Financed under a specific grant agreement no 2018/402-850 from EU IPA II Multi-Beneficiary Programme for Albania, Bosnia and Herzegovina, North Macedonia, Kosovo*, Montenegro and Serbia

Western Balkans Investment Framework Infrastructure Project Facility Technical Assistance 8 (IPF 8)

TA2018148R0 IPA

Mediterranean Corridor, Bosnia and Herzegovina - Croatia CVc Road Interconnection, Subsection: Konjic (Ovcari) - Prenj Tunnel - Mostar North

Gap Analysis & ESIA Disclosure Pack

WB20-BiH-TRA-02 Component 1

Volume 1: Environmental and Social Impact Assessment Report

Chapter 14 Landscape and Visual Amenity

December 2025

COWI | IPF

Western Balkans Investment Framework (WBIF)

Infrastructure Project Facility Technical Assistance 8 (IPF 8)

Infrastructures: Energy, Environment, Social, Transport and Digital Economy

TA2018148 R0 IPA

Volume 1: Environmental and Social Impact Assessment Report

Chapter 14 Landscape and Visual Amenity

December 2025

The Infrastructure Project Facility (IPF) is a technical assistance instrument of the Western Balkans Investment Framework (WBIF) which is a joint initiative of the European Union, International Financial Institutions, bilateral donors and the governments of the Western Balkans which supports socio-economic development and EU accession across the Western Balkans through the provision of finance and technical assistance for strategic infrastructure investments. This technical assistance operation is financed with EU funds.

PROJECT NO.	DOCUMENT NO.
WB20-BiH-TRA-02	

VERSION	DATE OF ISSUE	DESCRIPTION	PREPARED	CHECKED	APPROVED
1	25/09/2021	ESIA Report	Team of experts	Irem Silajdžić Konstantin Siderovski	Richard Thadani
2	21/11/2022	ESIA Report – Chapter 14 Landscape	Team of experts	Irem Silajdžić	Richard Thadani
3	03/03/2023	ESIA Report – Chapter 14 Landscape	Team of experts	Irem Silajdžić	Richard Thadani
4	06/01/2025	ESIA Report – Chapter 14 Landscape	Team of experts	Irem Silajdžić	Richard Thadani
5	01/08/2025	ESIA Report – Chapter 14 Landscape and Visual Amenity	Team of experts	Irem Silajdžić	Richard Thadani
6	31/12/2025	ESIA Report – Chapter 14 Landscape and Visual Amenity	Team of experts	Irem Silajdžić	Richard Thadani

CONTENTS

List of figures

List of tables

14 Landscape

14.1 Introduction

This chapter reports the findings of the assessment of the potential effects of the Project in relation to landscape character and visual amenity during both the construction and operational phases. For both phases, source and significance of potential effects are identified, and the measures that will be employed to minimise these described.

A desk-based review was undertaken in order to determine existing landscape features, landscape character, and potential visual receptors. The baseline data has been obtained through a combination of site visits during 2020, 2021 and 2024 and desk-based reviews. The photographs in this Chapter were chosen as being representative of key visual receptors in the study area. Photomontages were created in order to support the overall impact assessment. The photographs were taken from publicly accessible locations. The assessment presents a worst-case scenario, particularly concerning viewpoints and visual impact. Many residents will not have a view similar to those from designated viewpoints due to factors such as the orientation of objects, their position within the settlement, other objects in the foreground, and local vegetation.

This Chapter considers the likely effects of the Project upon the two separate (but linked) topics of landscape character and visual amenity. The key stages when carrying out assessments on the effects of landscape character and visual amenity are following:

- Assessment of the existing situation (baseline), analysing the existing landscape and visual amenity context of the receiving environment and human receptors,
- A review of local landscape character, including the existing site and features on the site,
- A review of surrounding potential visual receptors, located within the Project area, including identification of representative viewpoint locations,
- Identify potential impacts associated with the Project, relevant to landscape character and visual amenity during the construction and operational phases of the Project, to determine the potential for significant effect,
- Identify practicable mitigation measures, where the assessment identifies potentially significant effects, and
- Describe residual effects i.e., those effects upon the receiving environment that cannot be offset by mitigation measures.

This Chapter should be read in conjunction with the following Chapters:

Chapter 1 Introduction
Chapter 2 About the Project
Chapter 3 Detailed Project description
Chapter 4 Policy, legislative and institutional context
Chapter 5 Assessment methodology
Chapter 6 Biodiversity

Chapter 17 Cumulative impacts
Chapter 18 Residual impacts
Chapter 19 ESMP.

14.2 Baseline Conditions

All natural and anthropogenic components of the Project area act as mosaics and intertwine their features, projecting an overall image seen as landscape. Analysis separated these landscape components with the aim of easier understanding of their characteristics and effects on the surrounding area, but in the field, they do not have individual character and appear as a joint system.

Each natural landscape contains three main components: terrain, water, and vegetation. The cultural landscape, in addition to the natural components, contains anthropogenic interventions in an area, such as agricultural activities, infrastructure, and the formation of settlements and facilities.

Landscape elements along the route are characterised by:

- natural systems, with an accent on karst morphology and forest ecosystems, and
- systems created by anthropogenic influence (extensive agricultural area, local settlements, as well as existing infrastructure).

14.2.1 Natural Components of the Landscape

The natural component of the landscape along the route is characterised by the terrain structure with hilly, hilly-mountainous, and mountainous zones.

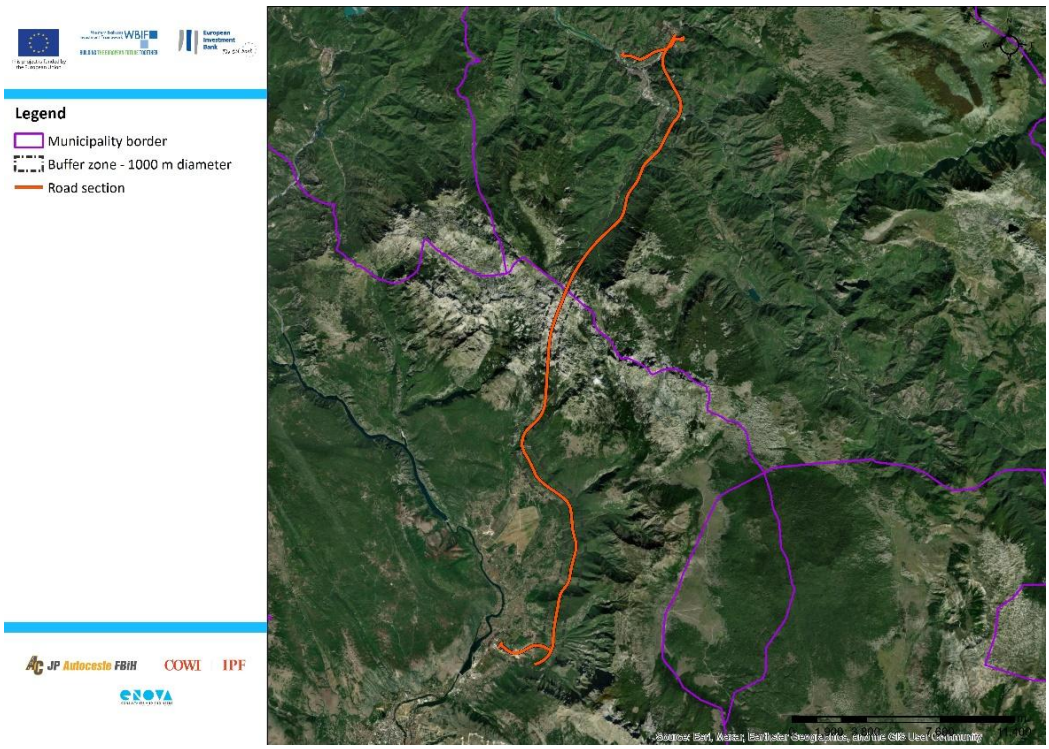

Figure 14-1: Terrain structured with hilly, hilly-mountainous, and mountainous zones

About 40% of the area belongs to the hilly-mountainous terrain over 500 m asl (e.g., Prenj, Cvrsnica, Cabulja mountains) and only about one-third of the terrain is located at the altitudes from 200 to 500 m asl. The rest is slightly hilly and flat terrain. Parts of the route outside the tunnels, especially in the canyon area and in the areas covered in screes, are characterised by landslides. The prominent elements of the landscape are in dynamic equilibrium with the climatic characteristics of the Project area and significantly depend on these characteristics.

The most dominant features of natural elements of the landscape are the karst morphology and vegetation cover. The karst-erosion terrain is dominant in the area of Prenj Mountain and occupies about 40% of the Project area. It is built of carbonate rocks, limestone, and dolomite of the Triassic, Jurassic, and Cretaceous ages. Karst formations are very specific - the slopes are very steep (gorge and canyon type).

Figure 14-2: Northern slopes of the Prenj Mountain

Existing natural vegetation systems are represented as forest, meadow, and pasture systems. Significant differences in geomorphological, geological, pedological, and climatic characteristics in the different parts of Project area resulted in formation of forest ecosystems with a high degree of diversity. Various types of forests can be seen, from thermophilic sub-Mediterranean forests, high deciduous forests, coniferous and mixed forests, to extremely degraded forests and thickets with reduced productivity. The forest areas close to settlements have lost much of their natural condition as a result of excessive logging and overgrazing by livestock, especially goats. Constant use of these areas for livestock feeding affected the natural regeneration of an already modest vegetation cover. An important feature of this system is the susceptibility to fires and self-ignition during the hot summer months, and this has specific impacts on the landscape characteristics. Sustainable management measures are continuously oriented towards the regeneration and preventive action against damage caused by fires and/or overgrowth of pathogens and harmful insects. The agricultural area is characterised by an extensive way of cultivation, primarily due to the karst character of the area. Natural ecosystems are adapted to vineyards or family farms for food production.

The morphology of the wider area of the route is typical for mountainous areas in the sub-Mediterranean scope. The area around the route is mostly uninhabited and it is characterised by hilly, hilly-mountainous, and mountainous zones, which have a special ecological value. Such natural conditions represent one of the most important characteristics in the observed area.

Figure 14-3: Landscape at the beginning of the route

According to scientific criteria, Prenj Mountain represents an exceptional natural value and belongs to the group of natural rarities and localities that are of special interest. Geomorphological characteristics, glacial phenomena, hydrogeological specifics, hydrological specifics, represented flora and fauna, with a number of endemic species, are part of the natural values that rank this area high on the scale of natural and visual heritage.

Figure 14-4: Landscape near the Mostar North Interchange

14.2.2 Cultural Components of the Landscape

The motorway passes through a few settlements in Konjic and Mostar North area. These settlements are scattered, placed between forest areas, and have rural character, with a smaller number of inhabitants who are usually engaged in agriculture and animal husbandry.

The section starts in Konjic, 650 m before Intersection in Ovcari. Ovcari is a rural settlement with 488 inhabitants, according to Census 2013, characterised by agriculture activities and animal husbandry.

Figure 14-5: Settlement Ovcari (source: Google Earth)

After passing Ovcari, the road section crosses the river Tresanica at the northern entrance to the urban area of Konjic and then enters tunnels T1 and T2. The road then passes through the settlement of Bijela, known for small agriculture activities, animal husbandry and occasional touristic activities. The settlement Bijela has under 200 inhabitants.

Figure 14-6: Settlement Bijela

The route continues along the valley of the river Bijela and it ascends towards the Prenj tunnel. The route then enters the tunnel Prenj of approx. 10 km. After exiting the tunnel Prenj, the route descends towards Mostar and the area with a high forest cover, followed by the settlement of Potoci. The route passes through the tunnels T5 and T6.

Figure 14-7: Landscape in Podgorani settlement

Figure 14-8: Settlement Podgorani

The section ends 500 m before the Mostar North Interchange in Kutilivac, a rural settlement with a total of 1,624 inhabitants as per Census 2013. The Project area of Kutilivac is characterised by small agriculture activities, where the agricultural land is mostly altered to vineyards.

Figure 14-9: Settlement Kutilivac at the end of the motorway route

14.3 Visual Amenity

14.3.1 Mapping Visibility

To understand the visual connection with the surrounding area and identify potential visual receptors, a Zone of Theoretical Visibility (ZTV) model was created. This approach was chosen due to the scale of the Project and its placement within

complex topography.

The Zone of Theoretical Visibility is a computer-generated model created using QGIS 3.40.0. 'Bare-earth' model, shown in Figure 14-10 and Figure 14-11. below, represents a 'worst-case scenario', based solely on topography and not taking vegetation or artificial obstacles (such as buildings, fences, or barriers) into account. The model was created based on a Digital Elevation Model (DEM) with a 30 m interval resolution.

A set of target points was identified along both sides of the proposed road at 20 m intervals. The target points were set approximately 4 m above ground level where alignment is planned, and ranges of 20-100 m height, where bridges are planned. The observer's sightline was set to 1.7 m. Tunnel sections were excluded from the analysis as they will not be visible, and their construction is not expected to have any impact on the surrounding environment. The resulting gradual model presents the zone of theoretical visibility - locations that have visual connections with the alignment. The dark blue areas represent the locations from which the highest number of study points along the motorway are theoretically visible.

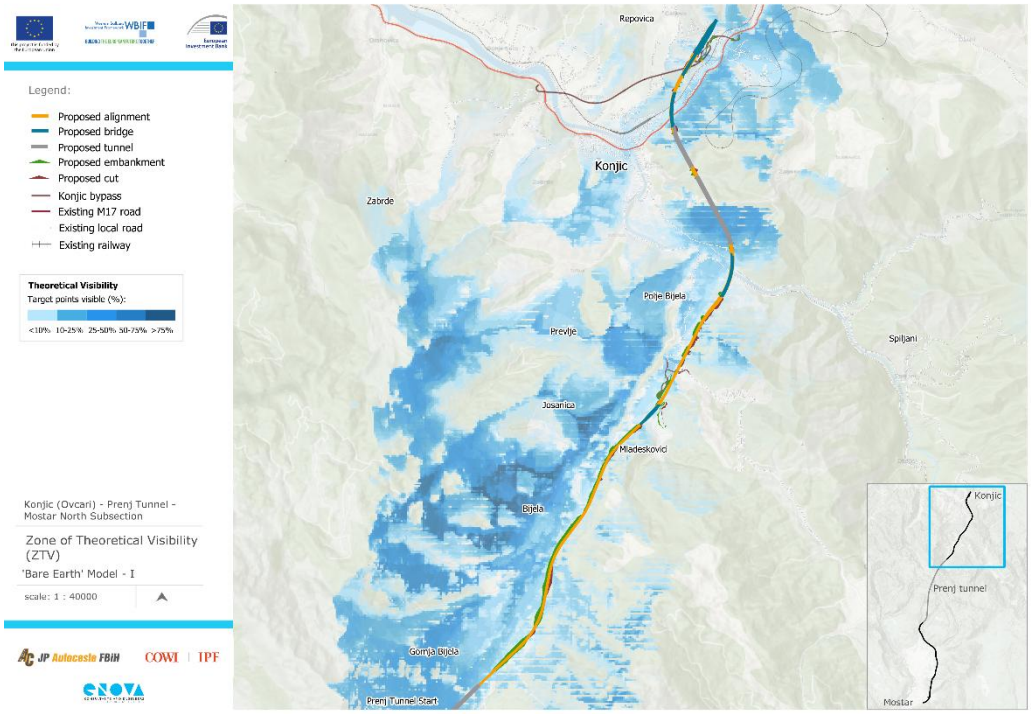

Figure 14-10: Zone of Theoretical Visibility, north of the Prenj mountain

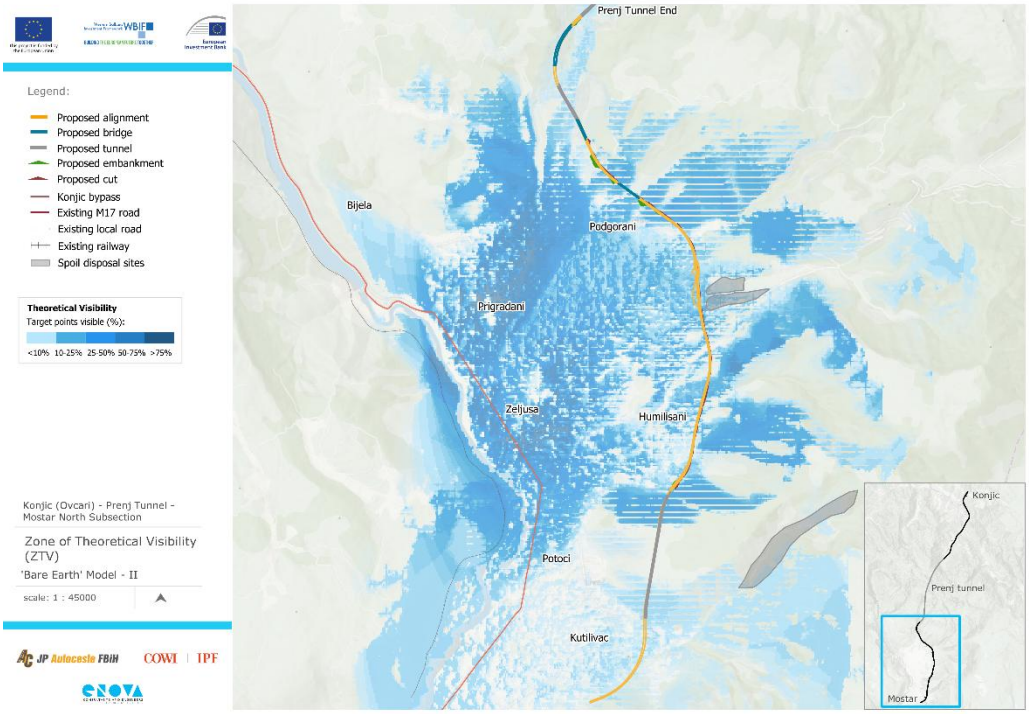

Figure 14-11: Zone of Theoretical Visibility, south of the Prenj mountain

It is important to note that just because visibility in an area is low (e.g., less than 25% of the total study points visible), it does not necessarily imply that the visual impact will be low. The visible target points at these areas might represent features, such as a bridge, which could be more visually intrusive than an open alignment. The ZTV was developed to cover a radius of up to 5 km, as this is considered a reasonable distance for any significant visual impacts of a motorway. However, upon reviewing the ZTV map, it is clear that the surrounding topography will restrict visibility on the eastern sides of the alignment, due to the presence of hills obstructing the view.

The ZTV model indicates that a significant portion of the motorway will be visible from the west, both in the area before the Prenj Tunnel and after its exit. However, during the site visit, it was observed that the Project in certain areas is situated in an area of significant woodland (with trees higher than five meters). It is reasonable to assume that woodland screening will further reduce the Project's visibility. To illustrate this, an additional ZTV map has been developed showing the woodland cover in the study area (based on the EU Corine Land Cover 2018), as shown in the Figure *14-12* and Figure 14-13 below.

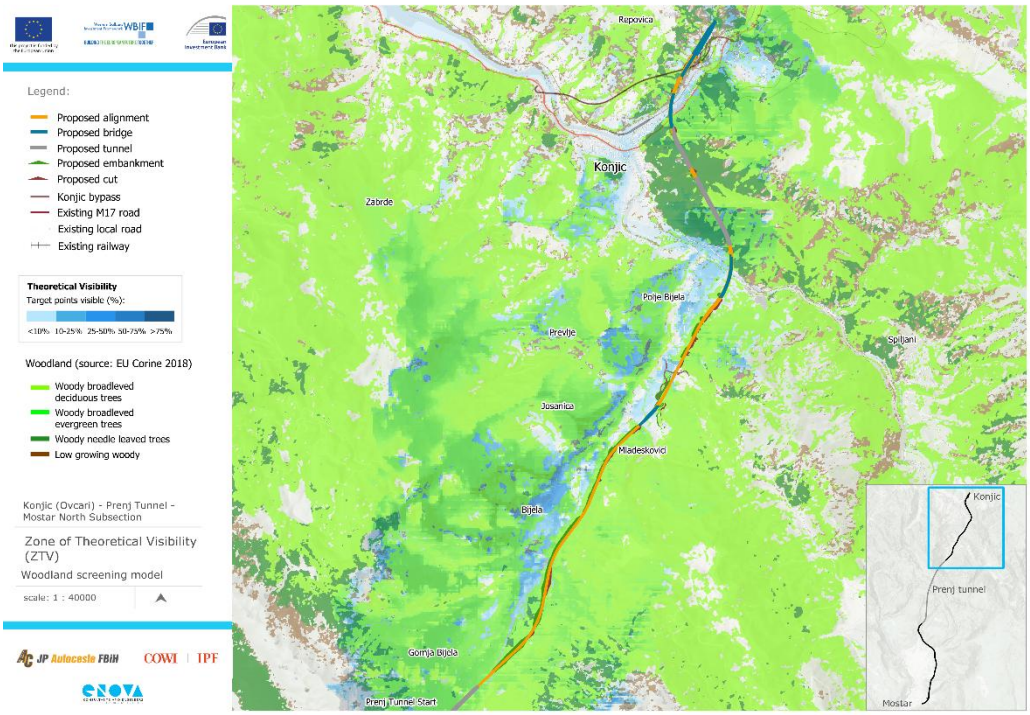

Figure 14-12*: ZTV – Woodland screening model – north of the Prenj mountain*

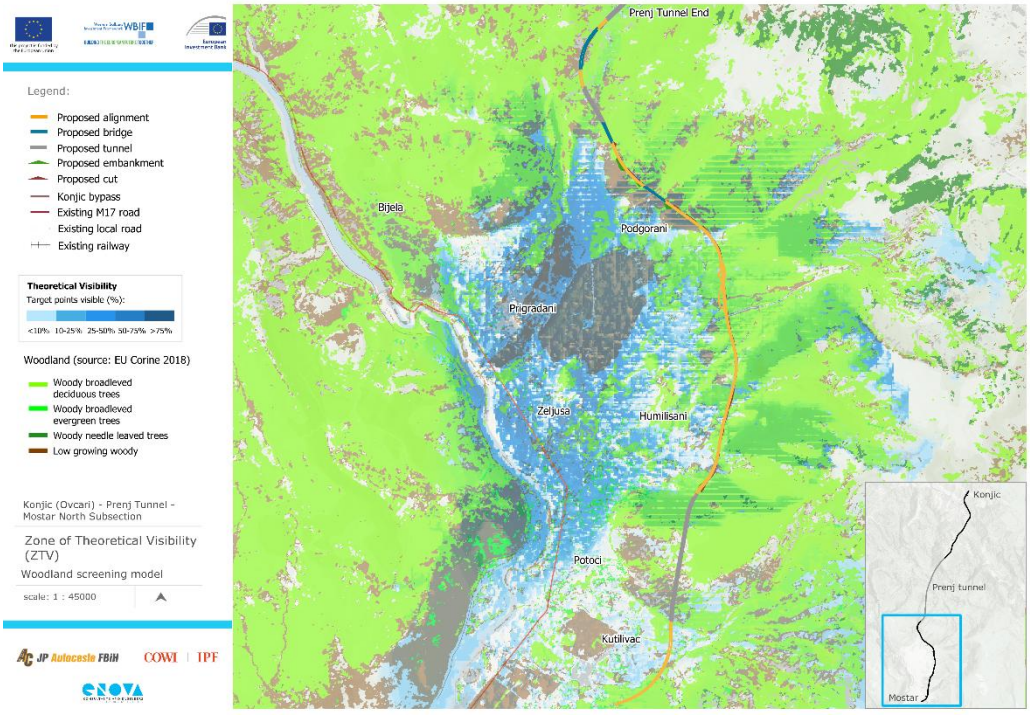

Figure 14-13: ZTV – Woodland screening model – south of the Prenj mountain

14.3.2 Visual Receptors

After creating the ZTV maps, the visual receptors were identified and confirmed during the site visit. Visual receptors are individuals within the area who will be affected by changes in views and visual amenity. They include:

- **Residents**: As per ZTV map, residents in settlements of Polje Bijela, Gornje Polje, Bijela, Josanica, Mladeskovici, Podgorani, Zeljusa, Humilisani will have partial views of the new project development. Residents in these settlements will be the most susceptible to the new development. Generally, residents are considered the most sensitive receptors, particularly those whose residential properties directly face the motorway.
  At the beginning of the subsections, residents in Ovcari will have a clear view of the viaducts that mark the start of this section, along with the toll booths and the connection point. This view will particularly affect residents in the part of Ovcari located opposite the M17 road. Moving southward, the route passes through several tunnels before reaching the Polje Bijela settlement.
  Residents in Gornje Polje and part of Polje Bijela settlement around Neretva river will have short-distance view of the bridge M3, that passes over Neretva. It will appear as large structure in the space, considering the surrounding residential homes.
  Through the Bijela valley and the settlements of Polje Bijela, Josanica, and Mladeskovici, the route appears as a linear element on the right side, when looking in the direction of the river's flow. A field visit revealed that, although the embankment is large and long, the terrain's configuration helps to soften overall impression. These settlements are situated on occasional small hills following the winding road. Due to these frequent small inclines, declines, and curves, as well as dense vegetation, the route only occasionally appears in short-distance views. The residential objects around the bridge M4 are located in a relatively flat valley and will have short-distance view towards the bridge, as shown in **Error! Reference source not found.**.
  The residents of the settlements located south of the Prenj tunnel will also see of the alignment, especially those in Podgorani and Humilisani, as the motorway passes above these areas. Both settlements are on a gentle slope facing southwest, towards the Neretva River and the M17 road. Taking this into account, along with the vegetation in the area, particularly in Humilisani, the views of the alignment will be localised and differ for each individual residential property. Residents of Podgorani will observe the alignment as a linear feature on the hill behind their settlement, whereas those in Humilisani will only have partial visibility of the alignment due to the dense forest in the vicinity.
  For residents in Prigradani, Zeljusa and Potoci the Project may occasionally appear in the distance, as a linear feature while looking towards the northeast.
- **Travellers using the M17 road**: The M17 is a major road in Bosnia and Herzegovina that connects the northern and southern boundaries of the country. As it enters the Konjic, the road will pass under the new motorway bridge M2, and the travellers will have short-distance view of the bridge. From this point onward, the motorway will not be visible from the M17 road as it continues towards Prenj Mountain, while the M17 road completely bypasses Prenj Mountain and continues towards Jablanica. At the northern entrance to Mostar, the M17 road passes through Prigradani, Zeljusa and Potoci. From this section of the road, the motorway may occasionally be visible in the distance on the northeastern side, and those views are fast and transient. Considering the nature of the traveller's activity, as they are in motion, their sensitivity is regarded as negligible.

- **Hikers and tourists**: Prenj Mountain and its foothills are among the most popular hiking destinations in Bosnia and Herzegovina. From a few designated hiking trails in the lower foothills of Prenj, the motorway may be visible. These locations include Klenova Draga, roads to Rujiste and Bijele Vode. However, most of these trails are situated within dense forests, which largely obstruct the view. The nature of tourists and hikers' activity is to be in motion, and given this, as well as the fact that the trails are mostly surrounded by forests, their sensitivity is characterised as low.
- **Workers in the fields**: Workers in the vineyards operated by the Hepok company, along with those in the surrounding smaller fields in Zeljusa, will have a distant view of the Project. The Project will appear as a small linear element above the settlements, when looking towards the hills above Podgorani and Humilisani. Their sensitivity is characterised as low, considering the nature of their activities in the fields.

Error! Reference source not found. below shows the identified visual receptors.

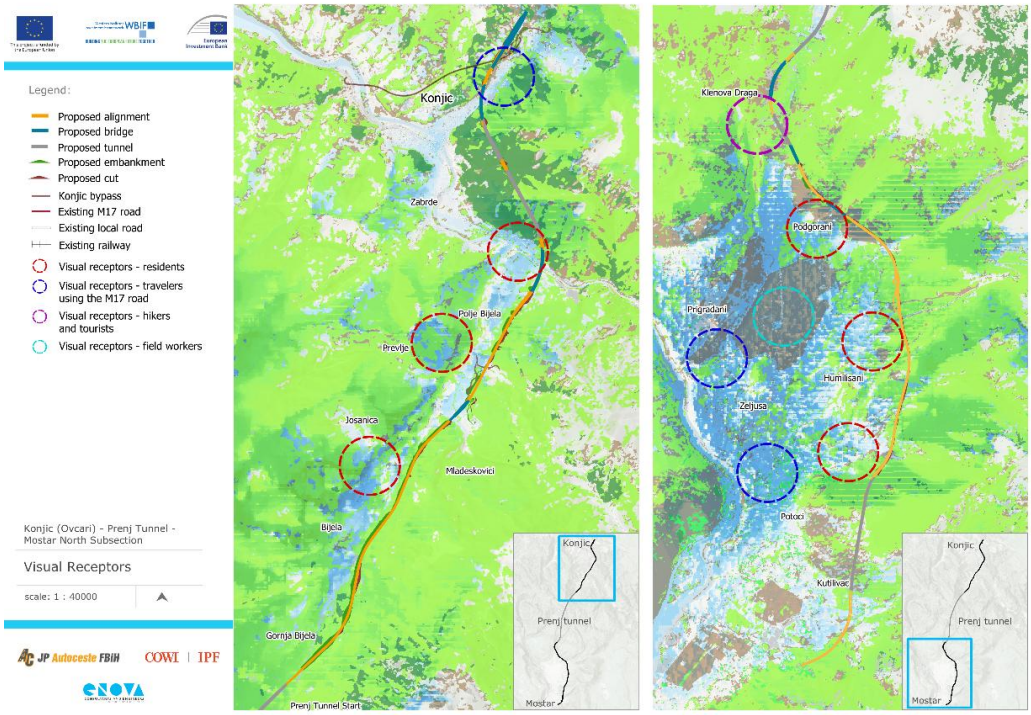

Figure 14-14: Visual Receptors

14.3.3 Viewpoints

After determining the potential visibility (ZTV) and identifying all individuals who may be impacted by the Project, the following viewpoints were selected as representative. The viewpoints were chosen based on their proximity to the Project and the nature of the Project at each location (whether it involves a high bridge, large embankment, continuous sections of open routes, or viaducts). These representative viewpoints offer a comprehensive understanding of the visual impact across different parts of the development:

- Polje Bijela settlement, the confluence of the Bijela river into the Neretva,
- Polje Bijela settlement, local road between residential objects,

> Bijela settlement, local road between residential objects,
> Klenova Draga, a road leading towards the canyon,
> Podgorani settlement, road between residential objects,
> Humilisani settlement, road through settlement, between residential objects,

Locations of these viewpoints are shown in
Figure 14-15 below. Detailed photomontages have been created to illustrate the interactions between the proposed development and visual receptors, providing a clearer understanding of how the Project will affect the surrounding environment. Photographs for all viewpoints were taken solely from publicly available locations (such as local community squares and roads).

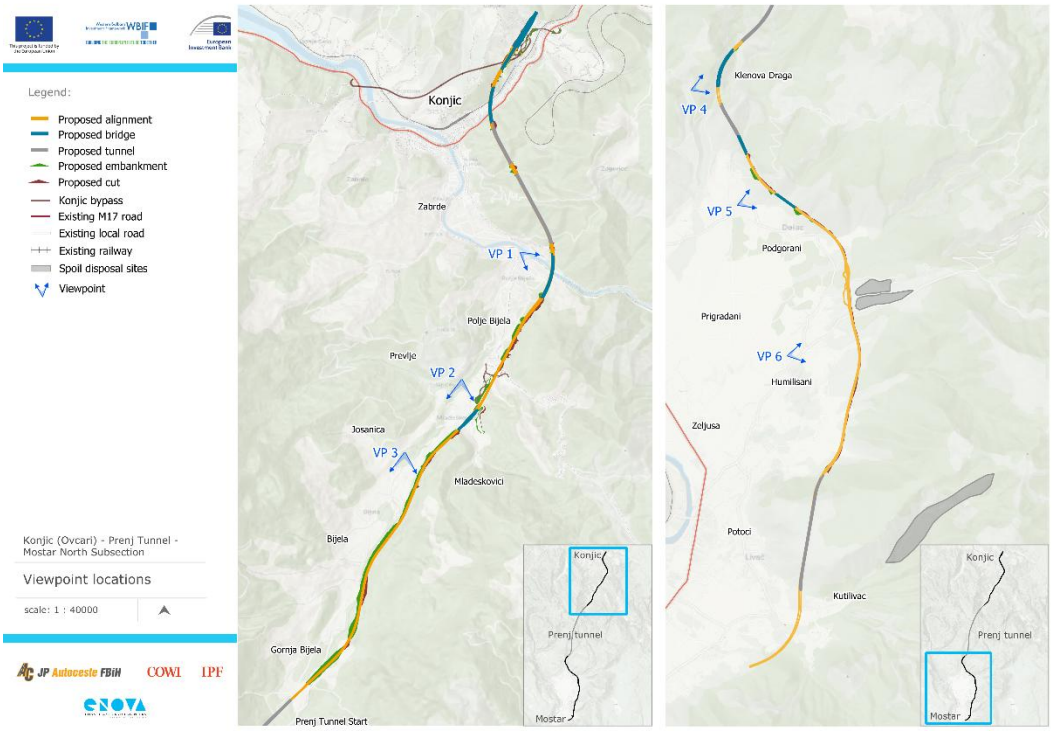

Figure 14-15: Viewpoint locations

14.3.3.1 Viewpoint 1

Figure 14-16 below shows the Viewpoint 1, located in a Bijela settlement, a place of the confluence of the Bijela river into the Neretva. The residents of Bijela and Gornje Polje, situated on opposite banks of the Neretva River, will experience a clear short-distance view of the bridge M3 as it spans across the river. The proximity of residential, commercial, and industrial properties in the area means that the bridge may be visible from various vantage points within these developments. Furthermore, the bridge's alignment, which emerges from the tunnel above Gornje Polje and stretches southward towards Prenj Mountain, will likely create a prominent visual element in the landscape. The combination of urban development and natural features, such as the river and surrounding topography, contributes to the visual impact of this section of the motorway.

Figure 14-16: Viewpoint 1

14.3.3.2 Viewpoint 2

The **Error! Reference source not found.** below shows the viewpoint 2. The settlement of Polje Bijela, extending from the M3 bridge to Prenj Mountain, follows the winding course of the Bijela River, resulting in a road network characterised by numerous curves, gradual inclines and declines, and areas with dense vegetation. These factors, along with the hilly terrain that surrounds the settlement, significantly obstruct the view of the new motorway alignment. The settlement itself is situated within a gently sloping valley, framed by hills on both sides. While the overall topography restricts visibility, occasional openings and flatter sections within the valley provide limited, unobstructed views of the new motorway for nearby residential properties. The presence of vegetation and the varied terrain further

enhance the natural screening of the motorway from this area. Viewpoint 2 presents a perspective from a local road, situated between residential properties, facing east. The M4 bridge will extend across the agricultural field, becoming a prominent feature within the landscape. While the visual connection with the surrounding environment will be maintained, since the bridge is elevated, it will alter the overall character of this peaceful micro-location.

Figure 14-17: Viewpoint 2

14.3.3.3 Viewpoint 3

The

Figure 14-8 below shows Viewpoint 3. The photograph was taken on the local road that runs south from the settlement of Polje Bijela towards the settlement of Gornja Bijela. The character of this settlement is similar to the one on the previous viewpoint, with residential buildings situated along the winding local roadThis area

will provide a short-distance view towards the Project on the eastern side, with the Project appearing as a linear feature in conjunction with the embankment. The view of the Project changes as one progresses along the road. Residential buildings are arranged irregularly along the road, following the natural terrain, which leads to significant variation in the view of the Project from different receptors. Only a few houses directly facing the motorway alignment will have an unobstructed view. The local road terminates nearby and transitions into a network of mountain gravel roads.

Figure 14-18: Viewpoint 3

14.3.3.4 Viewpoint 4

The

Figure 14-19 below illustrates Viewpoint 4, located in the Klenova Draga Canyon, situated on the southern hillside of Mount Prenj, above the Podgorani settlement. While there is no permanent watercourse within the canyon, periodic torrential flows do occur. The Klenova Draga Canyon stands out due to its unique morphological

features, notably the two large ridges that frame the view of the southern slopes of Prenj in the distance. While it does attract hikers and tourists, the number of visitors appears limited. This is likely due to the fact that most of the popular mountain trails leading to Prenj pass through the nearby Rujiste area and other more accessible foothills, offering alternative routes. The construction of a 360 meters long bridge M8 is planned between the two ridges. The bridge will disappear at the eastern side, transitioning into a tunnel, and continue towards the foothills above Podgorani and Humilisani. Most of the open route leading to the bridge remains hidden by the surrounding terrain, which makes the bridge the most visible structure within the landscape. While a bridge is generally a prominent structure in the landscape, in this case, its presence does not seem overly striking or unnatural, due to the rocky and stony backdrop that serves as its background. The bridge's visibility will likely become more pronounced for observers as they approach and enter the Klenova Draga canyon, where its scale and design will be more noticeable in relation to the surrounding terrain.

Figure 14-19: Viewpoint 4

14.3.3.5 Viewpoint 5

The
Figure 14-20 below shows Viewpoint 5, from Podgorani settlement. Podgorani is a dispersed settlement, characterised by small residential buildings primarily located on large plots. These residences align with the natural, winding road and are predominantly oriented southward, overlooking the fields. Conversely, economic and technical spaces face north, toward the Project site. Each building is likely to have some degree of visibility of the Project, depending on its orientation, surrounding vegetation, and position. The terrain gently slopes southward, so the buildings in the southern part of Podgorani sit at a lower elevation compared to those in the northern part. As a result, the northern objects, along with the vegetation, will naturally obscure some views of the Project area.

Figure 14-20: Viewpoint 5

14.3.3.6 Viewpoint 6

The
Figure 14-21 below shows Viewpoint 6, from Humilisani settlement. Humilisani is another large, dispersed settlement, but it is located on a steeper slope compared to Podgorani. Due to this, the buildings in the southwestern part of Humilisani will likely perceive the Project only as a distant linear element. Furthermore, as the local road runs northwards towards the foothills and Rujista, it passes through the settlement and is soon bordered by forest. This causes most of the views from the northern part of the settlement to be obstructed at shorter distances.

Figure 14-21: Viewpoint 6

14.4 Assessment of Impacts

The construction phase will have a temporary effect on the landscape of the Project area. A variety of visual impacts are expected to occur due to unavoidable earth and civil works, erecting of construction camps and associated facilities inside them, temporary storages of building material, presence of personnel and machinery, and formation of new structures including the spoil disposal sites.

The **construction phase** will primarily result in the following landscape and visual impacts:

- removal of the existing vegetation,
- loss of soil productivity and original morphology,
- presence of new motorway and new and widened access roads,
- presence of temporary construction facilities (e.g., construction compounds) and associated equipment,
- spoil disposal sites,
- noise, dust, and wastewater.

The visual receptors include residents of the settlements situated in the Project area, local people working in outdoor occupations (such as farmers in the vineyards) and users of nearby infrastructure. Some of the works will be executed in the close vicinity of houses. The overall sensitivity of the receptors in the construction phase is considered to be medium, considering the general acceptance of the Project by the residents who understand the overall importance of the motorway construction, and which expressed this opinion in the early stage consultation process (more details are given in the Volume 6 Stakeholder Engagement Plan which is part of the disclosure package).

The Prenj Tunnel is the longest and most demanding facility on the entire section of the road from Konjic to Mostar. The magnitude of change for the landscape at the entrance and exit portals is considered to be major in this area. The loss of woodland cover and impact on other natural systems is localised, but visually significant. Therefore, the overall effect on landscape during construction is considered to be moderate and significant.

Overall, the magnitude of changes for the visual receptors is considered to be moderate due to the public acceptance of the Project actions and the importance of the motorway construction.

The main landscape and visual impact in the **operation phase** will be associated with the permanent road construction above the ground, and the same impact analysis is applicable as in the case of the construction impacts. Project area permanently changes topographic structure and connected impact on the landscape is recognised in three forms:

- impact on the physical structure and aesthetics of the landscape – new structures in space will change the overall character of the landscape, especially in areas approaching Prenj mountain,
- the observer's experience of the landscape – landscape will be shifting from its current peaceful and quiet nature to one that may become busy and noisy in certain areas,

> lighting and signage – streetlight and motorway signage can introduce light pollution at night, affecting overall environment, especially at night.

Permanent alternation to the nature of the existing view will occur through the inclusion of prominent structures including:

> 9 viaducts,
> 2 overpasses,
> 1 underpass,
> fences,
> noise barriers.

The people living in local settlements are classified as the most sensitive receptors because of the ownership interests and the permanent exposure to negative impacts on parts of the Project area that are near settlements or individual residential buildings. Another group of receptors are future road users, but their short-term experience of the observed landscape, classifies their sensitivity to a lower level, in contrast to residents in the environment.

The construction of the road section should not significantly affect the agricultural zones as well as other natural and environmental specifics.

Important landscape values are found mainly in the area when approaching to the Prenj Tunnel and on the Prenj Mountain itself. Among other things, these areas, due to the abundance of endemic and relict species of flora, should be the subject of special concern in a sense of protection of natural resources and geomorphological specifics. The details related to their projection are given in Chapter 6 Biodiversity and Volume 4 Biodiversity Management Plan. Nevertheless, the motorway route will pass through the mountain with the tunnel so natural landscapes will not be negatively impacted.

Table 14-1: Summary of potential impacts on landscape and assessment of their significance before mitigation

Phase	Type of potential impact	Adverse/ Beneficial	Magnitude	Sensitivity	Impact evaluation	Significance (before mitigation)
Landscape						
Pre-construction	No impacts	-	-	-	**-**	**-**
Construction	Changes to the existing landscape and visual impacts due to the construction works	Adverse	Moderate	Medium	Moderate	Significant
Operation	Changes to the existing landscape and visual impacts due to the presence of permanent motorway structures	Adverse	Moderate	Negligible	Moderate	Significant

14.5 Mitigation and Enhancement Measures

14.5.1 Construction Phase

There are currently no industry standards or best practice guidance relating to landscape mitigation and management. As such the proposed mitigation measures associated with the Project have been derived from professional judgement to address potential impacts the landscape leading to significant effects in the construction phase identified in Table 14-1.

- As set out in the ESMP, a **Construction Environmental and Social Management Plan** (CESMP)[1] will be prepared by the Contractor, which will outline how the construction phase of the Project will be managed to minimise the effects on the surrounding environment. The CESMP will include the requirement for a **Land and Habitat Restoration Plan**. The Plan sets out how a development will maintain the retained landscape and existing ecology of the site through revitalisation of habitats adjacent to the motorway route. It should include plans to ensure the designed landscape fulfils its roles, including providing habitats and recreational space. The Plan contains, among other topics:
  - Overall vision for the designed landscape,
  - Management responsibilities,
  - Identification and description of landscape components, including existing and proposed vegetation,
  - Spoil disposal sites rehabilitation,
  - Erosion control,
  - Litter removal.
- Implement measures relating to the proper organisation of construction site defined in **Construction Site Organisation Plan** (CSOP). Mitigation can be achieved by keeping the construction site cleaned after the construction works, and if the machinery is parked on the route of motorway, not around it.
- Disposal of inert material on designated disposal sites and recultivation afterward.
- Recultivation with autochthonous species characteristic for the area in order to preserve gene pool and amenity. Focus should be on fast-growing species for immediate cover and slower species for long-term sustainability, especially in areas noted as being subject to significant loss.
- Implement recultivation and restoration as stipulated by **Biodiversity Management Plan** (BMP) and where possible reforest land within the Project area of influence.
- All planting will be of local provenance and in keeping with the local character.
- During the construction phase of the works, restricted hours of working will be proposed within built up areas, where the construction phase of the works is considered to impact on residential properties, avoiding the of use of machinery

[1] Construction Environmental and Social Management Plan (CESMP) to be developed as a part of the Construction Site Organisation Plan (CSOP), to meet the national requirements in accordance with the national *Decree on Construction Site Organisation, Mandatory Documentation on Construction Site and Construction Work Participants*, as well as the EBRD and EIB E&S requirements. The minimum content is stipulated in the ESAP.

during those hours when residents are most likely to be at home, thus reducing the potential of visual disturbance within view.

> Upon completion, areas used as construction compounds will be returned to their original use and state.

> Noise barriers with visual appeal in the places there they are required. Using transparent materials in selected sections to preserve landscape views and reduce visual obstruction. *(More on this topic can be found in Noise chapter of this ESIA)*

14.5.2 Operational Phase

Mitigation or enhancement measures for changes to the existing landscape and visual impacts due to the presence of permanent motorway structures are no applicable. The motorway is a linear structure that remains permanently in space and therefore changes its visual amenity.