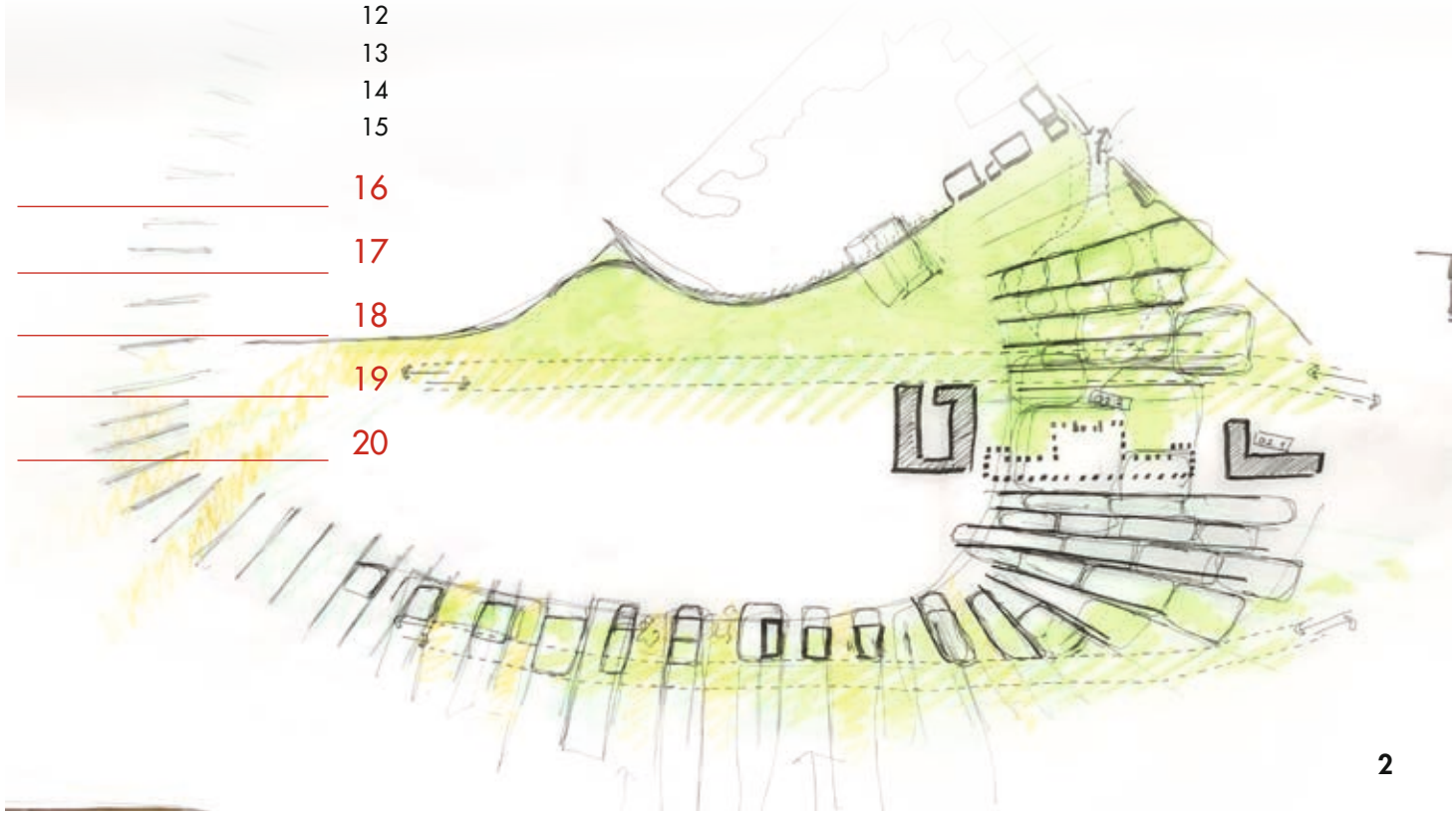
VILNIUS RAILWAY STATION COMPLEX, CENTRAL STATION SQUARE AND PUBLIC TRANSPORT TERMINAL
INTERNATIONAL OPEN ARCHITECTURAL PROJECT COMPETITION.

EXPLANATORY REPORT

Motto Code: 125973

CONTENT



1. URBAN IDEA

pedestrian connection

loop-connection

multidirectional access

pedestrian flow = design raster

The concept allows the location of the railway station to potentially decide the dynamics of the connectivity between the 3 major parts of the city Naujininkai, Naujamiestis and Senamiestis. An axial array has been derived from important connections around the railway Station towards forming an uninterrupted green wave. To allow this, the vehicular movement is proposed on an underground level making full use of the topographic advantage of the project site. This green pedestrian loop enables a multidirectional access, approach and houses all neccesary functions reviving the relations between the north and south part of the city, earlier divided by the railway lines. With the prioritization of pedestrians in the concept, especially in the Stoties Plaza, the railway station acts as a gateway welcoming the travelers presenting a magnificent view to the green city Vilnius.

The main pedestrian flow is generating the design raster for upcoming structures. The railway station complex and it's surrounding area is adapts to a new guideline that is generated by extending and connecting the existing urban fabric.

1. URBAN IDEA

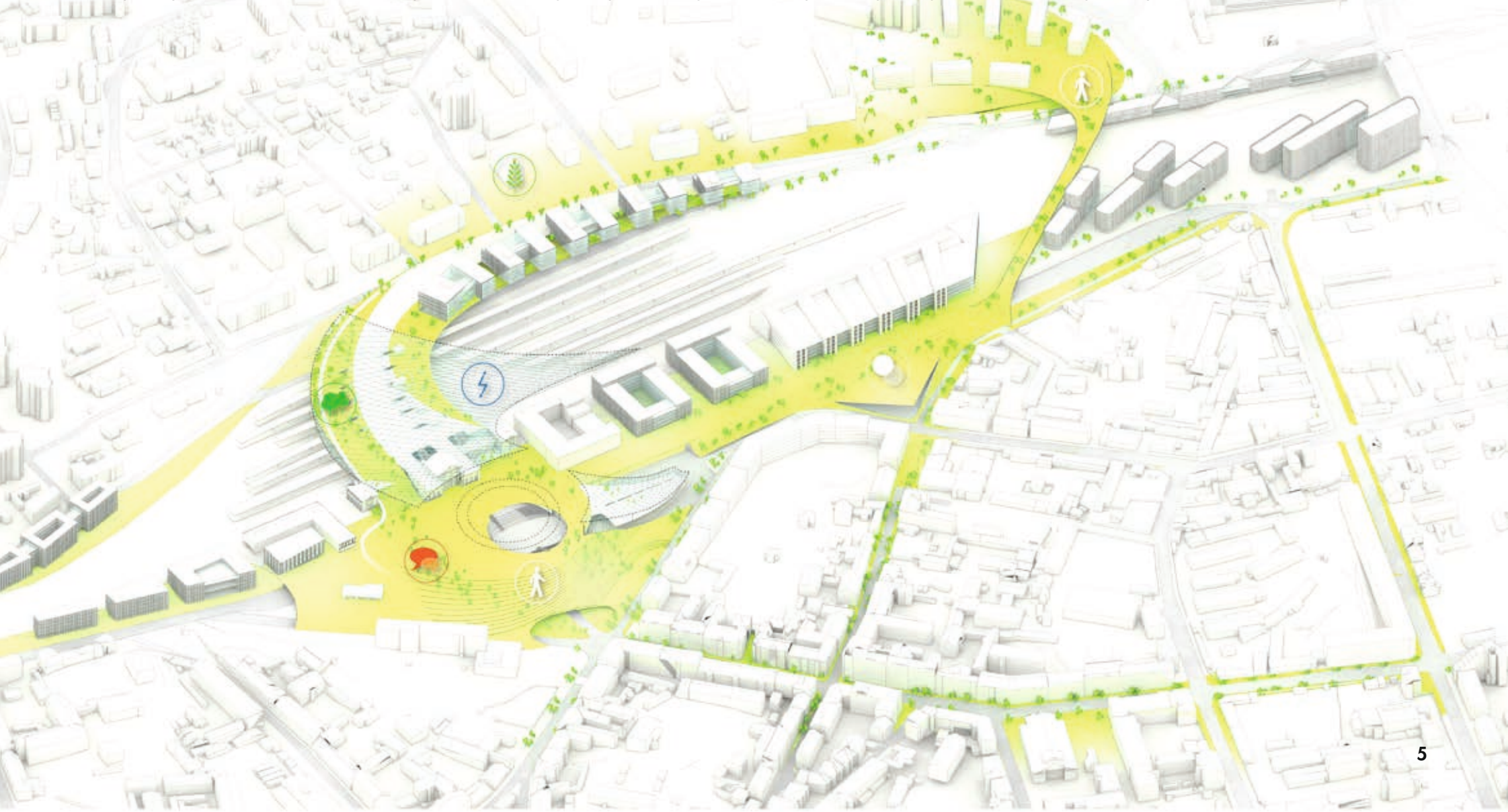
After cities sink into suburban suburbs on their fringes, inner-city train stations get the chance to function as gateways to the city and to become friendly places of welcome. The National capital city of Vilnius , Lithuanian Railways and LTG infra have recognized this potential for its Central Station and want to give the previously neglected area a pleasant atmosphere by transforming it into an attractive entrance to the city center. Vilnius is considered to be one of the main hubs within the Lithuanian railway network and future Rail Baltica network, which not only connects people, but also business technology and art. Therefore the station complex of Vilnius including the square should be designed as an inter-modal connection not only to the rest of Lithuania but the entire Europe.

new vehicular flow

pedestrian flow

connecting & activating areas

The concept allows the location of the railway station to potentially decide the dynamics of the connectivity between the 3 major parts of the city Naujininkai, Naujamiestis and Senamiestis. An axial array has been derived from important connections around the railway Station towards forming an uninterrupted green wave. To allow this, the vehicular movement is proposed on an underground level making full use of the topographic advantage of the project site. This wave helps enable a directional access, approach and houses multiple functions reviving the relations between the north and south part of the city, earlier divided by the railway lines. With the prioritization of pedestrians in the concept, especially in the Stoties Plaza, the railway station acts as a gateway welcoming the travelers presenting a magnificent view to the green city Vilnius.



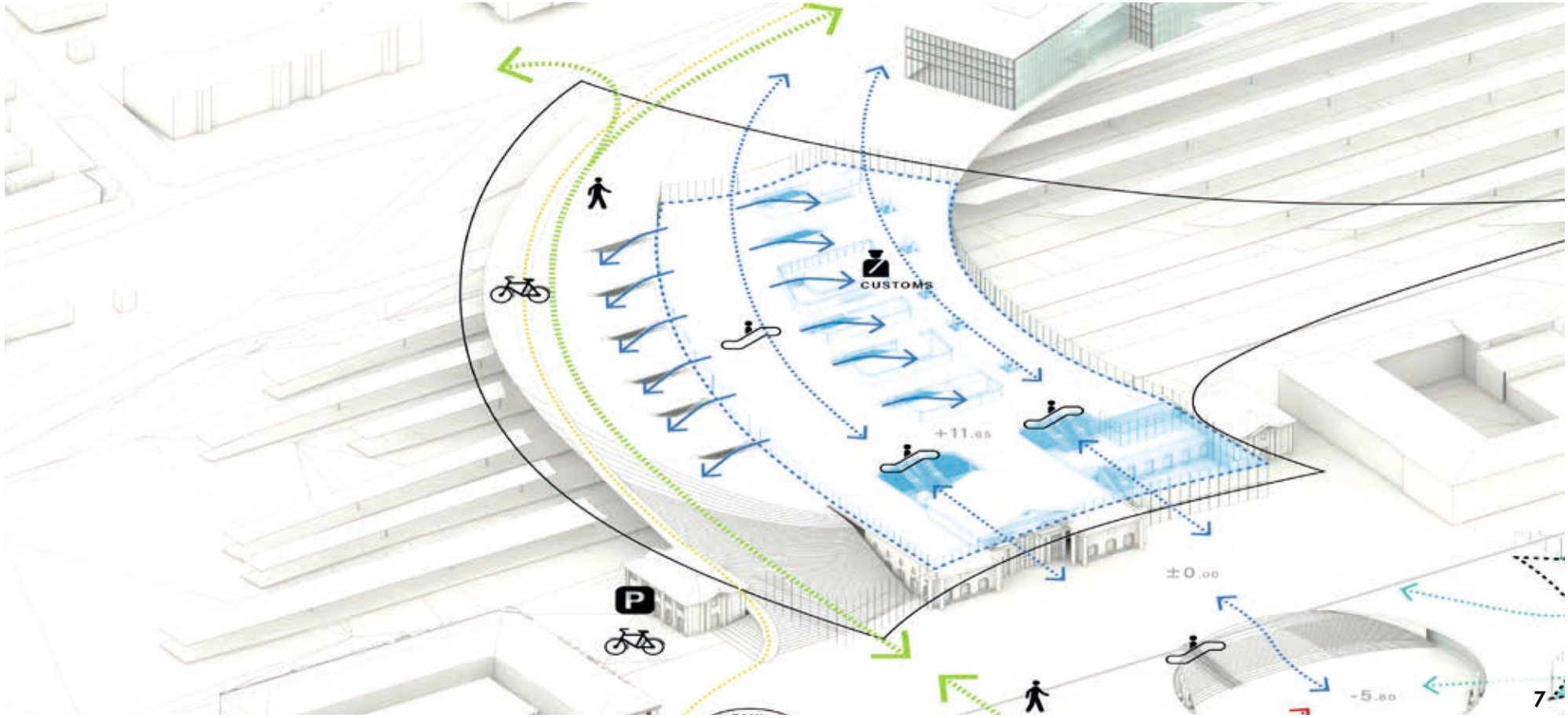
2. ARCHITECTURAL IDEA

In 2021 Vilnius was named among top-25 fDi's Global Cities of the Future – one of the most forward-thinking cities with the greatest potential in the World. This notion needs to percolate to the cities gateway and represent the values of this modern city of Vilnius. Keeping this intent in mind the architectural proposal seeks to create a modern railway station while minimizing the negative impact on the heritage value of the existing building. The old roofs from the east and west wings are replaced by the extending the glass and wood roof from the over the rail concourse while preserving the rest of the roof structure. This enables a unique homogeneous solution to an existing heritage building fusing with the new contemporary architecture paving the way for the future. The east wing of the complex, accommodates an open access through green stairs and a bike ramp from the Stoties Plaza to the concourse. From the west side you are able to access the above the rail concourse through an enclosed glass atrium by connecting levels in the existing railway station building by means of escalators and elevators. The connecting levels serve multiple commercial and hospitality activities. The enclosed concourse acts as attractor point serving functional and commercial activities to the commuters in a protected environment.

3. RAILWAY STATION COMPLEX

Functional Arrangement

The principal aim of the proposed design was to transform this urban void, which was isolated and not very permeable, into a freer, open and multifunctional space, where the citizen becomes the subject of the action. A variety of measures can improve accessibility and the quality of opportunities to be active, from the design of dedicated and well-connected pedestrian and cycle routes encourage people to spend time outdoors. Lighting pedestrian routes to a daylight-equivalent level can increase their usage by up to 38% compared to if left unlit. The same applies to cycle paths and can increase their usage by as much as 62%. Such findings reiterate the role of security in reducing the fear of crime and encouraging dwell time in public spaces. Keeping above in mind pedestrian movement is kept open in outdoors. The benefits of safe urban environments are both physical and mental, and while improving our health and well being a reduction in the sedentary population can also offer economic benefits in the form of reduced health risks and healthcare costs.



Materiality

WOOD

The proposal makes ample use of structural hybrid timber solution. The wood used is proposed to be lightweight pine recycled glue laminated timber. Not only timber provides a warm atmosphere but several studies in world have shown that being surrounded by wood has positive effects on our health. Some of the health benefits include:

- Improved emotional state, and self-expression
- Improved air quality by moderating humidity, encouraging easier breathing
- Feelings of warmth and comfort
- Lower blood pressure, heart rate, and stress level

GLASS

- Extensive use of the glass allows maximum utilization of daylight.
- Provides a sense of security.
- Promotes visibility and helps orientate commuters to the various possible routes.

STEEL Lightweight recycled

- Though the utilization of steel has been minimized its still incorporated strategically to keep the construction as light weight as possible
- Steel gives the flexibility of many color options including the brushed bronze finish which has been used for columns.
- Promotes visibility and helps orientate commuters to the various possible routes.

Clay Shingle cladding

- The robust shingles have a long lifespan, are completely maintenance-free and can be recycled.
- Installation is a low tech, dry process, and reminiscent of pantiles which have been used for centuries..
- The shingles are fixed to appropriate underlaying structures advised by European Building Materials.

Structural & Sustainable Solutions

The concourse forms a frame around a generous body of vegetation and functions as a vessel for the performance of the interior landscape. With technical support (but without air conditioning), the framed shape actively creates the micro-climate condition hugely reducing the impact of CO_2 emissions. Growth and ecological metabolism take place where light falls within this built framework.

The timber construction instead of the conventional metal framework hugely reduces the embodied energy factor in the proposal. Timber is one of the renewable and recyclable building material with a lower environmental impact. The manufacturing process of timber uses less fossil fuel energy per unit volume than cement, steel or aluminum. It minimizes the amount of pollutants generated during the process. This means that building with one cubic meter of wood, in place of other construction materials like concrete, blocks, or bricks or metal can save up to 0.75 to 1 tonne of CO_2 emissions

Indoor Air Quality & Thermal Comfort

- Around 900 trees & small vegetation is proposed to reduce CO_2 and improve the indoor quality.
- Indoor plantation will also help in regulating indoor comfort temperature. With the use of temperature monitoring systems heating and cooling loads can be reduced.

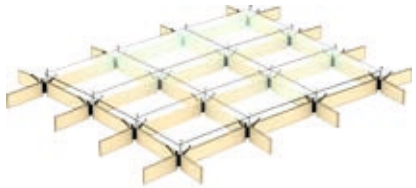
Visual Comfort

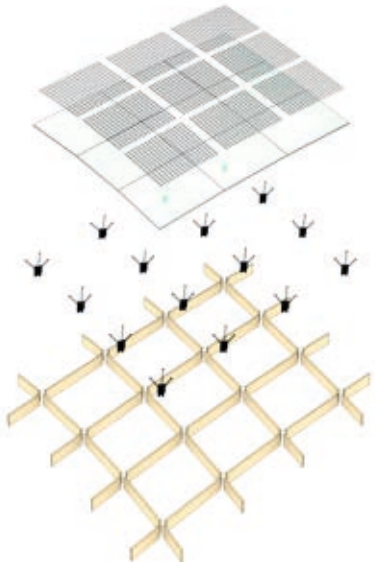
- The Concourse will be daylight for maximum daytime of the year. It will lead to indoor lighting energy savings and a feel of open environment.
- There is potential of disabling glare in the proposed design.

Separate walkway is provided for people crossing the railway station from one part of the city to another. This will lead to reduction in occupation loads inside the station building itself.

Solar PV

Photovoltaic glass is used for the concourse roof with the aim of capturing the sunlight and turn it into electricity. The panels are made of layers of heat-treated safety glass which can provide the same thermal and sound insulation as conventional architectural glass, not to mention the fact that they also let natural light go through in the same way as conventional glass. By providing the same thermal insulation as conventional glass, along with the capacity to generate free clean electricity from the sun, it enables buildings to drastically improve their energy efficiency, decrease operation and maintenance costs, and reduce their carbon footprint.
It also provides thermal and sound insulation, ensuring great filtering power as 99% of UV harmful radiation and up to 95% of IR radiation can be absorbed.



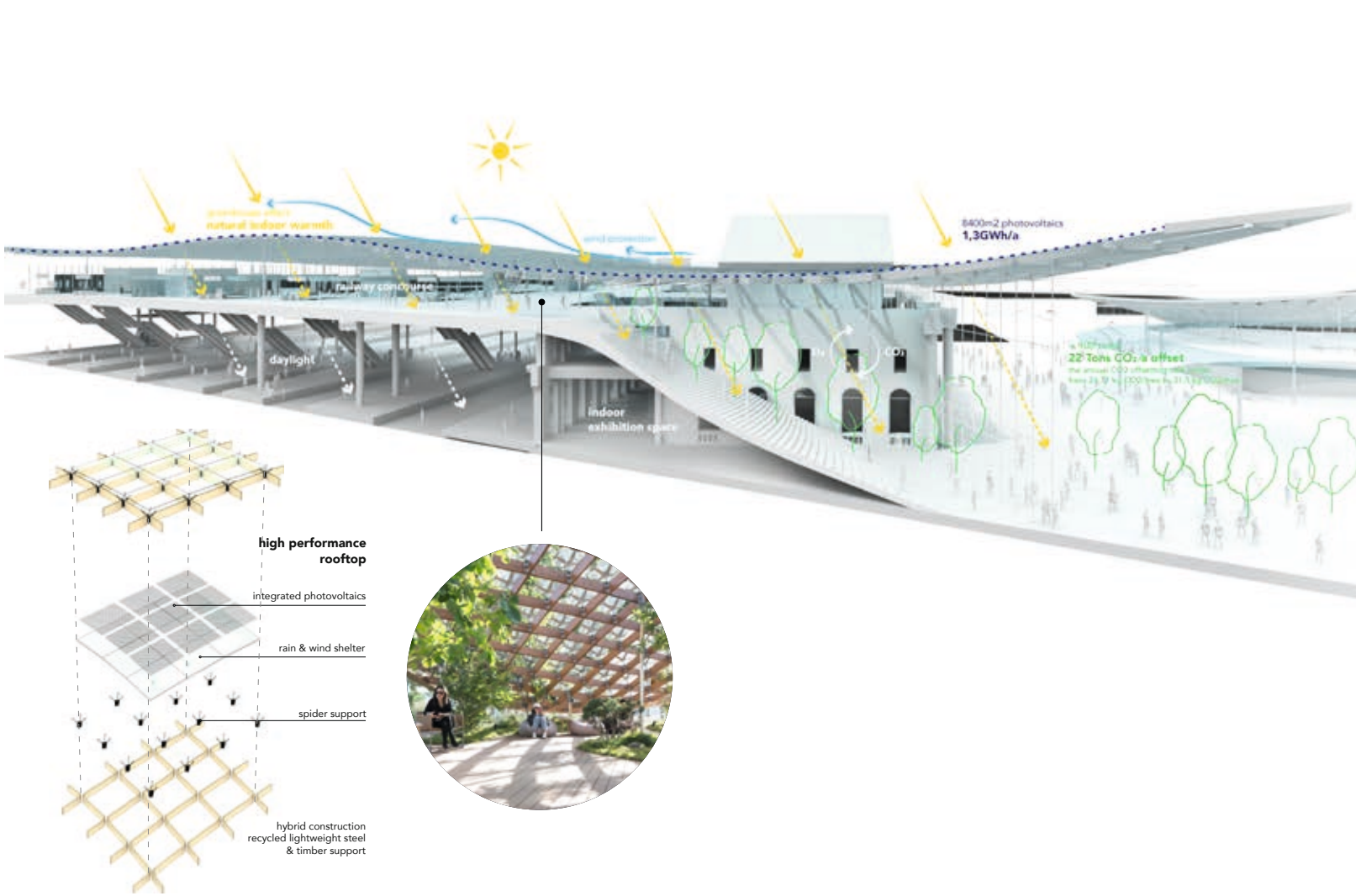


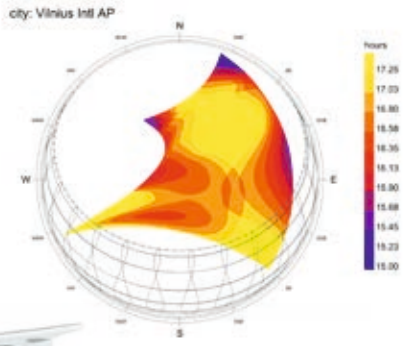
Month	Solar Radiatio (kWh / m^2 / day)	AC Energy (kWh)
January	0.68	38,325
February	1.37	71,027
March	2.53	143,757
April	3.91	203,166
May	5.36	277,750
June	5.65	279,082
July	5.37	273,470
August	4.89	245,927
September	3.16	162,757
October	1.73	94,418
November	0.79	42,443
December	0.37	20,170
	2.98	1,852,292

RESULTS 1,852,292 kWh/Year*

Structural & Sustainable Solutions

The hybrid lightweight timber roof structure is supported by pillars of steel and concrete, distributed among spans of 20 m over the concourse. The slab of the concourse level is reinforced by 'Double T sections'. This enables the entire concourse to be supported by 11 columns in total.





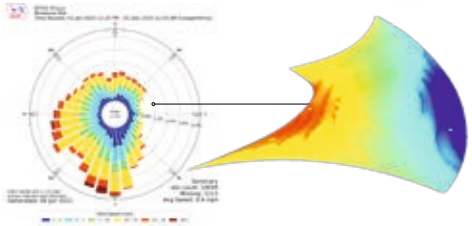
POWERPLANT (SOLAR) ROOF

Photovoltaic applied on glass is used to produce electricity and covers 100% of the primary energy demand of the railway station complex. Calculated at 956kWh/m²a (Vilnius solar radiation), 30% of the roof (28.000m²) PV-coverage (20% efficiency) generates **1,3 GWh/a**.

The transparent roof is made of layers of heat-treated safety glass which can provide high sound insulation an structural stability. Along with the capacity to generate free clean electricity from the sun, it enables buildings to drastically improve their energy efficiency, decrease operation and maintenance costs, and reduce their carbon footprint.

WIND(SHELTER)

The rooftop was designed to offer wind protection from the dominating wind directions trough the year, offering high level of comfort for the passengers and concourse users.



Safety Solutions

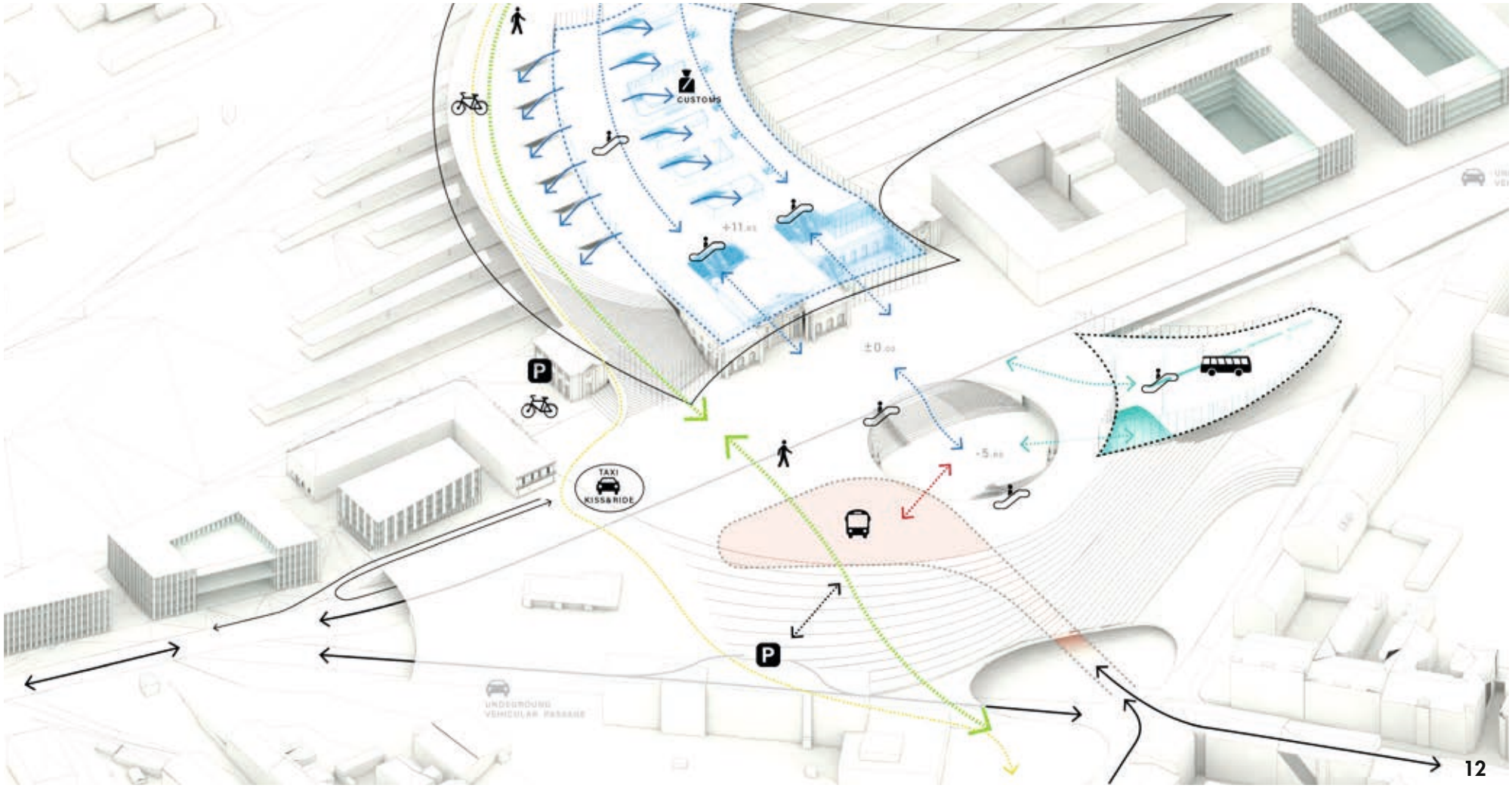
The security of public spaces or at least a sense of security is first and foremost determined by how busy spaces are, as active spaces will always seem safer than deserted ones, as well as spaces that are well overlooked and clearly visible from the outside. Ultimately, the objective should be the wellbeing and sense of wellbeing of users, and their ability to use spaces in a relaxed and comfortable manner. The huge glass facade will lead to a visual connection with outer spaces for the passengers. The spaces would be relaxing, with opportunities to stop and linger, with good quality, comfortable and informal seating opportunities. Soft landscaping and careful consideration given to microclimate (places to sit in the sun, and to shelter from the wind and the rain). Grass is very popular because it is comfortable, flexible and allows users to position themselves to take advantage of micro-climatic conditions. It is also highly conducive to relaxation, play and social engagement.

View from Atrium towards Stoties Plaza

4. STOTIES SQUARE AND PT TERMINAL

Functional Arrangement & Transport flows

The principal aim of the proposed design was to transform this urban void, which was isolated and not very permeable, into a freer, open and multifunctional space, where the citizen becomes the subject of the action. A process of humanisation of the place is followed, in which the pedestrian is favoured over the vehicles, and large green areas were accommodated to reduce paved surface. These green areas are not designed as a mere decorative element but hold a direct relation with existing railway station building. This is done to provide more open space and to encourage a welcoming feeling to the passengers in the city.



Materiality

Green Stoties Square

The vehicular traffic is designed underground making use of the unique topographic situation at the site. The area above the ground is kept user friendly, free from vehicular movement to make it largely pedestrianized and better connecting it to the city. The project creates a spatial connection between the city and the railway station through a new public space for travellers & visitors. The underground bus terminal and vehicular tunnel will scale down the air and noise pollution in green outdoor space.
We believe that the recognition of human capital in combination with environmental potentials, creates a valuable solution, whose impact is significant and corresponds to the needs of the railways station now and in the future. The construction of public landscape area effectively improves the quality of the city, and finally creates a special space for people's leisure, image display, and festival celebrations in Vilnius.

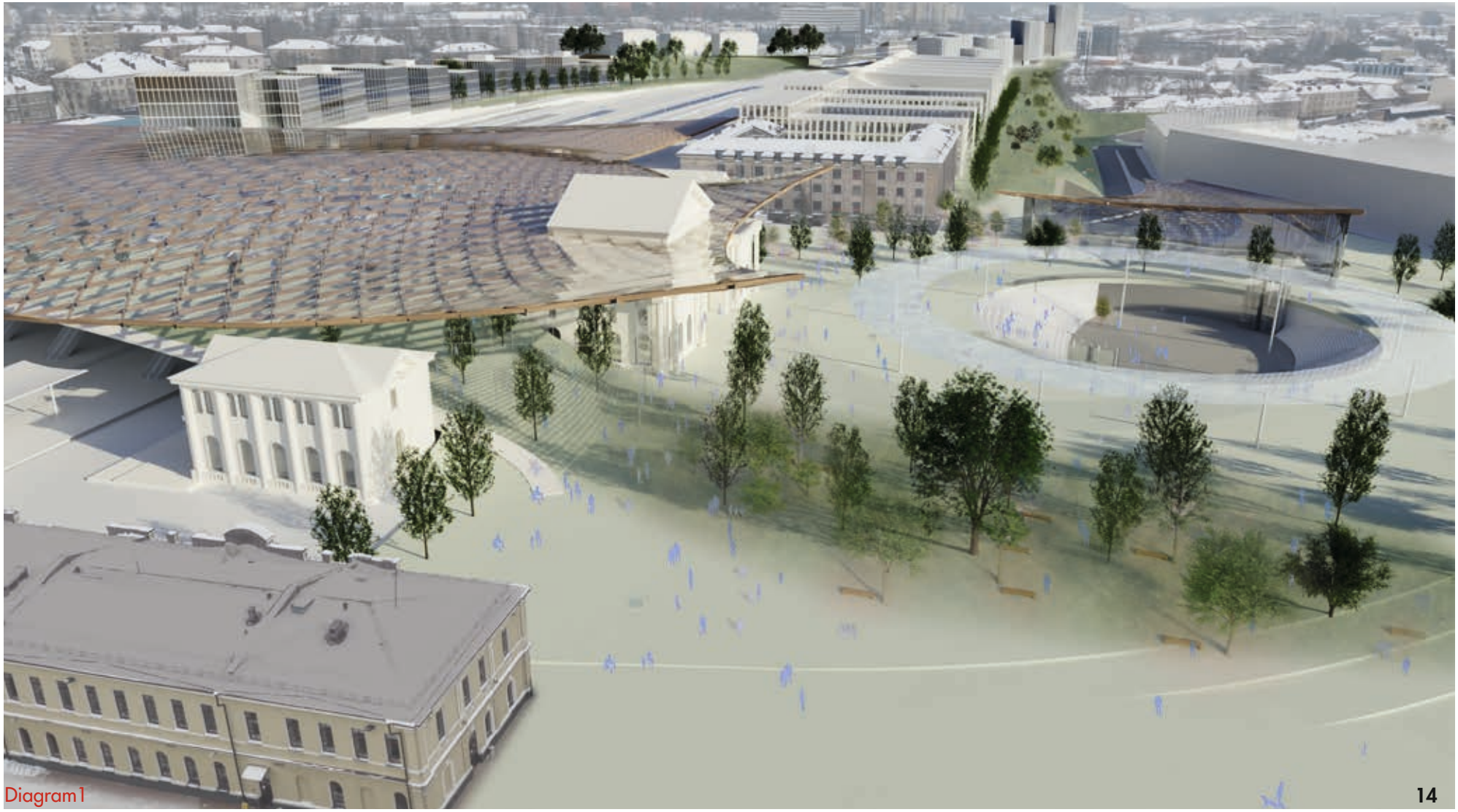
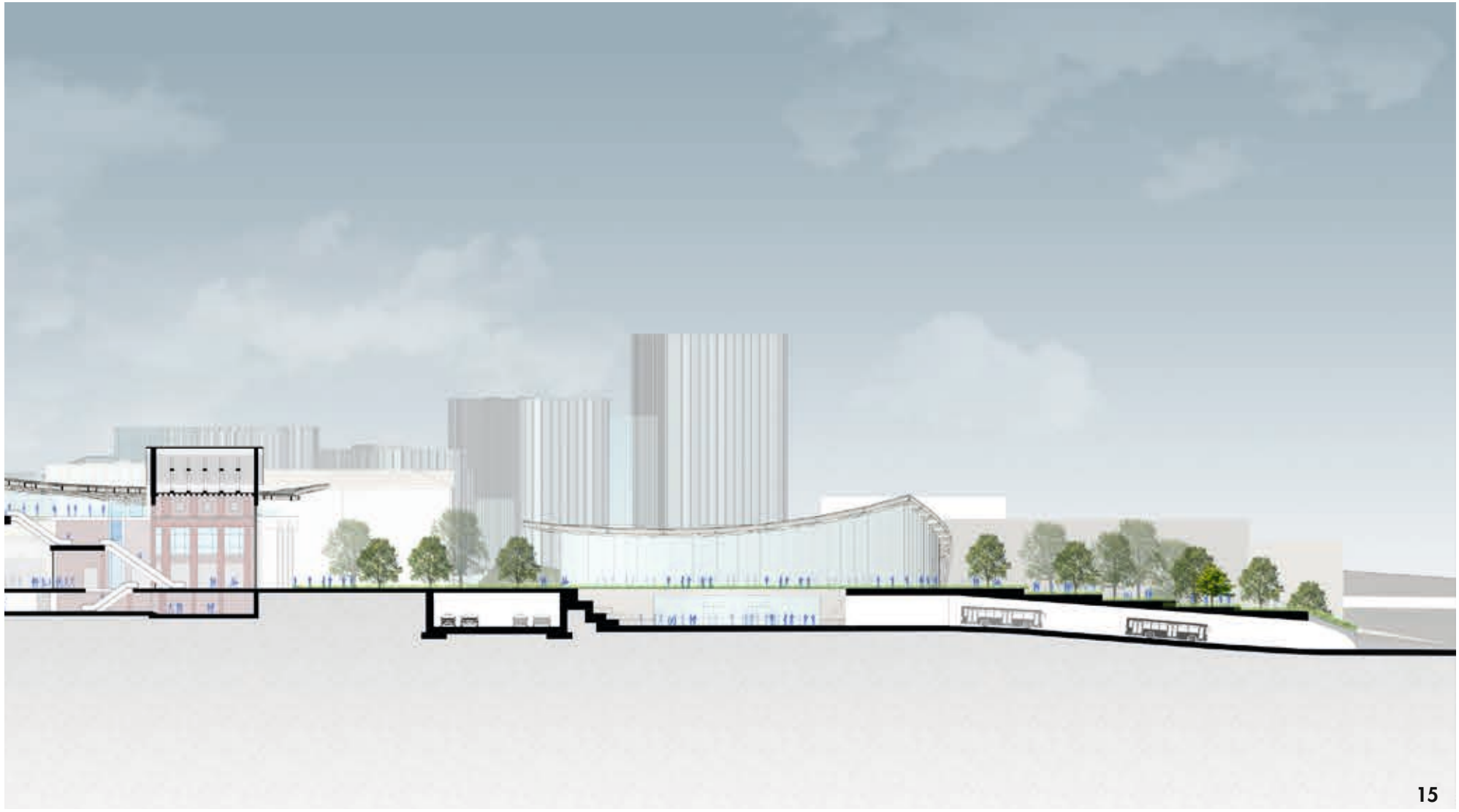


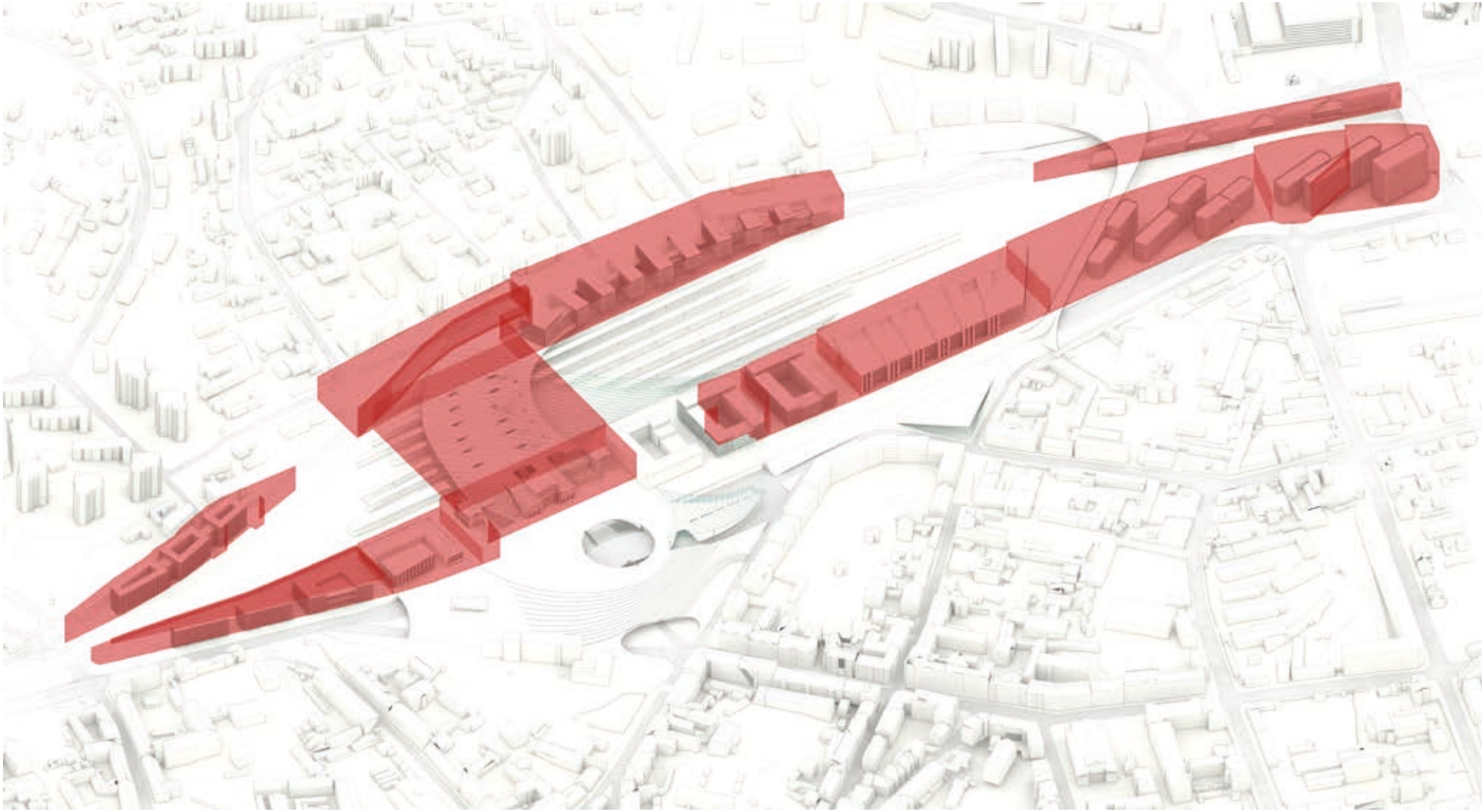
Diagram1

Safety Solutions

The safety of the commuters to the Vilnius railway station is prioritized through the traffic solutions in the Stoties square. By moving the entire traffic to the underground level, the square gives an unprecedented reign to the pedestrians, completely negating any traffic incidents. When needed its possible to completely close the Railway station and yet keep the pedestrian and bike connection over the concourse possible 24x7. Its also possible to close the existing part of the railway station and keep the concourse open serving the commerce and the track connection if the need arises. This keeps the safety criteria in check with extensive flexible solutions by limiting and easily directing the commuter flows. By promoting transparency and use of nodal junctures, these solutions reiterate the role of security in reducing the fear of crime and encouraging dwell time in public spaces. The benefits of safe urban environments are both physical and mental, improving our health and wellbeing a reduction in the sedentary population.

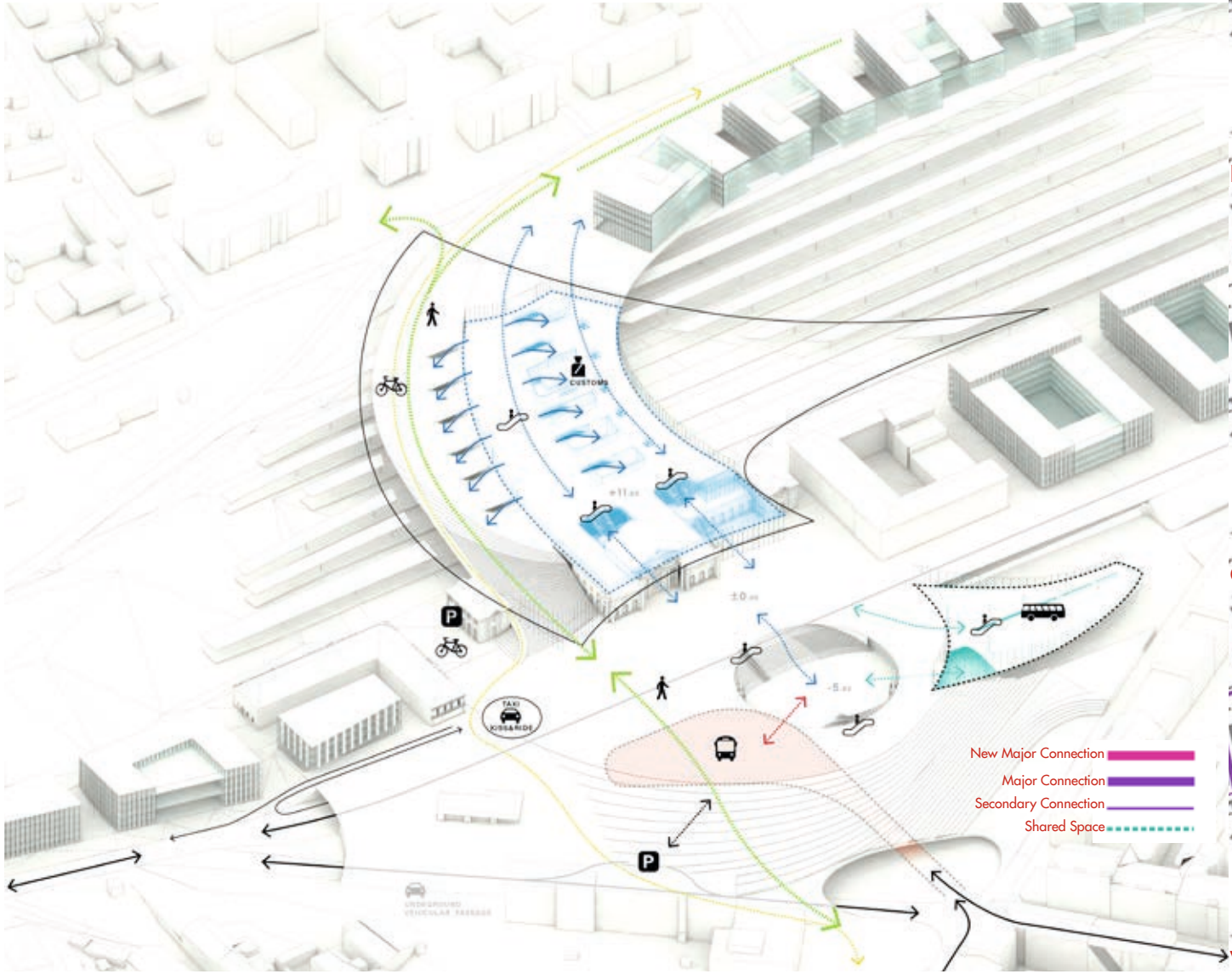


5. COMPLIANCE OF COMPETETION TERRITORY



6. TRANSPORT, PEDESTRIAN AND BIKE FLOWS

The various flows have been strategically streamlined by placing them at different levels. The Major transport spine going earlier through the Stoties Plaza has been moved completely underground to have an uninterrupted flow for pedestrians and Bikes alike. This solution drastically solves all the major concerns regarding the various flows as well as helps in considerably reducing the congestion and pollution at the stoties square.



Pedestrian Flow

Connecting and Activating Areas

Vehicular Flow

7. LANDSCAPE DESIGN SOLUTIONS

Public spaces require something in their physical form that allows us to distinguish them from their surroundings as a clear and identifiable place. Typically this is a sense of enclosure, where the buildings and landscape, to greater or lesser degrees, first open up to create a space, and second, wrap around and 'contain' space in order to hold the eye and create a distinct place.

Europena Larch

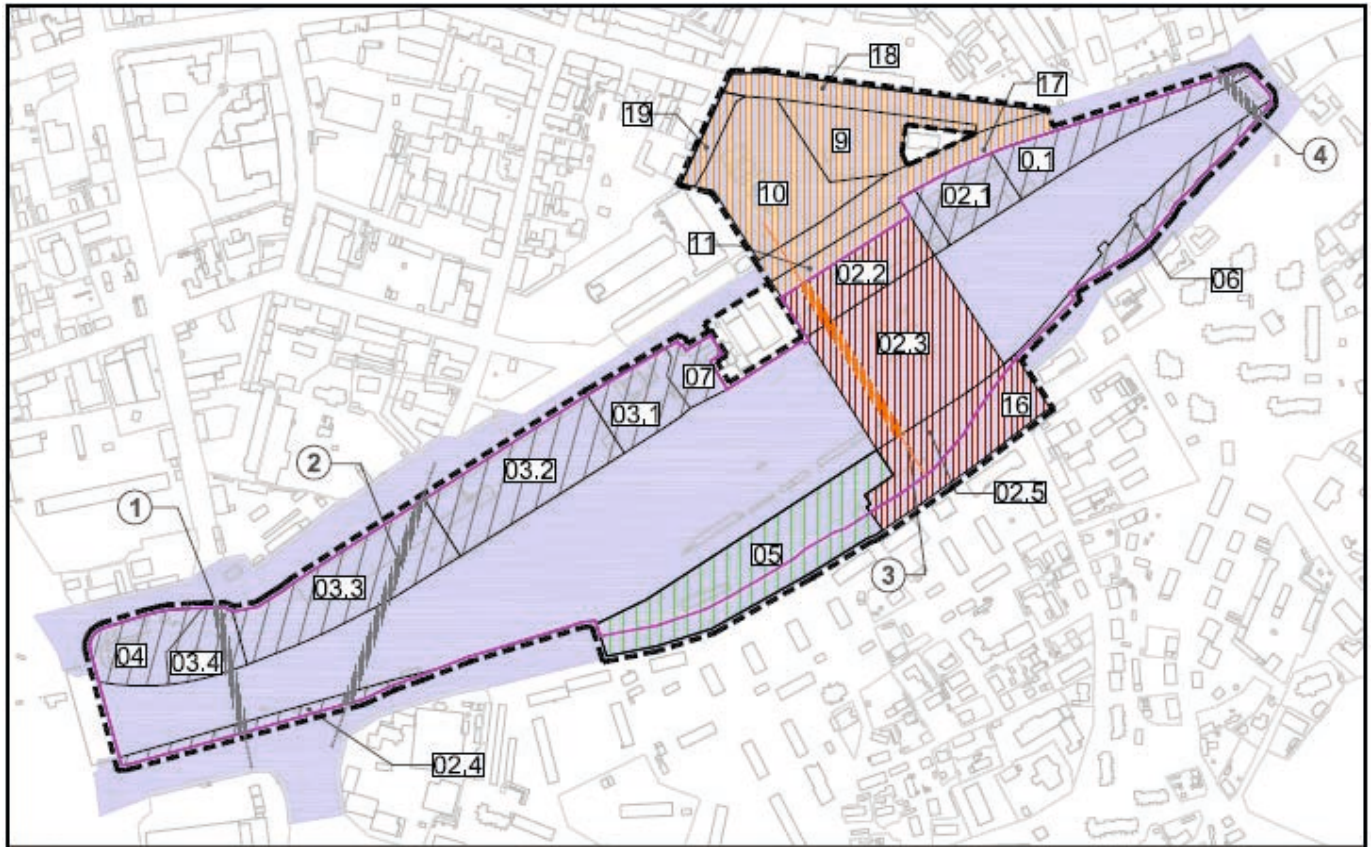
English Yew

Norway Maple

Common Adler

8. STRUCTURE GENERAL INDICATOR

Area No.	2 floors	3 floors	4 floors	5 floors	6 floors	7 floors	8 floors	9 floors	10 floors	11 floors	No. of Buildings	Total Area	Volume	Area of Plot	Density	Intensity	height	useful area	built area
0.1	0	0	1	2	0	0	0	0	0	0	3	16.561,90	55301	7278	0,425666392	2,275611432			3098
02.1	0	0	1	0	0	0	0	0	0	0	1	2524	13043	4976	0,153938907	0,507234727			766
02.2	0	1	0	0	0	0	0	0	0	0	1	9.488	67529	8014	0,604941353	1,183928126	22,9	8678	4848
02.3	0	0	0	0	0	0	0	0	0	0	0	9.820	67381	19407	0,506002989	0,506002989			9820
02.4	3	1	3	0	0	0	0	0	0	0	7	9.657,10	33619	2688	1,108258929	3,592671131			2979
03.1	0	0	0	0	2	0	0	0	0	0	2	24.988	118185	7900	0,787848101	3,163037975			6224
03.2	0	0	0	1	0	0	0	0	0	0	1	34.567,20	275073	12757	0,992239555	2,709665282			12658
03.3	0	0	0	0	1	2	0	0	0	0	3	19.247	66118	13668	0,22658765	1,40817969			3097
03.4 + 04	0	0	0	1	0	0	1	0	0	1	3	23.827,50	80266	9032	0,320084145	2,638120018			2891
0.5	0	0	4	1	0	0	0	0	0	0	5	23.699,40	93673	18050	0,480554017	1,31298615			8674
0.6	0	0	0	0	1	0	0	0	0	0	1	13.081,60	50255	4611	0,498590327	2,837041856			2299
Plaza	0	0	0	0	0	0	0	0	0	0	0	56.674,50							
PT	1	0	0	0	0	0	0	0	0	0	1	5.734,40							



Birds eye View from Švitrigailos gatve

View from Rail Platforms

Views

Birds eye View from East of Stoties Plaza

View of the Naujininkai Centre