 35-100 per tonne of carbon dioxide (CO_2). When implemented, road pricing can increase non-energy-related car-use costs by up to 2.5%. Parking prices are expected to increase by up to 20%.	Carbon pricing is implemented, and the carbon price reaches USD 65-200 per tonne of CO_2. When implemented, road pricing can increase non-energy-related car-use costs by up to 5%. Meanwhile, parking prices are expected to increase further, by up to 40%.
Transport infrastructure enhancements, including the expansion of bicycle and pedestrian networks, the development and expansion of public transport systems, and express lanes for buses, are set up or enhanced worldwide.	Bicycle and pedestrian infrastructure networks increase by 6-100%, while public transport systems expand by up to 34%. Meanwhile, express or priority lanes comprise up to 14% of bus networks and public transport fares decrease by 0.5-2.5%, thanks to integrated ticketing.	Bicycle and pedestrian infrastructure networks increase by 13-200%, while public transport systems expand by up to 67%. Meanwhile, express or priority lanes comprise up to 27% of bus networks and public transport fares decrease by 1-5%, thanks to integrated ticketing.
Transport service improvements, including public transport service optimisation, shared mobility incentives, carpooling policies and support for Mobility as a Service (MaaS) systems, are set up or enhanced worldwide.	Public transport service levels change by between -4% and 10%. The number of shared vehicles per capita is boosted by 0-67%. The average private vehicle occupancy rate grows by 1.1-2.8%. Meanwhile, MaaS systems decrease fares for public transport and shared mobility by 0.3-3.4%.	Public transport service levels change by between -7% and 20%. The number of shared vehicles per capita is boosted by 0-134%. The average private vehicle occupancy rate grows by 2.3-5.6%. Meanwhile, MaaS systems decrease fares for public transport and shared mobility by 0.6-6.7%.
An extensive set of regulatory measures, including speed limitations, parking restrictions, and urban vehicle-restriction schemes, are gradually enforced more strongly.	Speed limits decrease by 0.6-10%. Between 1.6 and 17% of urban surface areas are subject to parking constraints. Car ownership decreases by 5.9%.	Speed limits decrease by 1.3-20%. Between 3.3 and 34% of urban surface areas are subject to parking constraints. Car ownership decreases by 11.7%.
Additional measures, including land-use policies and transit-oriented development, are gradually improved. Exogenous changes such as teleworking are maintained after the pandemic.	The average population density ranges between -3.4% and 6.7%. There is a 1.7% increase in the land-use mix. Exogenous changes such as teleworking are maintained after the pandemic. Between 0.8% and 6.7% of the active population teleworks regularly.	The average population density ranges between -6.7% and 13.4%. There is a 3.3% increase in the land-use mix. Exogenous changes such as teleworking are maintained after the pandemic. Between 1.6% and 13.4% of the active population teleworks regularly.

Table 2.2. The High Ambition policy scenario specification for urban passenger demand and mode choice

2020s	2030s	2040s
Economic instruments including carbon pricing, road pricing and parking pricing are gradually set up or enhanced worldwide.	Carbon pricing is implemented and the carbon price reaches USD 65-150 per tonne of carbon dioxide (CO_2). Road pricing increases non-energy-related car-use costs by 0.8-9%, while parking prices increase by 6-50%.	Carbon pricing is implemented and the carbon price reaches USD 130-200 per tonne of CO_2. Road pricing increases non-energy-related car-use costs by 1.8-18%, while parking prices increase by 13-100%.
Transport infrastructure enhancements, including the expansion of bicycle and pedestrian networks, the development and expansion of public transport systems, and express lanes, are set up or enhanced worldwide.	Bike and pedestrian infrastructure networks increase by 13-167%, while public transport systems expand by up to 67%. Meanwhile, between 3% and 20% of bus networks are prioritised and public transport fares decrease by 0.5-4.2%, thanks to integrated ticketing.	Bike and pedestrian infrastructure networks increase by 26-334%, while public transport systems expand by up to 134%. Meanwhile, 6-40% of the bus networks are prioritised and public transport fares decrease by 1-8.4%, thanks to integrated ticketing.
Transport service improvements, including public transport service optimisation, shared mobility incentives, carpooling policies and support for Mobility as a Service (MaaS) systems are set up or enhanced worldwide.	Public transport service levels increase by between 3% and 17%. The number of shared vehicles per capita is boosted by 1-100%. The average private vehicle occupancy rate grows by 2.5-5.6%. Meanwhile, MaaS systems decrease fares for public transport and shared mobility by 0.6-6.7%.	Public transport service levels increase by between 6% and 34%. The number of shared vehicles per capita is boosted by 3-200%. The average private vehicle occupancy rate grows by 5.1-11.2%. Meanwhile, MaaS systems decrease fares for public transport and shared mobility by 1.3-13.4%.
An extensive set of regulatory measures, including speed limitations, parking restrictions, and urban vehicle-restriction schemes, are gradually enforced more strongly.	Speed limits decrease by 1.6-16.7%. Between 2.3% and 25% of urban surface areas are subject to parking constraints. Car ownership decreases by between 1.1% and 8.4%.	Speed limits decrease by 3.3-33.4%. Between 4.6% and 50% of urban surface areas are subject to parking constraints. Car ownership decreases by between 2.3% and 16.7%.
Additional measures, including land-use policies, transit-oriented development and teleworking-promotion policies, are gradually improved.	The average population density increases by up to 13.4%. There is a 2.5% increase in the land-use mix. Between 1.1% and 10% of the active population teleworks regularly.	The average population density increases by up to 26.7%. There is a 5% increase in the land-use mix. Between 2.3% and 20% of the active population teleworks regularly.

Table 2.3. The Current Ambition policy scenario specification for non-urban passenger demand and mode choice

2020s	2030s	2040s
	Outside of urban areas in most high-income countries, there is **investment in rail** and electrification of rail networks, leading to frequency and speed improvements. Some high-income countries make plans to develop high-speed rail connections.	Outside of urban areas in most high-income countries and some middle-income countries, there is investment in rail and electrification of rail networks, leading to frequency and speed improvements. Some high-income countries make plans to develop high-speed rail connections.
No targeted action to encourage **coaches** or **shared modes** outside of urban areas.	No targeted action to encourage coaches or shared modes outside of urban areas.	No targeted action to encourage coaches or shared modes outside of urban areas.
Carbon-pricing policies are implemented via a carbon tax of USD 15-35 per tonne of carbon dioxide (CO_2) across all regions.	Carbon pricing policies are implemented via a carbon tax of USD 35-100 per tonne of CO_2 across all regions.	Carbon pricing policies are implemented via a carbon tax of USD 65-200 per tonne of CO_2 across all regions.
Air travel ticket taxes, applied as a percentage of the airfare, ranges from 0% to 2.5% across all regions.	Air travel ticket taxes, applied as a percentage of the airfare, ranges from 1% to 7.5% across all regions.	Air travel ticket taxes, applied as a percentage of the airfare, ranges from 2% to 15% across all regions.
		In high-income regions, **a ban on short-haul flights** (i.e. for distances less than 500 kilometres) is introduced to encourage the uptake of rail where good-quality connections exist.

Table 2.4. The High Ambition policy scenario specification for non-urban passenger demand and mode choice

2020s	2030s	2040s
Outside of urban areas in most high-income countries, there is greater **investment in rail** and electrification of rail networks, leading to frequency and speed improvements.	Greater investment in rail and electrification of rail networks becomes a priority in all world regions. Rail transport becomes a more competitive alternative, with increased frequency and speed. Ambitious plans to develop high-speed rail connections in some countries.	Outside of urban areas, continued investment in rail sees a growth in viable transport links that qualify for the short-haul flight ban. Rail electrification and improvements in frequency and speed persist, and new high-speed rail connections continue to be deployed.
Incentives are introduced to encourage the use of **collective modes** such as coaches and ridesharing for regional and intercity travel.	Incentives to encourage the use of collective modes such as coaches and ridesharing remain in place for regional and intercity travel.	Incentives to encourage the use of collective modes such as coaches and ridesharing remain in place for regional and intercity travel.
Carbon-pricing policies are implemented via a carbon tax of USD 35-50 per tonne of carbon dioxide (CO_2) across all regions.	Carbon-pricing policies are implemented via a carbon tax of USD 65-150 per tonne of CO_2 across all regions.	Carbon-pricing policies are implemented via a carbon tax of USD 130-200 per tonne of CO_2 across all regions.
Air travel ticket taxes, applied as a percentage of the airfare, ranges from 0% to 5% across all regions.	Air travel ticket taxes, applied as a percentage of the airfare, ranges from 3% to 15% across all regions.	Air travel ticket taxes, applied as a percentage of the airfare, ranges from 5% to 30% across all regions.
	In high-income regions, a **ban on short-haul flights** (i.e. for distances less than 500 kilometres) is introduced to encourage the uptake of rail where good-quality connections exist.	A ban on short-haul flights is introduced for journeys shorter than 500km where an alternative rail connection of adequate quality is available. This is to encourage the uptake of rail where good-quality connections exist.

Table 2.5. The Current Ambition policy scenario specification for freight demand and mode choice

2020s	2030s	2040s
Decarbonisation measures for urban freight are slowly introduced. The uptake of pick-up and drop-off locations for parcels, and asset sharing, increase linearly. Restricted access zones also start to become more widely implemented. Meanwhile, the use of electric cargo bikes for last-mile distribution of various commodities grows exponentially.	The uptake of cargo bikes keeps growing exponentially until 2035, when this growth slows but continues to progress linearly. Restricted access zones expand at a linear rate half of what was observed in the 2020s. The use of pick-up and drop-off locations for parcels, and asset sharing, continue to increase at the same rate.	All of the developments from the 2020s and 2030s have cemented their place in the urban logistics system. All measures continue to expand their share at the same rate.
Incentives for high-capacity vehicles (road tractors) encourage a transition in interurban freight. By 2025, there is a 10% increase in the average load utilisation (load factor) of road freight.	Road tractors begin to have a larger impact, increasing the truck loads and decreasing the cost per tonne-kilometre.	Load factors continue to increase, ending up 25% higher in 2050, compared to 2019.
Distance-based charges are encouraged for road transport and introduced in policy discussions.	Distance-based charges are introduced in 2030 and begin to grow continuously.	Distance-based charges rise further in the 2040s.
Slow and smart steaming are incentivised in the shipping sector to reduce emissions.	Vessel speed reductions lead to a 5% improvement in efficiency.	Vessel speed reductions lead to a 10% improvement in efficiency compared to the baseline (2019).
Digital transformation strategies leveraging near-real-time data are used to reduce intermodal dwell times in journeys with sections undertaken by rail or on waterways.	Improvements in travel times make intermodal solutions more attractive but do not improve to the same extent as under the High Ambition scenario.	Travel times for intermodal solutions continue to reduce at a slower rate than under the High Ambition scenario.
Transport network improvement plans for rail, waterways and port infrastructure begin to be phased in and funded.		
	Carbon pricing is introduced but with prices set at varying levels in different regions.	Carbon pricing continues to vary by region, and between sea-based transport modes and other modes. The price of carbon ranges between USD 150-250 per tonne of carbon dioxide (CO_2).
The **trade in and consumption of petroleum- and coal-based commodities begins to decrease**, directly impacting freight transport demand for fossil fuels and the freight activity associated with the trade of these commodities.	While the trade in other commodities continues to increase, the trade in oil and coal grows to a lesser extent.	While the trade in other commodities continues to increase, the trade in oil and coal grows to a lesser extent.

Table 2.6. The High Ambition policy scenario specification for freight demand and mode choice

2020s	2030s	2040s
Sustainable urban logistics measures are implemented more widely than under the Current Ambition scenario. Cargo bikes and asset-sharing double the growth observed in the Current Ambition scenario. The use of pick-up and drop-off locations for parcels is 60% higher than in the Current Ambition scenario. Restricted access zones are stricter, increasing by a factor of three the likelihood that electric vehicles are used to transport goods in cities.		
Incentives for high-capacity vehicles (road tractors) encourage a transition in interurban freight. By 2025, there is a 10% increase in the average load utilisation (load factor) of road freight.	Road tractors begin to have a larger impact, increasing the truck loads and decreasing the cost per tonne-kilometre.	Load factors continue to increase, ending up 25% higher in 2050, compared to 2019.
Distance-based charges are encouraged for road transport and introduced in policy discussions.	Distance-based charges are introduced in 2030 and begin to grow continuously.	Distance-based charges rise further in the 2040s.
Slow and smart steaming are incentivised in the shipping sector to reduce emissions.	Vessel speed reductions lead to an average 10% improvement in efficiency which reduces dwell times and environmental impacts.	Vessel speed reductions lead to a 25% improvement in efficiency compared to the baseline (2019).
By 2025, **digital transformation strategies** leveraging near-real time data cause truck-to-port and truck-to-rail dwell times to decrease by 20%. Meanwhile, rail-to-port dwell times decrease by 15% by 2025. Inland waterways dwell times decrease by 5%.	Reductions in dwell times across road, rail and inland waterways result in a reduction in travel times associated with intermodal trips, making intermodal solutions more attractive. The improvements continue to increase.	Travel times for intermodal solutions continue to reduce. Truck-to-port and truck-to-rail dwell times decrease by 45% by 2050. Rail-to-port dwell times decrease by 45% by 2050. Inland waterways dwell times decrease by 25%.
The acceleration and expansion of investments in **transport network improvement plans** is greater than under the Current Ambition scenario.		
	Carbon pricing is introduced but with prices set at varying levels in different regions.	Carbon pricing continues to vary by region but at higher values than under the Current Ambition scenario. The price of carbon ranges between USD 300-500 per tonne of carbon dioxide (CO_2).
The **trade in and consumption of petroleum- and coal-based commodities begins to decrease**, directly impacting freight transport demand for fossil fuels and the freight activity associated with the trade of these commodities.	While the trade in other commodities continues to increase, there is a yearly decrease in demand for coal and petroleum.	There is a 50% yearly decrease in demand for coal and petroleum.

Table 2.7. The Current Ambition policy scenario specification for the transition to cleaner vehicle fleets

2020s	2030s	2040s
The **turnover of vehicle fleets** continues in line with historical trends. New vehicle efficiency improvements continue, driven by existing fuel economy standards and in line with historical trends.	Mandatory and aspirational zero-emission vehicle (ZEV) sales targets are met. European Union member states and signatories to the COP26 Accelerating to Zero Coalition declaration reach 100% ZEV sales by 2035.	Mandatory and aspirational ZEV sales targets are met in countries and regions with stated targets.
	Signatories to the **Global Memorandum of Understanding (MOU) on Zero-Emission Medium- and Heavy-Duty Vehicles** reach the target of 30% ZEV sales for heavy-goods vehicles (HGVs) in 2030.	Signatories to the Global MOU on Zero-Emission Medium- and Heavy-Duty Vehicles reach the target of 100% ZEV sales for HGVs in 2040.
Biofuel blending targets for road fuels are met in countries with defined targets, including Finland, India, Indonesia and the United Kingdom.	Biofuel blending targets for road fuels are met in countries with defined targets, including Argentina, Finland, India, Indonesia and the United Kingdom.	
Sustainable aviation fuel (SAF) mandates are introduced in the EU and the United States according to the ambitions set out in the ReFuel EU and SAF Grand Challenge initiatives, respectively (see note).	Mandates for SAFs increase in Europe and the United States.	By 2050, SAFs make up 85% of aviation fuels in Europe and 100% in the United States.

Note: The carbon intensity of fuels is estimated according to Yoo, Lee and Wang (2022[7]) and Ueckert et al. (2021[8]).

Table 2.8. The High Ambition policy scenario specification for the transition to cleaner vehicle fleets

2020s	2030s	2040s
The **turnover of vehicle fleets** continues in line with historical trends and to meet travel demand. New vehicle efficiency improvements for road vehicles double from historical trends, driven by more stringent fuel economy standards. Meanwhile, aviation efficiency improvements increase to 3% per year.	By 2035, 100% of sales of new passenger vehicles and vans in East and Northeast Asia (ENEA), Europe, and in the United States, Canada, Australia and New Zealand (UCAN) are zero-emission vehicles (ZEVs). This is in line with the Global Fuel Economy Initiative (GFEI) ZERO Pathway. By 2030, 100% of new bus sales in high-income regions (ENEA, Europe and UCAN) are ZEVs. Meanwhile, by 2035, 100% of new two- and three-wheelers in all regions are ZEVs.	By mid-decade, 100% of sales of new passenger vehicles and vans in emerging markets are ZEVs, in line with the GFEI's ZERO Pathway. By 2040, 100% of new bus sales in the remaining markets are ZEVs. Also by 2040, 100% of sales of new heavy-duty vehicles in high-income regions are ZEVs. Meanwhile, emerging markets will reach this 100% target by the end of the decade.
	Signatories to the **Global Memorandum of Understanding (MOU) on Zero-Emission Medium- and Heavy-Duty Vehicles** reach the target of 30% ZEV sales for heavy-goods vehicles (HGVs) in 2030.	Signatories to the Global MOU on Zero-Emission Medium- and Heavy-Duty Vehicles reach the target of 100% ZEV sales for HGVs in 2040. Non-signatories reach the target of 30% of ZEV sales for HGVs in 2040 and 100% in 2050.
		By 2040, all **new trains** in high-income regions (UCAN, ENEA, and Europe) are zero-emission. The remaining markets reach this target by 2050.
Sustainable aviation fuel (SAF) mandates are introduced in the EU and the United States according to the ambitions set out in the ReFuel EU and SAF Grand Challenge initiatives, respectively (see note).	The roll-out of SAF mandates continues and alternatives to conventional fuels begin to come down in price. SAF mandates also expand to other regions. Aircraft with electric powertrains become available and begin to take share for short-haul flights with low passenger capacities.	Commercial applications of electric aircraft emerge in niche sectors. SAFs make up 85% of aviation fuels globally by 2050 (see note).
	Initial deployment of **zero-emission shipping fuels** occurs in green corridors.	By 2050, zero-emission fuels make up 100% of shipping fuels. Also by 2050, the electrification of short sea shipping routes occurs (see note).

Note: The carbon intensity and lifecycle emissions of biogenic and synthetic pathways are estimated according to Yoo, Lee and Wang (2022[7]) and Ueckert et al. (2021[8]). The electrification of short-sea shipping is in line with Kersey et al. (2022[9]).