



HIA PRELIMINARY REPORT 2

Heritage Impact Assessment of the planned Bybanen Light-Rail Extension on the World Heritage Property Bryggen / Bergen

30 September 2021

HIA PRELIMINARY REPORT 2 - Heritage Impact Assessment of the planned Bybanen Light-Rail Extension on the World Heritage Property Bryggen, Bergen

1. HIA PRELIMINARY REPORT 2 – Background and Objectives

Bergen Municipality plans currently a Light-Rail Extension linking the Bergen regions to the centre. The planned Light-Rail Extension lies in the immediate proximity to the World Heritage Property Bryggen.

In October 2020, HIA PRELIMINARY REPORT 1 has been submitted to Bergen Municipality so as to assess potential impacts and risks of the planned Bybanen Light-Rail Extension.

Main recommendations of HIA Preliminary Report were:

- Step 1:** Further development of the planned Bybanen Light-Rail Extension (day option)
- Step 2:** Development of the alternative tunnel option in parallel
- Step 3:** Assess and compare both options concerning their potential impact on the Outstanding Universal Value of World Heritage property Bryggen

With regard to this background, the main goal of HIA RELIMINARY REPORT 2 is to compare both alternative options concerning their functional, visual and structural impact on the OUV of the WH-property Bryggen from an independent point of view in order to provide a basis for future decisions. In so doing, the *ICOMOS Guidance on Heritage Impact Assessments for Cultural World Heritage Properties 2011* serves as a starting point of the report.

2. HIA PRELIMINARY REPORT 2 – General Conclusions

The two options have completely different impacts on the World Heritage property Bryggen. The day option is situated at the forefront of the World Heritage property Bryggen and it will be clearly visible. The tunnel option passing behind the World Heritage property changes the environment only to a limited extent. But the building of the tunnel and a light-rail-stop with two planned entrances entails the demolition of existing houses at Øvregaten, part of the supporting values of the potential buffer zone of the World Heritage property. Besides, the planned tunnel can affect the groundwater level under the World Heritage Property.

Abstract

As a consequence, both the modified day-option and the planned tunnel option generate **positive** and **negative** impacts and risks concerning the OUV of the World Heritage property Bryggen. The day option causes large functional deficits at the Hanseatic Museum and large to moderate negative functional and visual impacts on Bryggen Quay due to the length and the frequency of the light-rail-cars and the introduction of new elements such as the high-voltage-line. Besides, construction works might cause large negative structural impacts at Sandbrogaten and Bryggen Quay, though after its placement the planned pile wall at Bryggen Quay might have positive effects concerning the protection against flooding and changes of groundwater level.

The tunnel option causes mainly large uncertainties concerning its structural impact as it entails residual risks concerning groundwater subsidence under the World Heritage property. As the tunnel is irreversible, this risk can only be mitigated to a certain extent by infiltration and other groundwater stabilizing measures. Thus, it requires an active and continuous risk monitoring process including identification of further risk-reducing measures. Moreover, both planned tunnel entrances at Øvregaten cause the need to demolish buildings and to work in the immediate vicinity of archaeological layers. At Mariakirken, which is an important World Heritage attribute, this is considered as a very large uncertainty making it necessary to relocate this planned entrance.

Overall, the day option is therefore considered a safer solution for the World Heritage property considering the large structural risks in the present tunnel option. However, it should be noted that the day option also causes large negative impacts and risks which have to be mitigated to a maximum extent prior to the realisation of the project.

In the following, these main conclusions will be further explained.

3. HIA PRELIMINARY REPORT 2 – Methodology

Throughout the assessment, this HIA PRELIMINARY REPORT 2, distinguishes

- Impact Assessment (Chapter 2)
- Risk Assessment (Chapter 3)

This separation is necessary because not all direct impacts on the structure of World Heritage property Bryggen are known at present. Therefore, the assessment grades here potential uncertainties and risks.

In detail, the following aspects have been considered:

Impact Assessment:

- Functional Integrity: Traffic and Access at WH property Bryggen and Vågen area
- Visual Integrity: Visual transformations of WH property Bryggen

Risk Assessment:

- Structural Integrity: Uncertainties and risks concerning archaeology & built heritage

According to the 2011 ICOMOS Guidance in Heritage Impact Assessments for Cultural World Heritage Properties the magnitude of impact is graded in the following 5 steps:

- **Very large:** Severe Impact / uncertainties = Loss of OUV
- **Large:** Significant Impact / uncertainties = Risk to lose OUV: further elaboration of existing plans is considered as necessary
- **Moderate:** Considerable Impact / uncertainties = Existing plans are considered to support the management of potential conflicts, greatest care should be taken throughout construction activities.
- **Slight:** Minor Impact on OUV
- **Neutral:** No Impact on OUV

4. HIA PRELIMINARY REPORT 2 – Assessment

The assessment of impacts and risks leads to the following conclusions:

Functional and visual integrity: comparison day option / tunnel option:

- Both the **day option** and the **tunnel option** will support Bergen's goal to remove car traffic from the city's centre and will have a **large positive impact** on the overall traffic situation.
- There are differences concerning the coverage of Vågen Area and the city centre. Mainly due to the planned stop at Torget and Sandbrogaten the **day option** will have a **large positive impact** on the accessibility of these central areas while the **tunnel option** will have a **large positive impact** on the accessibility of the area at Øvregaten. However, it has only a limited potential to support access to Torget and Bryggen Quay.
- The **tunnel option** creates no need for buses at Øvregaten. It has no negative functional impact here and is assessed as **neutral** in this respect. For the **day option** Øvregaten will carry bus traffic. The negative impact is assessed as **moderate** due to the relatively restricted numbers of buses.
- The **day option** might cause **large functional deficits** at the Hanseatic Museum and on Bryggen Quay due to functional barrier effect of light-rail-cars (length and frequency) combined with a cycle path in the immediate vicinity of the museum's entrance. For the **tunnel option** these negative impacts are restricted to a **moderate** level.
- For the **day option** the modifications concerning urban design are seen as beneficial. However, the light-rail-cars cause due to their length and frequency combined with masts for the high-voltage line still a **large / moderate** visual barrier effect at Bryggen Quay. For the **tunnel option** the lowered number of buses compared to the present situation is mainly seen to have a **slight positive impact** on the visual barrier effect.

Structural integrity: comparison day option / tunnel option:

- The **day option** will have a **moderate positive impact** on risk preparedness for sea water rise and flooding due to the planned pile wall and higher quay level at Dreggekaien. The **tunnel option** is assessed as **neutral** as no measures against flooding have been planned.
- The **day option might** cause **large risks** for built heritage foundations and groundwater changes during construction works on Bryggen Quay. The **tunnel option** is assessed as **neutral** as no substantial measures on Bryggen Quay have been planned.
- For the **day option** construction works in immediate vicinity of cultural layers in Sandbrogaten might cause **large risks** concerning medieval archaeological deposits and groundwater level. The **tunnel option** is assessed as **neutral** as no measures at Sandbrogaten have been planned.
- For the **tunnel option** construction works at tunnel portals might cause **large risks** with regard to built heritage and changes of groundwater levels in the World Heritage property and its potential buffer zone. Construction works in the area of Mariakirken are likely to cause undue damage and **very large risks** concerning damage of the cultural layers and building foundations. The **day option** will have no impact in these areas and is assessed as **neutral**.

4. HIA PRELIMINARY REPORT 2 – Recommendations

For both of the options the following recommendations should be considered to mitigate negative impacts and risks:

Recommendations **day option**:

- ▶ DEVELOP a detailed concept for the planned cycle path on Bryggen Quay. This plan should show precisely how a potential barrier effect is avoided.
- ▶ DEVELOP a detailed concept for save mobility of larger groups at Finnegården.
- ▶ DROP high-voltage-line and masts. PROVIDE visualisations showing clearly the design state of Bryggen Quay. Include detailed information of the planned cycle path as well day and night views so as to show clearly how the lighting concept will work.
- ▶ DEVELOP a precise plan with a clear view concerning risks during construction activities at Sandbrogaten and Bryggen Quay. These plans should thoroughly discussed with all stakeholders and experts!

Recommendations **tunnel option**:

- ▶ DEVELOP a detailed plan how to avoid groundwater changes in order to mitigate potential large uncertainties for the World Heritage property Bryggen
- ▶ DEVELOP a new plan for a light-rail-stop at Øvregaten without or with relocated entrance at Mariakirken.
- ▶ DEVELOP a detailed plan how to avoid or at least mitigate risks for built heritage at the entrances of the planned tunnel at Øvregaten.

Abstract

Recommendation for both Day option and Tunnel option: Provide a strategic plan for a future buffer zone

- ▶ COMBINE *knowledge of cultural environment management, urban planning and transport planning* in order to identify risks and potentials in the entire Vågen area.
- ▶ DEVELOP a *sustainable strategy for touristic traffic management* with a clear view for the sensitivity of WH property Bryggen including Øvregaten.
- ▶ DEVELOP a *concept for a World Heritage buffer zone* on this basis.



Abstract



1_BACKGROUND

- a. World Heritage Outstanding Universal Value
- b. Attributes of the World Heritage Property Bryggen
- c. Planned Bybanen Light-Rail-Extension (Day option & Tunnel option)
- d. Issues for impact assessment and risk assessment
- e. Explanation of the HIA methodology
- f. Structure of the Report

2_IMPACT ASSESSMENT

- a. Functional Integrity
- b. Visual Integrity
- c. Summary: Comparison of functional & visual impacts

3_RISK ASSESSMENT

- a. Structural Integrity (Archaeology & Built Heritage)
- b. Summary: Comparison of structural risks

4_RECOMMENDATIONS

- a. Recommendations for day option
- b. Recommendations for tunnel option
- c. General Recommendations for day option / tunnel option

5_APPENDIX

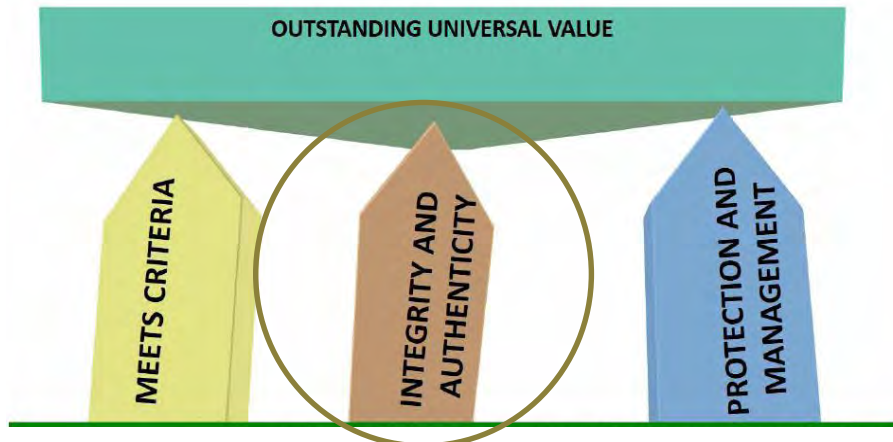
Content



1

Background

Process, Objectives, Methodology



The three pillars of Outstanding Universal Value (@ IUCN)

Operational Guidelines, §49:

„Outstanding Universal Value means cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity. As such, the permanent protection of this heritage is of the highest importance to the international community as a whole. The Committee defines the criteria for the inscription of properties on the World Heritage List.“

MAIN ISSUE

Assessment of impacts and risks of Day option and Tunnel option on functional, visual and structural integrity of World Heritage Property Bryggen

Starting Point of HIA: World Heritage Values

Outstanding Universal Value

Bryggen was inscribed in 1979 in the World Heritage List as a type of northern “fondaco”, unequalled in the world, where the structures have remained within the cityscape and perpetuate the memory of one of the oldest large trading ports of Northern Europe.

Bryggen Quay witnessed transformations throughout history. But the setting of the WH-property in its medieval cityscape and the medieval cityscape as such are still understandable and should therefore not be disrupted.



@Forvaltningsplan 2021-25



- Medieval cityscape + setting
- Medieval urban structure + public spaces
- Harbour + Quays
- Conservation + Continuity
- Understanding Hanseatic Office + Quay

Key OUV ATTRIBUTE	OUV ATTRIBUTES
Bryggen in medieval Bergen harbour city (context and setting of the WHP)	Bergen medieval cityscape and urban layout
	Medieval urban structure with public spaces / allmenningar and access roads
	Medieval Vågen harbour and its quays
Bryggen Hanseatic Office (WHP)	Building conservation and continuity of Hanseatic building practice
	The relation between built structure of the Hanseatic Office and Bryggen quay

Five Key Attributes as Basis for Assessment



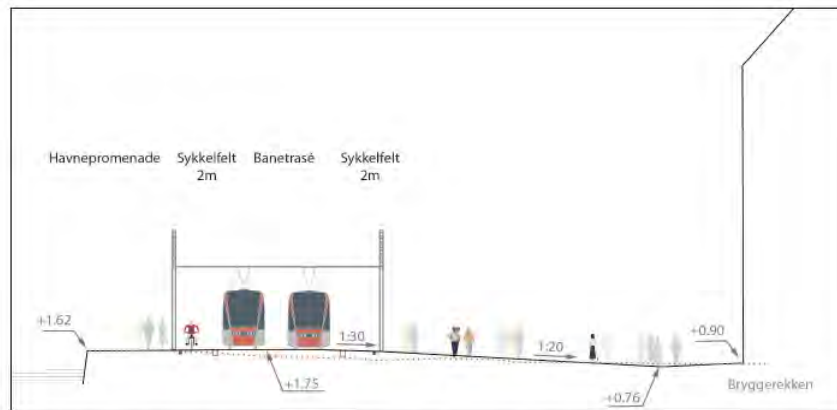
Routing of planned day option (yellow) and tunnel option (red) (@Miljøloftet)

- HIA PRELIMINARY REPORT 1 (submitted in October 2020) provided a first assessment of the impact of the proposed **day option** of the light-rail network (Bybanen) on the Outstanding Universal Value (OUV) of the World Heritage property Bryggen from an independent point of view.
- Recommendation 1: to **modify proposed day option** so as to mitigate negative impacts.
- Recommendation 2: to **develop an alternative tunnel-option** and to **compare impacts and risks with the day option**.
- It is the objective of HIA PRELIMINARY REPORT 2 to
 - assess both potential **positive and negative impacts and risks** of the two planned Bybanen Light-Rail alternatives on the Outstanding Universal Value (OUV) of the UNESCO World Heritage property Bryggen.
 - to **recommess future steps to mitigate potential negative impacts** and to enhance positive impacts respectively regarding the World Heritage Property's OUV so as to avoid, reduce, or compensate for negative impacts and to possibly amplify positive impacts.

MAIN ISSUE:

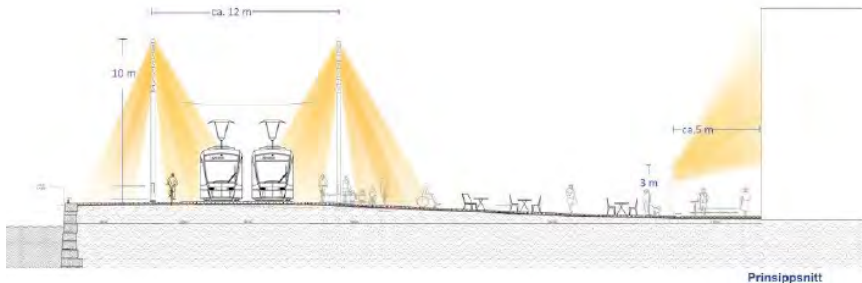
COMPARISON of positive and negative impacts and potential risks on the OUV of WH Property Bryggen due to planned alternative day option / tunnel option

Objective of HIA Preliminary Report 2



Figur 2-6 Snitt C-C' med høydeangivelse og fallforhold. Lavbrekk foran Bryggerekken er plassert med utgangspunkt i oppdatert plan fra "Mot Vågen". Rød stipling angir eksisterende terreng.

Day option: section through Bryggen Quay
@ Norconsult /asplan viak



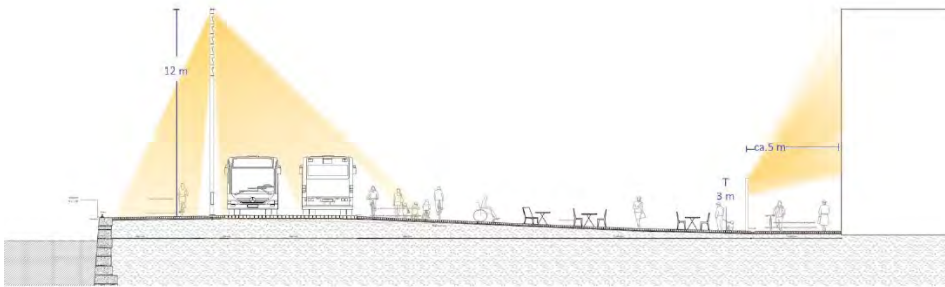
Day option: Systematic section shows high-voltage line and lighting
(@Mijøøfttet)

- **Routing:** The day option goes over Torget and Bryggen quay and continues in a tunnel at Sandbrogaten. It has two light rail stops in this section, on Torget and Sandbrogaten.
- **Traffic:** In case of the day option Bryggen Quay will be cleared from bus traffic. On both sides of the Bybanen track there will be located a cycle path. Bus traffic will go on Øvregaten.
- The day option has been assessed in HIA Preliminary 1. Recommendations in HIA Phase 1 have resulted in following adjustments:
 - **Lowered height of tracks:** Tracks of the Bybanen in front of Bryggen have been lowered to 1.75 meter above sea level. By Dreggekaaien and Finnegården the level is raised to 1.90 m so as contribute to a lower risk for flooding.
 - **Revised quay surface design:** new coherent levels and a cobble stone paving.
 - **Improvements at Finnegården/Hanseatic Museum:** Situation between the light rail track and bicycle zone at has been improved by widening the curve of Bybanen.
 - **High-voltage line along Bybanen:** This system remains, a new design combines masts with lighting on both sides of the track and bicycle path. The possibility of Bybanen without high-voltage overhead system after 2050 has been investigated.
 - **Construction works:** It is planned to renew and relocate existing infrastructure on Bryggen Quay. The functional integration of the Bryggen area with the city centre and the (redirection of traffic, replacing infrastructure, track building, tunnel from Sandbrogaten) are expected to take up to three years in the Bryggen area.

Planned Bybanen Light-Rail-Extension_Modified Day option

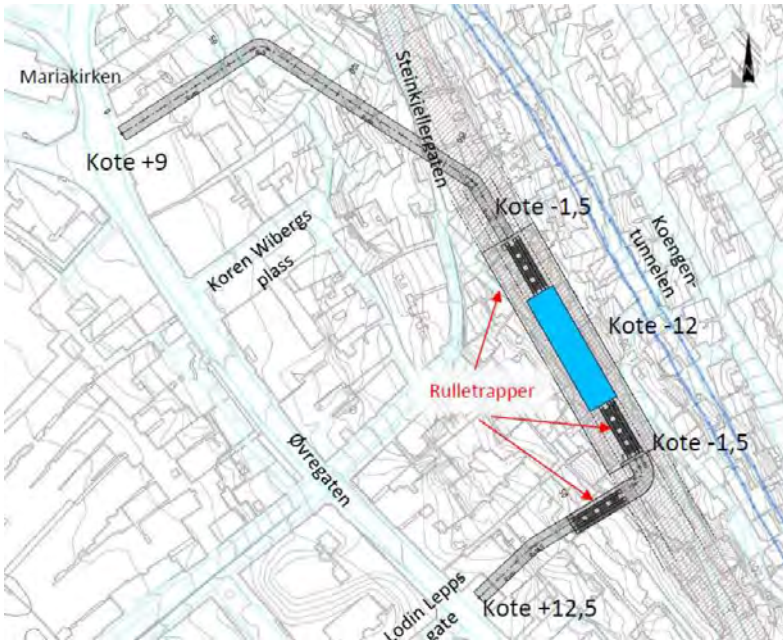


- The **tunnel option** goes in tunnel from Heggebakken in the centre to Sandviken. It has a tunnel station with two exits at Øvregaten, one at Lodin Lepps gate (Øvregaten 9/11) and one near Mariakirke (Øvregaten 43/43a).
- **Traffic:** In case of the tunnel option Bryggen Quay will carry bus traffic. On both sides of the bus track there will be located a cycle path. Øvregaten will be cleared from bus traffic.
- **Exits:** The proposed exits will likely require demolition or replacement of several existing buildings in the potential World Heritage buffer zone.
- **Construction works:** Time span to build the new entrances at Øvregaten is estimated for 3 years.



Tunnel option: Systematic section shows concepts for lighting of planned bus track and cycle path (@Mijøløftet)

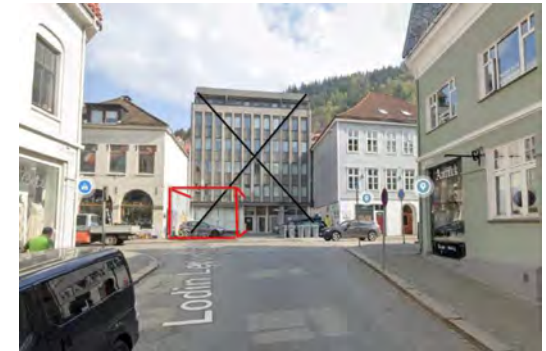
Planned Bybanen Light-Rail-Extension_Tunnel Option



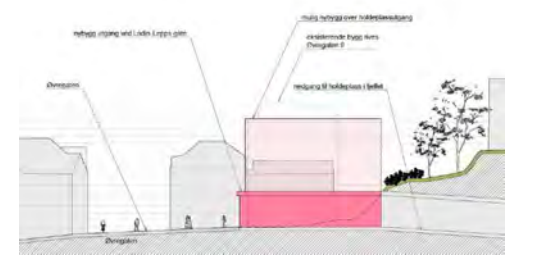
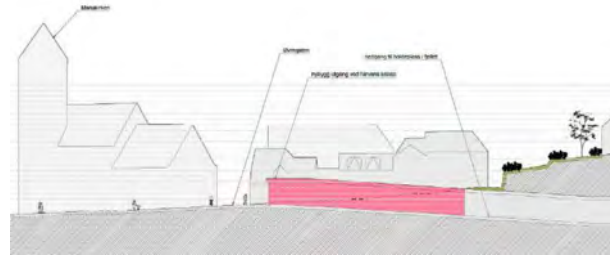
Tunnel option: Planned tunnel entrances (@Miljøløftet)



Tunnel option: Planned tunnel entrance at Mariakirken (Øvregaten 43/43a) (@Miljøløftet)



Tunnel option: Planned tunnel entrance at Øvregaten 9/11 (@Miljøløftet)



Tunnel option: Planned entrances



HIA 2021 – day option



HIA 2021 – tunnel option

Issue

Day Alternative

Tunnel Option

Functional Impact

Buses at Øvregatan
 Cycle lane on Bryggen Quay
 Planned stops at Torget / Sandbrogaten
 Planned light-rail-track at Finnegården/Hanseatic Museum

Buses on Bryggen Quay
 Cycle lane on Bryggen Quay
 Planned stop with entrances at Mariakirken / Øvregatan
 Planned bus-track at Finnegården/Hanseatic Museum

Visual Impact

Transformation of Bryggen Quay

Transformation of Bryggen Quay

Structural Impact

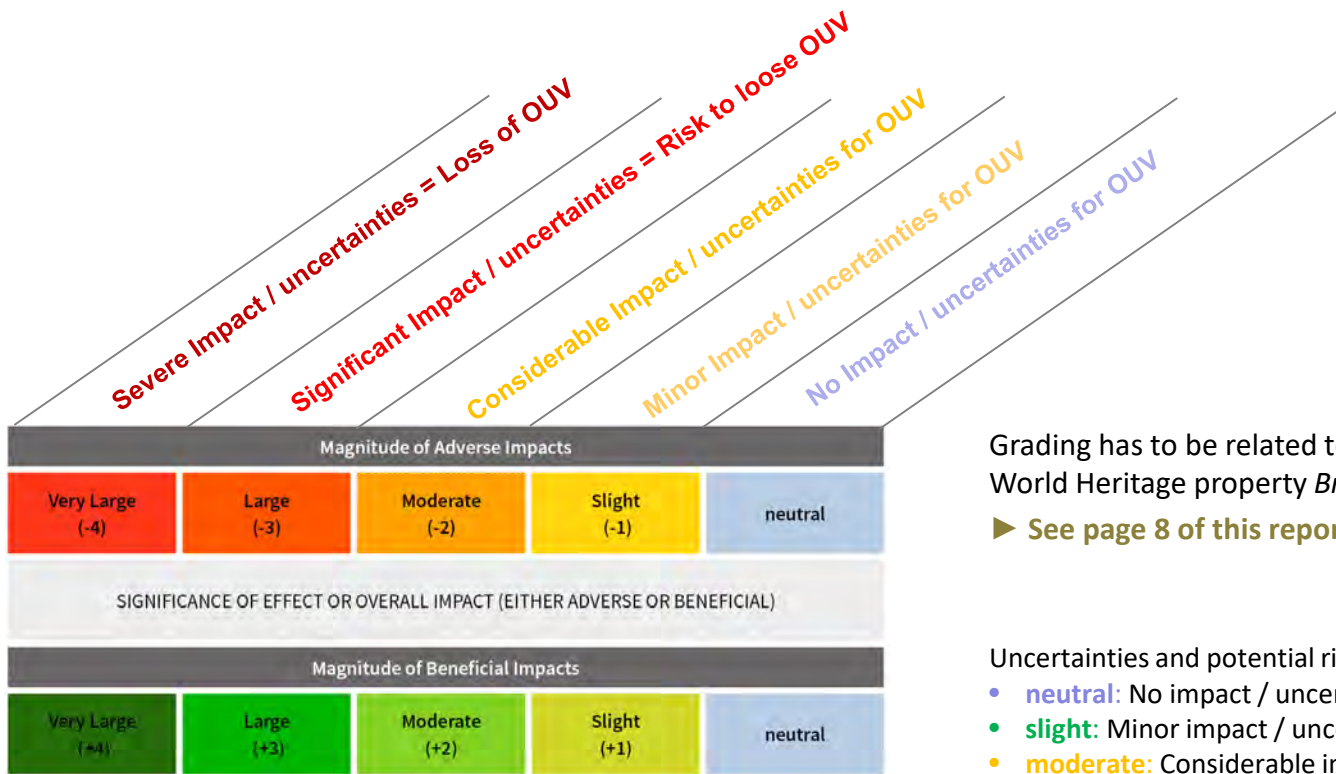
Planned tunnel and foundations of light-rail track at Sandbrogaten (Archaeology/Groundwater)
 Planned relocation of infrastructure and construction of pile wall on Bryggen Quay
 Construction works at Bryggesporden - Sandbrogaten

Planned tunnel Heggebakken - Øvregaten (Archaeology / Groundwater)
 Planned Entrances Mariakirken / Øvregaten (Built heritage)
 Construction works at Øvregaten

Impact Assessment

Risk Assessment

Issues to be assessed_comparison of day / tunnel option



Grading has to be related to attributes which convey the OUV of World Heritage property *Bryggen* (physical or immaterial level):

► See page 8 of this report.

Uncertainties and potential risks are considered as

- **neutral**: No impact / uncertainties
- **slight**: Minor impact / uncertainties, e.g. due to vibrations through traffic
- **moderate**: Considerable impact / uncertainties, but potential conflicts are considered to be solvable by existing plans, greatest care should be taken throughout construction activities
- **large**: Significant impact / uncertainties, further elaboration of existing plans is considered necessary
- **very large**: Very high impact / uncertainties, World Heritage Attributes might be damaged. Reconsideration of existing plans!

(© ICOMOS / mkphc)

MAIN ISSUE

Are there **very large / large** impacts or risks concerning functional and visual integrity of World Heritage property *Bryggen* which might endanger the OUV?

Methodology – Assessment / Magnitude of Impact

2

Impact Assessment

a) Functional Integrity: Traffic, Accessibility
b) Visual Integrity: Visual Impact



Figur 1-5: Trafikklegging i fase 2 der både Torget og Bryggen er bilfrie

(© Miljøløftet)

Key Result

Both the day option and the tunnel option will support Bergen's goal to remove car traffic from the city's centre and will have a **large positive impact** on the overall traffic situation.

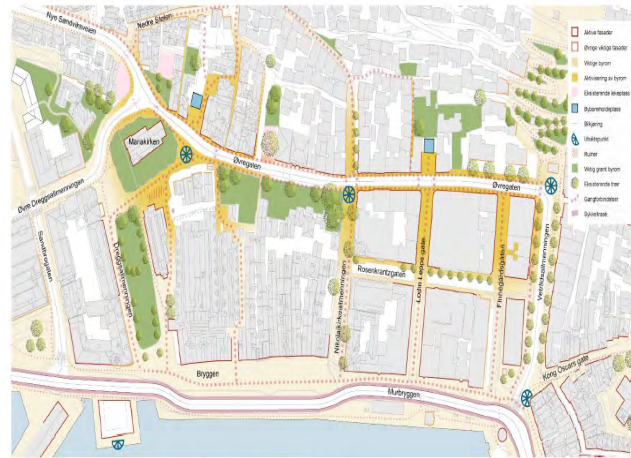
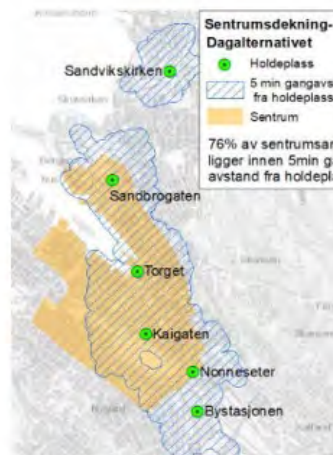
Traffic: Planned future situation

Traffic main principles:

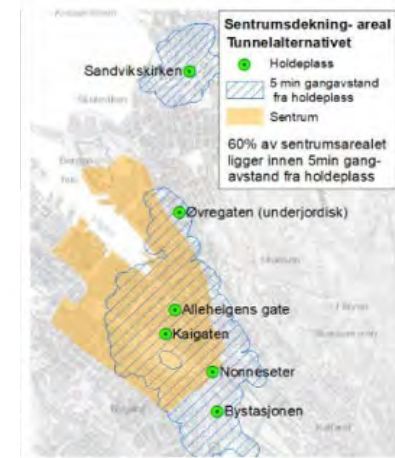
- According to the City council decision 2016 «Trafikkplan sentrum» will be implemented.
- The amount of car traffic through the city centre will be the same for both day and tunnel alternatives.
- In the day option there will be 12 (electric) buses each direction in the peak hour and the buses will be in Øvregaten.
- In the tunnel option the (electric) buses will be on Bryggen. The exact number is not defined
- When the Fløyfjellstunnel is closed, the City centre will be used. This is also the case for normal maintenance works or accidents today. The National Road Authorities has started planning of new flexibility in the existing Fløyfjellstunnel to avoid using the city center in these occasions.

Status regarding the City council decision in 2016 – Bryggen without car traffic – :

«Som en del av endelig sentrumsløsning skal Bryggen gjøres bilfri. Bystyret ønsker sak fram om hvordan dette kan løses på kortere og lengre sikt. I den trafikale løsningen ønsker Bystyret et mest mulig bilfritt Torget og trafikkreduksjon, eksempelvis i form av miljøgate, på strekningen Øvregaten - Nye Sandviksveien og Sandviksveien.»



Figur 4-8: Byromsanalyse Øvregaten med to utganger fra underjordisk holdeplass



Day option

(@Miljøløftet / Norconsult asplan viak)

Tunnel option

Key Result

There are differences concerning the coverage of Vågen Area and the city centre. Due to the planned stop at Torget and Sandbrogaten the day option will have **large positive impact** on the accessibility of these central areas while the tunnel option will have a **large positive impact** on the accessibility of the area at Øvregaten but a limited potential to support access to Torget and Bryggen Quay.

Accessibility – Day option:

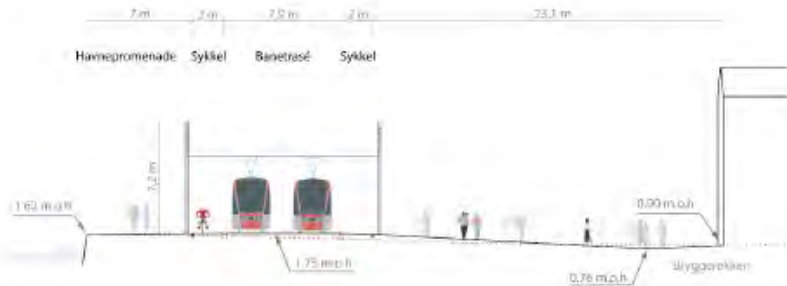
- Planned light-rail-stop at Sandbrogaten potentially improves the accessibility of Bryggen Quay and Mariakirken.

Accessibility – Tunnel option:

- Planned light-rail-stops at Øvregaten potentially improve the accessibility of Bryggen World Heritage property.

Traffic: Accessibility

Dagalternativet



Day option

Tunnelalternativet



Figur 4-7: Snitt over dag- og tunnelalternativet ved Bryggen. Stiplet linje viser dagens gatenivå.

Tunnel option (@Norconsult / asplan viak)

Key Result

The tunnel option has the clear advantage that there is **no negative functional impact** at Øvregaten while the day option might have a **moderate negative impact** here due to planned bus traffic.

Traffic: Buses

Bus traffic – Day option:

- Bus traffic will run at Øvregaten, a narrow medieval street of high value, might have a moderate negative impact.

Bus Traffic – Tunnel option:

- Bus traffic will run in forefront of Bryggen World Heritage property, but it will be reduced in number. The existing barrier

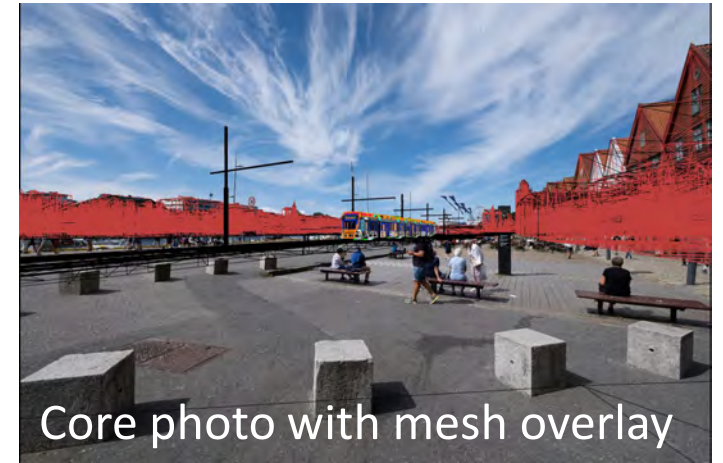
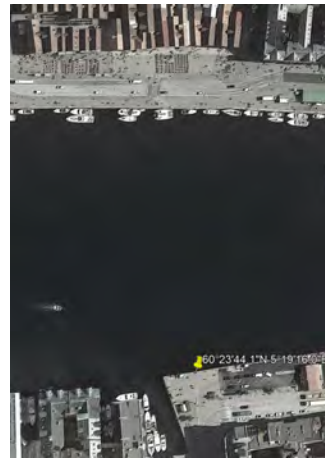
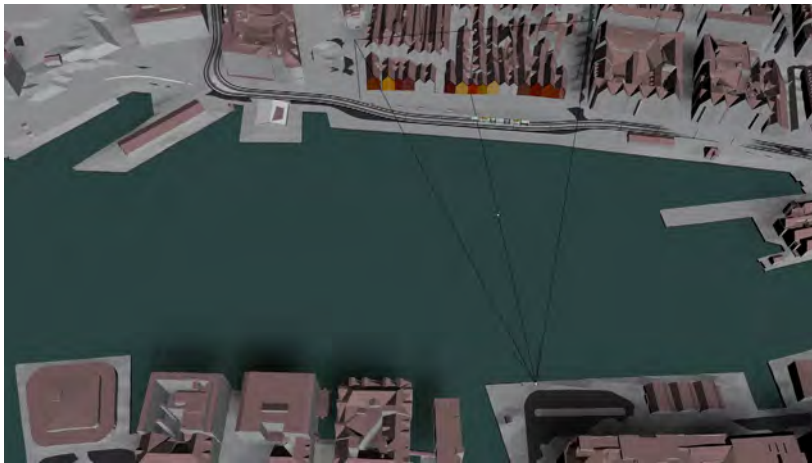


@ Google Maps Pro /mkphc

Visual impact: Viewpoints and view corridors (VPs colored white are not used in HIA 2)



Bryggesporden, 360° panorama stitch



Core photo with mesh overlay

Location determination and camera position in 3d model

Generation of Visualisations – 3D Model + digital photographs



panoramic view of existing situation

focal length of individual photo (panorama-stitch): 35mm (35mm equivalent)

photography: *Philipp Tebart*

Situation: The visually striking view of the Bryggen warehouses from across Vågen harbour is an iconic view of Bergen. Despite the new developments and change of use of the quay the setting of medieval Hanseatic Office maintains its integrity in the seascape and cityscape of Bergen.

Current state: During normal summer seasons, the quay is crowded by Bergen inhabitants, visitors and a large number of cruising ship tourists. The quay has outdoor cafés, pubs and leisure boats moor along the quay.



1580 Joachim Scholeus (@Bergen Byarkiv)



location: 60°23'44.1"N 5°19'16.0"E
aerial photo: *Google Earth*

1b_Strandkaien: Situation



Assessment day option: Although the setting of the World Heritage property is partly degraded by housing blocks, buses and leisure boats, it is still possible to enjoy the vista to Bryggen and its setting.

The planned Light-Rail Extension is visually dominant to the quay. While the light rail facilitates an easier access to Bryggen it accentuates a visual barrier effect between the Hanseatic Office, Bryggen quay and Vågen harbour.

However, it is still possible to understand the relation between Bryggen and its setting.

Assessment tunnel option: Although the setting of the World Heritage property is partly degraded by housing blocks, buses and leisure boats, it is still possible to enjoy the vista to Bryggen and its setting.

The planned bus track is comparable to the existing situation.

Key OUV ATTRIBUTE	OUV ATTRIBUTES	Impact grading + beneficial / - adverse	
		Day Option	Tunnel option
Bryggen in medieval Bergen harbour city (context and setting of the WHP)	Bergen medieval cityscape and urban layout	large (-3)	neutral
	Medieval urban structure with public spaces / allmenningar and access roads	large (-3)	neutral
	Medieval Vågen harbour and its quays	large (-3)	neutral
Bryggen Hanseatic Office (WHP)	Building conservation and continuity of Hanseatic building practice	slight (-1)	neutral
	The relation between built structure of the Hanseatic Office and Bryggen quay	large/very large (-3,5)	neutral
Total		large (-2,7)	neutral / no change

1b_Strandkaaien: Assessment day / tunnel option



panoramic view of existing situation

focal length of individual photo (panorama-stitch): 21mm (35mm equivalent)

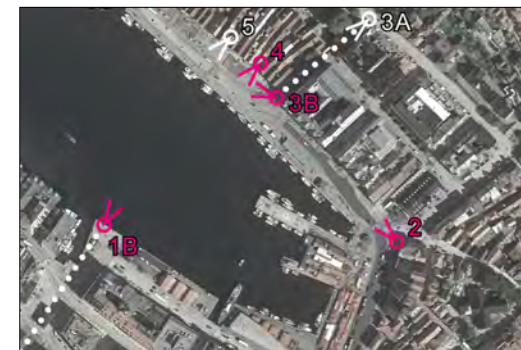
photography: Philipp Tebart

Situation: Although disturbed by ongoing traffic, the present view allows to identify the key themes of the World Heritage property and its setting; Finnegården – Hansa Museum, the Bryggen warehouses and quay, the Vågen harbour and the King's castle in the background. The harbour shed (Kur 11) is a listed building which represents the numerous harbour sheds which were on Bryggen quay.

Current state: The connection of Finnegården to the place is difficult to perceive even apart from the ongoing works. The entrance to Hansa Museum is often crowded by museum visitors as well as other tourists stopping by. Due to the present traffic hub the public space is fragmented by motorised traffic, pedestrian crossings, bus stops and a number of traffic signals.



1895 / 1900 Andreas Svanøe (@ marcus.uib.no)



location: 60°23'43.5"N 5°19'33.8"E
aerial photo: Google Earth

Viewpoint 2_Bryggesporden: Situation



HIA 2021– day option



HIA 2021– tunnel option

Assessment day option: The redesign of the traffic area and the potential refurbishment of the adjoining Finnegårdsgaten / Vertlidsallmenning will ameliorate the public space and the urban quality.

However, the understanding of the visual and functional relation of Finnegården with the medieval Bergen, Vågen harbour and Bryggen quay will be compromised by the high frequency of light rail traffic, related overhead masts, and track very close to Finnegården.

Assessment tunnel option: The understanding of the visual and functional relation of Finnegården with the medieval Bergen, Vågen harbour and Bryggen quay will be slightly compromised by buses, lighting masts and cycle path.

Key OUV ATTRIBUTE	OUV ATTRIBUTES	Impact grading + beneficial / - adverse	
		Day option	Tunnel option
Bryggen in medieval Bergen harbour city (context and setting of the WHP)	Bergen medieval cityscape and urban layout	slight (-1)	slight (-1)
	Medieval urban structure with public spaces / allmenningar and access roads	moderate (-2)	slight (-1)
	Medieval Vågen harbour and its quays	large (-3)	slight (-1)
Bryggen Hanseatic Office (WHP)	Building conservation and continuity of Hanseatic building practice	slight (-1)	neutral
	The relation between built structure of the Hanseatic Office and Bryggen quay	large (-3)	slight (-1)
Total		moderate (-2)	slight (-0,8)

Viewpoint 2_Bryggesporden: Assessment day / tunnel option



panoramic view of existing situation

focal length of individual photo (panorama-stitch): 18mm (35mm equivalent)

photography: Philipp Tebart

Situation: The pedestrian view along the Bryggen quay and towards the Vågen harbour encompasses the key attributes of the World Heritage property and illustrates the function and position of the Hanseatic League in Bergen.

Current state: Despite the changes of the Bryggen quay over time, the relation between the Hanseatic Office, the quay and harbour can still be experienced. The character of a harbour quay is compromised by the throughfare traffic and fragmented tourism facilities in high season.



location: 60°23'48.2"N 5°19'26.4"E
aerial photo: Google Earth

1860 /69 Knud Knudsen (© marcus.uib.no)

Viewpoint 3b_Bryggen / Nikolaikirkeallmenningen: Situation



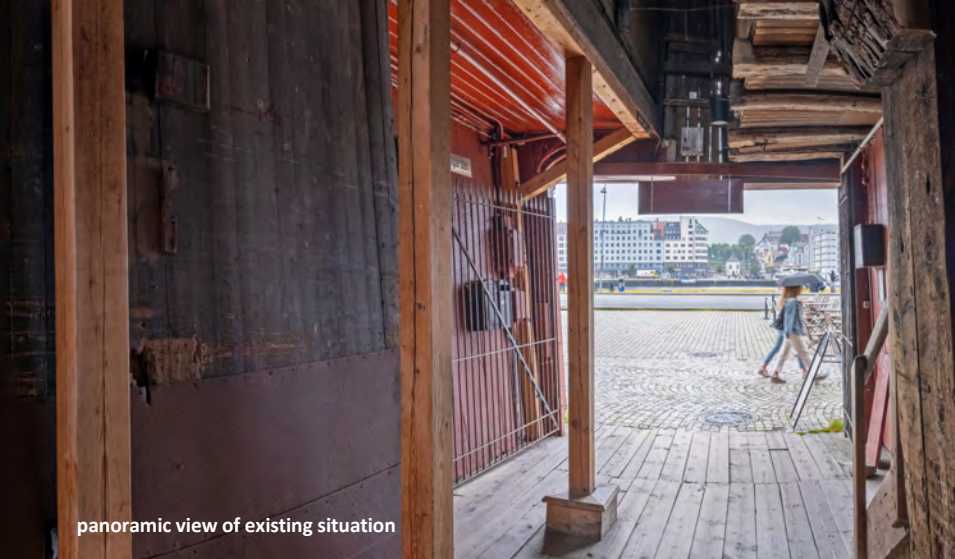
Assessment day option: The light rail access potentially enhances the visibility and awareness of the World Heritage property. The concept of the planned design with less fragmentation of the public space is considered as beneficial. However, the high frequency of light rail traffic, the length of the light-rail-cars with overhead masts increases the already compromised visual and functional relation between the Hanseatic Office, its quay and Vågen harbour.

Assessment tunnel option: The planned refurbishment of Bryggen Quay and the expected reduction of the number of buses is beneficial. There are only slight compromises due to the planned bus track and lighting masts.

Key OUV ATTRIBUTE	OUV ATTRIBUTES	Impact grading + beneficial / - adverse	
		Day option	Tunnel option
Bryggen in medieval Bergen harbour city (context and setting of the WHP)	Bergen medieval cityscape and urban layout	large (-3)	slight positive (+1)
	Medieval urban structure with public spaces / allmenningar and access roads	moderate (-2)	neutral
	Medieval Vågen harbour and its quays	large (-3)	slight positive (+1)
Bryggen Hanseatic Office (WHP)	Building conservation and continuity of Hanseatic building practice	moderate (-2)	neutral
	The relation between built structure of the Hanseatic Office and Bryggen quay	large -3	slight positive (+1)
Total		large (-2,6)	slight positive (+0,6)

Viewpoint 3b_Bryggen /

Nikolaikirkeallm.: Assessment day / tunnel option



panoramic view of existing situation



focal length of individual photo (panorama-stitch): 21mm (35mm equivalent)

photography: Philipp Tebart

Situation: The views from inside Bryggen out towards the Bryggen quay and Vågen harbour illustrate the daily life in the trading post. The close visual and functional linkage between the quay, the offices and warehouses encompass the spirit and feeling in a Hanseatic Office.

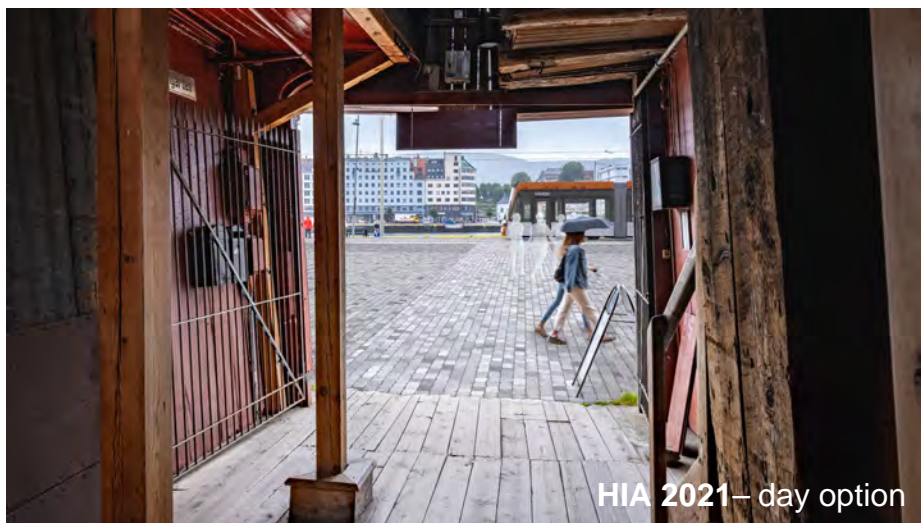
Current state: Under normal conditions the view towards the quay and Vågen harbour is impaired by existing traffic and street furniture, but the historic atmosphere and views from inside a Hanseatic Office toward the harbour can still be experienced.



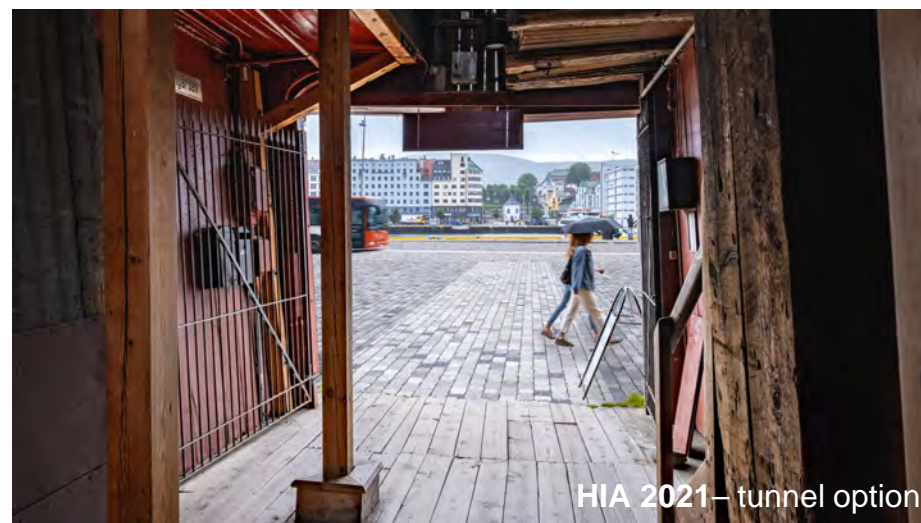
location: 60°23'49.4"N 5°19'25.7"E
aerial photo: Google Earth

Bryggen 1918 -39 (@marcus.uib.no)

Viewpoint 4_Inside Bryggen



HIA 2021– day option



HIA 2021– tunnel option

Assessment day option: The refurbishment of the quay will improve the overall quality of the urban design.

Although less raised, the view towards Vågen harbour is obstructed by the Bybanen track, the length of the light-rail-cars and frequency of light-rail-traffic.

Assessment tunnel option: The refurbishment of the quay will improve the overall quality of the urban design.

The view towards Vågen harbour is slightly obstructed by the buses but the expected reduction of the number of buses compared to the present situation is beneficial.

Key OUV ATTRIBUTE	OUV ATTRIBUTES	Impact grading + beneficial / - adverse	
		Day option	Tunnel option
Bryggen in medieval Bergen harbour city (context and setting of the WHP)	Bergen medieval cityscape and urban layout	Slight -1	slight positive (+1)
	Medieval urban structure with public spaces / allmenningar and access roads	moderate (-2)	slight positive (+1)
	Medieval Vågen harbour and its quays	very large -4	neutral
Bryggen Hanseatic Office (WHP)	Building conservation and continuity of Hanseatic building practice	moderate (-2)	neutral
	The relation between built structure of the Hanseatic Office and Bryggen quay	large (-3)	slight positive (+1)
Total		moderate (-2,4)	slight positive (+0,6)

Viewpoint 4_ Inside Bellgården: Assessment day / tunnel option



panoramic view of existing situation

focal length of individual photo (panorama-stitch): 21mm (35mm equivalent)

photography: Philipp Tebart

Situation: The view along the Bryggen quay towards the medieval centre of Bergen with Korskirken, Torget, Vågen harbour and the natural setting with mountains illustrates the important position of the Hanseatic Office in Bergen. The view also illustrates the different uses of Bryggen quay today.

Current state: The overall view of Bryggen quay in medieval Bergen is visible. It also shows the different uses with street traffic and areas for outdoor cafés and terraces along the waterfront buildings, quay walk and leisure boats. The public space is fragmented and degraded by the existing street



JFLDreierBryggen1817.jpg
 (@ <https://commons.wikimedia.org/wiki/File:JFLDreierBryggen1817.jpg>)



location: 60°23'51.8"N 5°19'17.3"E
 aerial photo: Google Earth

Viewpoint 6b_Dreggekaien: Situation



Assessment day option: The view allows to understand the setting of the World Heritage property in the urban landscape. The concept of the planned design with less fragmentation of the public space and without motorized traffic is considered as beneficial.

However, the already fragmented quay character is compromised by the light-rail-cars, the light rail track and its overhead masts which generate a visual barrier effect between the Hanseatic Office and the Vågen harbour.

Assessment tunnel option: The view allows to understand the setting of the World Heritage property in the urban landscape. The concept of the planned design with less fragmentation of the public space and without motorized traffic is considered as beneficial.

The already fragmented quay character is compromised by the buses and cycle path and lighting posts to a moderate / slight extent.

Key OUV ATTRIBUTE	OUV ATTRIBUTES	Impact grading + beneficial / - adverse	
		Day option	Tunnel option
Bryggen in medieval Bergen harbour city (context and setting of the WHP)	Bergen medieval cityscape and urban layout	large (-3)	moderate (-1)
	Medieval urban structure with public spaces / allmenningar and access roads	Moderate (-2)	slight (-1)
	Medieval Vågen harbour and its quays	large/very large (- 3.5)	slight (-1)
Bryggen Hanseatic Office (WHP)	Building conservation and continuity of Hanseatic building practice	moderate (-2)	neutral
	Relation between built structure of Hanseatic Office and Bryggen quay	large (-3)	moderate (-2)
Total		Large -2.7	moderate / slight -1.5

Viewpoint 6b_Dreggekaien: Assessment day / tunnel option

Functional and visual impacts				
World Heritage property OUV + Attributes	Day Option	Remark	Tunnel Option	Remark
Impact on Reduction number of motorized traffic and noise				
Vågen area - Torget	Very large positive (+4)	Reduction of traffic after realisation of «Trafikkplan sentrum».	Very large positive (+4)	Reduction of traffic after realisation of «Trafikkplan sentrum».
Øvre gaten	moderate positive (+2)	Reduction motorized traffic Reduction of bus traffic, use of electric buses	Very large positive (+4)	Reduction of motorized traffic Potential pedestrian street
Finnegården	Very large positive (+4)	Reduction of motorized traffic after realisation of «Trafikkplan sentrum».	Very large positive (+4)	Reduction of traffic after realisation of «Trafikkplan sentrum».
Bryggen (Quay)	large (+3)	No motorized traffic at Bryggen after realization of «Trafikkplan sentrum». Buses at Øvre gaten	moderate positive (+2)	Reduction of bus traffic on Bryggen quay after realisation of «Trafikkplan sentrum»
Impact on Walkability and Accessibility				
Vågen area - Torget	very large positive (+4)	New light-rail-stop at Torget	slight positive (+1)	Light-rail-stops at Øvre gaten are partly beneficial for accessibility of Torget.
Øvre gaten	moderate positive (+2)	Better accessibility of areas around Sandbrogaten and Mariakirken	large positive (+3)	Better accessibility of areas around Sandbrogaten and Mariakirken and Nikolaialimningen
Finnegården	very large positive (+4)	New light-rail-stop at Torget	slight positive (+1)	No light-rail-stop
Bryggen Quay	large positive (+3)	New light-rail-stops at Torget and Sandbrogaten	slight positive (+1)	Light-rail-stops at Øvre gaten are partly beneficial for accessibility of Bryggen Quay
Impact on Functional barriers				
Vågen area - Torget	large positive (+3)	Reduction of current barrier effect by elimination of motorised traffic, bus-shelters and platforms, traffic equipment.	large positive (+3)	Reduction of current barrier effect by elimination of car traffic, reduction of bus-traffic. Potential barrier effect due to buses and cycle traffic
Øvre gaten	moderate (-2)	Potential conflict with bus traffic at Øvre gaten.	Neutral	
Finnegården	large negative (-3)	Potential functional conflicts due to tram track combined with cycle traffic in immediate vicinity of entrance Hanseatic Museum. Safety concept for mobility and for large groups at Hanseatic Museum considered necessary.	Moderate -2	Potential barrier effect due to buses and cycle traffic immediate vicinity of entrance to Hanseatic Museum
Bryggen Quay	large negative (-3)	Potential barrier effect due to cycle traffic combined with tram track. Upgraded planning concept for cycle path needed.	moderate (-2)	Potential barrier effect due to buses and cycle traffic. Upgraded planning concept for cycle path needed
Impact on Potential visual barrier effect				
Vågen area - Torget Viewpoint: Strandkaien	large (+3,7)	Minimisation of barrier effect by avoiding a raised quayside and complete update of urban space. However, length and number of Bybanen cars cause visual barriers.	Neutral/no change	
Finnegården: Viewpoint Bryggesporden	moderate (-2)	Minimisation of barrier effect by avoiding a raised quayside and complete update of urban space. Bybanen-cars cause visual barriers due to their length and frequency.	Slight negative (-0,8)	Minimisation of barrier effect by avoiding a raised quayside and complete update of urban space. Buses cause slight visual barriers due to their length
Bryggen Quay: Viewpoint Bryggen / Nikolaikirkeallmenningen	large (+3,8)	Minimisation of barrier effect by avoiding a raised quayside and complete update of urban space. Bybanen-cars and masts for high-voltage-line cause visual barriers due to their length and frequency.	Slight positive (+0,6)	Minimisation of barrier effect by avoiding a raised quayside and complete update of urban space. Reduction of number of buses but traffic and masts for lighting cause visual barrier effect
Bryggen Quay: Viewpoint Bellgården Office 33	moderate (-2,4)	Minimisation of barrier effect by avoiding a raised quayside and complete update of urban space. Bybanen-cars cause visual barriers due to their length and frequency.	Slight positive (+0,6)	Minimisation of barrier effect by avoiding a raised quayside and complete update of urban space.
Bryggen Quay: Viewpoint Dreggekaien	large (+3,2)	Minimisation of barrier effect by avoiding a raised quayside and complete update of urban space. Bybanen-cars and masts for high-voltage-line cause visual barriers due to their length and frequency.	slight / moderate (-1,5)	Minimisation of barrier effect by avoiding a raised quayside and complete update of urban space. Reduction of number of buses but bus traffic and masts for lighting cause visual barrier effect.

Summary: Comparison functional and visual impact day- / tunnel option

KEY RESULTS

The upgrading of Bryggen Quay is beneficial for both options.

Day option:

Positive impact on overall traffic situation in city centre.

Positive impact concerning accessibility and walkability Vågen area / Torget / Finnegården.

Buses on Øvregaten, a narrow medieval street of high value, have a moderate negative impact.

Potential large functional deficits at the entrance of Hanseatic Museum and on Bryggen Quay due to functional barrier effect of light-rail-cars.

The length and frequency of light-rail-cars and masts for high-voltage line causes a moderate / large visual barrier effect.

Tunnel option:

Positive impact on overall traffic situation in city centre.

Positive impact concerning accessibility and walkability of Øvregaten but limited potential to support access to Torget and Bryggen Quay.

Reduction of buses on Bryggen Quay is beneficial.

Bus and cycle traffic might cause a moderate functional barrier effect at Finnegården.

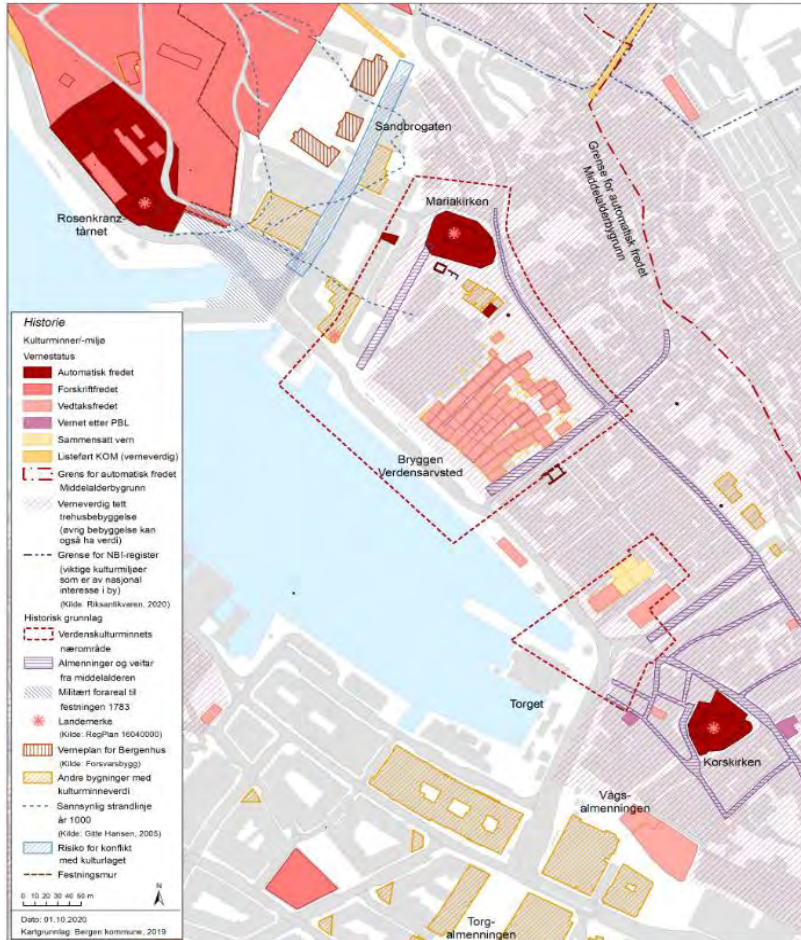
Summary: Comparison functional and visual impact day- / tunnel option



3

Risk Assessment

Structural Integrity: Archaeology and Built Heritage



IMPORTANT FACTORS WITH REGARD TO STRUCTURAL IMPACT

DAY OPTION:

Hydrology: Securing the groundwater level

Construction works along Bryggen Quay

Construction works on top of cultural layers in Sandbrogaten (tunnel & light-rail-track)

Operation of Bybanen light-rail-track on top of cultural layers

TUNNEL OPTION:

Hydrology: Securing of groundwater levels

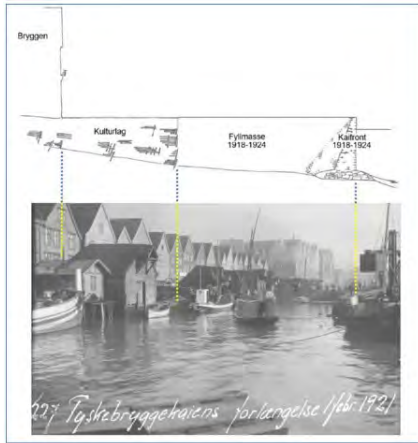
Construction works at the entrances and tunnel portals

Construction work of the tunnels

Demolition of houses at Øvregaten for tunnel entrances

Cultural heritage at entire planning area (@ source Norconsult / asplan viak)

Overview: Potential structural impacts



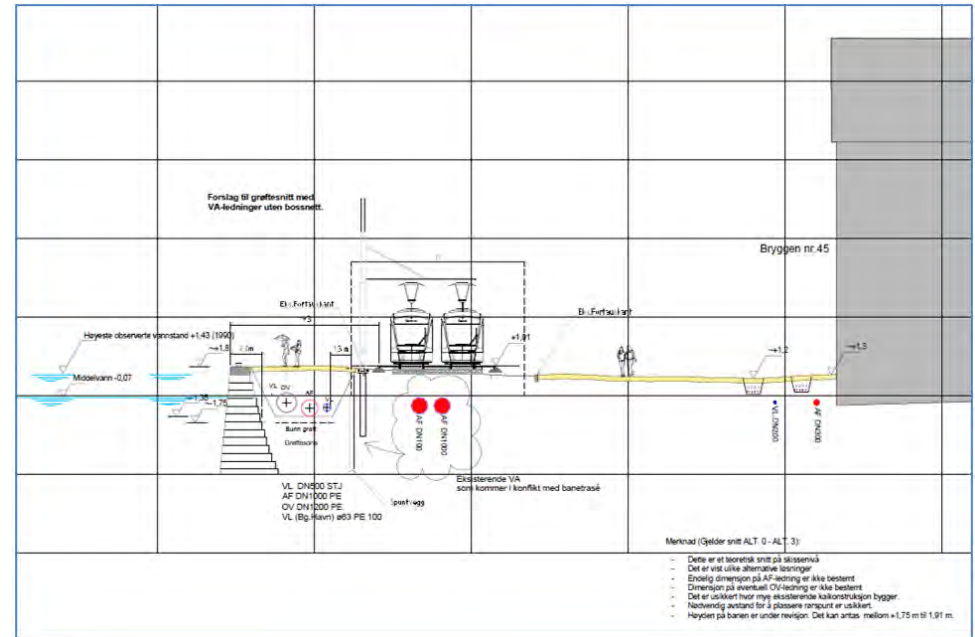
Archaeological layers at Bryggen quay (@ source Norconsult / asplan viak)

Key Result

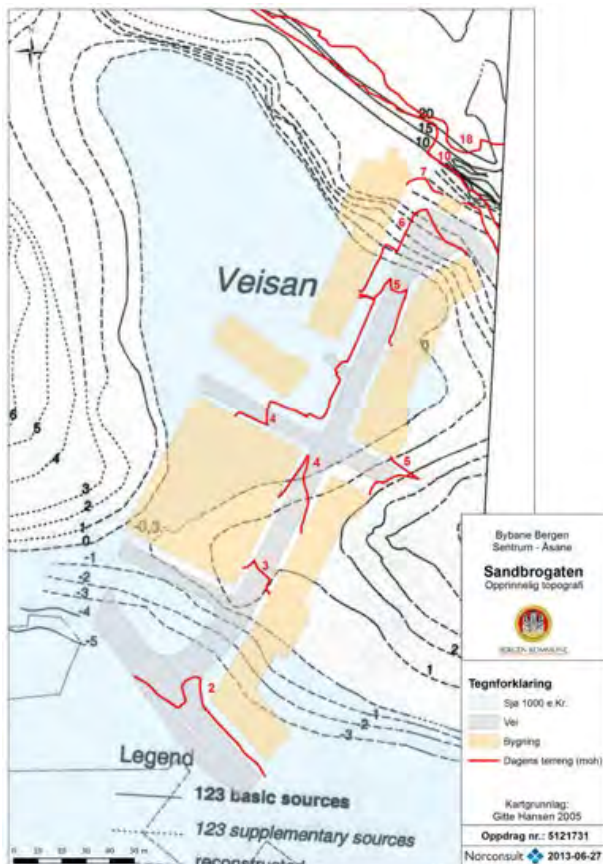
The day option will have a **moderate positive impact** on risk preparedness for sea water rise and flooding due to the planned pile wall and higher quay level at Dreggekaaien. However, **large risks** for built heritage foundations and groundwater changes during construction works on Bryggen Quay. The tunnel option is assessed as **neutral** as no measures against have been planned.

Bryggen (Quay)

- The light rail track is planned on the 1918- 1922 fillings of the quay.
- The works include replacing of the existing infrastructure.
- To ensure later access and avoid damaging of the track, the ditch for infrastructure will be secured with a pile wall.
- The introduction of the pile wall in the fillings outside Bryggen is expected to function as a water threshold securing the groundwater in zone C. Zone C is characterized by thick archaeological deposits in an excellent state of preservation.



Day option: Potential structural impacts on Archaeology & Built Heritage at Bryggen Quay



Sandbrogaten:

The area where today's Sandbrogaten is was reclaimed during the medieval period.

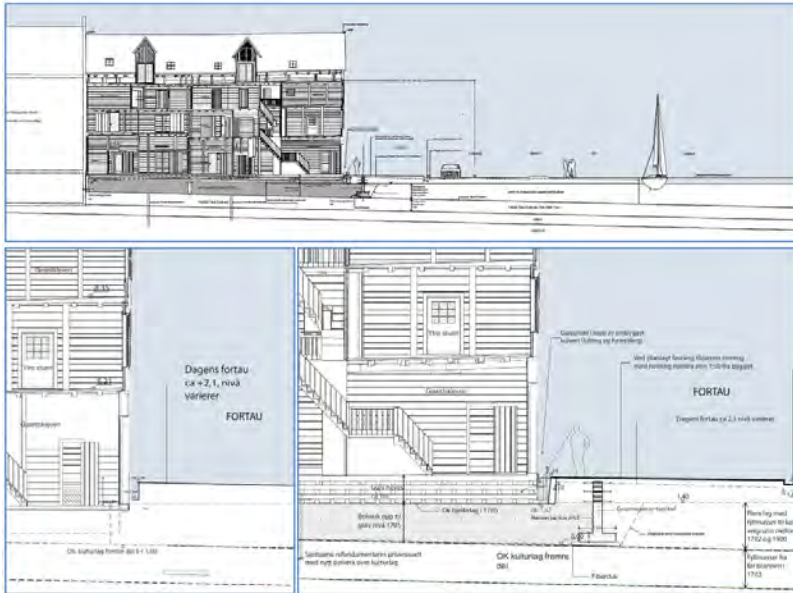
- According to Riksantikvaren the site holds the oldest and most important archaeological deposits in Bergen.
- Medieval finds are *from 1.32 m below surface and deeper*.
- The day alternative light rail track is planned on a basin *1 meter below surface*.
- The location for the ditches for the replacement of the infrastructure of 1-2 meters deep are planned to be located in areas with more recent fillings.

Archaeological layers at Sandbrogaten (@ source Norconsult / asplan viak)

Key Result

For the day option construction works in immediate vicinity of cultural layers in Sandbrogaten might cause **large risks** concerning medieval archaeological deposits and groundwater level. The tunnel option is assessed as **neutral** as no measures at Sandbrogaten have been planned.

Day option: Potential structural impacts_Archaeology Sandbrogaten



Finnegården

- The building is under restoration.
- A basin is being constructed around the foundations as prevention from eventual changes in groundwater level.



Archaeological layers at Finnegården / Bryggen Quay (@ source Norconsult / asplan viak)

Key Result

For the day option construction works in immediate vicinity of the Hanseatic Museum are assessed as **slight negative** as effective measures have been taken to secure the groundwater level. The tunnel option is assessed as **neutral** as no measures at Finnegården have been planned.

Day option: Potential structural impacts at Finnegården



@Byantikvaren

Key result

For the tunnel option construction works at tunnel portals might cause **large risks** with regard to built heritage and changes of groundwater levels in the World Heritage property and its potential buffer zone. Construction works in the area of Mariakirken are likely to cause undue damage and **very large risks** concerning damage of the cultural layers and building foundations. The day option will have no impact in these areas and is assessed as **neutral**.

Tunnel option

The present proposal is not adequately developed for an in-depth risk assessment.

- The main potential impacts are the overall hydrogeological risks for changes of groundwater levels especially during construction works and the impacts on the medieval built heritage at Mariakirken and Øvregaten.
- The entrance at Mariakirken entails the demolition of medieval buildings.
- Construction works in the area of Mariakirken are likely to cause undue damage to the cultural layers and building foundations.
- The construction works for the entrance at Lodin Lepps gate contains risks to existing buildings.



Planned location for tunnel entrances at Øvregatan 9 / Mariakirken (@Norconsult / asplan viak)

Tunnel option: Potential structural impacts

Uncertainties concerning Structural Impact / Archaeology and Built Heritage				
World Heritage property / Attributes	Day Option	Remark	Tunnel Option	Remark
Uncertainties due to Sea Water Rise / Flooding:				
Finnegården	Slight positive	Risk preparedness for sea water rise and flooding has been improved by planned pile wall	neutral	
Bryggen (Quay)	Slight positive	Risk preparedness for sea water rise and flooding has been improved by planned pile wall and higher quay level at Dreggekaien. The lower level of the quay is estimated to be within the operational levels.	neutral	
Uncertainties throughout construction period:				
Hydrogeology / ground water changes & Direct impact on built and archaeological heritage				
Sandbrogaten	Large	Planned tunnel and light-rail-track: Construction works in immediate vicinity of cultural layers in Sandbrogaten cause potential conflict with medieval archaeological deposits and groundwater level. More detailed plans are necessary.	neutral	
Øvregaten	neutral		Large	Construction works at tunnel portals might cause structural conflicts and changes of groundwater levels in World Heritage property and its potential buffer zone. Detailed ground investigations, as well as investigations on impact of tunnel on groundwater level are considered necessary.
Mariakirken			Very Large	Construction works in the area of Mariakirken are likely to cause undue damage to the cultural layers and building foundations.
Finnegården	Slight	Preventive conservation measures around the foundations have been applied	neutral	
Bryggen Quay	Large	Risks for built heritage foundations and groundwater changes during construction works.	neutral	

Comparison: Uncertainties concerning structural impact of day / tunnel option for archaeology and built heritage

KEY RESULTS for day option and tunnel option

- Day option:** Risk preparedness for sea water rise and flooding has been improved by planned pile wall and higher quay level at Dreggekaaien.
Risks for built heritage foundations and groundwater changes during construction works on Bryggen Quay. Construction works in immediate vicinity of cultural layers in Sandbrogaten cause potential conflict with medieval archaeological deposits and groundwater level.
- Tunnel option:** Construction works at tunnel portals might cause large structural conflicts and changes of groundwater levels in World Heritage property and its potential buffer zone.
Construction works in the area of Mariakirken are likely to cause undue very large damage to the cultural layers and building foundations.

Summary: Comparison of uncertainties concerning structural impact of day / tunnel option for archaeology and built heritage



4

Recommendations

General Conclusions

The two options have completely different impacts on the World Heritage property Bryggen. The day option is situated at the forefront of the World Heritage property Bryggen and it will be clearly visible. The tunnel option passing behind the World Heritage property changes the environment only to a limited extent. But the building of the tunnel and a light-rail-stop with two planned entrances entails the demolition of existing houses at Øvregaten, part of the supporting values of the potential buffer zone of the World Heritage property. Besides, the planned tunnel can affect the groundwater level under the World Heritage Property.

As a consequence, both the modified day-option and the planned tunnel option generate **positive** and **negative** impacts and risks concerning the OUV of the World Heritage property Bryggen. The day option causes large functional deficits at the Hanseatic Museum and large to moderate negative functional and visual impacts on Bryggen Quay due to the length and the frequency of the light-rail-cars and the introduction of new elements such as the high-voltage-line. Besides, construction works might cause large negative structural impacts at Sandbrogaten and Bryggen Quay, though after its placement the planned pile wall at Bryggen Quay might have positive effects concerning the protection against flooding and changes of groundwater level.

The tunnel option causes mainly large uncertainties concerning its structural impact as it entails residual risks concerning groundwater subsidence under the World Heritage property. As the tunnel is irreversible, this risk can only be mitigated to a certain extent by infiltration and other groundwater stabilizing measures. Thus, it requires an active and continuous risk monitoring process including identification of further risk-reducing measures. Moreover, both planned tunnel entrances at Øvregaten cause the need to demolish buildings and to work in the immediate vicinity of archaeological layers. At Mariakirken, which is an important World Heritage attribute, this is considered as a very large uncertainty making it necessary to relocate this planned entrance.

KEY MESSAGE

Both options have potential **positive** and **negative** impacts!

But overall, the day option is considered a safer solution for the World Heritage property considering the large structural risks in the present tunnel option. However, it should be noted that the day option also causes large negative impacts and risks which have to be mitigated to a maximum extent prior to the realisation of the project.

General findings / steps to take

Negative

Functional Impact:
Potential **large barrier effect** of light rail and cycle path on **Bryggen Quay**

Potential **large functional** conflict at entrance area of **Finnegården**



Functional Impact:

- ▶ DEVELOP a detailed concept for planned cycle path on **Bryggen Quay**. This plan should show in detail how the potential barrier effect is avoided!
- ▶ DEVELOP detailed concept for mobility and safety of larger groups at **Finnegården**.

Visual Impact:
Potential **large visual impact** on **Bryggen Quay**.
Visual impacts have been slightly improved, but will only be solvable to a limited extent due size of light-rail-cars and high-voltage line.



Visual Impact:

- ▶ DROP high-voltage-line and masts and PROVIDE visualisations showing clearly the design state of Bryggen Quay without high-voltage line. Include detailed information of the planned cycle path as well day and night views so as to show clearly how the lighting concept will work.

Structural Impact:
Large risks concerning archaeological deposits at **Sandbrogaten**:

Large risks for changes for structural damage to built heritage during the construction period on **Bryggen Quay**.



Structural Impact:

- ▶ DEVELOP precise plan with a clear view concerning risks during construction activities at **Sandbrogaten**. Communicate this plan especially with experts from Riksantikvaren!
- ▶ DEVELOP precise plans to mitigate risks during constructions!

ISSUES

RECOMMENDATIONS

Issues & Recommendations for day option

Negative

Several very large / large issues concerning structural Impact:

1. Potential **very large structural impact** on archaeological deposits at *Mariakirken*:
2. Potential **large risks for structural impact** due to changes of groundwater level at Bryggen World Heritage property and its potential buffer zone.
3. Potential **large risks** for demolition of listed buildings at medieval Øvregaten.
4. Potential **large risks** during construction activities for entrances at Øvregaten.



- ▶ DEVELOP a **new plan** for a light-rail-stop at Øvregaten without planned entrance at Mariakirken.
- ▶ DEVELOP a **detailed plan** how to seal planned tunnel in order to avoid potential large uncertainties for World Heritage property Bryggen.
- ▶ DEVELOP a **detailed plan** how to avoid or at least mitigate these risks.
- ▶ DEVELOP a **detailed plan** how to avoid or at least mitigate risks due to construction activities.
- ▶ **Provide active risk management** and identification of further risk-reducing measures.

ISSUES

RECOMMENDATIONS

Issues & Recommendations for tunnel option

Recommendation for both *day option* and *tunnel option*: Provide a strategic plan for a future buffer zone

- ▶ COMBINE knowledge of cultural environment management, urban planning and transport planning
- ▶ IDENTIFY risks and potentials in the entire Vågen area.
- ▶ DEVELOP a sustainable strategy for touristic traffic management with a clear view for the sensitivity of WH property Bryggen including Øvregaten.

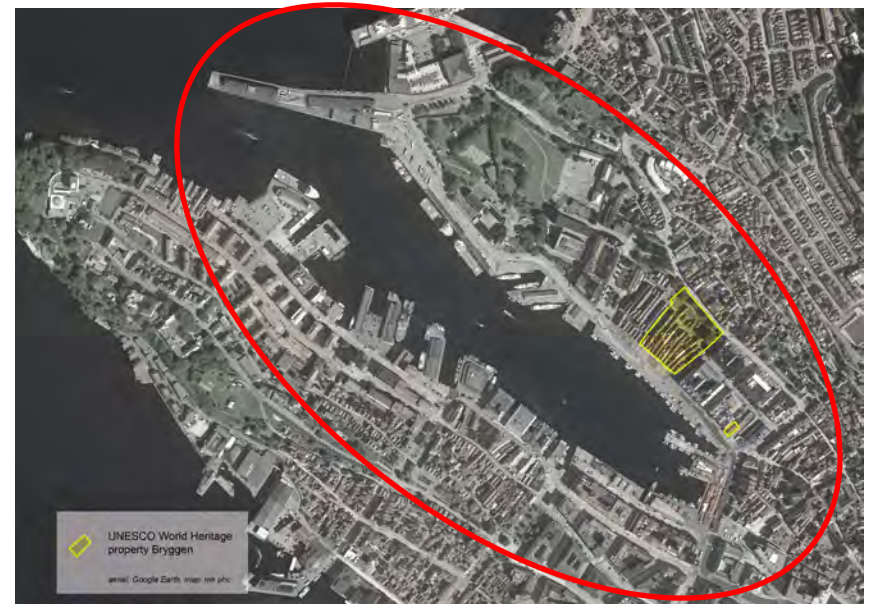


- ▶ DEVELOP a concept for a World Heritage buffer zone!

ISSUES

RECOMMENDATION

Suggested investigation area for future buffer zone of World Heritage property Bryggen (@ mkphc)



KEY ISSUE

Think about potential buffer zone which needs to cover entire Vågen area!

General recommendation for Day option and Tunnel option



5

Appendix



UNITED NATIONS EDUCATIONAL, SCIENTIFIC
AND CULTURAL ORGANISATION

CONVENTION CONCERNING THE
PROTECTION OF THE WORLD CULTURAL
AND NATURAL HERITAGE

Adopted by the General Conference at its seventeenth session
Paris, 16 november 1972



English Text

UNESCO-World Heritage properties are protected under the World Heritage Convention ("Convention concerning the Protection of the World Cultural and Natural Heritage")¹. The World Heritage Convention that took effect in 1972 is an international agreement between the states parties and the United Nations. The objective of the World Heritage Convention is to identify, protect and use the most important natural and cultural heritage of man-kind for intercultural mediation. World Heritage properties are inscribed on the World Heritage List to protect them for future generations due to their Outstanding Universal Value. The Outstanding Universal Value is therefore the central point of reference for all activities within the UNESCO World Heritage property.

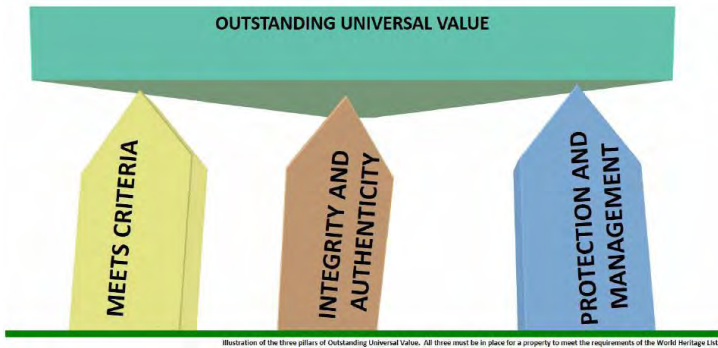
Pursuant to the World Heritage Convention, the State Parties are responsible for the protection and sustainable development of the World Heritage properties. According to Article 4 of the World Heritage Convention, "each State Party recognizes that the duty of ensuring the identification, protection conservation, presentation and transmission to future generations of the cultural and natural heritage referred to in Articles 1 and 2 and situated on its territory, belongs primarily to that State".

The protection and sustainable development of UNESCO World Heritage properties must therefore be ensured by State Parties that joined the World Heritage Convention. For this purpose, the internationally applicable guidelines must be observed, in particular the various charters on the implementation of the World Heritage Convention and the so-called Operational Guidelines serving to implement the World Heritage Convention.²

¹ UNESCO (1972): Convention Concerning the Protection of the World Cultural Heritage⁶

² UNESCO World Heritage Centre: The Operational Guidelines for the Implementation of the World Heritage Convention, Paris 2017. The Operational Guidelines are updated in regular intervals. This Assessment is based on the Operational Guidelines 2019

Background Information: World Heritage Convention



The three pillars of Outstanding Universal Value (@ IUCN)

³ The Operational Guidelines define the OUV as follows: “Outstanding Universal Value means cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity. As such, the permanent protection of this heritage is of the highest importance to the international community as a whole. The Committee defines the criteria for the inscription of properties on the World Heritage List.” See: UNESCO World Heritage Centre: The Operational Guidelines for the Implementation of the World Heritage Convention, Paris 2019

OUTSTANDING UNIVERSAL VALUE (OUV)

The inscription of World Heritage properties on the World Heritage List depends on their Outstanding Universal Value (OUV). The concept of the Outstanding Universal Value in the World Heritage Convention and its implementation stands for all UNESCO World Heritage properties in all regions of the planet. After inscription on the UNESCO World Heritage List, the Outstanding Universal Value is set in stone and must not be impaired.³ The Outstanding Universal Value is therefore the central point of reference for all activities within the UNESCO World Heritage property.

WORLD HERITAGE CRITERIA

Cultural and natural sites whose Outstanding Universal Value is acknowledged by the World Heritage Committee and its advisory organisations ICOMOS International, IUCN and ICCROM are inscribed on the World Heritage List using specific criteria. These criteria are defined in the internationally applicable guidelines for World Heritage properties, the Operational Guidelines. Six different criteria (criteria (i) – (iv)) exist for cultural World Cultural Heritage Sites. After a State Party to the World Heritage Convention has nominated a site for inscription on the World Heritage List, the UNESCO World Heritage Committee decides whether:

- at least one of these criteria applies, so that the Outstanding Universal Value of a site and therefore its inscription on the UNESCO World Heritage List is justified (Operational Guidelines, paragraph 77),
- any potential World Heritage property also meets the criteria of Integrity and Authenticity,
- any potential World Heritage property has an adequate system for its protection and management (Operational Guidelines, paragraph 78).

These above-mentioned conditional criteria are summarised in compact form for all World Heritage properties in a Statement of Outstanding Universal Value (SoOUV). For any World Heritage properties that were inscribed on the World Heritage List without a SoOUV, a so-called Retrospective Statement of Outstanding Universal Value (RSoOUV) is prepared. The RSoOUV must always be considered in compliance with the information provided in the nomination file, and cannot be applied in isolation. Therefore, the selection criteria are the starting point of this Heritage Impact Assessment, because these criteria must be maintained by all means and must not be impaired.

Background Information: Outstanding Universal Value

Heritage Impact Assessments (HIAs)

Heritage Impact Assessments are required by the UNESCO World Heritage Committee and its advisory organisations IUCN (Natural World Heritage Sites) and ICOMOS (World Cultural Heritage Sites) in order to evaluate and assess transformations in the World Heritage properties and consequences for their Outstanding Universal Value. A major reason for such requirements of Heritage Impact Assessments is that they explicitly take account of the particularities of the system of values of World Heritage properties, in particular the Outstanding Universal Value, and the Selection Criteria, respectively.

In contrast to Strategic Environmental Assessments (SEA) and Environmental Impact Assessments (EIA), Heritage Impact Assessments (HIA) have currently not been planned under EU law. The realisation of Heritage Impact Assessments and the implementation of the resulting recommendations is therefore done on a voluntary basis and usually falls under the responsibility of the individual State Parties.

ICOMOS International established applicable guidelines for the performance of Heritage Impact Assessments in World Cultural Heritage Sites, the so-called *ICOMOS Guidance on Heritage Impact Assessments for Cultural World Heritage Properties 2011*.¹ It is planned to review this Guidance soon.

¹ https://www.icomos.org/world_heritage/HIA_20110201.pdf



Background Information - Heritage Impact Assessments

ABBREVIATIONS

HIA:	Heritage Impact Assessment
ICOMOS:	International Council on Monuments and Sites, Paris
OUV:	Outstanding Universal Value
RSOUV:	(Retrospective)Statement of Outstanding Universal Value
UNESCO:	United Nations Educational, Scientific and Cultural Organization
WHC:	UNESCO-World Heritage Centre, Paris

Abbreviations

Contracting Authority, Coordination and Data Transmission

Byantikvaren, represented by

Johanne Gillow

Marianne Knutsen

Hege Bakke-Alisøy

Skostredet 5 | 5017 BERGEN

www.bergen.kommune.no/byantikvaren

Data transmission concerning planned bybanen Light-Rail Extension

Solveig Mathiesen

Karin van Wijngarden

Postboks 7700 | 5020 Bergen

www.bergen.kommune.no

Compilation of Preliminary Report, photographs and generation of visualizations

michael kloos planning and heritage consultancy (mkphc)

Michael Kloos

Katri Lisitzin

Philipp Tebart

Djana Tirai

Lothringerstraße 95 | D-52070 Aachen | Germany

www.michaelkloos.de

Colophone

Illustrations

Please address indicated sources

Copyrights Attribute Tables (Chapter 3)

- Bergen Byarkiv
- Bergen kommune
- Stiftelsen Bryggen
- Universitetsbiblioteket i Bergen /marcus.uib.no
- K. Lisitzin

If no source is indicated: copyrights belong to mkphc

©
michael kloos planning and heritage consultancy
&
Katri Lisitzin
Aachen / Uppsala 30 September 2021