



TEC3.1

# Mobility infrastructure



## Objective

Our objective is to save natural resources, reduce traffic-related emissions into the air, water and soil, increase user comfort via sustainable mobility infrastructure and to increase the opportunities for use of efficient and affordable mobility.

## Benefits

Sustainable and smart traffic infrastructure enables users to select the mode of transport that best suits their individual needs. If the conditions necessary for using a wide variety of forms of mobility are established for the building, it is to be expected that the level of pollution and other negative impacts from motorised private transport will be reduced. In addition, doing so increases user satisfaction of the site and the building, expands the extent of affordable mobility and encourages health-promoting cycling and walking.

## Contribution to overriding sustainability goals



### CONTRIBUTION TO SUSTAINABLE DEVELOPMENT GOALS (SDGS) OF UNITED NATIONS (UN)

### CONTRIBUTION TO THE GERMAN SUSTAINABILITY STRATEGY

	CONTRIBUTION TO SUSTAINABLE DEVELOPMENT GOALS (SDGS) OF UNITED NATIONS (UN)	CONTRIBUTION TO THE GERMAN SUSTAINABILITY STRATEGY
 <b>Significant</b>	3.4 Reduce mortality from non-communicable diseases and promote mental health	3.2.a/b Air pollution 11.2.b Mobility
	3.9 Reduce illnesses and death from hazardous chemicals and pollution	13.1.a Climate protection
	9.1 Develop sustainable, resilient and inclusive infrastructures	
	9.4 Upgrade all industries and infrastructures for sustainability	
	11.2 Affordable and sustainable transport systems	
	11.6 Reduce the environmental impact of cities	
 <b>Moderate</b>	13.2 Integrate climate change measures into policies and planning	



## Outlook

Mobility is currently in a period of upheaval (e.g. electromobility). Development will be closely monitored and adjusted as required.

## Share of total score

	SHARE	WEIGHTING FACTOR
Office Education Residential Hotel	2.3%	3
Consumer market Shopping centre	2.6%	3
Department stores		
Logistics Production	2.5%	3





## EVALUATION

Mobility is intrinsically tied to the building and its infrastructure as a starting point and goal. It involves increasing the use of alternative modes of transport as well as ensuring that the building features good infrastructure and parking facilities for various means of transportation. This is a qualitative and quantitative method which evaluates the availability of appropriate facilities for the indicators of bicycle infrastructure, rental systems, electromobility and user comfort in the building. In this criterion, the total available points add up to 110 points; however there is a cap of maximum 100 points that can be attained. Including bonuses, a maximum of 120 points can be awarded for this criterion.

Note: In case one or more of the following indicators do not apply in a country, alternatives solutions proposed by a DGNB auditor could be taken into account for the evaluation of a project.

NO.	INDICATOR	POINTS
<b>1</b>	<b>Bicycle infrastructure</b>	
1.1	<b>Parking facilities</b>	<b>Max. 20</b>
	Parking facilities, clearly assigned to the building, are located in or around the building and are easily accessible	5
	Anti-theft measures for bicycles and anti-vandalism measures for the parking facilities/spaces have been adopted	5
	Maintenance facilities are available	5
	Weather protection is available for the parking facilities/spaces (at least 80%)	5
	Lighting is available for the parking facilities/spaces (at least 80%)	5
<b>2</b>	<b>Rental systems (public or private)</b>	
2.1	<b>CIRCULAR ECONOMY BONUS – MOBILITY SHARING</b>	<b>+10</b>
	Parking spaces for mobility sharing (car, scooter, bike sharing, etc.) are available in the immediate vicinity of the entrance (max. 350 m)/easily accessible at the building, or the building is within the area of an operation of a free-floating sharing provider	
<b>3</b>	<b>Electromobility</b>	
3.1	<b>Electromobility – motorised private transport</b>	<b>0–30</b>
	Supports the local minimum requirements (e.g. in Germany according to the federal programme for charging infrastructure (BMVI programme 2017)	
	Two charging stations are available and 50% of all car parking spaces (internal or external) are pre-fitted for installing charging stations	10
	50% of all car parking spaces (internal or external) are pre-fitted for installing charging stations, an additional 25% of the parking spaces as a minimum are equipped with charging stations	15
	25% of all car parking spaces (internal or external) are pre-fitted for installing charging stations, an additional 50% of the parking spaces as a minimum are equipped with charging stations	20
	25% of all car parking spaces (internal or external) are pre-fitted for installing charging stations, an additional 75% of the parking spaces as a minimum are equipped with charging stations	25
	All car parking spaces (internal or external) are equipped with charging stations	30



<b>3.2</b>	<b>Electric bikes</b>		<b>0–30</b>
	All electric bike parking spaces (internal or external) are pre-fitted for installing charging stations		10
	75% of all electric bike parking spaces (internal or external) are pre-fitted for installing charging stations, and at least 25% of the parking spaces are equipped with charging stations		15
	50% of all electric bike parking spaces (internal or external) are pre-fitted for installing charging stations, and at least 50% of the parking spaces are equipped with charging stations		20
	25% of all electric bike parking spaces (internal or external) are pre-fitted for installing charging stations, and at least 75% of the parking spaces are equipped with charging stations		25
	All designated electric bike parking spaces (internal or external) are equipped with charging stations.		30
	As an alternative, documentation on the existence of charging facilities at the respective workplace can be provided. This documentation should be supported by a declaration by the electrical planner (in this case, only 10 points can be awarded).		
<b>3.3</b>	<b>Electromobility: Integration of charging stations</b>		<b>Max. 20</b>
	Integration of the charging stations into the building energy management system		10
	Integration of the charging stations into the networked charging management system, for 10 or more charging spaces		10
	Integration of the charging stations into the billing system of the car park operator		10
	Integration of the charging stations into a billing system with roaming capability		10
<b>3.4</b>	<b>AGENDA 2030 BONUS – CLIMATE PROTECTION GOALS</b>		<b>+10</b>
3.4.1	Vehicle to grid: Preparations are in place for <b>bidirectional</b> charging and discharging of electric vehicles.		
<b>4</b>	<b>User comfort</b>		
<b>4.1</b>	<b>User comfort inside the building</b>		<b>Max. 10</b>
	Shower facilities are available		5
	Changing and drying rooms are available		5
	Storage facilities are available		5
	Parking spaces/facilities for mobility aids such as walking frames, prams, Segways, etc. are available		10
<b>Re 1–4</b>	<b>INNOVATION AREA</b>		<b>As in 1–4</b>
	Explanation: If there are measures implemented which encourages building users to extensively and regularly use environmentally friendly forms of transportation (non-motorised modes of transport, public transportation or rental systems) to travel to the building, these measures can also be evaluated positively in accordance with the objectives of the criterion and the evaluation of the other indicators. This is also possible in the section of electromobility (e.g. "Green logistics" that enable low-emission or emission-free delivery in inner city locations).		



## SUSTAINABILITY REPORTING AND SYNERGIES

### Sustainability reporting

The following aspects can be used for communication as key performance indicators (KPI):

NO.	KEY PERFORMANCE INDICATORS (KPIs)	UNIT
KPI 1	Number of high-quality parking facilities for bicycles	[Number]
KPI 2	Number of nearby parking spaces for car sharing	[Number]
KPI 3	Number of nearby parking spaces for bike sharing	[Number]
KPI 4	Number of car charging stations (standard and bidirectional)	[Number]
KPI 5	Percentage of car parking spaces pre-fitted for charging stations	[%]
KPI 6	Number of electric bike charging stations	[Number]
KPI 7	Percentage of electric bike parking spaces pre-fitted for charging stations	[%]

### Synergies with DGNB system applications

- **DGNB DISTRICTS:** Indicators 1, 2, 3 and 5 are compatible with the content of criteria TEC3.1 and TEC3.2 (mobility infrastructure for motorised/non-motorised transportation) from the schemes for urban districts and business districts.



## APPENDIX A – DETAILED DESCRIPTION

### I. Relevance

Mobility is currently an important site factor for buildings. The availability and of various forms of transportation and an efficient transport system concept increases the user comfort and convenience. The correspondingly high acceptance and take-up by users have a positive effect on the evaluation of a site and thus on the choice of site for a property.

### II. Additional explanation

Mobility does not begin outside a building – hence adequate provisions must also be made available inside.

Flexibility and user-friendliness contribute to increased user acceptance.

Flexibility means accessibility to alternative modes of transport such as public transport, rental systems or mobility platforms, as well as satisfaction of the various individual mobility requirements, such as the use of electric vehicles in the form of electric cars, electric scooters or electric bikes.

User-friendliness includes access to passenger information and the routing within a building, easy access to storage areas for mobility aids such as walking frames, prams, bicycles or Segways, as well as user comfort and convenience within the building via the provision of shower facilities, and changing and drying rooms.

### III. Method

Infrastructure for modes of transport at the site:

#### Indicator 1. Bicycle traffic infrastructure

This indicator is evaluated by means of assessing parking spaces, maintenance facilities, weather protection and lighting.

- Parking facilities: Available in sufficient quantity and quality in accordance with local guidelines / standards. The result based on reference values must be increased or reduced if, in individual cases, the result is grossly disproportionate to the requirements derived from the existing or expected number of bicycles for users and visitors to the building.

Alternatively, the following recommendations for determining space requirements can be used:

- Instructions for planning bicycle parking facilities and Technical Guidelines TR 6102 from the German Cyclist's Association (ADFC): [http://www.adfc.de/files/2/110/111/TR6102\\_0911\\_Empfehlenswerte\\_Fahrrad-Abstellanlagen.pdf](http://www.adfc.de/files/2/110/111/TR6102_0911_Empfehlenswerte_Fahrrad-Abstellanlagen.pdf)
- Bicycle Parking Manual by the Danish Cycling Federation: [http://www.cycling-embassy.dk/wp-content/uploads/2010/08/Bicycle\\_Parking\\_Manual.pdf](http://www.cycling-embassy.dk/wp-content/uploads/2010/08/Bicycle_Parking_Manual.pdf)
- "Making Buildings Fit for Sustainable Mobility" report from the European Cyclists' Federation (ECF): [https://ecf.com/system/files/Bicycle%20vs%20Car%20Parking%20in%20Building%20Codes\\_ECF\\_ONLINE.pdf](https://ecf.com/system/files/Bicycle%20vs%20Car%20Parking%20in%20Building%20Codes_ECF_ONLINE.pdf)
- Other comparable international / local guidelines, standards, etc.



A requirement for the evaluation of this indicator is documentation that the bicycle parking facilities contain an appropriate number of bicycle parking spaces.

The design of the parking facilities must be as vandal-proof as possible and includes anti-theft measures for bicycles.

- Maintenance facilities: the area in or around the building can be easily accessed by cyclists in case of need, which is reserved exclusively for bicycle servicing. This area should be protected from the weather, easy to find, well lit, and should be equipped with simple maintenance tools, such as a bicycle mount and an air pump.
- Weather protection: the extent of weather protection for the parking facilities/spaces is evaluated.
- Lighting: the extent of lighting for the parking facilities/spaces is evaluated.

#### **Indicator 2. Rental systems (public or private)**

- Evaluation points are awarded for the availability of rental systems that are within walking distance from the building.

#### **Indicator 3. Electromobility in the buildings and on the premises**

This indicator is evaluated on the basis of an assessment of the amount of (pre-fitted) charging stations for motorised private transport and electric bicycles in and around the building. The objective is to maintain a comprehensive network of charging infrastructure, enabling all users (residents, workers, visitors, etc.) to charge their electric vehicles at any time, and in accordance with local standards that vehicles can be charged any time, anywhere. The following aspects are evaluated:

- Support and installation of infrastructure facilities in and around the building in the form of charging stations, or pre-fitting of charging stations, for car parking spaces
- Support and installation of infrastructure facilities in and around the building in the form of charging stations, or pre-fitting of charging stations, for electric bike parking spaces

Please note:

- Recommendations for the qualitative and quantitative planning of electrical systems in buildings with regard to electric mobility are provided in VDI 2166 Sheet 2. These recommendations also make reference to relevant European Standards.
- Integration of charging stations into the building energy management system should be included in the planning process as early as possible (e.g. for using electricity generated within the building itself).
- Integration into billing systems with roaming capability is important in particular for charging systems intended for public use.
- The layout and dimensioning of the parking spaces must enable unimpeded charging. This means that parking spaces should ideally have a width of 3.0 m.

For the Agenda 2030 Bonus: V2G (vehicle-to-grid), preparations for bidirectional charging and discharging of electric vehicles must be documented.



#### **Indicator 4. User comfort inside the building**

This indicator is evaluated by means of assessing shower facilities and storage and parking spaces.

- Shower facilities
- Changing rooms and drying rooms
- Storage facilities
- Parking/storage facilities for mobility aids such as walking frames, prams, Segways, etc. are available

#### **Indicator 5. Innovation area**

If there are measures implemented which encourages building users to extensively and regularly use environmentally friendly forms of transportation (non-motorised modes of transport, public transportation or rental systems) to travel to the building, these measures can also be evaluated positively in accordance with the objectives of the criterion and the evaluation of the other indicators. This also applies in the section of electromobility (e.g. "Green logistics" => low-emission or emission-free delivery in inner city locations).

### **IV. Usage-specific description**

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## APPENDIX B – DOCUMENTATION

### I. Required documentation

Examples of possible evidence include the following items. The documentation submitted for the evaluation of individual indicators should comprehensively and clearly demonstrate compliance with the relevant requirements.

#### Indicator 1. Bicycle infrastructure

- Parking facilities documentation: In a sufficient quantity and quality in accordance with regional building regulations or corresponding implementation regulations
- A requirement for the evaluation is the documentation that the bicycle parking infrastructure contains an appropriate number of bicycle parking spaces.
- Documentation on the number and location of the bicycle parking spaces, e.g. via floor plans and photo documentation
- Documentation on bicycle maintenance facilities via site plan and photo documentation

#### Indicator 2. Rental systems

- Documentation via screenshot of the area of operation, photo documentation and site plan

#### Indicator 3. Electromobility equipment in the buildings and on the premises

- The existence of cable routing to the parking space must already be documented for the pre-fitting
- A rough assessment of the power requirements and documentation of availability of the required electrical power with the public utilities provider are also required for the preparations, e.g. via electrical planning concept and documentation of coordination
- Documentation via site plan, photo documentation
- Documentation on the charging stations (see also VDI 2166 sheet 2. Planning of electrical installations in buildings – Advice for electric mobility)
- Performance documentation on the integration into billing systems with roaming capability
- Preparations are in place for bidirectional charging and discharging of electric vehicles (Agenda 2030 Bonus)

#### Indicator 4. User comfort inside the building

- Documentation via site plan, photo documentation

#### Indicator 5. Innovation area

- Documentation via site plans, photo documentation and other appropriate documentation



## APPENDIX C – LITERATURE

### I. Version

#### Change log based on version 2020

PAGE	EXPLANATION	DATE
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### II. Literature

- VDI guideline VDI 2166 sheet 2: Planning of electrical installations in buildings – Advice for electric mobility. Verein Deutscher Ingenieure e.V. October 2015
- VDI-Richtlinien im DGNB Zertifizierungssystem. Paragraph 4.3 “TEC3.1: Mobilitätsinfrastruktur” Verein Deutscher Ingenieure e.V. June 2012 (this book is written in both German and English).
- Federal programme for charging infrastructure (BMVI programme 2017 ):  
<https://www.bmvi.de/EN/Topics/Mobility/Electric-Mobility/Electric-Mobility-In-A-Nutshell/electric-mobility-in-a-nutshell.html>