



Modernisation of Rail Route 2, Podgorica – Albanian Border: Feasibility Study and ESIA WB20-MNE-TRA-02

3rd Progress Meeting
16th December, 2020
Podgorica





PROJECT DATA

Beneficiary	Ministry of Transport and Maritime Affairs (MoTMA) Railway Infrastructure of Montenegro (ŽICG)
Lender/ Lead IFI	Kreditanstalt für Wiederaufbau (KfW)
Client	European Commission, DG NEAR, represented by EIB
WBIF Grant Code	WB20-MNE-TRA-02
Resources	€1,300k – 27 Experts – 1,710 Expert-days
Start Date	19 May 2020
Duration	15 months



PROGRESS UP TO DATE

Completed Activities

- ✓ Inception Phase
 - Final Inception Report submitted on July 31th, 2020
- ✓ Definition of alternative Development Scenarios
 - Description of Development Scenarios Interim Report

Ongoing Activities

- ✓ Traffic Demand Analysis
 - ✓ Development Scenarios Assessment
- } additional NKEs are officially appointed

Activities that have not started yet

- ✓ Conceptual Design
 - ✓ Financial and Economic Analysis
 - ✓ Environmental and Social Impact Assessment
- } Preferred Development Scenario



TRAFFIC DEMAND ANALYSIS – ACTIVITIES' OVERVIEW

PHASE 1

Data Collection & Surveys

- Identification of the study area and the networks' characteristics
- Collection of traffic data on road and railway network, collection of cross-border traffic data
- Collection of socioeconomic data
- Surveys elaboration

PHASE 2

Development of the Base Year Transport Model

- Identification of available transport modes and networks in the examined area
- Division of the study area into traffic analysis zones
- Transport network development
- Estimation of generalized cost per year for base year
- Modal split for rail passenger and freight
- Trip assignment
- Model calibration & validation

PHASE 3

Traffic Forecasts

- Future Network Development
- Estimation of growth factors for both countries
- Forecast of transport demand in both countries
- Estimation of generalized cost per mode
- Trip assignment
- Preparation of the Traffic Demand Analysis Report

SUPPLY

Activities Finalized

Base year calibration / validation

DEMAND

Traffic forecasts



ZONING SYSTEM – INTERNAL ZONES ,



- ▣ 24 Internal zones based on Montenegro municipalities
- ▣ 3 Special zones in Montenegro
- ▣ 12 Internal zones based on Albania's prefectures
- ▣ 6 Special zones in Albania





ZONING SYSTEM – EXTERNAL ZONES₂

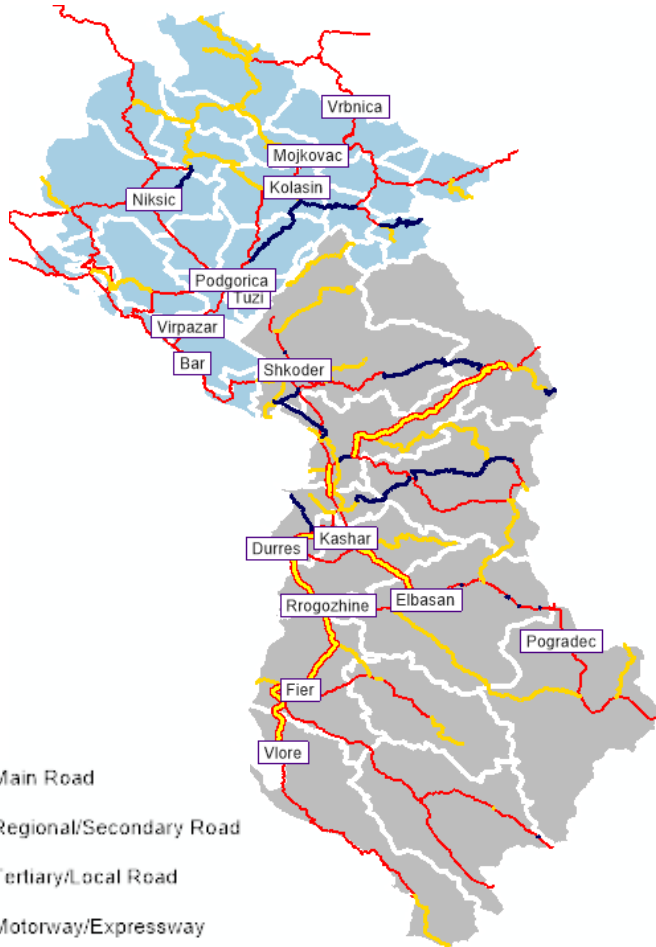
6 external zones

- ✓ Croatia merged with Bosnia & Herzegovina & Western Europe
- ✓ North Serbia merged with Eastern Europe & Russia
- ✓ South Serbia merged with Northern Bulgaria
- ✓ Kosovo
- ✓ North Macedonia merged with Southern Bulgaria
- ✓ Greece merged with Turkey





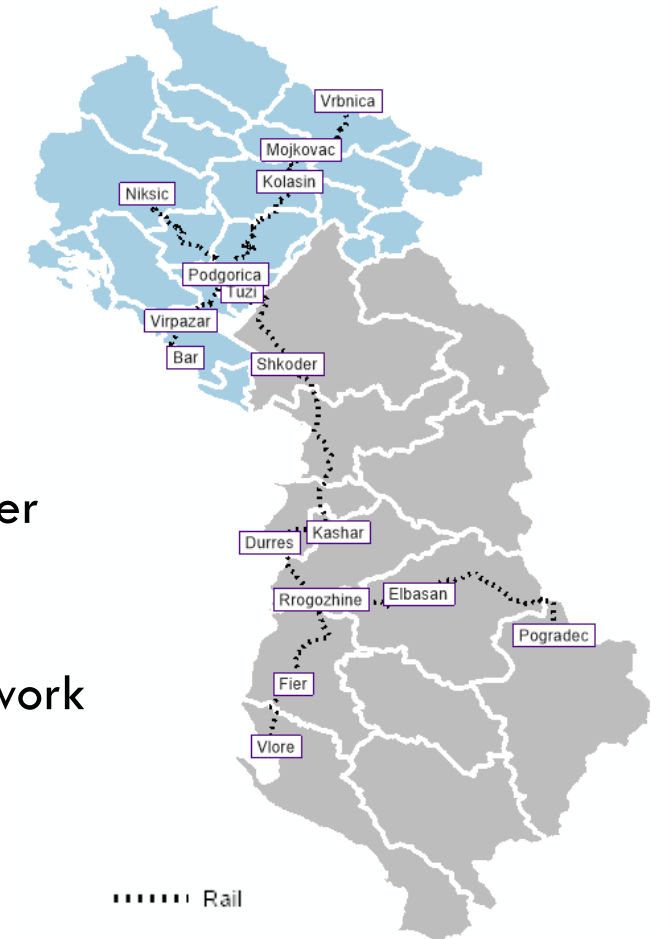
STUDY AREA'S ROAD & RAILWAY NETWORK



- App. 1,400 links
 - ✓ App. 1,200 links for the road network
 - ✓ App. 200 links for the rail network

- Characteristics for each separate link
 - ✓ Daily Capacity, Speed, Length and Number of Lanes for each link regarding road network
 - ✓ Speed and Length regarding railway network

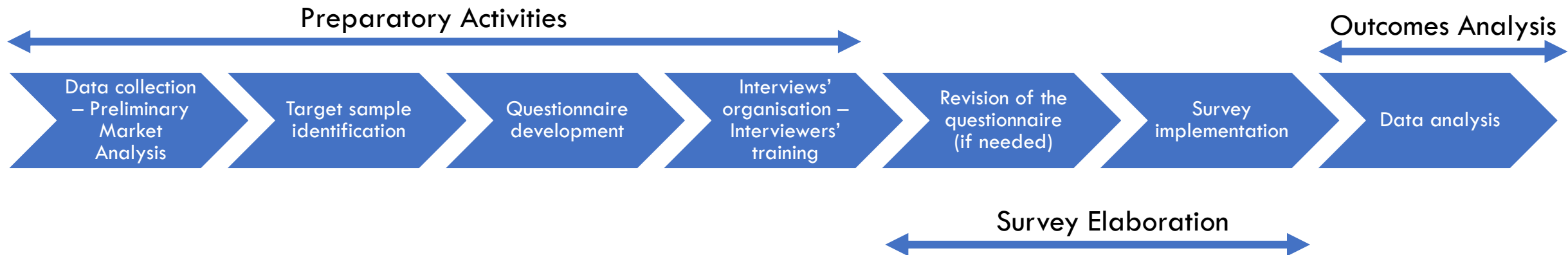
* The connectors for road and rail transport mode are currently under final refinement





TRAFFIC SURVEYS PLANNING & ELABORATION₁

- ❑ EIB's N-O on the direct award of the surveys: 14/12/2020
- ❑ Commencement of preparatory works for the surveys
- ❑ Execution of surveys estimated to start on mid-January 2021





TRAFFIC SURVEYS PLANNING & ELABORATION₂

FREIGHT TRANSPORT SURVEY

- Survey to be conducted in **both countries**
- Preparation of the list of companies to participate in the survey
- Transport **operators, freight forwarders, logistics companies**
- Assistance from Beneficiary/ Client required: letter/invitation towards the companies in order to participate in the survey
- Sample: at least **15-25 companies in each country**

Freight Transport Surveys Questionnaire

- Part A: General Information (Profile questions & fleet characteristics)
- Part B: Trip Characteristics (O-D pairs - national & international level)
- Part C: Hypothetical Scenarios (choice between two modes of transport, depending on the provided transport cost and trip duration for each mode)



TRAFFIC SURVEYS PLANNING & ELABORATION₃

PASSENGER TRANSPORT SURVEY

- Survey to be conducted on **Albanian-Montenegrin borders** (Private cars - drivers)
- Survey to be conducted – **if possible - in Tuzi public spaces** (random sample of citizens)
- Permission required and assistance by traffic police
- Sample: app. 150 - 180 questionnaires

Passenger Transport Surveys Questionnaire

- Part A: General Information (Profile questions)
- Part B: Trip Characteristics (O-D questions - national & international level)
- Part C: Hypothetical Scenarios (choice between two modes of transport, depending on the provided transport cost and trip duration for each mode)



EXAMPLE OF SP SURVEY

- Part C of the Questionnaire consists the actual SP survey
- Various hypothetical situations to be presented at the respondent

1st hypothetical scenario (example)

Attributes	Road	Railway
Travel Cost	200 €	- 20% from road transport
Travel Time	2 hours	+ 1 hours in comparison to road transport
Choice		

Assuming that a truck trip costs 200 EUR and lasts for 2 hours, would you choose railway if the trip cost was reduced by 20% but the overall trip duration was increased by 50%?

2nd hypothetical scenario (example)

Attributes	Road	Railway
Travel Cost	60 €	- 35% from road transport
Travel Time	3 hours	+ 0.5 hours in comparison to road transport
Choice		

Assuming that your road trip costs 60 EUR and lasts for 3 hours, would you choose railway if the trip cost was reduced by 35% but the overall trip duration was increased by 30 minutes?



TRAFFIC SURVEYS OUTPUTS

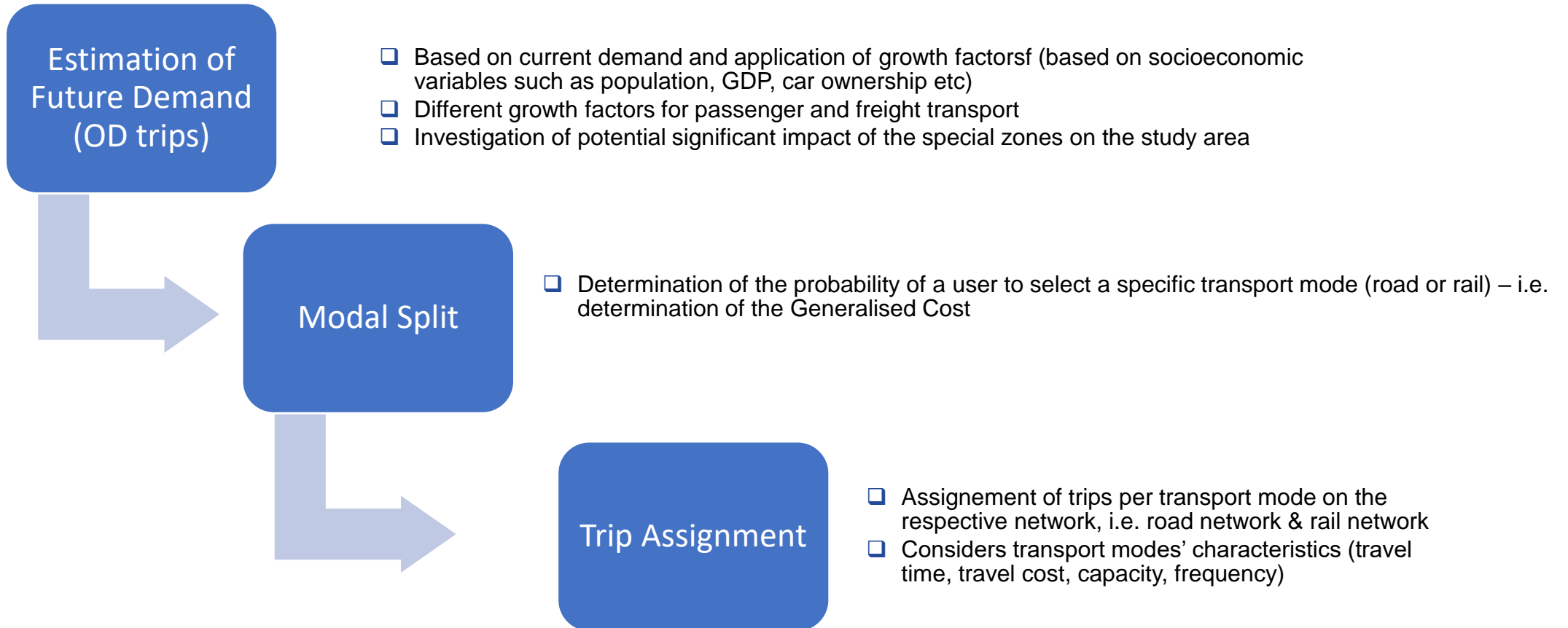
- ❑ Estimation of the **Willingness of users to shift from road to rail.**
- ❑ Determination of the **Value of Time** parameter, for the **identified trip purposes**



Main parameter in the **Generalised Cost** equation



TRAFFIC FORECASTS



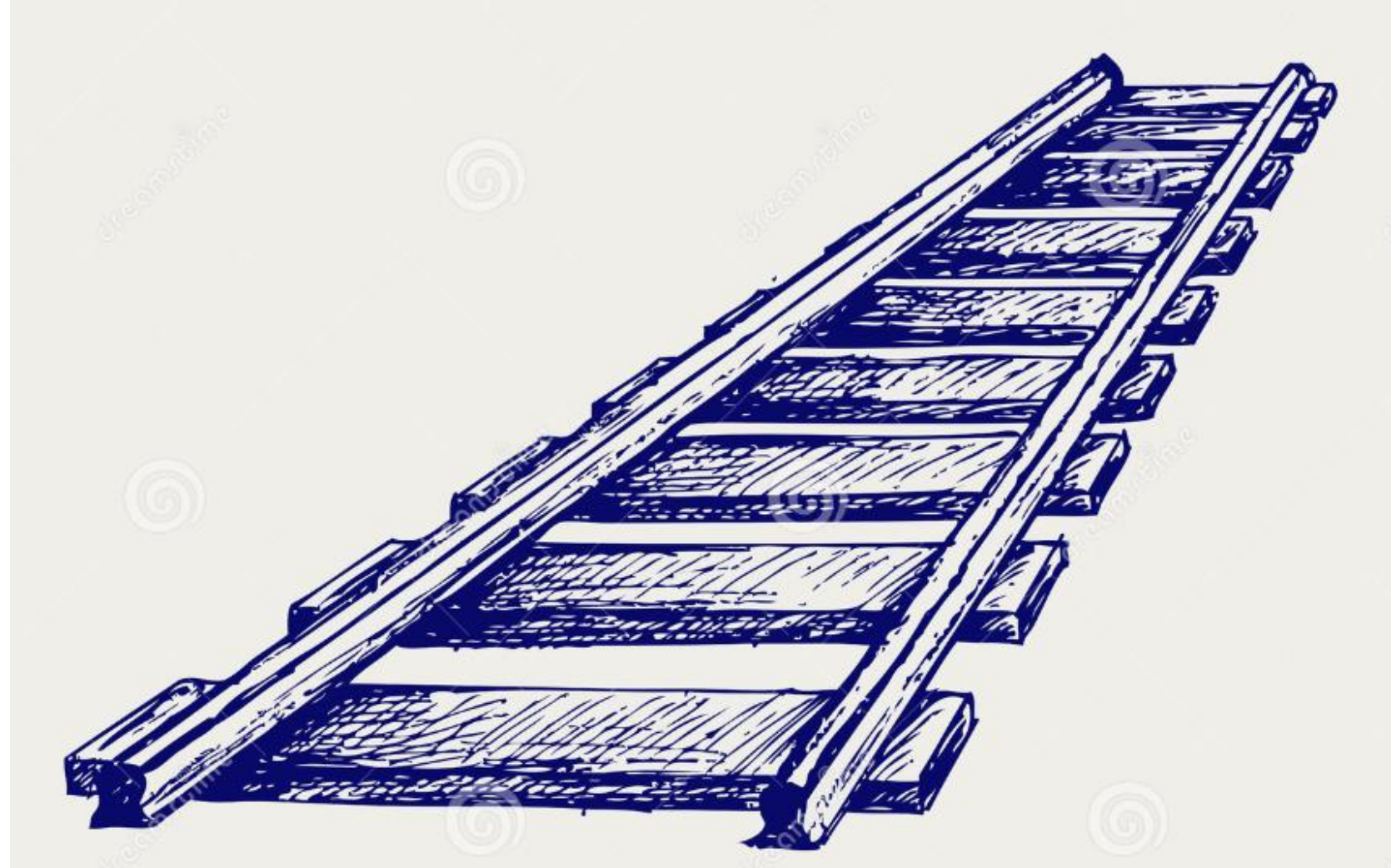


ANALYSIS SCENARIOS AND YEARS

- ✓ Base Year: 2019, representing the current traffic conditions (before COVID-19)
- ✓ Traffic assignments will be prepared for the scenarios:
 - Without the project (Do-Nothing Scenarios)
 - With the project (Business as Usual / Limited Rehabilitation / Full Modernization)
- ✓ Horizon Years
 - 2028: Short-term, assessing all interventions included in all examined With-the-project scenarios, by the time of their completion
 - 2040: Mid-term, in case significant network changes take place (to be discussed with the Beneficiary)
 - 2052: Long-term, to assess the impacts of all transport investments in the long run



TECHNICAL PART





Progress up to date

Progress on the activities presented during the 2nd Progress Meeting

(October 2020 - November 2020)

1.	Track geometry-alignment	<ul style="list-style-type: none">• Preparation of the proposed typical cross sections (e.g. potential widening of the existing typical cross section, accommodate future electrification poles, implementation of min required dimensions for safety and maintenance reasons etc)• Adjustments on the vertical alignment considering the improved typical cross section• Preparation of development scenarios. V completed.
2.	Tuzi station	<ul style="list-style-type: none">• Preparation of a draft masterplan• Propose suitable technical solutions to meet TSI and PRM - TSI requirements (regulation for persons with reduce mobility) V completed.
3.	Geology/Geotechnical	<ul style="list-style-type: none">• Preparation of a geology map.• Identification of potential geotechnical risks.• Rockfalls/Landslides/Settlements identification of the route (if any).• Examination of protection measures (protection of cut slopes, embankments slopes etc.). V completed.



Progress up to date

Progress on the activities presented during the 2nd Progress Meeting

(October 2020 - November 2020)

4.	Structures – Bridges/Tunnels	<ul style="list-style-type: none">Detailed inspection on-site of the major bridges and tunnels. Photographical documentation, identification and drafting on sketches/drawings of the existing maintenance problems/damages/ structural and functional issues, checking of existing dimensions and loads in comparison to the original design etc.Initial estimation of costs, based on the presented development scenariosPreparation of the first draft of drawings of the major structures, showing the as-built situation in typical cross sections and longitudinal sections, combined with the identified problems and proposed interventions. V completed.
5.	Signaling - Telecom	<ul style="list-style-type: none">Preparation of development scenarios document for Signaling and for Telecommunications (business as usual, limited rehabilitation and full modernization) V completed.
6.	Description of development analysis report (interim report)	<ul style="list-style-type: none">Development of the draft description of development analysis report . <u>Under Final review</u>



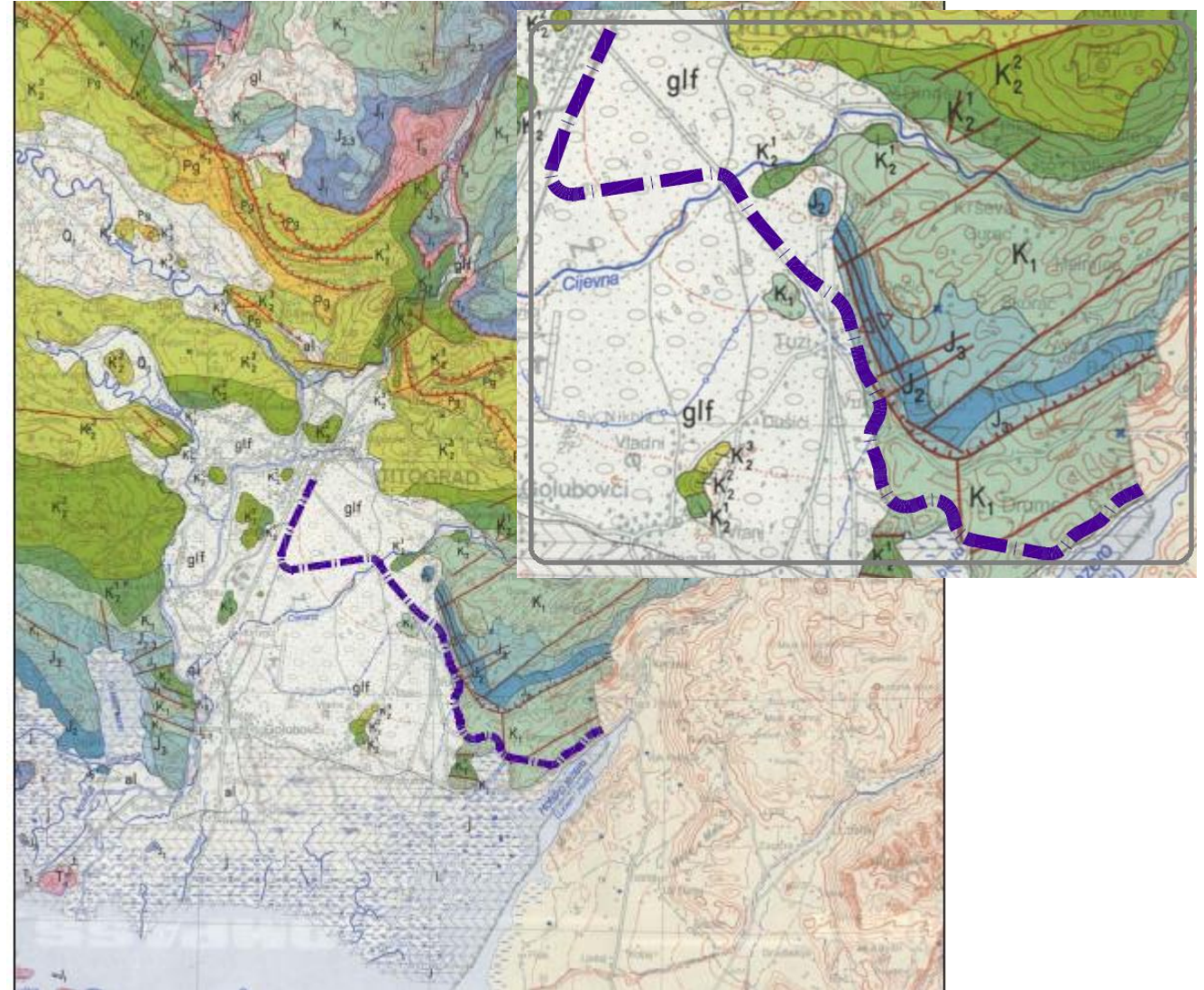
Progress up to date



Site visits

Geology field surveys

- Were performed to examine and assess the geological and geotechnical conditions along the railway line.
- Geological map of the wider area 1:200000 was prepared





Progress up to date

➤ Site visits

Geology field surveys

- The slopes and fills are generally stable.
- Identify the problematic sections
 - a. Near the Tuzi railway station, from Ch. 13+470 to Ch. 13+620
 - b. Cut slopes from Ch. 17+530 to 17+880





Progress up to date

➤ Site visits

Geology field surveys

- The slopes and fills are generally stable.
- Identify the problematic sections
 - c. Embankment with unstable slopes from Ch. 19+000 to 19+400 Vitoja/Druma
 - d. Cut slopes from Ch. 24+050 to 24+600

➤ Interventions on these specific areas are proposed





Progress up to date

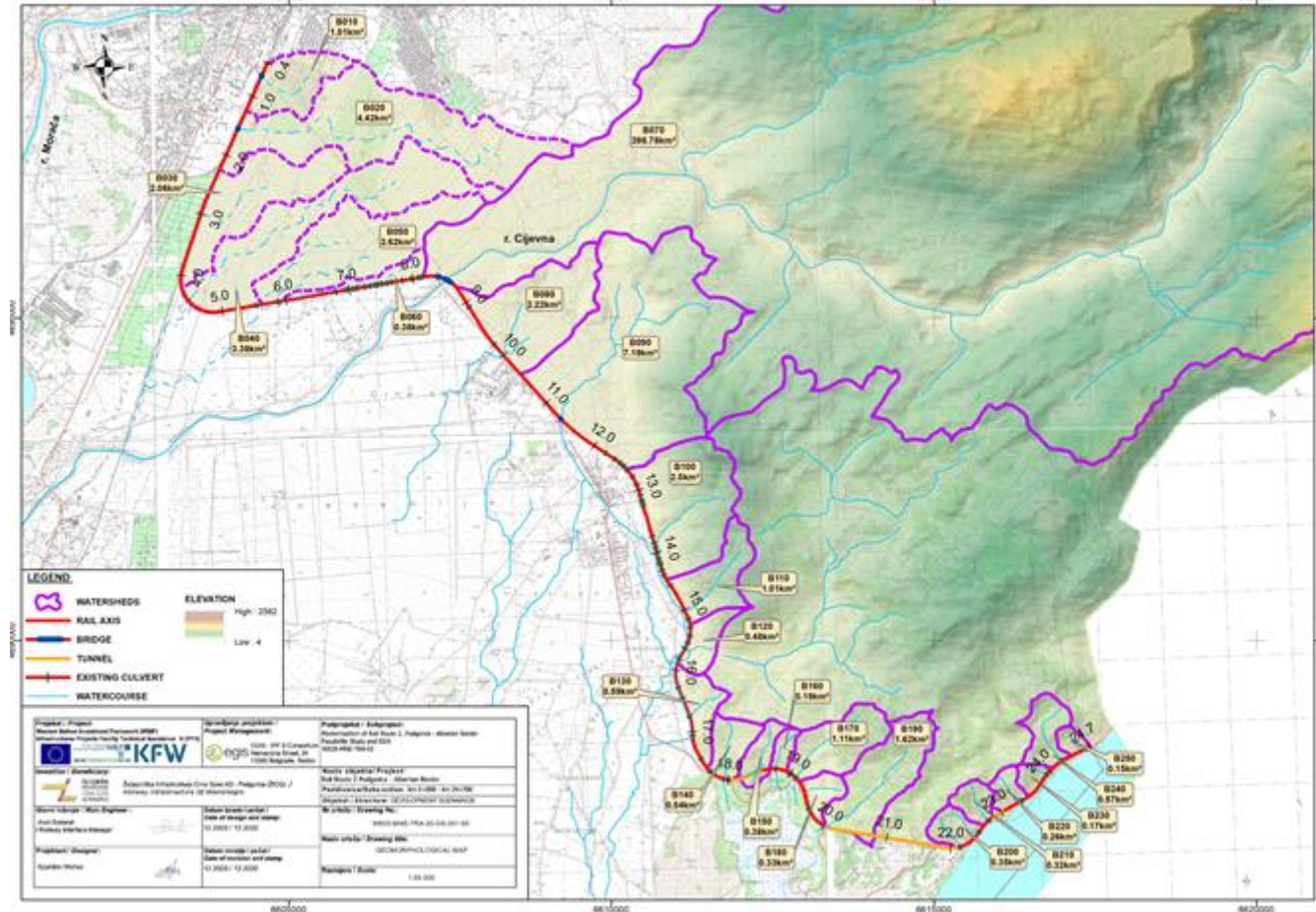
➤ Assessment of Hydrological Conditions

Identify Watercourses and catchments

The main watercourse crossing the railway line

- river Cijevna
- river Rujela

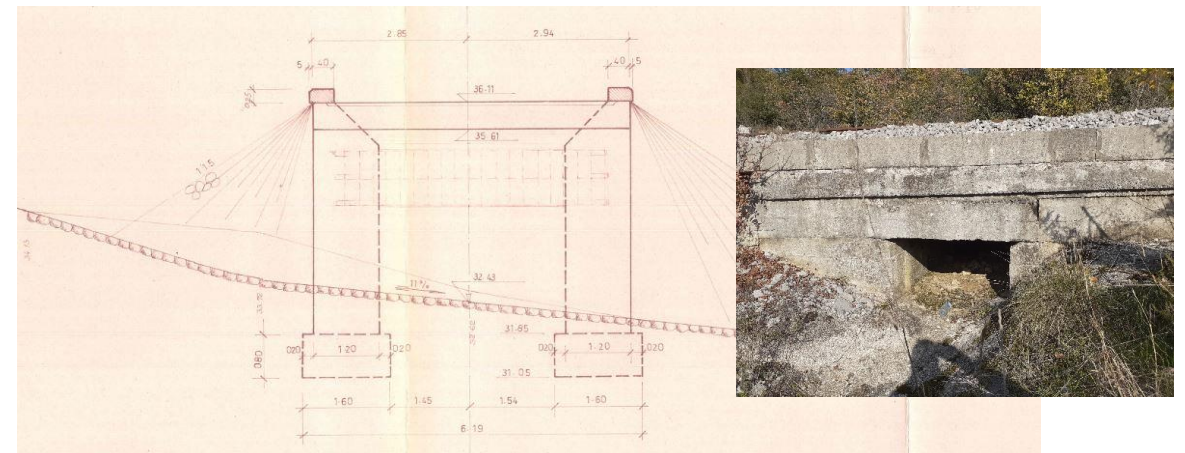
The formed catchments along the alignment and their corresponding watercourses are shown on the geomorphological map and the slope map





Progress up to date

- **Assessment of Hydrological Conditions**
 - Calculations of the peak flow rates for a return period of 50 years and for 100 years period have been done in order to account possible increased peak flows due to climate change
- Assessment of the Existing drainage structures
 - pipe and culverts (primary culverts and others secondary), drainage ditches on the side

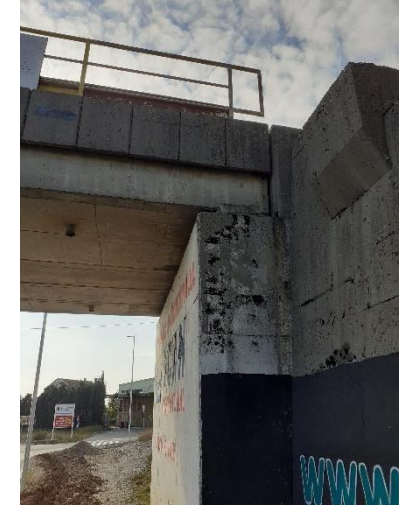




Progress up to date

➤ Site visits - Structures

- Detailed inspection on-site of the major bridges and tunnels. Identification and drafting on sketches/drawings of the existing maintenance problems/damages/ structural and functional issues, checking of existing dimensions and loads in comparison to the original design etc.
- Visual inspection of bridge and tunnels

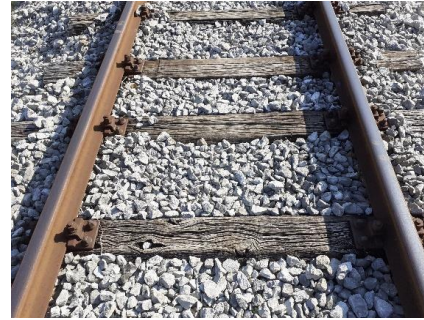




Progress up to date

➤ Site visits - Railway Track

- Detailed inspection on-site of the railway track open route bridges and tunnels. Assessment of the current condition





Progress up to date

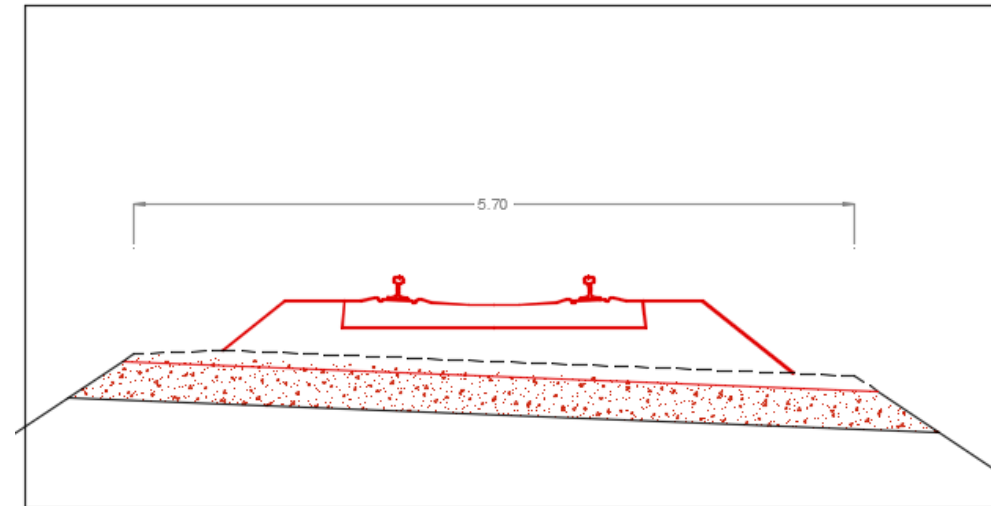
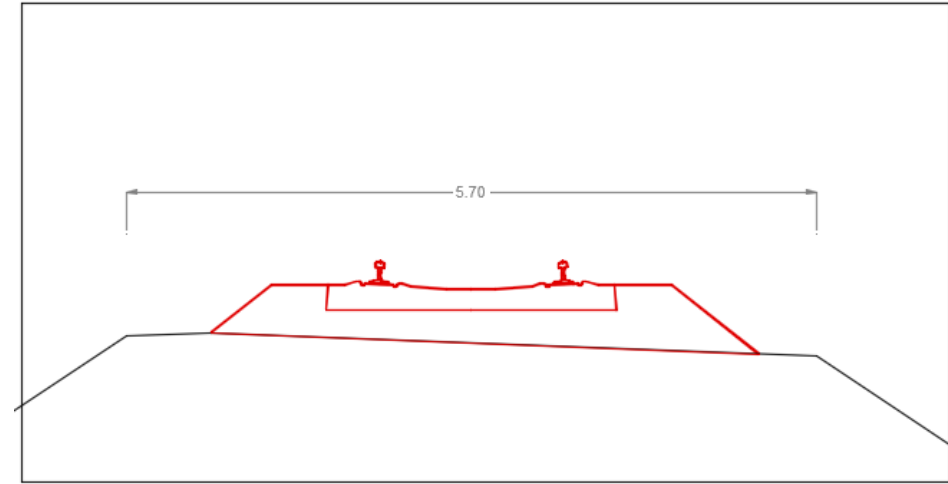
➤ Main Scenarios from the Permanent way point of view

Business as usual

- New ballast layer, wooden sleepers 2,4 m wide, fastenings, 60E1 type rails – Typical cross section based on the National standards
- Alternative – instead wooden – to have concrete sleepers

Limited rehabilitation

- New ballast layer, Concrete sleepers 2,4 m wide, fastenings, 60E1 type rails – Typical cross section based on international standards.
- New subgrade layer





Progress up to date

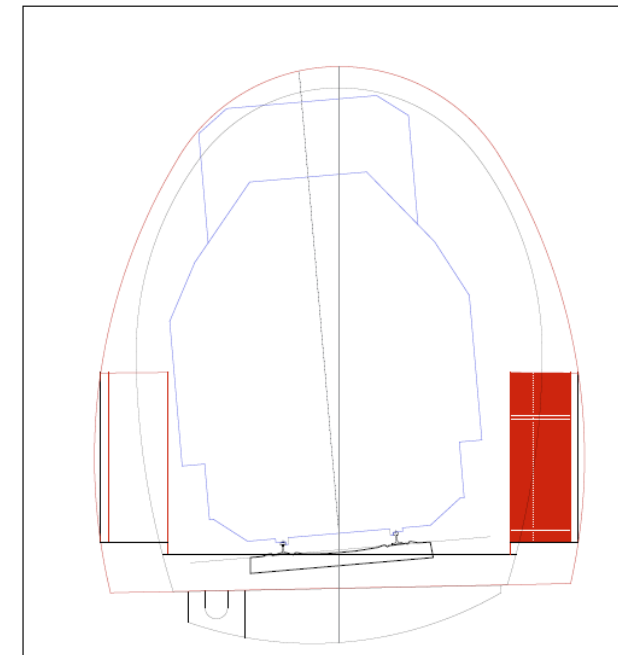
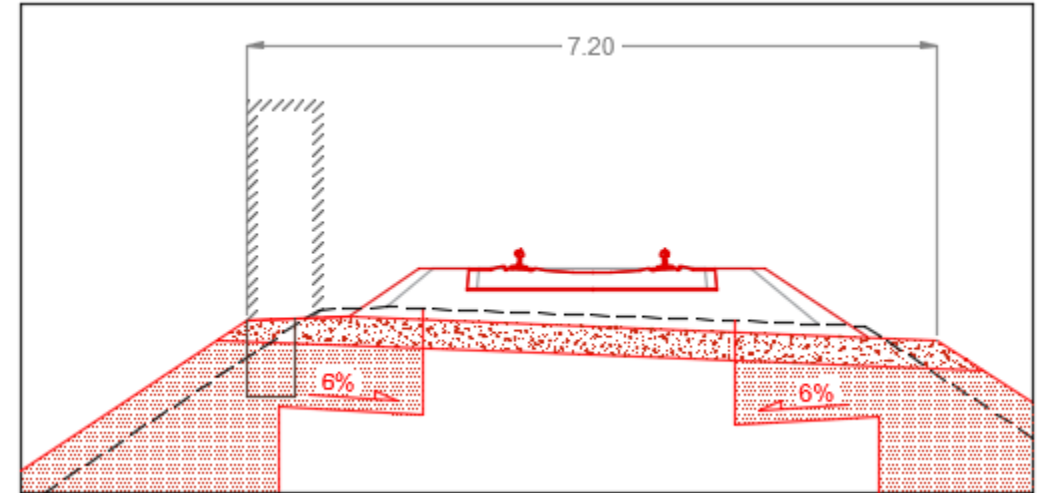
➤ Permanent way - Scenarios

Full modernisation

- Widening of the Typical cross section, following International standards .
- New ballast layer, concrete sleepers 2,6 m wide, fastenings, 60E1 type rails
- New subgrade layer
- Extension on the embankments (one side or bilateral)

Alt.1: widening of the Tunnel profile in all tunnels in specific sections

Alt.2: widening of the Tunnel profile (tunnel 1 and 3)
new construction of the tunnel 2

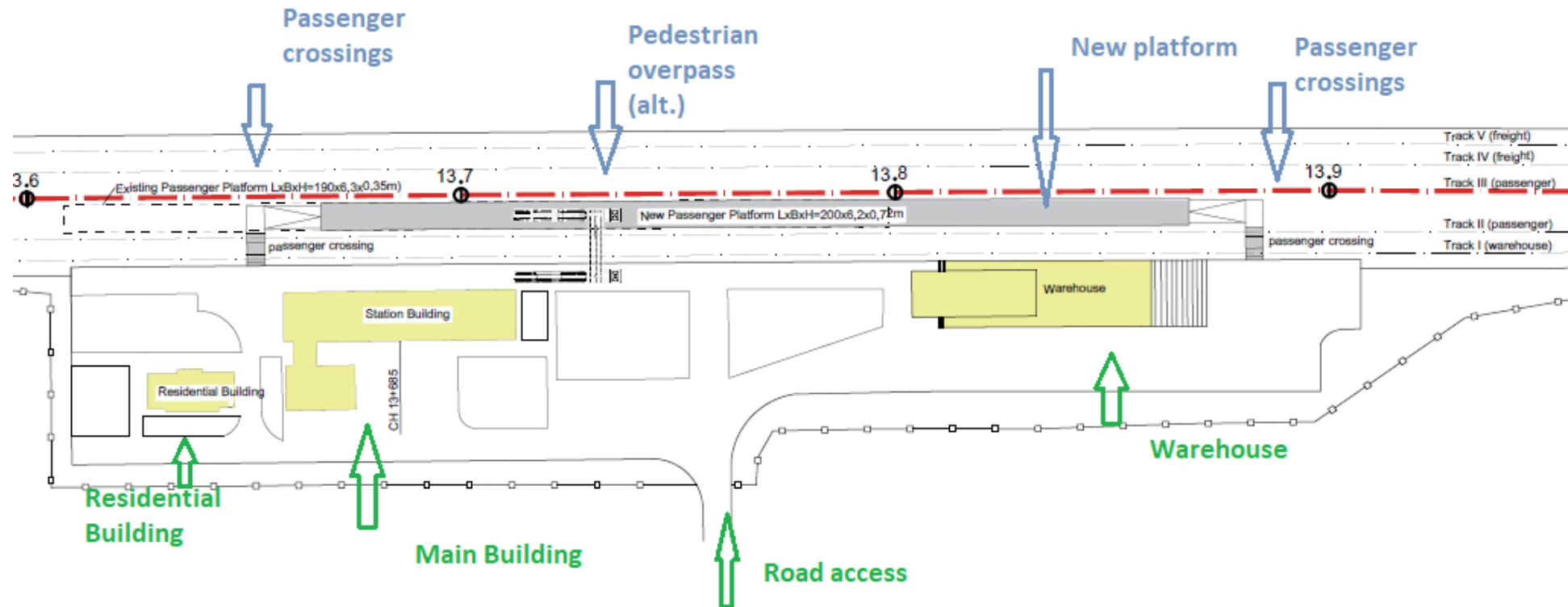




Progress up to date

➤ Tuzi Station

- Track layout ,
- Platform
- § 4.2.9.2 TSI
- Passenger crossings (level crossings or pedestrian overpass)
- Assessment of the condition of the buildings
- large surrounding area, which is owned by ŽICG

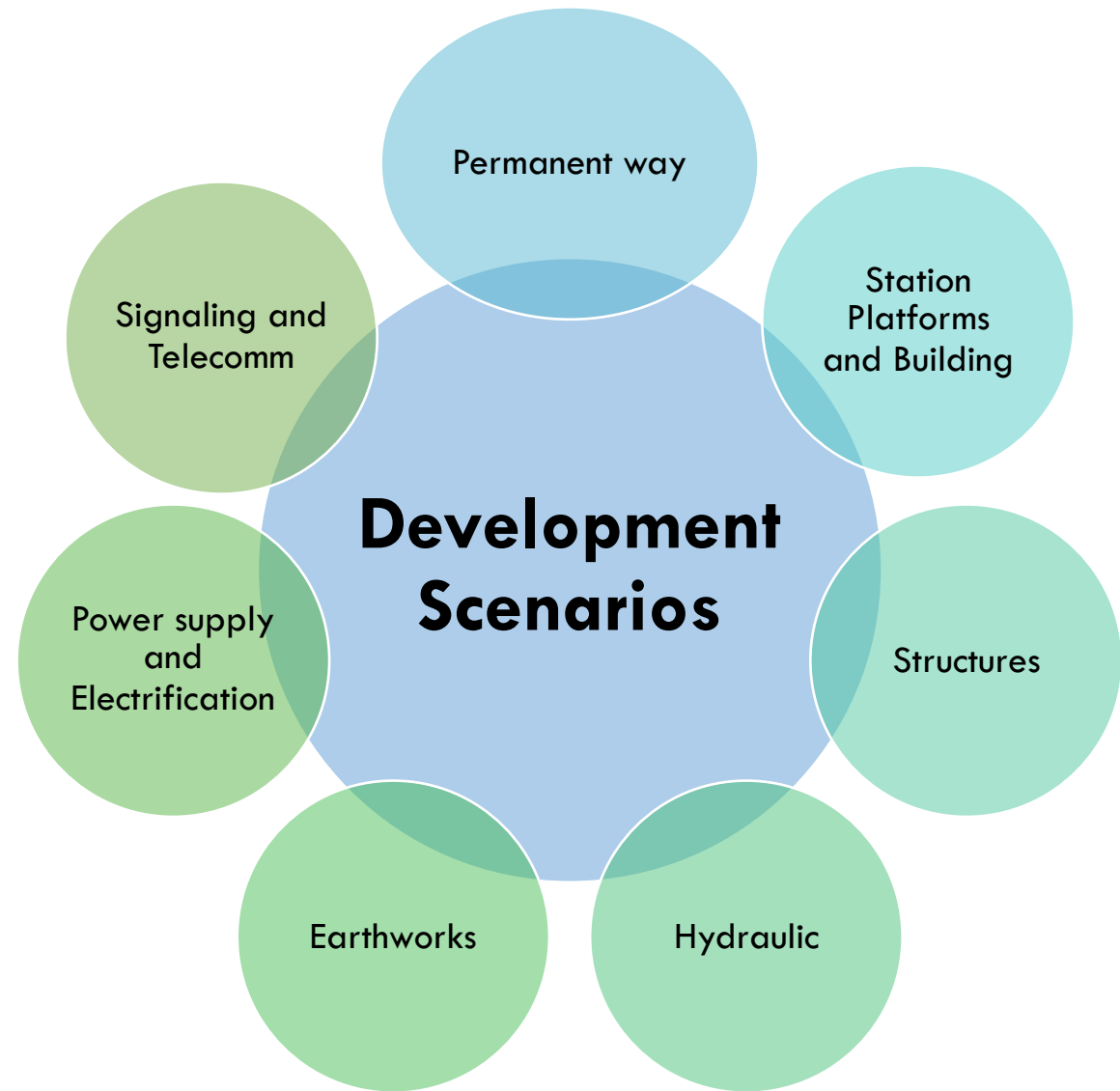




Progress up to date

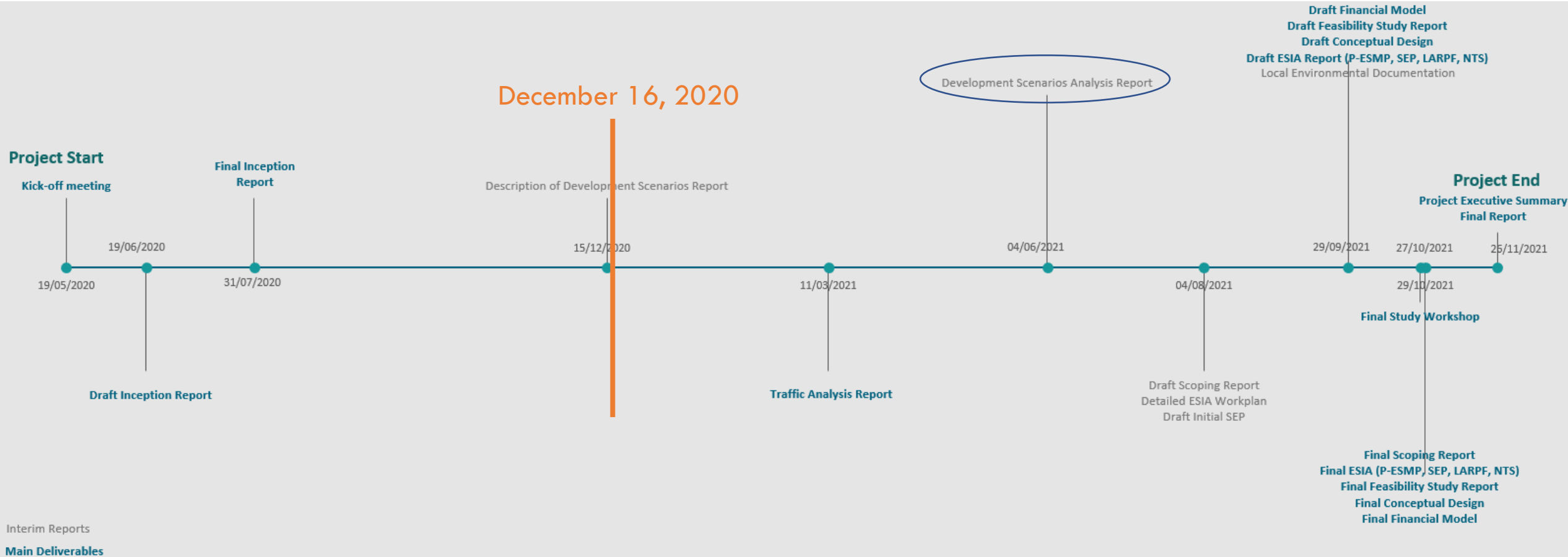
- **Development scenarios**
- **Preparation of the Interim Report**

- **Identification and Description of Development Scenarios**
- **Based on the main scenarios provided from the Permanent way all disciplines elaborated on that.**
 - ✓ **Business as usual**
 - ✓ **Limited Rehabilitation**
 - ✓ **Full modernisation**
- **Cost Estimation for per scenario**





PROJECT TIMELINE





RISKS ASSESSMENT

COVID-19 restrictions

Delays in the elaboration of traffic surveys

Delays in the elaboration of necessary site visits,
visual inspections

Constraints on necessary consultation processes
(ESIA)

Impact on the overall timeplan

Mitigation measures

Strengthening of the team with local experts (to
liaise with the local authorities and key
stakeholders).

Technology usage to communicate

Coordinate with the client and beneficiary to adjust
the workplan (if and where needed)



NEXT STEPS

- Working meeting with the Beneficiary on the identified Development Scenarios
- Traffic Surveys elaboration
- Calibration / Validation of the Base Year Transport Model
- Definition of evaluation parameters for the assessment of the alternative Development Scenarios
- Estimation of growth factors and transport demand – traffic forecasts



Thank you for your attention

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