Source: ŽSR - completion of classification yard Žilina - Teplička and the following railway infrastructure in the Žilina node, Assessment Report 06/2013, REMING CONSULT a.s.

Generally Comprehensible Final Summary

Claimant: Železnice Slovenskej republiky
Klemensova 8
SK — 813 61 Bratislava

Name of the Intent: ŽSR - completion of classification yard Žilina - Teplička and the following railway infrastructure in the Žilina node

Affected municipality: Žilina, Teplička nad Váhom, Gbeľany, Varín, Mojš, Gbeľany, Strečno

Planned start and end date of the works: construction start **2018**
construction completion **2021**

Cost estimate:

Table Investment and operating costs of the individual options

	Cost in EUR	Percentage
Green Option	299,892,129.26	100%
Orange Option	328,513,954.96	109.54%
Violet Option	820,462,704.05	273.59%

Construction purpose: The operation was launched in the new classification yard Žilina-Teplička on 04 March 2012 at 00:00 CET. From the perspective of the infrastructure investment, modification of the train marshalling, organisation of work and deployment of the most modern technologies in the classification yards of the Železnice Slovenskej republiky (ŽSR - Railways of the Slovak Republic Company), this is an important event in the recent decades. the new station now hosts the activities from all the marshalling stations in Vrútky, Žilina and Žilina - classification yard.

The purpose of the construction lies in two reasons:

1. the existence of the new classification yard and redirecting the activity created the need to address the **elimination of the morally obsolete and unused railway infrastructure**in the railway station Žilina, classification yard Žilina and railway station Varín,
2. the railway line Žilina – Čadca and railway station Bratislava – Čierna nad Tisou were inserted into the international corridors in the territory of Slovakia as part of the pan-European corridor, the affected sections however do not conform with the criteria of the modernised tracks that we are contractually obliged to adhere to. Another objective of the construction is therefore **the modernisation of the technical infrastructure of the track in order to achieve the parameters of the AGC agreement** (European Agreement on Main International Railway Lines) **and AGTC** (European Agreement on Important International Combined Transport Lines, 1993).

The modernisation of the selected lines of ŽSR consists of the reconstruction of the railway transport route in order to increase its level of technical equipment and usability by incorporating the modern and progressive elements, therefore enhancing its parameters. The railway transport route includes: the plots, structures and equipment of the railway tracks and buildings (RTB), telecommunication and protection technology (TPT), energy and electro-technical devices (EE) as well as immediate transport management.

The purpose of the submitted Assessment Report is the environmental impact assessment of the completion of classification yard Žilina - Teplička and the following railway infrastructure in the Žilina node. The report is elaborated with three options besides the Zero Option (Green Option for speed 120 kph, Orange for 140 kph and Violet for the speed 120 kph with the embedded passenger station Žilina on the level -8m).

The requirement for modernisation of the selected railway tracks of the ŽSR is based mainly on the concept of European Transport Corridors defined at the 2nd Pan-European Conference of the Transport Ministers in Crete in 1994. It pursued the efforts of the European Union to develop a new railway policy that would express as well the integration efforts to unify the functioning rail system, harmonisation of the quality indicators, legislative measures and increase in the efficiency of the railways in all European states even outside the EU.

The above mentioned conference defined 9 transport corridors in Central and Eastern Europe.

The ŽSR network is in direct contact with the following:

- no. IV. in section state border with CZ – Kúty – Bratislava – Štúrovo - HU state border.
- **no. V. - branch A in section Bratislava – Žilina – Čierna nad Tisou**,
- **no. VI. in section Žilina – Čadca – Skalité – PL state border.**
- no. IX. - in section Čaňa – Košice – Kysak - Plaveč

The purpose of the construction is to modernise the technical infrastructure in order to achieve the parameters:

- AGC - the European Agreement on Main International Railway Lines (1985)
- AGTC - the European Agreement on Important International Combined Transport Lines (1993)

The submitted construction falls within the railway track Žilina - Čadca which is part of VI pan-European transport corridor and railway track Bratislava - Čierna nad Tisou which lies on Corridor no. V, branch Va.

Location of the project: The proposed activity is located in the area of the existing railway station Žilina, approximately between the rivers of Rajčianka and Váh and subsequently eastwards, it is composed from the railway track section between Žilina and Strečno municipality, including Varín municipality.

ESSENTIAL CHARACTERISTICS OF THE TECHNICAL AND TECHNOLOGICAL DESIGN

Modernisation principles:

- Passability of the railway bridge constructions for the load testing train UIC-71 and spatial adjustment according to STN 73 6201. New bridges designed for the T Class load testing train
- Reconstruction of railway stations in order to achieve the useful length of tracks and passing loops of at least 750 m, other transport track of 700 m (exceptionally 650 m). The platform with the edges 550 mm above the rail top (RT) and length of 250 m at all the stops and stations, 400 m long at the stations with the regular operation of the IC, EC, Ex or R trains, roofed in the length up to 300 m. Platformisation with grade separated access for the passengers and the adjustment of all the communications in the stations and stops for persons with a physical disability.
- Adjustment of the public premises of the passenger building to achieve higher standard of services, information system and travel culture depending on existing and planned density of passengers.
- Exclusion of all the level crossings with local communications, i.e. construction of new underpasses and overpasses (for traffic and pedestrians) across the local communications
- Complex reconstruction of the traction lines for the operating speed of 160 kph + 30 %. The traction line shall be both transversal and longitudinal, divided into independent units with the possibility of local and remote control of disconnectors
- If the reconstruction of railway stops and stations requires so, the affected grid of heavy current and electric lighting shall be reconstructed, electric switch heating shall be built along with the system of train pre-heating in selected stations.
- The management of technological processes of the power supply of fixed traction equipment and selected electric points of power take-off shall be done via local control systems as well as via remotely controlled systems from the operator centres.
- New station protection equipment of category 3 on the principle of electronic signalling controls with connection to the train protection system and systems of automatic management of train speed respectively.
- New track protection system built with the system of automatic block posts with the addition for speed control, whereas the electronic signalling control of the fulfils the role of station protection equipment (SPE) in the neighbouring sections of the track. Part of the TPE is also train protector (TP) enabling transfer of the information necessary for the train speed control from the track to the traction unit The matter of the construction include only stationary equipment of this system. The equipment in the mobile devices, ensuring the reception of information and calculation of the maximum speed based on the parameters of the track and driving properties of the train as well as checking adherence to the top speed limit, are not part of the matter of construction and are part of the mobile devices - locomotives.

- New telecommunications technology - new telecommunication lines for data transfer and digitalisation of the entire railway telecommunication network. New systems of data transfer shall be applied with implementation of TP NET management and control.

The modernisation of the railway track shall be implemented while maintaining the operation on the line by gradually excluding the individual tracks in the railway station and maintaining the operation on at least one track in the section between stations. This will significantly affect the process and duration of the construction. The parts of the track built in the new positions - track re-routings, horizontal adjustments of the curves shall be built in advance and then reconnect with the existing track.

Zero Option: current state if the intent is not implemented.

All the options remove the original set of tracks of the classification yard with the exception of the Zero Option. The proposed activity contained in all the options (with the exception of the Zero Option) proposes to remove the train wash facility and place a new one on the tracks of the selected option. The level crossings will be replaced with grade separated interchanges.

Green Option (Option no. 1 - surface, 120 kph) in the section Strážov - depot, the track is led through the middle ground of the classification yard, the minimum transit speed is 120 kph, the level crossings shall be eliminated and replaced with grade separated interchanges, complemented with overpasses and underpasses for pedestrians and cyclists. The area of Nová Žilina will be made accessible through a new overpass and the grade separated overpass shall be built next to the intermodal transport terminal which is under construction. The entire section is composed of surface tracks. The section from the passenger station to Varín is horizontally identical with the Zero Option.

Violet Option (Option no. 2 - underground in the section of the passenger station Žilina, 120 kph) the horizontal routing is identical with the Green Option however it differs in the fact that the passenger station is underground on the level -8m and covered with a slab on which the newly built station building is situated. The underground station will cause changes on Bratislavská and Sasinkova streets, the underpass on Kysucká street shall be changed to overpass. The construction shall cause a temporary relocation of the passenger station and construction of temporary railway detour.

Orange Option (Option no. 3 - surface, 140 kph): the horizontal curve enabling higher track speed brings the track to immediate vicinity of the Váh River. The section from the passenger station is parallel with the other options. The entire section is composed of surface tracks with the minimal speed of 140 kph

ASSESSMENT OF THE EXPECTED ENVIRONMENTAL IMPACTS AND SELECTION OF THE OPTIMAL OPTION

Multicriterial evaluation that considered the findings and fact acquired so far and whose result reflects the detailed specification of the impacts on the individual components detailed in the text of the Assessment Report, has determined the suitability of the implementation of the individual options of the modernisation of the railway track in the following order:

1. ***Green Option*** **- the most suitable**
2. ***Orange Option***
3. ***Violet Option***
4. ***Zero Option*** **- least suitable**

The Zero Option was assessed as the least suitable where a natural multiplication of the negative impacts of the operation of the non-modernised track shall occur and the objectives of the track modernisation shall remain unfulfilled. The surface of the unused classification yard would be left in the current state and the speed on the track triangle would remain unchanged (40 kph). Not implementing the activity, i.e. the Zero Option is the most **unsuitable** from perspective of the intent processors.

The modernisation of the railway track in the given area is proposed in several options in the section Strážov - the Váh River. The section from the River Váh crossing to Varín has all the options routed in parallel.

All the proposed option are more suitable than the Zero Option (if the modernisation is not implemented) from the transport perspective, as once the other sections of the track are modernised (modernised section Žilina - Krásno nad Kysucou, implementation of the modernisation of the section Nové Mesto nad Váhom - Púchov, tendering is under way for the contractor for Púchov - Žilina construction), this section could become a bottleneck limiting the transport and decreasing the passability of the entire line.

From all the options, we recommend to pursue the preparation of the *Green* option - surface, speed 120 kph. The green option represents the most balanced unit from the perspective of the technical benefits required by the investor, the realistic possibilities of the area and construction costs.

As the railway station Žilina from the passenger transportation perspective, is a station where all long-distance lines stop, it is not feasible to construct the main station tracks for the speeds higher than 120 kph. This is also endorsed by the fact that the preceding section Považská Bystrica - Žilina has n entry curve to the bridge over the Rajčianka River designed for speeds of 120 kph.

The speed of 120 kph is optimal also for the freight transport - for the cargo expresses this is the maximum speed. The cargo expresses therefore can pass through the entire railway station Žilina up to the neighbouring freight station Žilina Teplička with full track speed thus reducing the transit time (today the maximum speed is 40 kph).

From the technical perspective, the need to construct the engineering objects - overpasses, railway bridges retaining walls and similar - is limited to the smallest scale among all the options. This will be reflected in simpler construction processes, lower environmental impacts and construction costs during the implementation. *Green and Violet Option* enable to free vast and valuable area of the former classification yard after the implementation and make the Váh River bank accessible for the civil and tourism purposes.

Orange Option, on the contrary, fully occupies the river front and interferes with the Váh River through its engineering activities. Besides the need to re-route the canalisation collector in the Orange Option, another important deviation from the Green Option is the need to construct the railway and road elevated routes with the length of 260 m to bridge over the Rajčanka River at orkm 199.700.

The most complicated option from the perspective of maintaining the operation during the construction is the *Violet Option.* In case the Violet Option is implemented, it will be necessary to construct a temporary detour track (the track in light blue colour) and a temporary passenger station in a new location due to the excavation of an extensive cut that will eliminate the current tracks of the Žilina passenger station and both tracks in direction of Čadca.

The temporary line will serve the purpose of maintaining the operation during the construction. The elimination of the main tracks would otherwise lead to the disruption of the railway traffic between Bratislava and Košice and also between Čadca and Košice.

The temporary detour track must be located on the perimeter of the construction site, outside of the current area of the tracks. The location of the detour track will cause the elimination of high number of structures of high importance (structures along Uhoľná street including the Lidl supermarket, large number of industrial structures and a hall in the premises of the Slovena plant neighbouring with the railway track Žilina - Čadca etc.).

Besides the existing track, also the existing station building shall be demolished in the process, once the cut is covered with a slab, a new station building shall be built over the underground track. Given the reasons above, it will be necessary to construct a temporary passenger station for the duration of the construction implementation. The temporary station shall be located in the premises of the current container transshipment facility, which is basically the former railway station Nová Žilina. The connection with Košice - Bohumín line caused its transformation to freight station and classification yard.

Currently, Železnice Slovenskej republiky (ŽSR) are renting part of the unused track set to the Company The Slovak Combined Transport INTRANS, dealing in freight transportation. The track set is connected from a single side through Eastern siding. Once the implementation is completed, its reconnection will be possible only with the *Green Option*. In case of *Violet Option*, the above mentioned track set will serve as the temporary passenger station during the process of excavation of the cut and its reconnection will be possible once the new passenger station will be operational. in case of the *Orange Option*, the technical solution does not enable the reconnection of the existing siding. The cancellation of the rent for the company INTRANS would eliminate jobs.

The need to construct a detour track in the *Violet Option* will cause the large-scale demolition - on one hand the structures along Uhoľná street including the Lidl supermarket and subsequently also all the industrial structures and halls of the former Slovena plant neighbouring with the railway track Žilina - Čadca. The Lidl Supermarket will be affected with the *Orange Option* as well, which, besides impacting the supermarket, will require demolition of 2 residential blocks of social housing owned by the city of Žilina and a low-threshold centre located in their vicinity. The buildings are located at the elevated

communication on Bratislavská street. *The Green Option* will cause the demolition of the railway structures and administrative and storage facilities and odes not affect the industrial area or the residential blocks.

The comparison of the track modernisation implementation and the Zero Option is not objective from the economic perspective as each not implemented activity is more convenient than the implementation itself from the short term perspective. The modernisation of the railway track is however necessary from the long term perspective. The tendency of the growing operation costs and repairs of the existing track, redirecting the investments into other transportation types or abroad in case of transits and other already mentioned impacts of the Zero Option point out the real necessity of the implementation of the proposed solution.

From the economic perspective, the calculation of the estimated costs of the construction implementation proves the *Green Option* as the most economic. *The Orange Option* due to more complex technical elements and induced investments (re-routing of the canalisation collector, elevated rail and road route) is more expensive compared to the green option by 10 %. The costs of *Violet Option* because of extreme technical complexity of the construction (a cut with a complicated drainage system to conduct the water under the underground body, roofing of the cut), complex temporary structures (temporary railway track detour, temporary passenger station), a large number of demolished objects (the industrial structures of the Slovena premises, Lidl, the station building), induced investments (re-routing of the Všivák stream, re-routing of the engineering networks) and redesign of the affected road communications represent 270 % of the price of the Green Option.

	Cost in EUR	Percentage
Green Option	299,892,129.26	100%
Orange Option	328,513,954.96	109.54%
Violet Option	820,462,704.05	273.59%

The negative impacts of the implementation of *Violet Option* include the need to dispose the excavated soil, which should be spread evenly on the plots freed by the dismantled tracks of the classification yard. The excess of the excavated soil is present in all the options, the thickness of the disposed soil in the Orange and Green Options however is significantly thinner and takes less area than the excavations disposed in the Violet Option The area of disposed matter and uniform thickness of the disposed soil with various options are following:

Green Option - area 72,401 sq. m, thickness of the disposed soil 1.92 m

Orange Option - area 79,587 sq. m, thickness of the disposed soil 1.74 m

Violet Option - area 123,987 sq. m, thickness of the disposed soil 4.39 m

Geological study elaborated by the CAD-ECO a.s. Company in November 2012 on the basis of the summarised findings on the area states that from the perspective of the geological risks, the green and orange options may be considered as equal with the exception of the section routed on the edge of the Hrušov water reservoir (Orange Option) where an elevated railway route shall be built, imposing a greater risks on the foundations. Besides, the main risks include especially high heterogeneity of the geotechnical parameters of the ballast

on the level of the plain of the railway substructure and incidence of the contaminated soil. From the perspective if the impact on the rock environment, the Green Option represents the most suitable solution.

The Violet Option 120 kph -8m (underground) may be considered as highly risky from the perspective of the stability, incidence of hetereogenic properties of the soils and rock in the level of the plain of the railway substructure, expected high impact on the ground waters regime, need to excavate a large volume of highly contaminated soil and its processing, probability of the incidence of suffosion and possibility of inflow of large amounts of ground water into the construction pit (requires sealing). We consider this option as not suitable if compared with the other two.

The modernised railway track in **neither option comes into contact with the large- or small-scale protected area** and does not come into contact with their protection zones.

The collision spot from the perspective of the environmental protection is the proposed SAC Varínka which is crossed by the modernised track in the original spot. In case of the reconstruction, access has to be provided for the heavy machinery causing the felling of the trees in the necessary extent and will affect the habitat of Alluvial willow-poplar and alder forests (91E0). This impact is considered as temporary and given the extent of the SAC, it is not very significant, the area shall return to the original state in the course of several years.

From the perspective of the **impact on the ground waters** the most serious impact is brought by the Violet Option. The dominant construction of the option is the water proof basin of the reinforced concrete constructed under the ground water level with flat carrier roof covering the platforms. According to the preliminary assessment of the geological conditions, the bottom of the basin is located in water impermeable layer. This fact along with finding that the ground water flows from the centre in direction to the Váh River, creates a serious complication - the underground wall shall create a dam for the ground and shall cause the elevation of the ground water levels in the centre of the city. In order to eliminate the effect, a set of "culverts" under the floor of the station cut will have to be constructed to which the ground water will have to be conducted through a system of hand-fan-like drainage system.

A highly positive effect of a better serviceability of the area shall be achieved by adding **a new railway stop Nová Žilina** (in all the options except for the Zero Option) located in the centre of the former classification yard. Thereby, the access of the passengers from the suburbs of Strážov and the nearby residential area to the rail transport shall be enhanced.

The Violet Option shall have negative - although temporary - impact on the population as it will require **relocation of the passenger station** into the area of the unused classification yard during the process of the excavation of the cut and construction of the new station building. On the other hand, the positive effect of this option consist in the **elimination of the barrier effect of the railway station** in the length of 450 m and improving the accessibility of the planned shopping centre and the existing football station. Making this area more accessible in case of Orange and Green Options shall be ensured by extending the underpass leading from Národná to Uhoľná street.

The elimination of the track set of the classification yard will have positive impact for the city and the future development activities. The area of the plot that is currently part of the railway track set and is proposed for a different utilisation is 373,010 sq. m. The potential development of the recreational purpose of the abandoned area of the Žilina classification yard can be defined as follows:

- *Orange Option* - from the perspective of the freed area, this options seems to be the most suitable as the area with the removed tracks will be uniform and usable for the development purposes. Its location however shall create a barrier between the area and the Váh River which is less attractive from the perspective of the recreation.

  Green and Violet Option - the horizontal routing through the middle of the eliminated track set will limit the development plans of the city on the area, the spatial arrangement however shall enable a construction of recreational zone with the access to water.