



Sustainable tunnel checklist

Find opportunities to make a tunnel project more sustainable



Introduction

In a previous COB project, sustainability aspects for road tunnels have been identified, such as energy consumption, social participation and flexibility. In this checklist, these aspects have been translated into specific questions that can help determine how sustainable the tunnel project (new construction or renovation) is and where there are still opportunities.

“When we picture the sustainable tunnel at the stages of construction, use and maintenance we see a tunnel that leaves the earth and its inhabitants in a better position than before its construction,” says Prof. Dr. Marcel Hertogh in his preface to the *Inspiration Document Sustainability* (2014). But how do you achieve that, a (more) sustainable tunnel project? A COB working group has developed a checklist to help projects get started.

The checklist comprises a total of 57 questions spread over five overarching sustainability themes: energy, materials, environment, organisation and resilience. The questions can be answered with yes or no, so that the ‘sustainability status’ of the tunnel project quickly becomes clear. Is renewable energy generated at the tunnel? Does the tunnel, or the project, stimulate biodiversity? Is there a sustainability policy? Does the tunnel fit naturally in its environment? Because the questions are about very specific topics, the checklist can be used as a practical tool to make the project more sustainable.

Note!

This checklist is constantly evolving. The sustainability team of the COB receives continuously good feedback, for example when using the questionnaire during a workshop, and the comments and tips are collected and processed. You will always find the latest, current version online.

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1 ENERGY

1.1 Use

Reduce energy consumption.

1.2 Generation

Generate renewable energy in the vicinity of the tunnel for use in the tunnel.

1.3 Storage

Temporary storage of sustainably generated energy.

2 MATERIALS

2.1 Environmental impact

Reduce the environmental impact of the use of raw materials, equipment and products.

2.2 Circularity

Reduce the use of primary raw materials and encourage the reuse of secondary raw materials.

2.3 Human rights

Protect vulnerable groups in society.

3 ENVIRONMENT

3.1 Water

Reduce the use of water and the tunnel's impact on the water system.

3.2 Soil

Protect the soil from contaminants and promote soil fertility.

3.3 Integration into the natural environment

The tunnel fits well into its surroundings.

3.4 Air

Reduce emissions of harmful substances through and from the tunnel.

3.5 Noise

Reduce noise pollution from the tunnel.

3.6 Use of space

Make good use of the space taken up by the tunnel and its surroundings.

3.7 Biodiversity and ecology

Protect and promote natural values and biodiversity.

3.8 Health and well-being

Protect against negative consequences and promote healthy living.

4 ORGANISATION

4.1 Policy

Sustainability policy promotes the sustainable development, asset management and maintenance of the tunnel.

4.2 Leadership

The project leader and advisers involved have a strong focus on sustainability so that sustainable thinking is supported by all team members.

4.3 Finance

Ensuring that the sustainable goals are financially feasible and that the added value becomes visible.

4.4 Participation

Stakeholders are involved in the sustainable design, construction, use and maintenance of the tunnel.

4.5 Culture

A sustainable culture guarantees sustainability in the DNA of the tunnel, the manager and all parties involved.

5 RESILIENCE

5.1 Climate adaptation

Reduce the impact of climate change and promote climate resilience.

5.2 Flexibility

Ensure that the tunnel can continue to function and will be improved despite changing circumstances, wishes and needs.

5.3 Safety

Promote safe use of the tunnel and reduce the safety risks arising from (use of) the tunnel.

5.4 Mobility

Reduce travel time and promote healthy mobility.

1.1 Use

Reduce energy consumption.

1.1.0 *Is there insight into actual energy consumption?*

YES
NO

1.1.1 *Are energy-efficient installations used?*

YES NO

1.1.2 *Is energy-efficient lighting used?*

YES NO

1.1.3 *Is there an active focus on using less lighting?*

YES NO

1.1.4 *Are measures being taken to reduce energy waste?*

YES NO

1.2 Generation

Generate renewable energy in the vicinity of the tunnel for use in the tunnel.

1.2.1 *Is renewable energy generated in the tunnel?*

YES NO

1.2.2 *Is this energy used in the tunnel?*

YES NO

1.3 Storage

Temporary storage of sustainably generated energy.

1.3.1 *Does the tunnel have a storage system for the renewable energy that is generated?*

YES NO

2.1 Environmental impact

Reduce the environmental impact of the use of raw materials, equipment and products.

2.1.1 Does asset management take into account the environmental impact of materials?

YES NO

2.1.2 Is there an active focus on reducing the environmental impact of asset management (e.g. through Environmental Cost Indicator [ECI], LCA)?

YES NO

2.2 Circularity

Reduce the use of primary raw materials and encourage the reuse of secondary raw materials.

2.2.1 Does asset management take into account the reuse of removed materials?

YES NO

2.2.2 Are decommissioned installations reused or processed correctly?

YES NO

2.2.3 Is it known which materials are available in the tunnel and what the possibilities for reuse are?

YES NO

2.2.4 Are the materials used in asset management reusable in the future?

YES NO

2.2.5 Are there possibilities to reuse already used materials in this project?

YES NO

2.3 Human rights

Protect vulnerable groups in society.

2.3.1 Are vulnerable groups in our society protected?

YES NO

3.1 Water

Reduce the use of water and the tunnel's impact on the water system.

3.1.1 Does the tunnel system have a negative impact on the quality of ground and surface water?

YES NEE

3.1.2 Does the tunnel interfere with water management?

YES NEE

3.1.3 Is rainwater separated from the sewage system?

YES NEE

3.2 Soil

Protect the soil from contaminants and promote soil fertility.

3.2.1 Is soil contamination cleaned up?

YES NO

3.2.2 Is soil fertility stimulated?

YES NO

3.2.3 Is soil erosion being mitigated?

YES NO

3.3 Integration into the natural environment

The tunnel fits well into its surroundings.

3.3.1 Does the tunnel fit naturally into its surroundings?

YES NO

3.3.2 Is the tunnel part of the ecosystem?

YES NO

3.4 Air

Reduce emissions of harmful substances through and from the tunnel.

3.4.1 Is the air that leaves the tunnel cleaner than the average ambient air quality?

YES NO

3.4.2 Is air quality in the tunnel being actively improved?

YES NO

3.5 Noise

Reduce noise pollution from the tunnel.

3.5.1 Is the noise level at the mouth of the tunnel lower than 55 dB?

YES NO

3.5.2 Is the noise level at the tunnel actively being reduced?

YES NO

3.6 Use of space

Make good use of the space taken up by the tunnel and its surroundings.

3.6.1 Are there multiple uses of space in and near the tunnel possible?

YES NO

3.7 Biodiversity and ecology

Protect and promote natural values and biodiversity.

3.7.1 Are the ecological values and opportunities known?

YES NO

3.7.2 Does asset management take account of ecological values?

YES NO

3.8 Health and well-being

Protect against negative consequences and promote healthy living.

3.8.1 Are the negative health effects of the tunnel (e.g. noise, air quality, light pollution) mitigated as far as possible?

YES NO

3.8.2 Is a healthy lifestyle promoted for both staff and tunnel users?

YES NO

4. ORGANISATION

4.1 Policy

Sustainability policy promotes the sustainable development, asset management and maintenance of the tunnel.

4.1.1 *Is there a sustainability policy that addresses one or more themes in this checklist?*

YES NO

4.1.2 *Have concrete targets been set for objectives relating to energy transition and circularity?*

YES NO

4.1.3 *Is the sustainability policy periodically assessed and accounted for?*

YES NO

4.2 Leadership

The project leader and advisers involved have a strong focus on sustainability so that sustainable thinking is supported by all team members.

4.2.1 *Does the project leader have sustainable goals in his/her assignment?*

YES NO

4.2.2 *Has a sustainability coordinator been appointed who is responsible for the implementation of the policy?*

YES NO

4.3 Finance

Ensuring that the sustainable goals are financially feasible and that the added value becomes visible.

4.3.1 *Are the costs of achieving sustainable objectives included in the budget?*

YES NO

4.3.2 *Are sustainable values defined?*

YES NO

4.3.3 *Does the tender provide a financial incentive to come up with sustainable proposals?*

YES NO

4.4 Participation

Stakeholders are involved in the sustainable design, construction, use and maintenance of the tunnel.

4.4.1 *Are the main stakeholders known and periodically informed about tunnel asset management?*

YES NO

4.4.2 *Are the main stakeholders involved in the tunnel?*

YES NO

4.4.3 *Does the tunnel provide added value for stakeholders?*

YES NO

4.5 Culture

A sustainable culture guarantees sustainability in the DNA of the tunnel, the manager and all parties involved.

4.5.1 *Is sustainability a theme in all activities and do all stakeholders have a contribution to make?*

YES NO

4.5.2 *Is there room for proactively enhancing the tunnel's sustainability and is there room for innovation and renovation?*

YES NO

5. RESILIENCE

5.1 Climate adaptation

Reduce the impact of climate change and promote climate resilience.

5.1.1 *Has a climate stress test been conducted for the project? For example, is there insight into the impact of extreme weather on the project?*

YES NO

5.1.2 *Are the consequences of climate change mitigated?*

YES NO

5.2 Flexibility

Ensure that the tunnel can continue to function and will be improved despite changing circumstances, wishes and needs.

5.2.1 *Is there an overview of changes in the use of the tunnel and wishes/needs relating to the tunnel?*

YES NO

5.2.2 *Are changes in use, wishes and needs taken into account?*

YES NO

5.2.3 *Is there any insight into the bottlenecks that threaten the flexibility of the tunnel (now and/or in the future)?*

YES NO

5.3 Safety

Promote safe use of the tunnel and reduce the safety risks arising from (use of) the tunnel.

5.3.1 *Is the extent to which the tunnel can be used known and is there an active focus on increasing safe use of the tunnel?*

YES NO

5.3.2 *Are the tunnel's safety risks known and actively managed to reduce them?*

YES NO

5.4 Mobility

Reduce travel time and promote healthy mobility.

5.4.1 *Is the tunnel making an increasing contribution to reducing journey times?*

YES NO

5.4.2 *Does the tunnel, or the project, promote healthy mobility?*

YES NO

5.4.3 *Are efforts actively being made to reduce the stress (perception) involved in using the tunnel?*

YES NO

5.4.4 *Are initiatives taken while managing the tunnel to promote sustainable mobility and reduce the environmental impact of, for example, alternative routes?*

YES NO

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The sustainability checklist is intended for tunnel managers, engineers, contractors and all other stakeholders in the tunnel world who wish to conduct an initial exploration of the opportunities for sustainability in a tunnel project. They can receive help from the COB's Sustainability expert team, but they can also complete the checklist themselves. The questionnaire provides a picture of the sustainability state of the tunnel and the opportunities that exist for making the project more sustainable. In addition, the checklist can structure and facilitate the discussion about sustainability in the project. Just like the sustainability team of the COB can.

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