# CORRIDOR CAPITALISATION PLAN FOR THE SOUTH MORAVIAN REGION

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# A. Introduction

KORDIS in cooperation with the South Moravian Region got involved in the implementing of the Corridor Capitalisation plan. We are interested in implementing modern rail network and thus making transport among neighbouring countries faster and more effective.

To capitalise the opportunities of the infrastructure investment for multi-modal environmentally friendly freight, the South Moravian Region teamed up with the Free State of Saxony, partners from Germany, the Czech Republic, Slovakia and Hungary. Realising activities aimed at better coordination among stakeholders in the field of transport and spatial planning, the partners will contribute to the creation of an environment for more efficient rail freight in Central Europe.

Corridor Capitalisation plan has been elaborated to achieve the objectives of the CORCAP project and to facilitate the interaction of regional development and transport infrastructure development. These plans, which will have a planning horizon corresponding to the perspective of realisation of the new railway line Dresden-Prague, will demonstrate how an intensively used corridor affects regional development and logistics, and which contributions made on regional level will strengthen the corridor and its functionality.

Corridor Capitalisation plan addresses local, regional and transnational challenges for efficient and environmentally friendly freight transport. It will contribute to the enhancing of corridor functionality through improved coordination between transport and spatial planning and to the strengthening of logistics locations.

As informal instrument it addresses existing planning levels and instruments in the field of transport and logistics, regional development and spatial planning on local, regional, national and transnational (partly macro-regional) level, thus contributing to multi-level governance.

The Plan is an innovative instrument with potential relevance for all TEN-T corridors. Currently, the existing practice of corridor development is mainly focused on infrastructure standards and technical surroundings of the infrastructure system, following the principles of sectoral planning. The approach followed by the project goes beyond this practice, as it aims at the elaboration of consolidated strategies oriented to the interaction of regional development and transport infrastructure development, considering as well operational requirements of multimodal logistics locations and transport services.

# B. SCENARIOS OF DEVELOPMENT OF FREIGHT TRANSPORT CROSSING AND TARGETING THE SOUTH MORAVIAN REGION UNTIL 2050

This part of the Corridor Capitalisation Plan presents various scenarios of possible transport development within the South Moravian Region and in the world in general. These are 4 scenarios that serve as a guideline for further transport measures that could be implemented in the South Moravian Region.

## 1.1. Key groups of factors, axes of determination

The future development of transport will be influenced by a number of sub-factors and facts, which will also strongly influence each other. In an attempt to simplify a complex and complicated situation, we consider the following groups of factors, or rather the axes of determination, to be crucial:

- the degree of regulation/deregulation of the transport system;
- the extent of technological innovation;
- a wide range of other issues with the potential to modify ongoing developments in a different direction.

The degree of regulation/deregulation of the transport system reflects the current tendencies to influence/modify the future development of transport in a desirable direction by public authorities of different levels, from the municipal level, through the regional and national level to the supranational/international level (e.g. EU initiatives) or even global level (global climate agreements, etc.). The regulation of transport systems can of course be motivated by different objectives, but among the most resonant in contemporary society is the regulation of transport supply or even demand in order to reduce their negative environmental and social impacts. Thus, in line with this general formulation, there are both efforts to decarbonise contemporary transport, efforts leading to increased equity and equality in access to transport and transport infrastructure (Schwanen, 2016; Sutton, 2015), as well as activities aimed at ensuring that transport no longer functions per se within society, but more as part of a broader stream of activities supporting other policies aimed in different directions (Lyons and Loo, 2008).

The scale of technological innovation will clearly influence the future development of transport, with both the continuation of existing trends discussed in the relevant chapters of this report (e.g. on-demand mobility services, autonomous vehicles, electro-mobility, maglev, suborbital flights, etc.) and - given the length of the outlook up to 2050 - the emergence of some new, as yet unknown technologies highly likely. IT solutions and technologies for remote control of vehicles and entire traffic flows (telematics, navigation, etc.) will also develop and be implemented even more in transport, which may contribute to reducing some of the current negative phenomena linked to transport (e.g. congestion). Intensive development can also be expected in the field of virtual mobility, where the primary issue is the acceptance of these solutions by their future (potential) users. Technological development thus introduces a high degree of uncertainty into the outlook for future transport developments, since speculating today on the technologies commonly used in 30 years' time is difficult, if not impossible (cf. also the previous discussion on visions published several decades ago).

Other issues with the potential to modify the ongoing transport development in a different or alternative direction represent a broad and internally very differentiated group, which includes both the factors and aspects discussed earlier in this chapter (demographic dynamics and changes in the population

structure, energy and environmental aspects, economic aspects, financial aspects) and other facts not yet mentioned. The impact of these factors can range from local to global and can modify transport development more or less significantly.

On the basis of the combined effect of the listed groups of factors, or the determination axes, we identify the following scenarios of future transport development in the following text:

● The business-as-usual scenario represents a continuation of the existing trends in the development of the transport market, which is neither significantly modified by regulatory interventions nor does it show the effects of the advent of major technological innovations in the future period;

● the futuristic transport system development scenario is primarily based on the assumption of successful introduction of major technological innovations that will fundamentally transform the existing transport system, even without the need for strict and complex regulatory interventions from the public sphere;

● the scenario of transport market regulation assumes a massive impact on the transport system in the coming decades due to the introduction of regulations of various nature, in which, given the territorial anchorage of this study, a great influence is attributed mainly to regulations planned in the European Union area (implementation of the current Strategy for Sustainable and Intelligent Mobility - Directing European Transport into the Future as well as other sub-strategic and conceptual documents), The Czech Republic (especially the recently approved Transport Policy of the Czech Republic for the period 2021-2027 with a view to 2050) and also the City of Brno (especially the comprehensive Mobility Plan of the City of Brno). In this scenario, a number of major transport innovations are expected to be implemented, which are often a necessary condition for the successful implementation of the planned regulations;

● the scenario of realistic development of the transport system represents the intersection of the key tendencies presented in all previous scenarios; in other words, the scenario takes into account the supporting trends, the projection of which would imply the fact that even through relatively minor partial changes, significant modifications of the transport market organisation can be achieved.

In addition to the above scenarios, some other issues with the potential to modify ongoing transport developments in a different direction will be briefly described below. In our opinion, these do not have the potential to affect the overall transport system, so they do not constitute a separate scenario in the context of this study, which would correspond in its complexity to the four defined above, but they are nevertheless facts that should not be omitted in the interests of a fair outlook for future transport development.

## 1.2. Business-as-usual scenario

The basic characteristic of this scenario is based on the assumption that current trends in the transport market will continue. These will not be significantly modified either by regulatory interventions or by the advent of major technological innovations. The broader social and economic context in which passenger and freight transport operates will also not undergo major changes, so that the drivers of transport performance growth operating today (e.g. residential and commercial suburbanisation, the spatial structure of the economy influenced by globalisation processes, etc.) will continue to operate in the future. The business-as-usual scenario is thus essentially a kind of reference framework for where the development of the transport system would go and what it would lead to if no major social, economic, political or technological changes were to occur in the next period.

In the business-as-usual scenario, we therefore expect that uninterrupted growth in mobility will continue in the coming decades of the first half of the 21st century, and hence that demand for passenger and freight transport will continue to rise. This demand will continue to be met by the modes of transport that are already strongly represented in the transport market today, with the fastest growth

in passenger transport by road and air, and in freight transport by truck and sea. The key role of these transport modes will of course be complemented, as today, by other modes with relative comparative advantages within specific transport segments, but their share of modal split/share of transport work will not increase significantly. Thus, mobility needs in the passenger transport segment will be partly met by the performance of various forms of public transport (public transport and also bus and rail transport) and also by non-motorised modes (bicycle, walking), and a similar situation will prevail in the freight transport segment (partial role of rail, inland waterway, air and pipeline transport). The role of new modes of freight transport (drones, autonomous vehicles, etc.) will be marginal and development will be slow, as it will face technological, regulatory and social barriers. There will thus be no major restructuring of the transport market - over time, of course, we foresee a deepening of the trends already underway, but these will not lead to major modifications of the transport and mobility system as a whole. In line with the thesis presented, we foresee partial changes in the following areas, for example: a slight shift away from car ownership towards car sharing (a greater spread of carsharing and carpooling, especially in urban areas), the development of autonomous vehicle technology, a partial transformation of vehicle propulsion technologies (a greater spread of electric and hybrid vehicles, especially in the segment of shorter, repeated commuting journeys), a greater spread of telematics and traffic flow management and coordination systems, a continuation of the process of the second intermodal revolution, and so on. The demand for the availability of a flexible and private form of mobility embodied by the current form of car transport, which is quite significant for the current transport market, will not be replaced by any other transport solution in the coming decades. The current approach, based largely on a liberal and deregulated attitude towards the transport sector, coupled with efforts to add the necessary additional infrastructure and capacity, will thus continue to be the primary solution applied by the public sector to transport. Partial regulation of the transport sector will of course continue to take place, the tradition of transport policies will not be broken, but the impact of these documents on actual changes in transport behaviour will remain limited.

As a result, the scenario envisages a deepening of the problematic consequences already attributed to transport today. In addition to the worsening problems associated with intensive traffic on the roads (congestion, parking, noise, accidents, etc.), the negative environmental and social impacts of traffic must also be highlighted. Traffic will thus continue to exacerbate existing social and gender inequalities in terms of limited access to employment, shopping, social and other opportunities for differently disadvantaged people.

If the development of the transport market in the period up to 2050 follows a business-as-usual scenario, we assume the following for the South Moravian Region and Brno:

● Overloading of the local road infrastructure with intensive passenger and freight traffic. This will put pressure on the construction of additional hierarchically superior roads, both in the Brno metropolitan region (completion of the large urban ring road and also the construction of additional tangents and outer ring roads to avoid increasingly congested roads in the centrally located parts of the metropolis) and in the remaining area of the South Moravian Region (completion of the motorway network in the direction of all existing major traffic routes).

● Only slow progress in the construction of the infrastructure necessary for the development of transport alternatives in passenger and freight transport (e.g. high-speed rail for longer distance transport needs or the North-South rail diameter as the backbone system of urban and suburban transport in the metropolitan region. At the same time, the construction of HSR would allow the existing infrastructure to be freed up for rail freight).

● The Brno metropolitan region will continue to be increasingly burdened by deliveries from delivery companies, and competition from couriers on bicycles, scooters and electric scooters will remain low after the initial boom, mainly due to the lack of extensive and safe infrastructure for this type of service

(cycle paths, dedicated road lanes). Robodelivery will prove to be a capital-intensive and relatively low-use technology, applicable only in the centres of large cities.

● The technology for the development of alternative drives for cars and trucks will move forward only very slowly and will not allow significant regulation of the entry of conventional cars and vans into the central areas of Brno and other larger cities in the South Moravian Region.

● The position of Brno and its metropolitan region, both within the settlement system of the Czech Republic and the wider settlement system of (Central) Europe, will not change significantly. Of course, Brno will remain a strong interregional centre, but its importance will not increase within the globalised economy.

● In the interim period, the importance of Brno-Tuřany Airport will increase slightly in line with the continuing process of spatial decentralisation of air transport supply. In addition to a larger number of low-cost airlines, the airport will be integrated into the network of several traditional network airlines through connecting routes. The accessibility of Brno by this mode of transport will thus be slightly improved - the role of air transport will still be significant due to the unfinished construction of the high-speed railway lines.

● The migration of people to suburban villages adjacent to the core city of Brno will continue, resulting in its spatial growth associated with the decreasing population density of the metropolitan region. Commuting will increase the pressure on the existing and slowly being completed infrastructure, both individual car and public transport. A partial counter-pressure will be the gradually developing homeoffice and digitalisation of services. Suburbanisation coupled with some home office development will increase the need for local NA-N1 vehicle freight, especially in the context of the gradual growth of e-commerce and home-delivery.

● The negative impacts of transport (congestion, noise, environmental and wider social consequences) will be intensively felt both in Brno and in the territory of the South Moravian Region. The consequence will be a deterioration in the quality of life, especially in locations immediately adjacent to major traffic routes and in congestion-prone areas.

## 1.3. Futuristic transport system development scenario

The basic features of this scenario are primarily based on the assumption of the successful introduction of major technological innovations that will fundamentally transform existing transport, even without the need for heavy regulatory intervention from the public sphere. This scenario reflects the technological trends discussed in detail in the relevant passages of this study. While the more pessimistic business-as-usual scenario is based on an evolutionary approach to transport development, this scenario, on the other hand, represents an optimistic forecast that corresponds more to a revolutionary development.

In this scenario, we assume that relatively fundamental changes in mobility behaviour will be determined not only by technology, but also by broader societal changes and the demographic and generational changes currently underway. For Generations Y (millennials) and Z (children of the new millennium), whose members have already been born, raised and grown up in natural harmony with virtual and globalised environments, In fact, compared to their parents' older generations, a modification of value systems will be characteristic, which will also significantly affect transport and mobility behaviour (less pressure to own mobility devices, more emphasis on environmental values, the habit of using information and communication technologies routinely and fully, even as a substitute for physical mobility). Moreover, the relationship to virtual technologies will naturally be reinforced by the current pandemic experience among other social classes and demographic cohorts, so that in the coming decades we can expect a decline in the need for face-to-face contact to deal with everyday life issues, including work

and school responsibilities, and probably also a certain decline in routine, regular physical mobility driven by these needs (decline in the importance of the traditional form of commuting).

The construction of high-speed rail is clearly one of the key transport-technological innovations that will be fully implemented in the Czech Republic and Central Europe by 2050. This will connect Brno via direct routes with Prague, Ostrava and Vienna and via these cities with other (Central) European high-speed lines leading to other destinations (Katowice, Warsaw, Dresden, Berlin, Munich, Frankfurt, etc.). In an optimistic scenario, we expect at least some of these lines to be in operation sometime in the 2030s. Due to the relatively small size of the South Moravian Region, it can be assumed that the high-speed railway will only fully serve the city of Brno and possibly also the terminal in Břeclav, due to its location at the crossroads of lines heading from here to both Vienna and Bratislava. In particular, the regional city of Brno will thus be fully integrated into the Central European and pan-European high-speed train network. In the discussed time horizon up to 2050, it is also possible to consider the possibility that new railway infrastructure constructions could, in addition to conventional high-speed rail, also use magnetic levitation technology (maglev) or lines in vacuum tubes (hyperloop).

In addition to the high-speed rail transport system, the South Moravian Region will also see the further development of related public urban and regional transport systems, which will enable the distribution of the positive effects of the improved transport location of Brno to other areas of the metropolitan region and the entire South Moravian Region. However, in addition to conventional public transport, based, among other things, on the completed regional spine formed by the North-South rail diameter, other modes of transport will also be used in this system. Carsharing and carpooling will have a significant presence on the transport market. The development of these transport concepts will be stimulated both by restrictions on the private form of individual motoring (e.g. complete coverage of Brno and other towns in the South Moravian Region with parking zones) and by the change in the value system of the emerging generation, which will consider the use of shared means of transport as a standard way of saturating mobility needs. However, the concept of sharing will not be limited to cars, but will also use other technologically rapidly developing transport alternatives related mainly to electromobility and micromobility - i.e. means of transport such as electric bicycles, electric scooters or electric pedestrians.

The future shape of transport will also be significantly influenced by technological developments in the form of automation. Autonomous vehicles, both in the form of private cars and public transport, will be widely used in the transport market over the next decades. This change will lead to the development of a new type of transport service - mobility-as-a-service passenger transport. This way of providing transport to the public will be strongly supported by the public sector, which sees the potential to complement and transform conventional public transport. The expansion of these so-called smart solutions will, among other things, make the public transport capacity on offer more responsive to fluctuating demand, both within the day and the week, as well as other types of time periods. Automated means of transport and new online or virtual tools will enable the inhabitants of Brno and the South Moravian Region to have fast and convenient door-to-door transport to work and school, as well as for other everyday needs. Providing mobility needs in the above described shared way, or through mobility-as-a-service services, will lead to a reduction in the intensity of individual car transport.

The entire transport system will also be efficiently and effectively coordinated and managed by advanced IT solutions, which will enable the management of both individual vehicles and entire traffic flows through the application of telematics and navigation tools. As a result, congestion will gradually become an unknown phenomenon in the transport system. Automation will also be fully implemented in rail traffic management, with the introduction of ECTS and more advanced automatic train control systems. These changes will have a positive impact on line capacity and also on rail safety.

By 2050, most transport vehicles will be powered by fuels other than those based on fossil energy sources. Major advances in the development of electro-mobility, fuel cells and some other forms of propulsion will lead to the overall decarbonisation of transport.

The shape of the transport market in the coming decades of the 21st century will also be strongly influenced by the spread and mass acceptance of forms of virtual mobility. Developments in technology will allow for more frequent use of home-office and home-schooling, leading to a reduction in the number of routine, repetitive journeys such as commuting to work or school.

In addition to the above, there will also be the development of new modes of individual mobility within the region through air/flying-taxi or individual or shared air transport adapted to urban or regional conditions through eVTOLs, etc. However, this mode of personal transport will continue to be aimed only at the smaller and more affluent section of society for whom it will be affordable. In the context of the newly introduced technological possibilities and new means of transport within the air transport mode, it can be mentioned that the use of suborbital flights for long-distance passenger transport over very long distances can also be expected to develop. In 2050, however, this mode of transport will still be limited to higher-order cities capable of generating sufficient demand; in Central Europe, this is likely to be limited to Berlin, Munich and Frankfurt, and perhaps, with a higher degree of optimism, to Vienna.

The current form of B2C (business-to-customer) freight transport will completely disappear from the city. The position of parcel services, couriers and other delivery services will largely be replaced by autonomous delivery methods. Drones, delivery robots and autonomous (private) cars, or autonomous mobile and fixed delivery boxes will have their irreplaceable place. A significant part of the delivery will be moved from roads to pavements and into the air. This transformation will require a noticeable modification of existing ground infrastructure - dedicated lanes for different types of transport (robots, small delivery vehicles with lower operating speeds, etc.). This will leave only B2B (business-to-business) freight transport and transport to local micro-hubs within the city. The more freight traffic within the wider city centre declines, the more pressure will be placed on peripherally located logistics centres to serve as a source of delivery not only within the city but also to much of the rest of the county. This trend may be countered by a general trend towards reduced consumption, the increasing popularity of local products and a growing awareness of the need for sustainable behaviour. However, with the development of green sources of electricity, modern modes of transport will be environmentally friendly and thus their use will not be burdened by either environmental concerns or potential regulation. In this scenario, we therefore expect to see an increase in the importance of backbone traction and a reduction in road congestion within urban freight transport.

In this scenario it is necessary to consider two different options for the development of Brno as a regional centre:

● The first is the optimistic option, which assumes the gradual development of Brno as a major Central European metropolis, which will be an attractive urban area with a growing population, a higher representation of progressive tertiary and a growing economy. The clear improvement of Brno's transport accessibility on a pan-European scale, coupled with its better connection to the European metropolitan core (the Blue Banana area) via high-speed rail, will represent a significant impetus to its rise within global settlement hierarchies, for example in the ranking of so-called world cities. However, Brno's rise may take place at the expense of the surrounding or peripheral rural areas of the South Moravian Region, which will gradually be transformed from traditional Moravian countryside into recreational natural areas. All of this will contribute to placing significant demands on the development of urban transport itself, especially in the central parts of the metropolitan area, including the construction and operation of the North-South rail diameter, which will gradually be extended to other directions or arms. Conversely, regional transport from the more remote parts of the region will tend to be in decline on

weekdays, while there will be a significant increase in demand for transport at weekends specifically for recreational opportunities. Thus, there will be increasing temporal volatility in regional traffic with respect to weekday and non-weekday travel. Conversely, on weekdays, home-office, home-schooling and other virtual services will somewhat reduce peak-hour traffic and distribute transport demand more evenly throughout the day, allowing for more efficient frequency and capacity planning on public transport. In terms of freight transport, population growth and the development of new modes of transport will create increasing pressure to upgrade transport infrastructure to serve not only growing traffic volumes but also changing transport modes, with this pressure being greatest in an era of natural infrastructure sharing by autonomous and traditional vehicles. The transitive period will require dedicated lanes and the greatest possible separation of these modes. Personal mobility will further complicate the situation. With the development of freight transport via drones, there will also be a need to build local heliports for drones, which naturally claim space near existing and newly established logistics parks.

● In the latter case, technological development will also take place, but Brno's relative position within the (Central) European settlement system will not be positively affected. The overall improvement of high-speed transport options will allow easier travel to major metropolises, not only within the Czech Republic (i.e. to Prague), but also abroad (i.e. to Vienna or towards German metropolises), which, together with the increasing use of home-office, home-schooling or online retail and the development of virtual mobility, will lead to a stagnation of Brno's regional importance. This will not keep up with the growth rate of the surrounding more attractive metropolises, such as Prague or Vienna. As a result, the frequency of long-distance travel for the purpose of irregular commuting to more attractive metropolises with more attractive job offers will increase significantly, and the population, educational and economic potential of Brno will actually be siphoned off in favour of the surrounding stronger centres (pump-priming effect). The result will be both stagnation of the service sector and (high-status) job opportunities in Brno. There will not be as much pressure on the suburbanisation processes caused by the attractiveness of the metropolitan centre as in the previous cases, as the inhabitants will, thanks to the above-mentioned development of automated services in regional transport, rather demand housing in other parts of the region, including the peripheral ones, which will allow them very good accessibility to recreational natural locations and, in combination with virtualisation, the possibility to perform their work in these sometimes more remote locations. For freight transport, the pessimistic scenario of futuristic development means more or less the same development as in the case of the optimistic scenario, only with a lower intensity, which will be due to lower population growth in the area of Brno and consequently the South Moravian Region. The actual mode of transport of goods and infrastructure needs will not be avoided in this scenario either.

## 1.4. Transport market regulation scenario

This scenario corresponds with the above-mentioned documents summarising the principles of the currently valid European, Czech and local transport policy (Strategy for Sustainable and Intelligent Mobility - Directing European Transport into the Future, Transport Policy of the Czech Republic for the period 2021-2027 with a view to 2050 and Mobility Plan of the City of Brno) and also corresponds with the selected principles of the futuristic scenario. The basic starting point of the above-mentioned European, Czech and local strategy is a shift from gradual evolutionary development and implementation of environmental innovations in transport to a fundamental and at the same time publicly regulated transformation of the entire transport system. In order to achieve such a fundamental transformation of the transport and mobility sphere and also to implement it in a controlled manner, milestones have been set in all these documents, which correspond to selected innovations in transport. Based on these milestones, the transport market regulation scenario will formulate the possible positions of the South

Moravian Region and its metropolitan centre Brno in the process of regulated transformation of the transport system.

The first transformational change will be the achievement of 30 million emission-free vehicles in operation on the roads in the European Union. To this end, it should be noted that the term emission-free is to be understood as a vehicle that does not emit greenhouse gases (mainly CO2) or other pollutants that reduce the overall level of health of the population, such as nitrogen oxides, dust particles, heavy metals, benzo(a)pyrene and possibly other potential pollutants, during its operation (not during its production or disposal). Only electric or hydrogen powered vehicles are likely to meet these requirements in the automotive transport sector. In this scenario, a real revolution in the composition of the car transport fleet can therefore be expected in the coming decades. The scale of this projected change can be illustrated by the hitherto de facto negligible transformation that has taken place over the past decade, namely between 2012 and 2019. In this period, the number of electric cars in the EU rose from 100 000 to just under 600 000, and by the end of this period there were only 411 hydrogen vehicles registered in the EU. These figures are very low considering that in 2018, a total of 269.2 million passenger cars were registered in the EU-28. Thus, the lack of interest in electric cars, often despite public subsidy policies, can be a barrier to meeting environmental policy objectives in transport.

This planned revolutionary transformation of the vehicle fleet is also linked to another milestone that already has significant implications for transport policies at regional and metropolitan level - the EU's goal of achieving climate neutrality in cities, to which the transformation of the transport sector is expected to make a significant contribution. This objective will result in a rather intense pressure to reduce car traffic in urban and metropolitan environments in the coming period. This will be manifested by the gradual introduction of parking zones and, in their wake, low-emission zones (by 2030) and even zero-emission zones (by 2050). These changes will be implemented in the area of the South Moravian Region first in its metropolitan centre, i.e. in the core city of Brno, but over time they will also be introduced in other parts of the Brno metropolitan region and in other urban centres of the South Moravian Region. In 2050, it will thus be possible to use de facto only emission-free cars, i.e. electric and hydrogen-powered cars, in the territory of the South Moravian Region. Among other things, the availability of electricity for recharging batteries will be a limit for the spread of electric vehicles. This is not just about the actual amount of energy that will need to be produced, but also about the ability of the grid to cope with the significant temporal variation in car charging - typically after the morning and especially afternoon rush hours.

Closely related to the goal of achieving climate neutrality in cities will be the massive development of shared transport systems based on the use of emission-free cars (mass application of carsharing schemes) as well as other alternative vehicles (electric scooters, electric bikes, electric scooters, etc.). These forms of mobility provision will replace conventional cars, or a mobility system based on private ownership of the means of transport, even more than in the futuristic scenario of transport system development.

The path to climate neutrality will of course also involve the further development of public transport systems, which will necessarily be based on different forms of electrified rail transport suitable for serving spatial links/routes over different distances. In fact, electrified rail transport can form the basis of a public transport system both at the scale of cities and metropolises (urban railways in the form of metro or trams), suburban and regional transport (conventional railways), and for longer-distance journeys on a national or international scale (high-speed railways). The rail transport system will be very efficiently connected with other related transport systems throughout the territory of the South Moravian Region, so that the mobility needs of the Region's inhabitants will be sufficiently met by a combination of conventional public transport and the shared transport schemes discussed above. This system will result in a fully-fledged alternative to the private form of mobility linked to the (emission-free) private car in almost the entire territory of the region - the need to purchase and operate it will

be strongly minimised. Car ownership will actually become a complication as a result of the fundamental transformation of public services in the provision of public transport, and this phenomenon, so typical of the contemporary world, will largely disappear.

At the same time, the public transport system will be designed to be inclusive, which means that it will offer mobility services that are accessible to all socially, economically, gender, health or otherwise defined groups. This will ensure respect for the principle of equity in transport and will also ensure equal access for all residents of the South Moravian Region to work, school, service, recreation and all other necessities of life.

The provision of public transport services will also be thoroughly planned and coordinated, both in relation to the existing mobility needs of the population and in relation to other modes of transport used (forms of shared transport, private forms of mobility based on the ownership of emission-free vehicles, walking, cycling, etc.). Public authorities at all levels (municipalities, cities, regions) and public transport coordinators will therefore be involved in the regular preparation and continuous updating of sustainable mobility plans. These will not only be produced by public bodies, but also by the private sector, especially large companies, as well as by many other institutions and organisations that have the potential to generate mobility either for their employees and students or for their clients (e.g. shopping centres, university campuses, industrial zones, etc.). The advantage of the South Moravian Region in this area is its long-term experience in planning and coordination of public transport, which are activities provided in the territory of the Region through the company KORDIS JMK.

Mobility planning will also be closely linked to the strategic and spatial planning process. Within this framework, approaches will be applied which can contribute to the fact that the actual creation of mobility needs will be significantly reduced or in some cases almost eliminated as a result of the application of appropriate urban design concepts. An appropriate and well-designed distribution of residential and other functions in the area will enable the population to meet a significant part of their needs in the immediate vicinity of their homes, so that there will be no need to travel longer distances. The sites will also landscaped to maximally stimulate and facilitate active mobility options - walking and cycling. These modes of transport also have great potential to contribute to reducing car traffic.

An extreme approach to mobility planning, which could be applied if other measures do not sufficiently lead to the achievement of zero emissions and a reduction in car traffic, is to regulate transport demand, e.g. in the form of an allocated maximum personal kilometre limit that each person can use during a given period. However, we assume that this way of regulating transport and mobility behaviour is a solution that would be very difficult to implement and could potentially face public opposition.

In the context of long-distance transport taking place nationally or internationally, high-speed rail will be the most common mode of transport in 2050. This will be related both to the fact that the construction of the necessary infrastructure will be completed at that time (in the South Moravian Region, it is mainly the lines currently referred to as RS1 Prague - Brno - Ostrava and RS2 Brno - Vienna/Bratislava), but also to other related measures. It can be assumed that the annual fee for the use of the motorway network for passenger cars will be significantly increased, and it is very likely that these cars will gradually become subject not only to the annual fee but also to the toll system (with certain concessions only for the above defined emission-free vehicles). This will reinforce the spill-over effect of demand for high-speed passenger transport from cars in particular. However, this objective may be limited by the low willingness of passengers to give up travelling by car, for a variety of reasons, including e.g. the time lost by changing trains, the longer distance to the train terminal, the reluctance to give up a familiar mobility routine, etc.

High-speed rail will also take over a significant proportion of air passengers, especially those flying shorter distances to destinations within Europe. In the context of the South Moravian Region, therefore, a reduction in the importance of Brno-Tuřany Airport can be expected. Intercontinental transport will be provided only from major European airports well integrated into the high-speed rail network, and

flights over shorter distances will tend to be cancelled over time. Passenger air transport will thus remain in Brno only in the form of seasonal summer flights to more distant holiday destinations.

Even under the scenario of transport market regulation, we expect continued digitisation and automation of the transport system. However, this process will not only be used for the purposes described in detail in the futuristic development scenario (autonomous vehicles, efficient management of traffic flows and flows, smart mobility, mobility-as-a-service, application of telematics and navigation, drones and autonomous delivery methods in freight transport, etc.), but also to a greater extent to monitor compliance with established regulatory measures. Thus, the regulations on parking, low-emission and emission-free zones in cities will de facto be impossible to violate, as automatic control systems will be introduced, as well as automatic settlement of penalties and fines. This will be another important aspect that will change the overall set-up of the transport system in the region and in its metropolitan centre in Brno.

Within the freight transport segment, in addition to all the general tendencies discussed above, we also expect intensive development of intermodal or combined transport in this scenario. The latter is based on the coordination and interconnection of individual modes of freight transport in such a way that a functional and efficient chain is created in which the individual modes of transport are integrated in the most efficient way in the most efficient way. Thanks to the concentration and subsequent deconcentration of transport flows, the involvement of capacity-intensive modes of transport can be assumed in the decisive and often longest transport segments; in the case of land transport, it is possible to speak in this context primarily of the use of rail freight transport. In the South Moravian region, several intermodal/combined transport terminals will be operating in 2050, which will ensure the aforementioned concentration or deconcentration of transport flows. The terminals will be hierarchically arranged; we expect that a terminal of (Central) European importance could operate near Brno. Greater use of rail will be made possible, among other things, by shifting a large part of passenger traffic to HSR and freeing up the relevant capacity of conventional rail for freight transport.

The scenario of transport market regulation will also have significant impacts on the Brno metropolitan region itself and on the entire territory of the South Moravian Region. A number of specific territorial projections have already been discussed directly in the text, so at this point it is only necessary to add the resulting effect of this scenario on the position of Brno and the South Moravian Region in the wider (Central) European context. These effects can be seen in a very similar way to the previous scenario of futuristic development of the transport system, because here too the primary carrier technology ensuring accessibility of Brno and the region within this area will be high-speed rail. For this reason, it is also possible to formulate here:

● as an optimistic variant, which assumes the gradual development of Brno as a major Central European metropolis with a growing population, a higher representation of the progressive tertiary sector and a growing economy and, as a result, as an entity rising also within global settlement hierarchies;

● as well as a variant in which Brno's relative position within the (Central) European settlement system will not be positively affected, as the easy accessibility of more important metropolises may lead to Brno's growing dependence on their labour markets (pump effect).

Compared to the previous scenario, however, we assume a much higher probability of an optimistic scenario under the transport market regulation scenario. We base this expectation in particular on the belief that the fundamental changes introduced in this scenario, affecting in essence not only the conditions on the transport market itself, but also involving in fact a broader transformation of the urban or social framework in which mobility and transport take place, will significantly improve the quality of life and environment both in Brno and in the South Moravian Region. As a result, the residential and economic attractiveness of the area will increase, and the reasons for leaving Brno or the South Moravian Region, for example because of the unavailability of jobs here, will be clearly weakened. The optimism in this option is based on the assumption that all the EU's transport and environmental targets

for 2050 will be met. When the evolution of key parameters diverges from these targets, one can imagine the many negative impacts that regulation will have. The main one, and by far the most serious, would be a reduction in the mobility of people and goods, with serious impacts on economic performance and ultimately the well-being of the population. In this scenario, however, we work on the assumption that developments will be in line with the visions presented in the EU and Czech transport policies.

Due to increasing regulation, the burden on the freight backbone networks in the South Moravian Region will be reduced and there will be no need for major construction innovations. Within the city of Brno and the centres of the major cities of the South Moravian Region, the construction of infrastructure for new types of transport will become more important - bases for drones, charging stations for electric vehicles (or battery exchange stations), dedicated traffic lanes for autonomous and robotic vehicles and cycle paths for emission-free courier transport.

## 1.5. Realistic scenario for the development of the transport system

The scenario of realistic development of the transport system is based on the premise that none of the previous scenarios can be fully realised in a real situation, because all the conditions necessary for real development to go in the direction assumed by the scenario will never be achieved. In other words, there are always risks or factors that will divert the development of the transport sector, or the development of mobility behaviour, in a different direction.

The risks of the business-as-usual scenario are therefore mainly the significant environmental and social consequences of continuing current transport trends. At some stage, these will inevitably exceed the acceptable limit and therefore trigger at least partial adjustments in the public sector's approach to transport. This is likely to result in a strengthening of the regulatory elements that are rather absent in the scenario as it stands.

The risk of the futuristic transport system development scenario is overconfidence in both the rapid pace of technological change and innovation and the positive impact of such change on the functioning of the transport market. However, innovations may develop more slowly than expected, and even their implementation in routine operations may be more complicated and slower than it appears today, for example due to unknown and unpredictable obstacles. User acceptance of new technologies may also be affected by their current mobility and transport habits and possibly their lack of trust in them. Thus, the transformation of the transport market in the dictates of the futuristic transport system development scenario may be far from being realised by 2050.

The risk of the transport market regulation scenario is that the scope of the regulations themselves may be too great and that the consequences of the planned actions may not be fully understood - even intentions motivated by sound, socially accepted and reasonable objectives may lead to other, unintended consequences. The willingness of the population to accept all the plans can also be problematic, as this often requires a rather radical change in transport or mobility behaviour. The transition from the private form of (car-)mobility, which is currently dominant and to which people have been accustomed for decades and to which they have adapted their daily mobility routines, to shared mobility or mobility based on the use of public transport requires a truly fundamental change in thinking and behaviour.

The implication of the existence of the risks outlined is therefore that the actual, real evolution of the transport system in the coming periods will indeed follow the trajectories outlined in all the scenarios defined above, but not completely, but only to a certain extent. Thus, the resulting transport market arrangement in 2050 will actually be an intersection of the supporting tendencies presented in the previous scenarios, but none of them will materialise to the full extent described in their frameworks. The realistic transport system scenario thus assumes that the current transport market arrangement will

certainly change gradually over the coming decades, with the extent or speed of change being influenced in particular by the following tendencies:

● A certain degree of inertia in the existing passenger and freight transport market arrangements, including persistent patterns of transport and mobility behaviour of residents, passenger transport users, businesses, hauliers, customers and other freight transport users. This factor will be a preservative and inhibitor of a more fundamental transformation of the transport system.

● Within the inertia of transport and mobility behaviours, a particularly strong element will be the routine habit of using one's own personal car in everyday mode, i.e. a car available to its owner in an instantaneous way at basically any time and anywhere. This habit is likely to be the biggest obstacle to a significant increase in shared mobility schemes and also to a more massive shift to public transport. Moreover, the car remains, along with one's own home, one of the key material goods that people aspire to own, and through which they acquire or consolidate their adult status.

● Preferences for modes of transport and forms of mobility behaviour will change in the coming periods in relation to demographic and generational change, but the transition to a mode of transport sharing or the common use of virtual technologies instead of physical transport will be slower than the futuristic scenario of transport system development assumes. Indeed, even the emerging generations (Generations Y, Z and others) will be confronted with the increased mobility demands and requirements associated with this phase of life as they move into adulthood and may reassess the progressiveness of some of their original mobility plans and intentions as a result of this new experience.

Slower development, implementation and social acceptance of major innovations may slow down the development of transport automation and the introduction of telematics and navigation technologies in transport. In the case of automated autonomous transport, it is also necessary to mention the related need for new legislation related to the rights and responsibilities of users and operators of this system. Slower technological development may also undermine the growth of virtual mobility. There is also the question of the speed of development of alternative vehicle propulsion technologies and the solution of all the associated technical problems (e.g. sufficient electricity production in the energy sector, the existence of a sufficient network of petrol stations, etc.). As a consequence, some downstream services, such as smart mobility or mobility-as-a-service, will also develop more slowly.

● Also, the construction of high-speed rail infrastructure, which is an important part of the considerations presented in the previous scenarios, may face both financial and spatial planning problems and the lines may not be opened to the extent necessary for its seamless operation on a national and international, i.e. pan-European, scale by 2050. This may lead to high-speed rail not being able to realise its full potential as an alternative to long-distance car and air transport.

● In the coming decades, the different modes of transport will certainly become more interconnected on the transport market in coherent and coordinated integrated transport systems (passenger transport) or intermodal/combined transport and logistics chains (freight transport), but the pace and intensity of this interconnection may lag behind current expectations.

● The delay in technological progress (development and introduction of electromobility and other emission-free alternative fuels) may result in missing some important milestones planned in the transport market regulation scenario and thus postponing them to a later date. Thus, transport market regulation may take place at a lower intensity and its impacts on the transport regime may be less pronounced and less obvious.

● Some regulatory interventions by the public sphere may be more difficult to accept by residents and other actors in the transport market. In particular, any plans to introduce transport demand regulation could be seen as a disproportionate interference with the rights and freedoms of contemporary society.

Therefore, in accordance with the above theses, in the scenario of a realistic development of the transport system, we expect that transport in Brno and the South Moravian Region in 2050 will certainly

be less dependent on car transport than it is today, new technologies will certainly be integrated within it and new ways of regulation will also be applied. However, due to the complexity of the transport system and its dependence on a large number of underlying factors, it is difficult today to predict more precise and detailed contours of its internal organisation.

Since the scenario of realistic development of the transport system is an intersection of the tendencies described in the three previous scenarios, we deliberately refrain from analysing its specific impacts on the territory of the city of Brno and its metropolitan region and also on the area of the South Moravian Region. These are also specified in more detail in the relevant passages of the previous scenarios and here we would only repeat with different accents what is already stated and commented in the text.

## 1.6. Other issues with the potential to modify ongoing transport developments in a different direction

The aim of this passage is to briefly introduce some other issues/realities that, in our opinion, have the potential to influence the development of the transport system in other, alternative ways. However, the following overview is by no means complete, but should rather be seen as an illustration of the directions in which one can proceed in thinking on the subject:

● The high price/shortage of oil as a basic resource for fossil fuel production - this factor may intensify the pressure to decarbonise transport, and could possibly lead to serious problems for the current economic, political and social system, which is based on large volumes and high intensity of transport and mobility, even over global distances. An extreme consequence of these developments could be the collapse/collapse of existing societies and the reinforcement of tendencies towards autarkic development of settlement and regional systems.

● Low price/surplus of oil as a basic resource for fossil fuel production (as a consequence of extraction of unconventional oil, e.g. in the form of shale oil) - this factor could provide a strong incentive to continue transport development along the business-as-usual scenario.

● Long-term restrictions on mobility, including international mobility, introduced as a result of the current pandemic situation could intensify the pressure to move towards virtual forms of communication. These could relatively quickly become the de facto only form of mobility for these types of journeys and could result in a decrease in the need for the construction of high-speed rail infrastructure as well as a significant decrease in demand for air transport.

● Long-term and severe global economic recession triggered by the current pandemic situation - this factor could lead to a significant decrease in the amount of available public financial resources needed to both build and maintain transport infrastructure, to support public transport systems and to support the investments needed to develop the decarbonisation of the transport system.

● Significant political and economic changes at different scales. This may include changes at the macro scale concerning the replacement of the position of economic hegemon, which will not maintain a relatively positive economic relationship with the European Union, leading to a gradual economic stagnation, leading also to certain geopolitical difficulties. Similarly, however, there may also be the emergence or renewal of conflicts on a micro-scale, which may take place in the relative proximity of the South Moravian Region (possible reawakening of the Balkan conflicts, etc.).

● Unexpected technological breakthroughs, e.g. the discovery of teleportation technology, which, thanks to the possibility of instant mobility over any distance, could completely revolutionise current transport and mobility practices.

● The limit to the electrification and automation of the fleet in individual or public passenger and freight transport is the availability of all the necessary minerals (lithium, silicon, etc.). The possible

unavailability of only one of the entire portfolio of required resources will not only slow down the development of electrification or automation, but also cause the possible total collapse of development plans along these lines. This unavailability may be due to the exhaustion of those resources that are affordable or technologically available, or it may be conditioned by geopolitical reasons, e.g. the domination of one key resource by one geopolitical player that makes access to that resource impossible.

● The development of advanced navigation systems is, of course, dependent on the operation of increasingly advanced satellite systems, which must not only be developed but also brought to the necessary atmospheric layers and gradually renewed in parts. This poses a certain risk, in particular in that the possible use of military technology or even mere dependence on satellite launches to a non-European power could pose a potential problem for the future in securing these systems. A similar risk could, of course, be posed by an unprecedented astronomical event, such as a collision with a dense meteor shower, which would render some of these systems inoperable, etc.

# C. SPECIFIC MEASURES EXPECTED IN THE SOUTH MORAVIAN REGION

Following the scenarios mentioned above, this part of the Corridor Capitalisation Plan lists the various planned and expected measures within the South Moravian Region borders both on train and car transport modes that should be implemented by 2030 and 2050.

## 1.1. Railway transport

### 1.1.1. High-speed rail in the Czech Republic

The Czech railway faces such problems on a daily basis in relation to capacity, distance and speed. The line section Česká Třebová - Prague no longer allows adding more connections due to lack of capacity. The section Brno - Česká Třebová is difficult to pass due to complicated geomorphology and the line through Vysočina has a problem with long distance. The planned construction of the high-speed line will speed up connections not only between Brno, Prague and Dresden, but also with the capitals of neighbouring countries.

At present, the construction of high-speed lines is in the study or planning phase. Two routes have been considered - along the D1 motorway or via Pardubice. The shorter option along the D1 motorway was chosen.

The high-speed line will allow the inhabitants of the Czech Republic and tourists to enjoy fast connections between cities and countries. The HSR will also produce a minimum level of emissions. Travel time will be reduced several times. For example, the journey from Brno to Prague currently takes 2 hours and 35 minutes, after the construction of the HSR the journey will take 55 minutes.

The first section of the HSR to be prepared in the Czech Republic is the Polabí HSR, which will operate between the Prague-Běchovice station and Poříčany. The key milestones of the HSR according to the information portal of the Railway Administration (2021a) are described below. These are as follows:

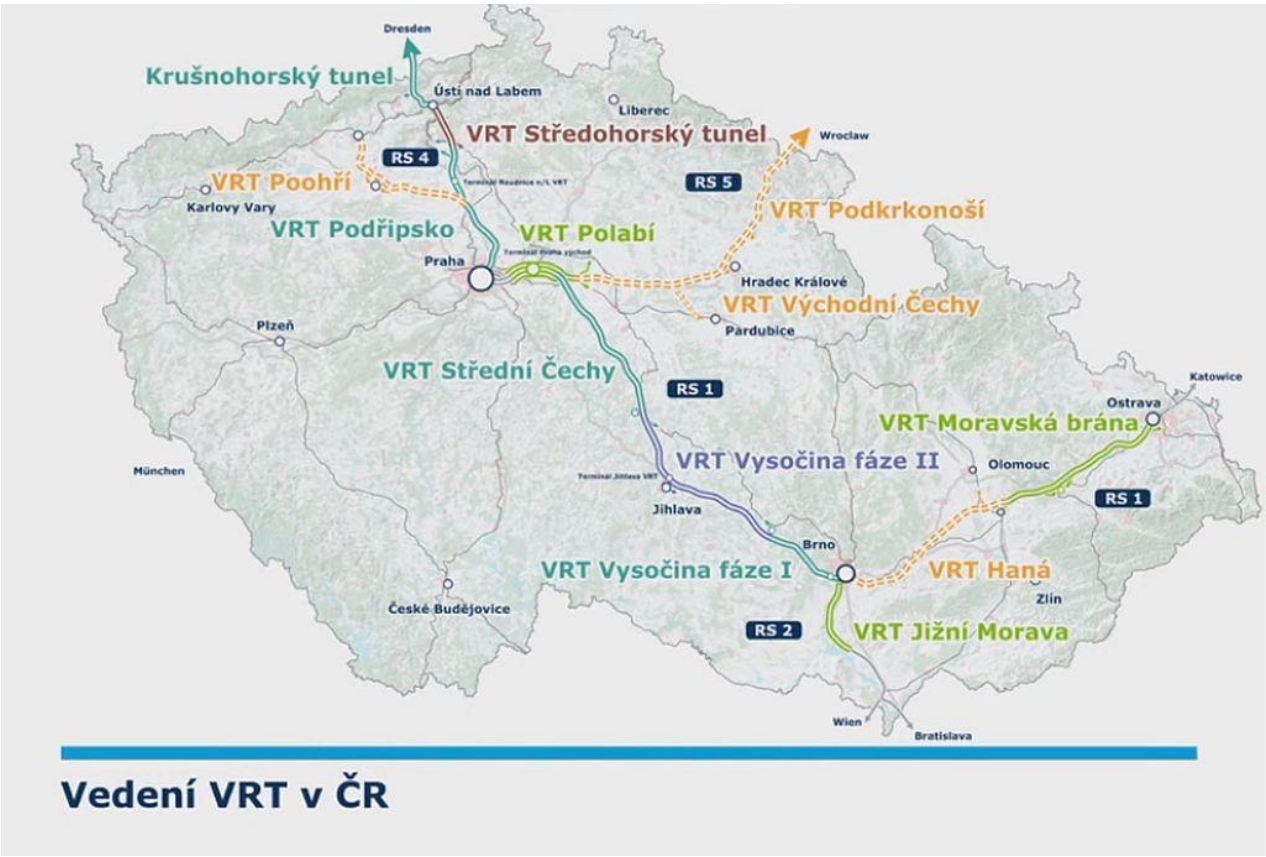
Completion of the EIA (Environmental Impact Assessment) process for the first section of the HSR (2022);

- Start of planning procedures for the first sections of the HSR (2022);
- Securing land for the construction of the HSR (2022/2023);

- Preparation of documentation for construction permits (2023);
- Start of construction procedures for the first HSR sections (2023/2024);
- Start of construction of the first HSR section (2025);
- Start of operation of the first HSR section (2028).

The figure shows the planned HSR network in the Czech Republic. The Railway Administration foresees that the HSR Jižní Morava, HSR Moravská Brána and HSR Polabí will be put into operation in 2029. By 2031, HSR Vysočina Phase I, HSR Střední Čechy and HSR Podřipsko are planned to be put into operation. Implementation of HSR Vysočina II. Phase is expected in 2034, and the Poohří HSR will be put into operation next year. Two more HSRs will be built in 2040. HSR East Bohemia and HSR Podkrkonoší. HSR Haná will be commissioned after 2045.

**HSR in the Czech Republic**



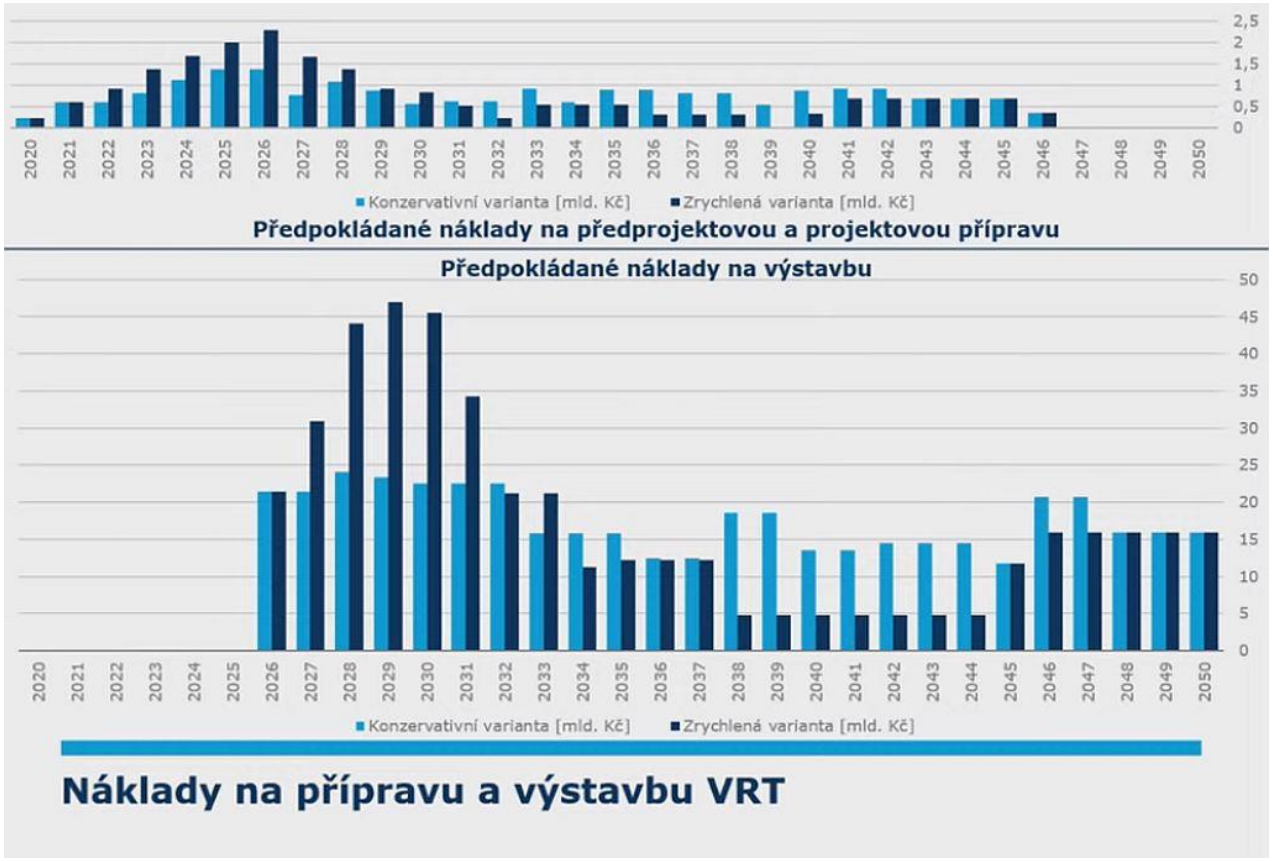

Source: Railway Administration (2021)

The presentation of the costs for the preparation and construction of HSR is divided into two cost variants. Assumed costs for pre-project and project preparation and assumed costs for construction. Each option is further divided into a conservative option and an accelerated option. In the costs for pre-project and project preparation, the highest costs are in the years 2025-2027, further the costs decrease from CZK 2 billion to CZK 0.5 billion.

In the conservative option, the costs are almost the same at around - CZK 0.5 - 1 billion. As far as construction costs are concerned, in the accelerated variant the highest costs are in 2028-2030, then they

decrease from CZK 45 billion to CZK 15 billion. In the conservative option, the costs are almost the same, at around CZK 20 billion.

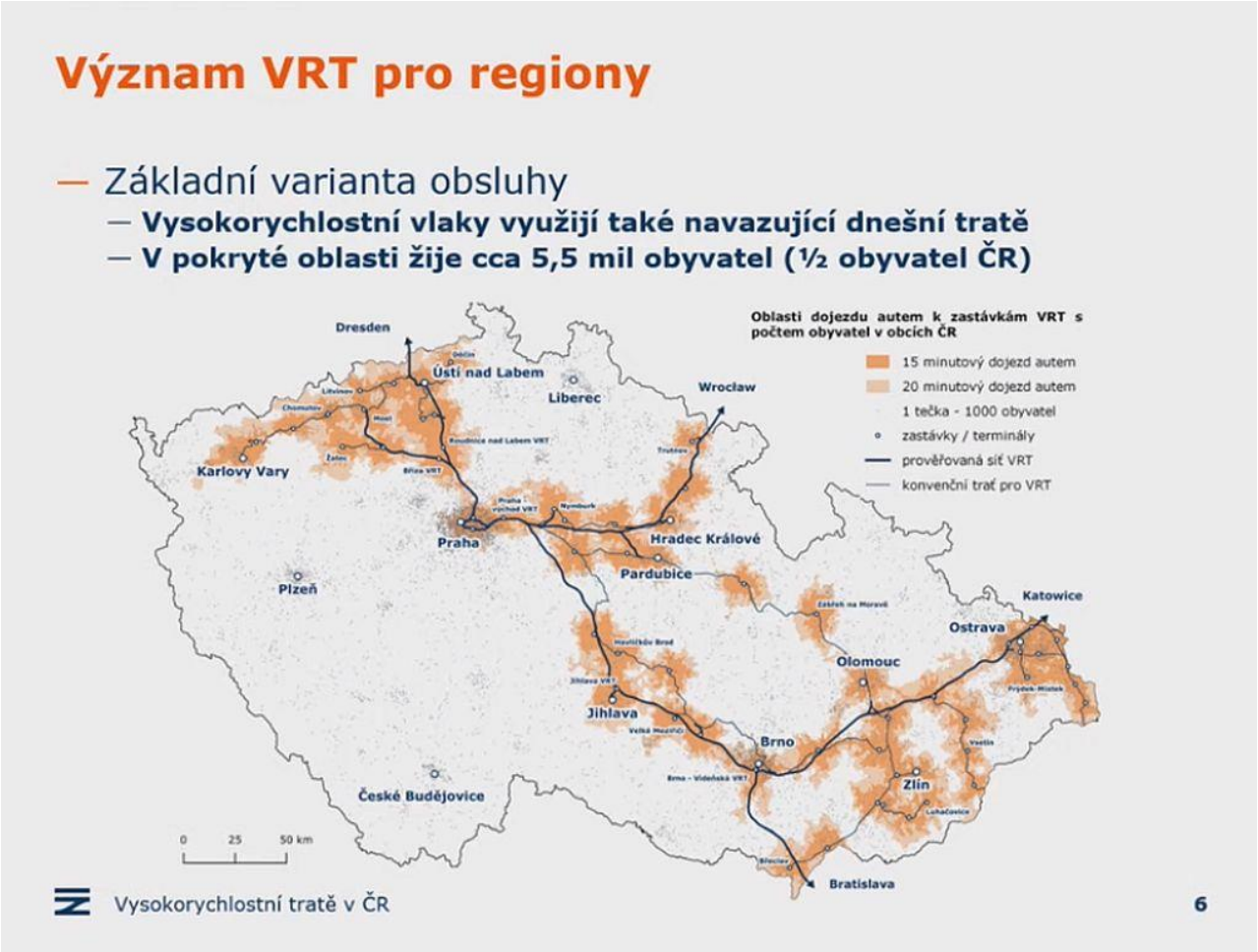
**Costs for the preparation and construction of HSR**




Source: Railway Administration (2021a)

The figure shows graphically the benefits for the regions. Areas in orange indicate locations where it takes 15-20 minutes by car to reach a HSR stop. The total area of the orange shaded area is 5.5 million people, half the state's population.

**Importance of HSR for the regions**




Source: Railway Administration (2021a)

## 1.1.2. High-speed lines on the territory of the South Moravian Region

The South Moravia high-speed line on the territory of the South Moravian Region is one of the first HSR sections under preparation.

The length of the Jižní Morava section of the HSR is 34 km. HSR South Moravia will speed up the train connection between Břeclav and Brno. According to the Railway Administration, HSR Jižní Morava will be mainly for long-distance connections, while the original line will remain in operation for local and regional trains. It is expected to be put into operation in 2029.

Another HSR in the South Moravian Region is the HSR Vysočina and HSR Haná. HSR Vysočina will run between Prague and Brno and will cross the entire territory of the Vysočina Region. On the territory of the South Moravian Region, the section Velká Bíteš - Brno is 33 km long. According to the Railway Administration, the expected year of operation is 2031.

According to the Railway Administration, the Haná HSR is at the feasibility study stage. The aim of the studies is to examine the provision of possible additional capacity in the long term. The exact length of the line is unknown and the year of commissioning is 2045. This line will significantly improve the connection between Brno and Ostrava and reduce the total travel time to 30 minutes.

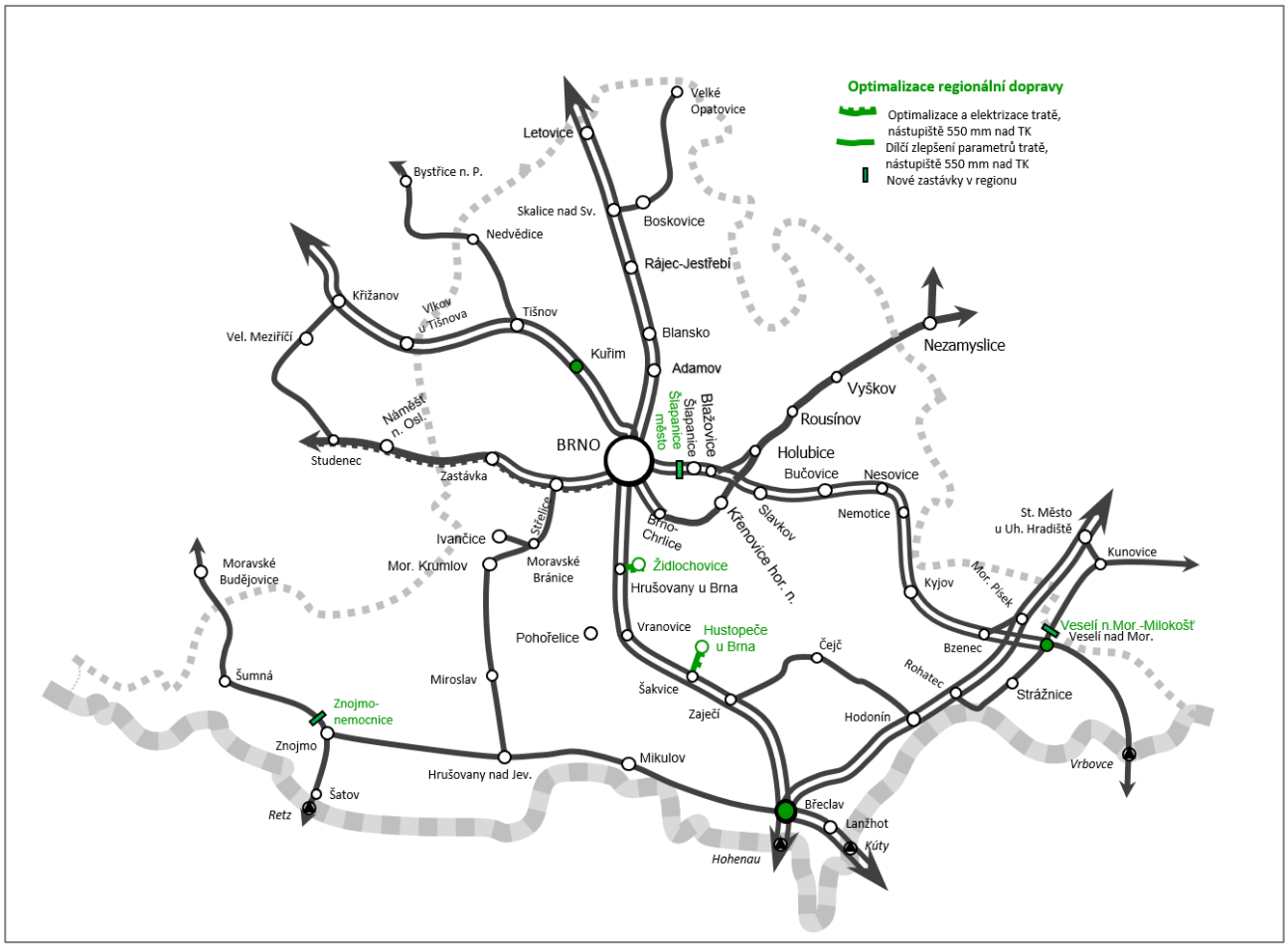
## 1.1.3. Regional rail transport

Regional rail transport is of great importance for the South Moravian Region. Within the framework of the integrated transport system, the South Moravian Region supports the development of passenger rail transport, modernisation and electrification of lines. In some directions, passenger rail transport is faster than passenger car connections, which is reflected in high passenger demand. However, many lines in the South Moravian Region are outdated, very difficult to pass and affected by frequent closures. The South Moravian Region is striving to modernise them. In some cases, it has been successful in this endeavour.

## 1.1.4. Regional rail transport - projects implemented in the last 5 years

The following figure shows the projects that have been implemented in the field of regional rail transport in the last 5 years. These are the construction of new stops Znojmo nemocnice, Šlapanice-město, Veselí nad Moravou - Milokošť and Brno dolní nádraží. The Břeclav, Veselí nad Moravou and Kuřim stations were substantially modernised. The modernisation and electrification of the Hrušovany u Brna - Židlochovice line and the modernisation and electrification of the Šakvice - Hustopeče u Brna line had a major impact on the operation of regional trains. The reconstruction of the railway junction in Břeclav, where higher safety and reliability of operation is currently ensured, had a major impact on rail freight transport.

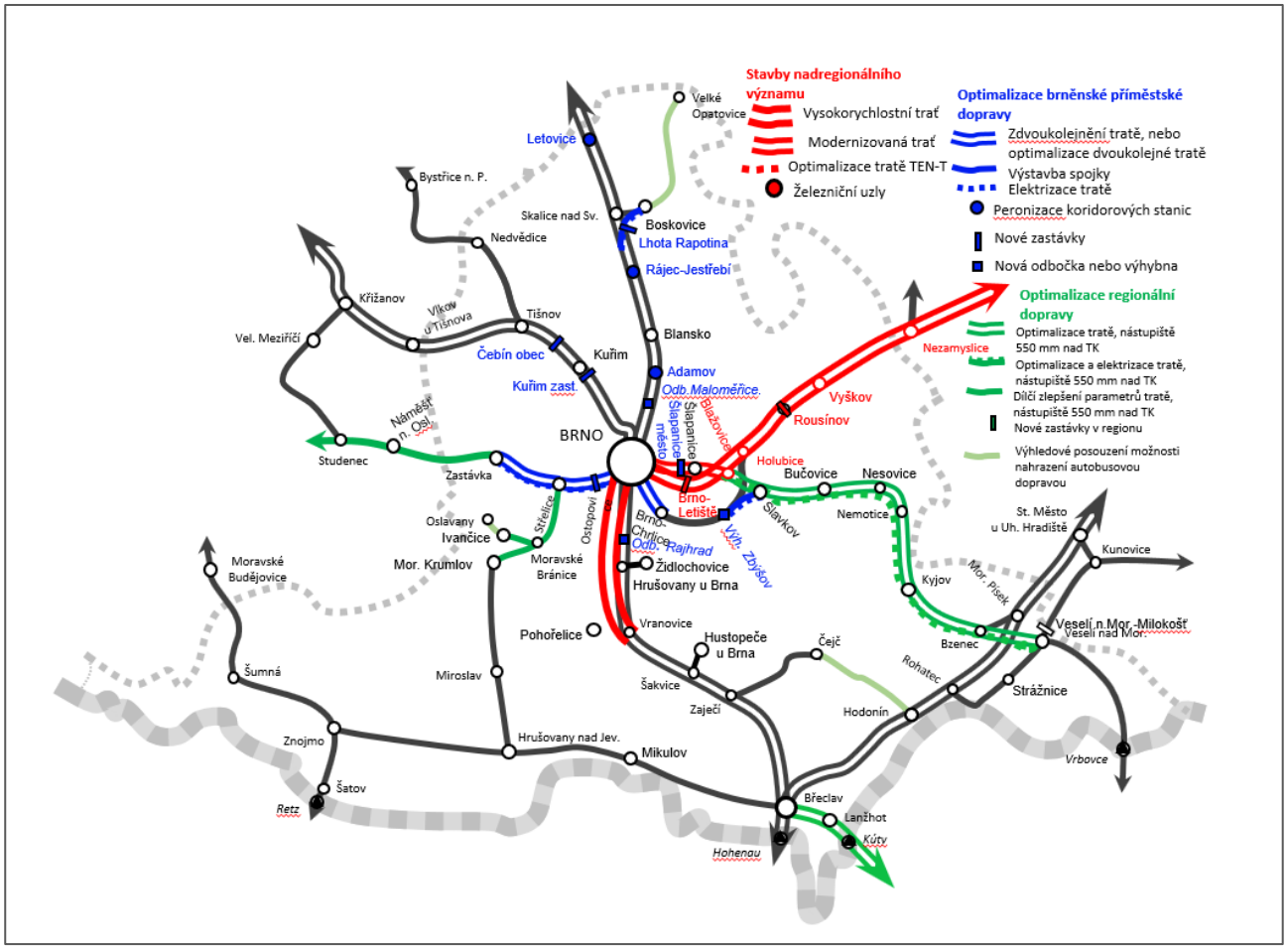
**Projects implemented in the last 5 years**



## 1.1.5. Development measure 2030

The figure shows the measure of railway development in the South Moravian Region in 2030. The figure shows that in 2030, according to the Railway Administration, the construction of the HSR South Moravia and the modernisation of the line Brno - Přerov (to 200 km/h) is expected to be completed. The modernisation of Letovice, Rájec - Jestřebí and Adamov stations will be completed by 2030. Two new branch lines at Maloměřice and Rajhrad will improve the quality of public transport. The construction of two new stations in the Brno region - Čebín obec and Kuřim zastávka - is under consideration. Improvement of the parameters of the line from Zastávka towards Třebíč and the line from Střelice to Moravské Krumlov / Ivančice is being prepared. Double-tracking of the line will be completed on the lines Brno - Zastávka and Brno - Brno-Chrlice. A link between Zbýšov and Slavkov will be created. A new electrified link will be created between the new Lhota Rapotina stop and Boskovice.

**Development measure 2030**

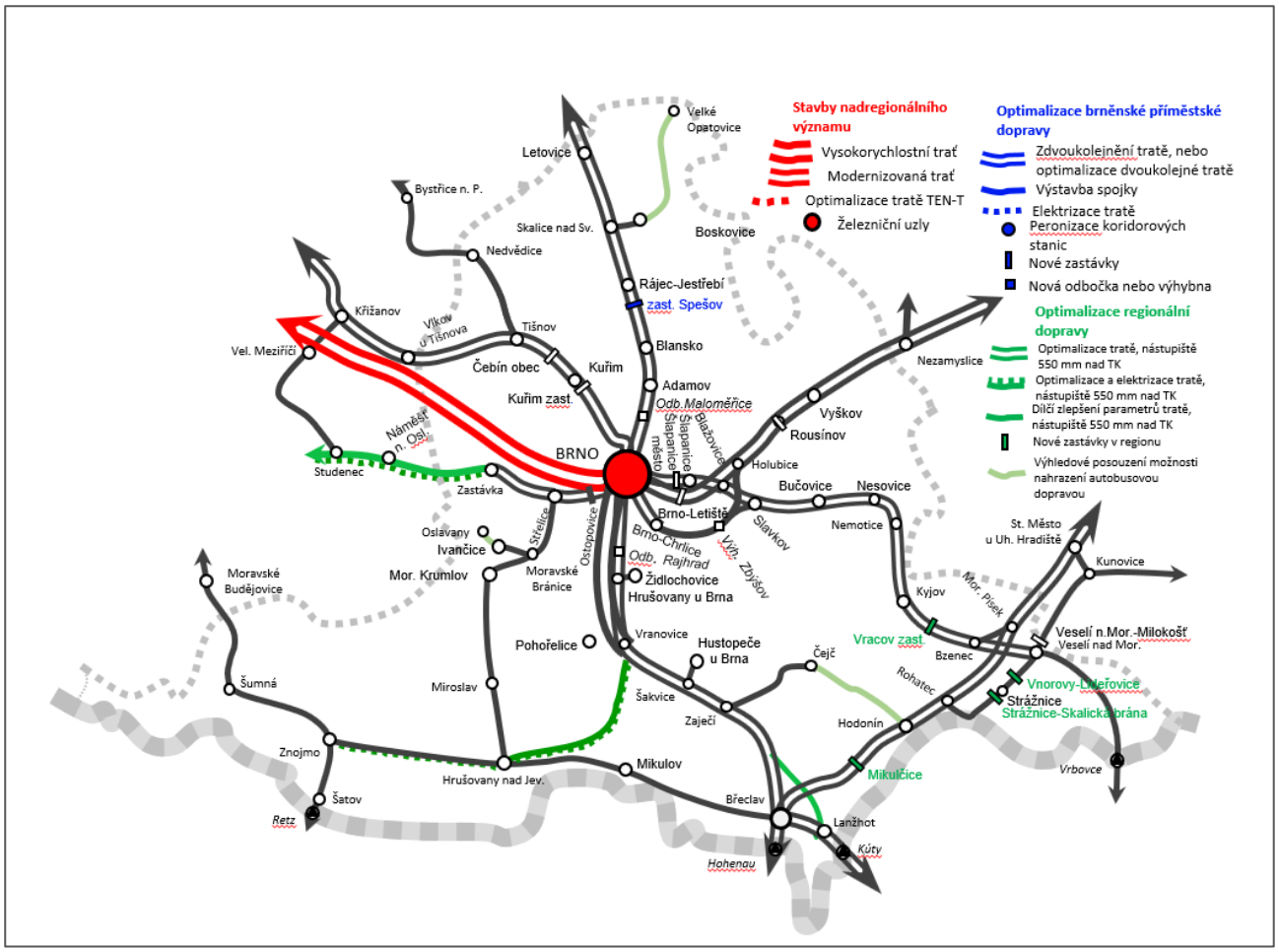



## 1.1.6. Development measure 2050

Based on the plan of the Railway Administration (2021d) until 2050, the construction of the HSR Vysočina Phase 1 towards Prague will be carried out. The possibility of building a new line connecting Znojmo with Brno from Hrušovany nad Jevišovkou to Vranovice is currently being examined. The construction of a new freight link between Lanžhot and Ladná is also possible, which will enable a fast bypass of the Břeclav junction. The electrification of the line Zastávka - Třebíč will be completed. New stops will be

created at Mikulčice, Strážnice - Skalická brána, Vnorovy-Lideřovice, Vracov stop and Spešov. The Brno railway junction will be completed.

**Development measure 2050**




The main benefit of the construction of the HSR both in the Czech Republic and in the South Moravian Region is an increase in the capacity of regional lines. They will gain sufficient capacity for freight, regional and suburban trains. Increasing the capacity of regional and suburban trains will guarantee more connections and better links to other modes of transport. It will also allow better freight transport for freight traffic in the region and in the Czech Republic.

Regardless of the construction of the HSR, it is essential to modernise the Brno railway junction. In Brno, as part of the construction of the railway junction, Brno-Židenice and Brno-Slatina stations will be modernised.

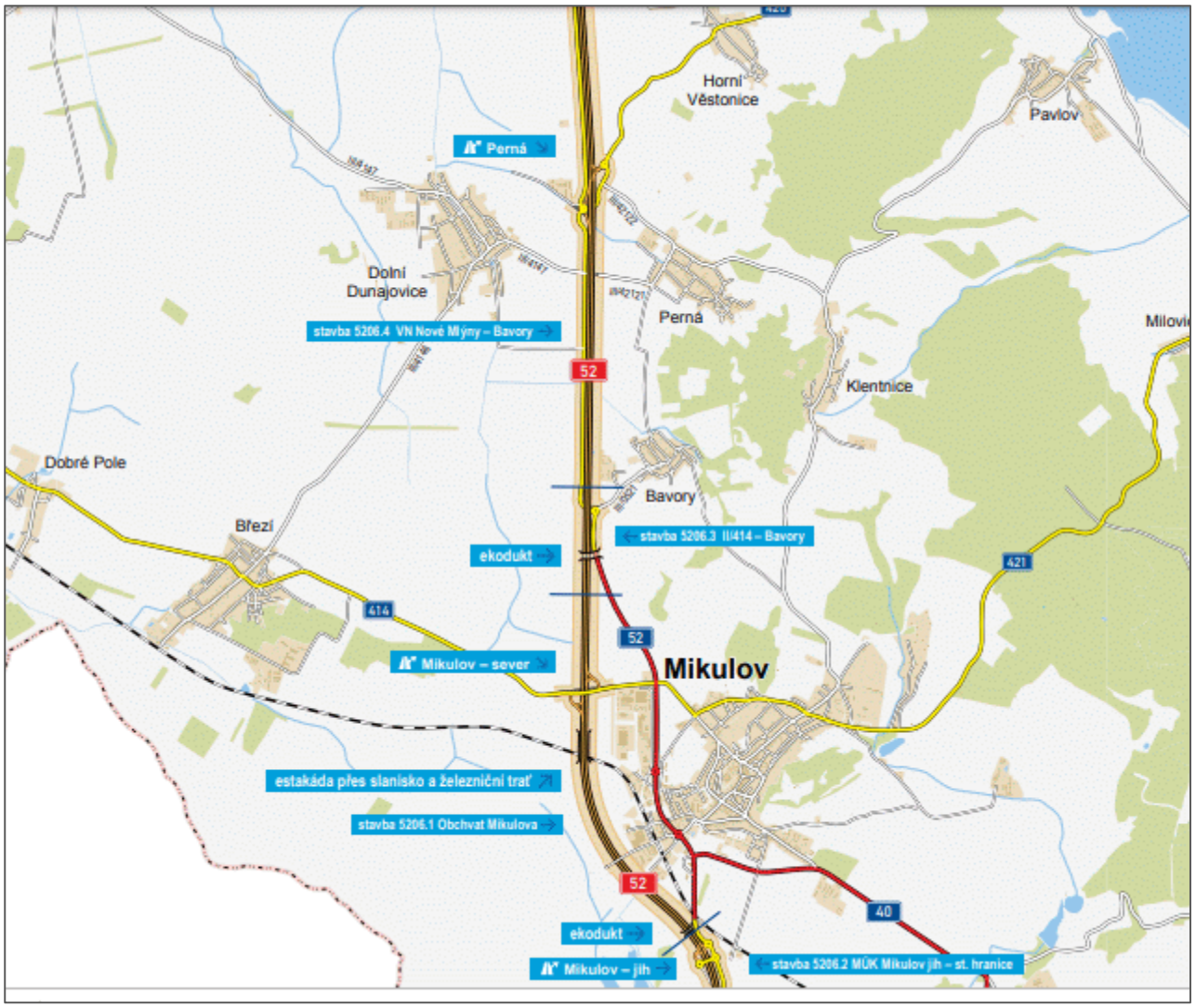
## 1.2. Road transport

### 1.2.1. Development measure until 2030

The largest construction in road transport in the South Moravian Region is the D52 motorway to Vienna. This road link is of international importance within the TEN-T transport infrastructure of the VI multimodal corridor Gdańsk - Warsaw - Katowice - Ostrava - Brno - Vienna and the V multimodal corridor

Berlin - Prague - Brno - Budapest - Istanbul, crossing near the city of Brno, according to the South Moravian Region (2021).

**D52 motorway to Vienna**




Source: https://zdopravy.cz/pravni-bitva-o-d52-mikulova-rsd-ma-opet-uzemni-rozhodnuti-ktere-napadl-rakousky-spolek-69781/

At the moment, the D1 motorway in the section around Brno is congested. Drivers are constantly faced with long waits in traffic jams. According to the plan of the Czech Highways and Roads Directorate (2021a), it was decided to increase the motorway from four lanes to six lanes. The six-lane motorway should be in the section Kývalka - Brno.

According to the project of the Directorate of Motorways and Roads in the Czech Republic (2021b), other small constructions that await the inhabitants of the South Moravian Region in the next 10 years are bypasses of villages. ŘSD is designing the construction of a bypass of the town of Znojmo, which will improve the overall traffic situation in the town and at the same time bring a positive impact on the ecological situation in the town. The bypass will serve drivers of individual car traffic and freight transport, which will continue from the Czech Republic to Austria and back. The next bypass on the territory of the South Moravian Region

will be in Bučovice. This bypass will serve mainly for drivers continuing their journey towards Slovakia and will ease the traffic situation in Bučovice.

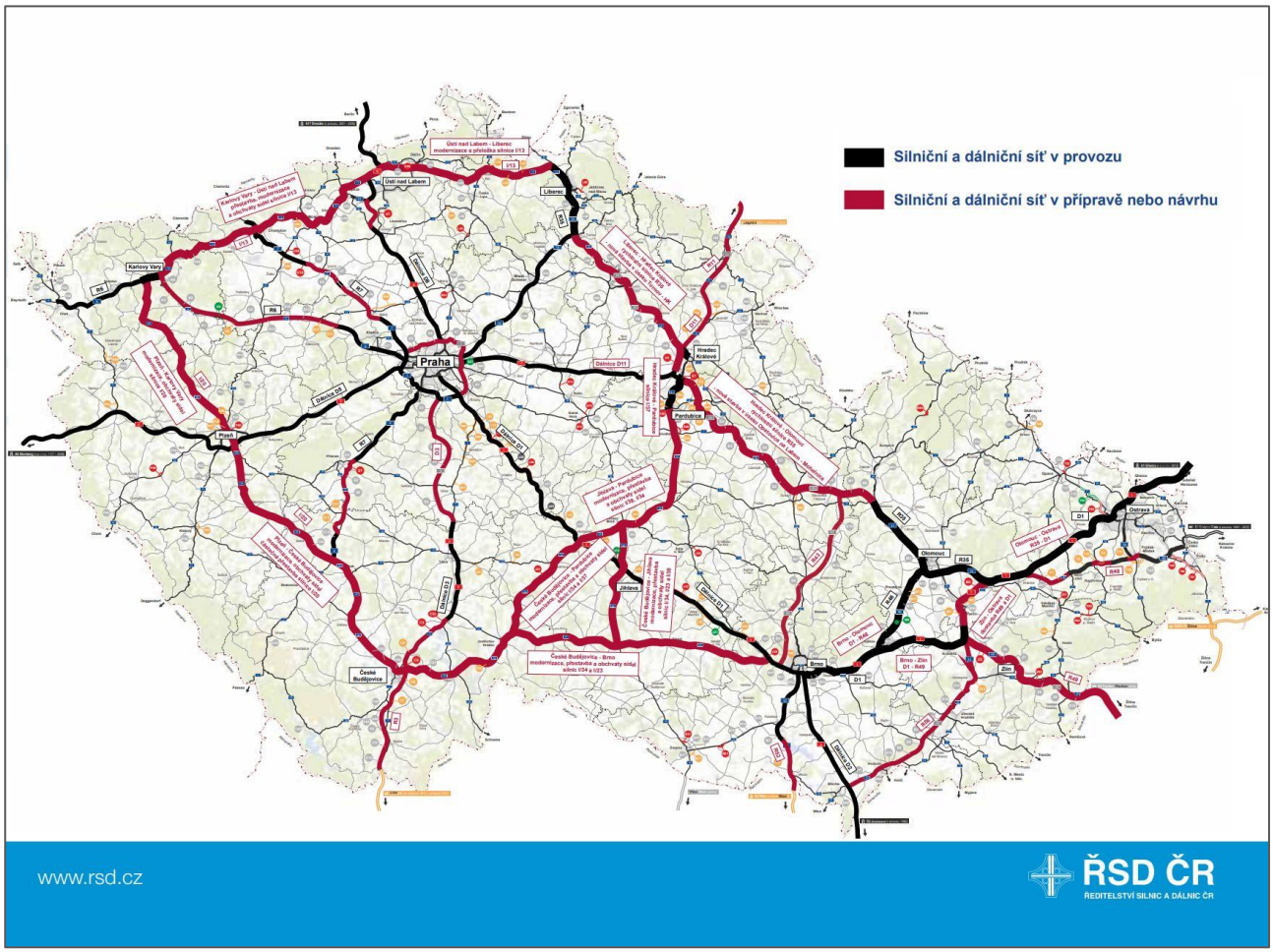
### 1.2.2. Development measure until 2050

According to the project of the Czech Highways and Roads Directorate (2021d), the bypass of Břeclav will be completed by 2050. The traffic from Svitavy towards Vienna will be solved by the D43 expressway. This road will be further connected to D1.

**Motorway D43**


Source: https://zdopravy.cz/jihomoravsti-zastupitele-uvolnili-cestu-pro-d43-prisly-tisice-pripominek-60677/

**Motorway and road network as envisaged by the Road and Motorway Directorate of the Czech Republic**




Source:https://zpravy.aktualne.cz/ekonomika/doprava/nova-sit-dalnic-ma-spojit-krajska-mesta-a-vynechat-prahu/r~5d223bc058dd11e894960cc47ab5f122/