Landscape Vision TU/e Campus 2040

Starting points for the landscape based on the Master Plan 2040 TU/e Campus
The Landscape Vision TÜV Campus 2040 is a follow-up to the Landscape Plan TÜV Science Park from 2011. It specifies the details and lays down the guidelines for the landscape features relating to the urban green structure of Eindhoven and the internal Campus structure. The Landscape Plan from 2011 preceded and shaped the Master Plan TÜV Science Park from 2012. This urban Master Plan formed a foundation for the successful spatial development of the TÜV Campus in the past decade. The start of the restructuring of the Gemini-Noord, Gemini-Zuid and Laplace buildings in 2021 completes the projects that were planned 10 years ago.

The recently drafted Master Plan 2040 TÜV Campus provides a framework for the further growth and intensification of the university campus over the next twenty years. The Landscape Vision TÜV Campus 2040 fleshes out the landscape structure and establishes a basis for the development schemes for the Campus to be drawn up in the coming period.

The Landscape Vision TÜV Campus 2040 was commissioned by Real Estate Management TÜV.

Paul Achterberg
May 2020
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an inner-city Campus with outer-city qualities

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Introduction

an inner-city Campus with outer-city qualities

The Campus motto “an inner-city Campus with outer-city qualities” formulated over 10 years ago by the TU/e Executive Board has proved to be effective and will be the motto for the Campus in the future also. The Campus will continue to distinguish itself from the Eindhoven urban structure. Within this structure the landscape surrounding the Campus plays a crucial role. The building typology with the characteristic walkways distinguishes itself from the urban civic buildings. The Landscape Vision keeps building on that identity.

The Campus as a place where students, scientists, entrepreneurs and employees of research institutes work, meet and live is concentrated not only around the current “Groene Loper” but will continue to develop farther to the northeast, given the scope of the program to be realized. On that side of De Zaale, too, attractive meeting places must take shape.

At the same time the city of Eindhoven is developing quite dynamically in the vicinity of the Campus, as evidenced by the urban plan Eindhoven Node XL. This development provides an opportunity to reprofile radial roads such as the J.F. Kennedylaan and the Prof. Dr. Dorgelolaan for the benefit of public transport and slow traffic, while also enhancing the green structure of the Dommel valley. The traffic capacity and the shape of the inner-city ring road, the O.L. Vrouwestraat and Insulindelaan, are connected with this.

Given the powerful spatial layout of the TU/e Campus it is quite possible to expand ecological, valuable structures so as to compensate for new buildings and the construction of new meeting places.

Over the past decade the Campus landscape has been made more attractive for recreational use. Such use must be extended further by adding informal pedestrian routes, play areas and cycle and jogging tracks. Reducing traffic circulation and parking areas will be essential for the development of a strong green structure and an ecological equilibrium. At present, extensive car parks still dominate the central Campus. Given the building density in the Master Plan Campus 2040, car parking facilities will have to be shifted towards the edges of the Campus in stages, possibly combined with an innovative public transport system. For the parking of bicycles it will be necessary to lay out recessed or semi-recessed solutions, more so than is the case today.

The Landscape Vision TU/e Campus 2040 and the preceding Landscape Plan TU/e Science Park from 2011 can be read as a twofold scheme. Given the close connection between urban development, architecture and landscape, the main morphological analytic drawings have been copied, while adding the architectural ensembles as rendered in the Master Plan 2040 TU/e Campus.

First the reinforcement of the Campus within the urban landscape of Eindhoven will be dealt with. Then the morphological analysis will follow of the development of the Campus up to and including the Master Plan 2040 TU/e Campus. After this, partial aspects and cross sections of the Landscape Vision TU/e Campus 2040 will be clarified. Finally, principles for paving and planting have been included.
The urban landscape

the TU/e Campus in the urban landscape of Eindhoven
The urban landscape

The TU/e Campus is located in the heart of an economically extremely successful urban region. The density of the city of Eindhoven is increasing rapidly, witness the development of the International Node Eindhoven XL around the central station. The green Dommel valley and the green belt around the TU/e Campus form an appealing spatial contrast to that greater urban density. Enlargement of the park area along with improvement of cycle and pedestrian routes can only go hand in hand with urban growth if public transport is encouraged. Due to the absence of the northeastern segment in the ring of motorways around Eindhoven, the O.L. Vrouwestraat and the Insulindelaan, part of the inner-city ring road, are used as semi-motorways. An advantage of the absence of that segment is a strong connection of the landscape around the IJzeren Man and the Kaapdorpskanaal to the extensive Brabant landscape “Het Groene Woud” under development. A disadvantage are the noise nuisance on and its barrier effect in relation to the Campus; the pools created by sand dredging form a very attractive outflow area and are barely accessible to pedestrians and cyclists.

Once this section of the inner ring is incorporated into a tunnel, with a modest ground level profile of the O.L. Vrouwestraat, the Insulindelaan and the eastern entrance to the Campus, the recreational area of the Campus is enlarged considerably. If the tunneling of the Dommel is impossible, the accessibility to these pools can be realized by constructing a footbridge/cycle bridge across the Insulindelaan; it is a safer alternative to the present underpass under the Dommel bridge which is hardly used at all. Reduction of the number of lanes in the J.F. Kennedylaan and the Prof.Dr. Dorgelolaan will benefit public transport lanes and expansion of the Dommel park, extra trees along these lanes and water storage by means of wadis.

A transferium could be built in or near the Insulindeplein. Moreover, the relation between the Campus and the De Hondsheuvels sports complex north of the O.L. Vrouwestraat would be improved markedly; it would provide opportunities for further growth of the university while retaining its identity through its location at the Dommel valley.

At this moment the intersection of Fellenoord / Prof.Dr. Dorgelolaan is downright lousy for pedestrians traveling by train or bus. The improvement proposals within the Node Eindhoven XL plans are commendable, with visibility of the TU/e Campus and the TU/e logo on the roof of Vertigo along the diagonal route from the central station being a precondition. The position and the length of the future entrance to the new underground bus station should not impede the pedestrian route between the Campus and the central station.

A third station entrance at the Dommel side of the platforms of the central station is a powerful statement in linking public transport, the Dommel landscape and the TU/e Campus. Important features will be the viaduct width, the profile of the Dommel valley and the tracing out of the cycle tracks and footpaths parallel to the Dommel bank up to the current diagonal route to the Groene Loper. This is tied up with the monumental position of the Campus opening up to the Dommel valley.

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The landscape unraveled
an analysis
"one can never lay down the future through urban plans, it is far more important to fathom the present as best one can in order on that basis to form a picture of what will come and what is the most desirable."

S.J. van Embden

The schematic overview of buildings TU site 1st building phase (ca. 1956-1966) by Van Embden et al. has been decisive for the development of the landscape structure. A non-rigid systematic grid of roads has created a flexible incorporation of buildings and provided scope for the growth of a lush, highly differentiated planting structure. In a series of steps the urban principles underlying those landscaping qualities are clarified.
The basic grid of roads
The campus site is a more or less oval-shaped site surrounded by J.F. Kennedylaan, O.L. Vrouwestraat, Insulindelaan and Prof. Dr. Dorgelolaan with the longest stretch in an east-west direction. The orthogonal basic grid is positioned accordingly with the greatest dimension as the central axis. The course of the Dommel has been shifted towards the west, strongly enhancing the layout.

The grid distances itself from the surrounding roads
A landscape structure has taken shape amid the campus buildings and the urban roads. Campus buildings at the edge of the grid have an inner orientation while also aligned all-round with the surrounding landscape, which assumes a mediating role towards the environment.

Staggering in the basic grid
The staggering in the grid that has been caused by the diagonal location of the Dommel and the Prof. Dr. Dorgelolaan become visible in a grand urban rhythm through the position of three staggered high-rise buildings: Vertigo, Atlas and Luna at the Dommel valley.

Aurora is positioned as a fourth high-rise on the transition towards the Dommel valley in the axis of de Lismortel.

The Dommel valley
The west side, the Dommel valley, features three zones, from park-like on the city side to landscaping on the north side. Clumps of trees in the south line the run-up to De Groene Loper, in the middle a grid of trees marks the entrance to De Groene Loper and to the north more varied landscaped planting has been laid out. This landscaped planting forms a windscreen for the sports fields at the northern Dommel bank with poplars and ashes and blends into the verge of oaks, birches, acacias and Scots pine in the northeast.
Student accommodation according to the Master Plan 2040 Campus TU/e

with interjacent low-rise buildings and monumental relics Paviljoen

Footpaths parallel to De Lornertel (1) and De Lampendriessen (2) bear off
where they cut into the Dommel valley.
“An inner-city TU/e Campus with outer-city qualities” presupposes a powerful surrounding landscape, Campus buildings which leave room for sightlines towards that landscape, and incorporates meeting places. There is ample space for pedestrians, there are attractive cycle routes and motor traffic adjusts to slow traffic.
1. The surrounding landscape

In the Dommel valley the spatial sequence from park to landscape is enhanced. The southwestern part is dominated by loose clumps of trees. These are positioned such that diagonal sightlines to the Auditorium, Vertigo, Atlas and Luna are maintained or recreated. The swamp zone southwest of the Auditorium is made more accessible and the pioneer forest that has arisen is thinned out, so as to improve the view of the Auditorium.

On either side of the Dommel lie footpaths, on the right bank this footpath has been joined with a regional cycle track (“slow lane”), which runs towards Son en Breugel and Nuenen via a new bridge across the Insulindelaan. On either side of the bridge Den Dolech formal rows of trees set the scene and line the route to the Auditorium, Atlas and De Zaale. The parking lot north of the Auditorium is reduced to a parking strip for visitors in favor of the greening of the Dommel bank and footpaths.

On either side of the Dommel, north of this bridge retains its landscape moist-loving plants. A new footpath runs from Den Dolech to the terrace of the Sports Center and the lower sunny terrain meadow and a jetty with rental canoes on the Dommel bank. Loose clumps of trees, such as grey poplars, mark the sunbathing and events area on the right bank. In the past 10 years, after the demolition of the temporary accommodation, the construction of Aurora and the installation of footpaths, this area has become more prominent. Between the Sports Center and this meadow a new footbridge across the Dommel has been built as an extra connection between the recreational programs on both banks. For this purpose the existing westerly footbridge will be widened as well. East of the Het Eeuwsel bridge the landscape, forest-like atmosphere will be reinstated on either bank of the Dommel. The profile of Het Eeuwsel has been reduced to a profile for cyclists and pedestrians.

The abutments of the Dommel bridge in the O.L. Vrouwestraat are marked by groups of grey poplars. The landscape planting is continued to the east, featuring more drought-loving species such as oak, birch and fir. The transformation of the Paviljoen into a more open structure with two residential tower blocks and ground-oriented dwellings creates the opportunity to strengthen this belt of forest to the south and to enhance the tangibility of the Dommel landscape up to the Lismortel. This forest belt also lines the east side of De Zaale, the entrance from the Insulindelaan. To the south this belt surrounds a new cluster of businesses around a secluded garden. Through this belt a new footpath runs along a weak and several monumental oaks, remnants of the past agricultural landscape. The wooded border continues up to the new entrance connecting De Rondom with the Prof.Dr. Dorgelolaan. The border between the Campus and the Prof.Dr. Dorgelolaan retains its more formal appearance with a long beech hedge along the cycle track, shields of plane trees and loose clumps of trees as counterpoints within staggered buildings freely situated in the grass.
formal trees planted near the entrance Den Dolech on either side of the Dommel

clump of grey poplars events site

grey poplars on either side of the Dommel bridge Insulindelaan

grid of oaks near Atlas

white willows near events site

contrast in plants on the left and right Dommel banks in the east of the Campus

grey poplars on either side of the Dommel bridge Insulindelaan

intensive and extensive mowing management Dommel valley and events site

trimmed plane trees and beech hedge on the south side of the Campus
the path along the left Dommel bank connects Den Dolech to the Sports Center

old relics of oaks from the agricultural landscape predating the construction of the Campus

sunbathing area on Dommel bank near Sports Center with clumps of trees events site near Luna

green belt around Campus and Karpendonkse Plas, pedestrian and jogging route

new footbridge and cycle bridge across the Insulindelaan between Campus and Karpendonkse Plas (reference bridge Park Lingezegen)
1. Minimal distance new buildings landscape zone Dommel

2. Minimal distance new buildings landscape zone northeast edge
2. Mobility

The intensification of buildings on the Campus towards the northeast and growing numbers of occupants and users of the Campus will result in a substantial increase in the traffic burden. A Campus only honors its name if ample space is given to pedestrians. In order to create a fully-fledged spatial network of a non-residential quality, drastic measures are required for traffic and parking facilities. These are preconditions to a green Campus with an ecologically balanced use of the landscape in the coming decades. The characteristic location of the TU/e Campus, between the inner-city ring road and Eindhoven central railway station, constitutes a unique opportunity to shape this network in a strong Campus zone stretching from south to north. The outcome for the three traffic modalities is as follows:

a. The circulation of cars in case of receptions is concentrated on the northwestern and northeastern flanks of the Campus, which can be reached via the inner-city ring road, the O.L. Vrouwestraat, the Insulindelaan, J.F. Keneddlaan, Den Dolech and De Zaale-oost.

b. Cycle traffic is concentrated on De Zaale, along which new (semi-)underground bicycle shelters are located, partly combined with public recreational areas, partly under new buildings. On the west side bicycle shelters are situated between Vertigo/Gaslab and contiguous to Impuls. In addition, bicycle parking shelters have been provided in or under all new buildings.

c. Ample space is granted to pedestrians in the connection with the central station, on the Groene Loper and along the Dommel banks and on separate paths along De Zaale-oost, De Horsten and De Rondom. Diagonal informal pedestrian routes connect the remote corners of the Campus.

From the sports fields next to the Sports Center two footpaths and footbridges run across the Dommel to the northwestern flank of the central Campus. The construction of a new overhead bridge across De Zaale near “MetaForum 2” (a multi-functional low-rise hall inspired by the former W-hal) and a new building next to Flux establishes a clear connection between the north and south walkway routes. The Campus ground is accessible to supply traffic with allowed delivery times, taxis and receptions of an official nature. On the Campus yards and the unprofiled roads in cement cinders and concrete bricks, cars and motorcycles are guests amid pedestrians and cyclists.

The Prof. Dr. Dorgelolaan gives a face to the cluster of buildings in the southeast corner. On the eastern Campus the driving strips of De Horsten and De Rondom have been accentuated with cycling strips instead of parallel parking. Separate footpaths have been laid out between the lines of trees.

parking cars

Three models are conceivable for the parking of cars. As the university expands towards the north, the parking of cars could be realized step by step in the next few decades.

Model 1: parking cars in the immediate surroundings of the Campus
This model is based on the assumption of very high-quality public transport. The parking facilities are located near the inner ring road and in the Railway zone south of the Prof.Dr. Dorgelolaan. In the eastern and western Campus grounds there are parking pockets for visitors attending receptions.

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Model 2: parking at ground level and parking in an above-ground car park

If the eastern cluster of businesses is not realized before 2035, the existing parking lot can be expanded to a lot with approx. 750 spaces. This lot serves the entire eastern Campus. The northwestern Campus can be served by landscaping the sports fields west of the Student Sports Center as a parking field. Via the two footbridges across the Dommel there is a short and attractive pedestrian route to the Campus buildings. The fields can accommodate approx. 600 cars.

The southwestern Campus can be served by an above-ground car park, possibly combined with a bicycle shelter, between Vertigo and Gaslab, accessible via the Kranenveld and the Prof Dr Dorgelohlaan. This car park can be linked to the walkway south of Matrix. It can accommodate approx. 450 cars.

Model 3: car parks, aboveground and (semi-)underground

In this model the realization of the eastern cluster of businesses and buildings on the sports fields is assumed. The car parks are underneath these buildings. This model, too, is based on the assumption of an above-ground car park in the southwestern corner of the Campus. If the basement area underneath the high-rise cluster near De Rondom is given a flexible structure, car park facilities could be realized here in a later stage.
cyclists
- bicycle shelter (semi-)underground
- bicycle shelter aboveground

De Zaak cycle and pedestrian boulevard

exemplary structural integration of bicycle shelter (Auditorium)
Pedestrians
The network of pedestrian routes in the Dommel valley and along the eastern verge of the Campus is expanded; on the central Campus a diagonal pedestrian route connects the main meeting places.
3. The landscape articulation of the Campus buildings

The landscape articulation provides a spatial hierarchy and meeting places within the building complex while at one creating a close relation with the Dommel valley.

The articulation comprises three east-west-oriented spatial sequences:

a. central string of beads
b. northern sequence; the water garden
c. southern sequence; the Groene Loper
3a. Central string of beads:
This string of beads comprises from west to east:

1. monumental grids of trees on either side of the Dommel bridge, Den Dolech;

2. Atlaspoort with adjacent gardens;

3. monumental greenery along De Zaale with triangular planting of plane trees and typical asymmetry with new meeting places north and south of De Zaale:
   a. A garden for breaks between Laplace and Gemini (combined with semi-underground bicycle shelter);
   b. A recreational sports field east of Laplace, the new sportive heart of the Campus (combined with semi-underground bicycle shelter);
   c. A mirror pond with a terrace in the corner of De Zaale and De Horsten contiguous to the new high-rise buildings and marking the eastern entrance.

4. grid of trees between De Rondom and Horsten with sightline across the new pond from De Zaale-oost

5. landscape zone with footpaths along De Zaale-oost to the Insulindelaan
1 future profile De Zaale

2 profile De Rondom

3 profile De Horsten
Northern spatial sequence

1. narrowing Eeuwsel to cycle route
2. expansion forest belt to the south
3. axis former Paviljoen is new walking route between Paviljoen courtyard with new plants, new Dommel bridge at Sports Center and sunbathing terrace student dwellings
4. forest-garden environment as gradient to the forest belt
5. grasses garden under eaves
6. events site on either side of cycle route
7. cycle/footbridge across Insulindelaan

3b. Northern spatial sequence

After the demolition of the Paviljoen this will be a “lieu de memoire”, a recreational area around the preserved water patio, three kiosks and a part of the courtyard with diagonal paving. On either side of this courtyard lies an elongated water garden stretching north of the Lismortel. Here rainwater draining from roofs and paving can be collected so as to be used for the plants of this relatively dry Campus site. The profile of this water garden is attuned to the proportion of the southern Paviljoen kiosk.

In the past, the sharp point at which the orthogonal structure of the campus building joined the ring-shaped structure of the Insulindelaan was eased by the receding east wing of Het Paviljoen. This spatial deflection returns in a beveled water basin. Via the elongated water garden north of the Lismortel and along Het Eeuwsel emergency drainage to the Dommel takes place. A fifth and sixth high-rise building following the series of Vertigo, Atlas, Luna and Aurora mark the transition to the Dommel valley.

The monumental planting of trees of the former Paviljoen courtyards will be preserved as much as possible. The forest belt is expanded towards the south.
reference forest-garden environment Catalyst

reference grasses garden under eaves

monumental sweet chestnut Paviljoen

courtyard to be preserved

shade-loving forest belt plants

reference grasses garden under eaves

museum Branly Paris
3c. Southern spatial sequence: de Groene Loper

The Groene Loper was laid out in the past decade and has proved to be a success. The movable yellow picknick benches allow flexible use. A fabric of paving in concrete slabs with a size of 50x100 cm links up with the various departments, where the raised floors are accessible by means of broad granite steps. The paving surrounds green ground floors and a mirror pond marking the transition to the Dommel valley. In the southeast corner of the Groene Loper this paving has been continued up to De Rondom and the new campus entrance at the Prof. Dr. Dorgeloslaan in order to try and make this corner blend in more with the central Campus. The gateway under Gemini-zuid is transformed into an entry with a broad connection to the entrance of Laplace opposite. The Campus buildings are firmly set on the ground surface, leaving them easily accessible to pedestrians and providing recreational quality. The detailing of the plinth and terraces of Flux are examples in kind. In conjunction with the walkways a very spatial pedestrian domain has been created, typical of the TUE Campus landscape.

Southern spatial sequence: de Groene Loper

a. extension paving Groene Loper to new entrance Gemini-zuid
b. extension paving Groene Loper to De Zaale, the Prof. Dr. Dorgeloslaan and De Rondom
4. Planting types

Four planting types are decisive for the connection of the most compact Campus sections to the surrounding landscape. These are of extreme importance for the view from basements, first floors and overhead bridges. These plants will be preserved and more will be added if possible.

- The gardens in the arch between Vertigo, Atlas, Luna and Aurora. In the development of a fifth and sixth high-rise north of the Lismortel, gardens could be added by way of transition to the pond patio, the Paviljoen kiosks and the gardens around Catalyst.

- The shrubs and hedges with solitary shrubs adorning the building plinths and trimmed rows of plane trees in the compact central section of the Campus.

- Courtyard plants next to De Rondom on the southwest giving rhythm to this lane.

- Patio plants:
  - in new buildings between the lanes and fields of trees of De Rondom and De Horsten,
  - in the center of the new cluster of buildings in the most eastward section of the Campus,
  - in the Paviljoen patio to be preserved, as pond plants.
5. Paving

The fabric of the characteristic paving of Schellevis in grey 50x100 cm concrete slabs in the Groene Loper is continued across De Zaale, marking the pedestrian area on the Campus. Broad steps and ramps in granite link up with this. These transitional areas form attractive recreational spots.

On De Zaale-oost, De Horsten and De Rondom the driving strip in red Dutch clinkers is maintained. De Zaale, the Lampendriessen and Den Dolech are transformed in phases into an unprofiled strip in reused red Dutch clinkers for the benefit of cycles, supply traffic and emergency services. Flanking strips, laid out as much as possible in reused concrete bricks mark the pedestrian area. This profile has already been realized on either side of MetaForum.
central strip Dutch clinkers flanking strips in concrete bricks

paving types
- central strip Dutch clinkers
- flanking strips of concrete bricks

paving granite clinker at Garden for breaks
6. A recreational program for the Campus community

Over the past decade the Campus has gradually developed as a city within a city. Urban facilities such as catering, a supermarket and a day-care center have been given a place. Similar to functions within a city, this occasionally causes friction. Thus, the outdoor area at the day-care center in the plinth of Luna suffers nuisance from the residents living above it, so that emergency measures must be taken which impair the spatial quality. The day-care center would be better placed in the northeast corner of the Campus, the original spot, where short parking can easily be realized for ferrying the children. One of the Paviljoen kiosks could play a role within that day-care center.

Digital study and work limit physical exercise and personal meetings.

The design of the hall of Atlas and the library in MetaForum are very successful examples of monumental areas within which the importance of meeting others and the exchange of knowledge has been recognized and has accordingly been granted space. From many of the indoor spaces the Campus landscape with its many trees is visible as a splendid contrast, allowing the eyes to accommodate differently after many hours of digital reading and peering, in order to enjoy how the symbiosis between technology and nature has been fleshed out.

The transitions between buildings and the Campus ground have gained in quality. For instance, the steps outside MetaForum and Flux allow for very informal use. In case of residential buildings in particular, gardens may be added as attractive recreational areas. Thanks to its central position, the huge roof of “MetaForum 2” is clearly visible from the surrounding high-rise buildings. Active gardening on top of this roof symbolizes the merger between technology and nature. (ref. dakakker Schieblock, Rotterdam)

The movable yellow picknick benches on the Campus lawns are a simple and effective response to the demand for meetings, consultations and studying in the open air. In the heat of summer the benches can be moved to shaded areas. They can also be shifted so as to make room for short events. The reduction of parking space for cars and motorcycles and the expansion of the system of walkways and overhead bridges is an equally obvious stimulus for physical exercise, as has long been the case for users of public transport commuting to the TU/e Campus.

On a regional traffic level, an incentive for healthy exercise is created by cycle routes and attractive shelters including repair shops. The Dommel valley route to be developed further deserves a national reputation.
a doctoral feast on the Dommel bank near the Sports Center

the Dommel can be experienced on the water also