



ASO TECHNOLOGY BASE

Next-Generation Industry and Technology Ecosystem



Ankara Sanayi Odası



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Next-Generation Industry and Technology Ecosystem*
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This study is a comprehensive summary of the ASO TECHNOLOGY BASE New Generation Industry and Technology Ecosystem Feasibility Report. All details, references, and the bibliography related to the study can be found in the full report.



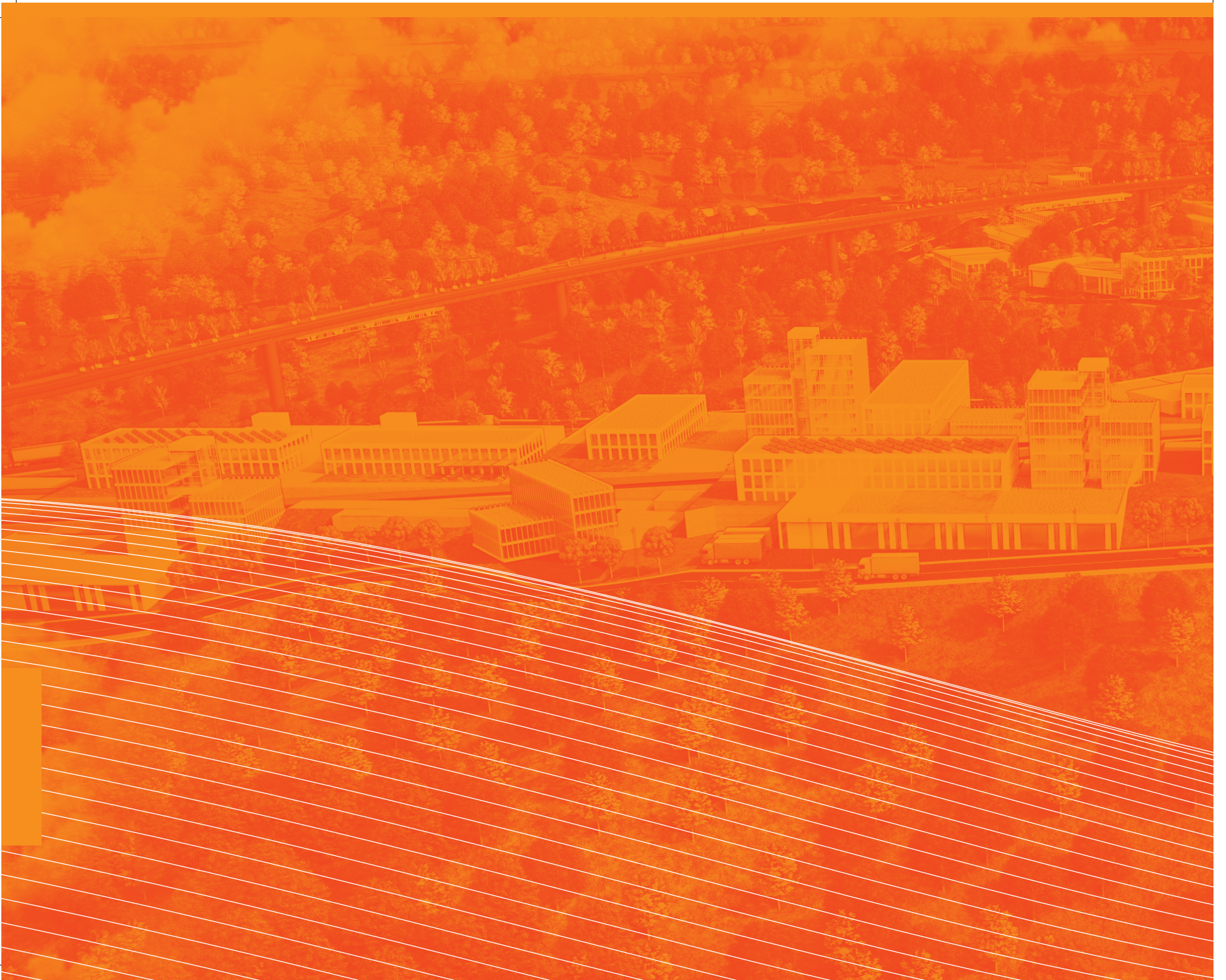
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Abbreviations

| | |
|-------|--|
| ADB: | Asian Development Bank |
| AiIB: | Asian Infrastructure Investment Bank |
| ASO: | Ankara Chamber of Industry |
| AP: | Advanced Placement |
| B2B: | Business-to-business |
| EBRD: | European Bank for Reconstruction and Development |
| EIB: | European Investment Bank |
| GDP: | Gross Domestic Product |
| HDI: | Human Development Index |
| IB: | International Baccalaureate |
| IFC: | International Finance Cooperation |
| OECD: | Organization for Economic Co-operation and Development |
| OIZ: | Organized Industrial Zone |
| PAL: | Policy Analytics Lab |
| R&D: | Research and Development |
| SES: | Solar Energy Systems |
| SMEs: | Small and Midsize Enterprises |
| SOFR: | Secured Overnight Financing Rate |
| TDZ: | Technology Development Zone |



Ankara Sanayi Odası

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TECHNOLOGY BASE

Next-Generation Industry and Technology Ecosystem

Opening Remarks

Seyit ARDIÇ

Ankara Chamber of Industry (ASO)
Chairman of the Board

As the Ankara Chamber of Industry (ASO), we believe that our industry must be equipped to meet today's needs while also supporting the transformation of the future through strong and resilient infrastructures. With this vision, we developed the ASO Technology Base, which is an ecosystem where industry, technology, life, and the environment coexist in an integrated and sustainable structure. We carefully examined international examples and analyzed the prominent features of models from different countries, so that we could combine the most innovative practices. Based on this comprehensive evaluation, we believe we have developed a distinctive and forward-looking framework that can serve as a reference for future initiatives.

“
The ASO Technology Base is designed as a next-generation production and technology zone, as well as a vibrant, accessible, and sustainable environment that fosters innovation and offers a high quality of life.
”

With this project, our aim is to establish a “technology neighborhood” through the ASO Technology Base. This will be an integrated environment that connects high-tech manufacturing companies with a qualified workforce, supports R&D activities, and is embedded in social life. The base features incubation centers, technology transfer offices, laboratories, university-affiliated research institutes, as well as a green campus and educational institutions. The base undoubtedly offers a complete spatial infrastructure for technology production with inclusion of a hotel, a marketplace, housing, and social facilities.



ASO Technology Base
*The Meeting Point of
Industry, Technology and Life*

“

The technology free trade zone planned within the project will create a unique investment environment for international tech companies and marks a significant step toward transforming Ankara into a regional R&D and innovation hub.

”

ASO Technology Base will function as a manufacturing site while also generating knowledge, establishing collaborations, commercializing ideas, and accessing global markets.

In addition to being designed to meet today’s needs, the ASO Technology Base also aims to meet those of the future with a zero-emission target, renewable energy systems, electric public transit infrastructure, smart building designs, circular economy solutions, and green technology clusters. The integrated residential areas, healthcare services, festival and experience zones, quality educational institutions, and shared social spaces will enhance the quality of life for employees and their families while increasing the overall attractiveness of the area.

With all these dimensions, the ASO Technology Base is not only a technology-driven manufacturing hub, but also a center for living and learning, collaboration, and social interaction. In essence, it represents a fully integrated city of industry and technology. In doing so, it will bring to life an innovative ecosystem that unites production and R&D.

“

ASO Technology Base is projected to be established on a 1.2 million square meter site, with a total investment cost of US\$296.7 million. The project is scheduled to begin in 2026, proceed in three construction phases, and become fully operational by 2033.

”

It is projected that 73% of the total cost of the buildings in the area will be covered by the Ankara Chamber of Industry through internal resources along with national and international credit facilities, while the remaining

27% will be undertaken by investor firms through external financing. However, the efforts of the private sector alone are not sufficient for this transformation to succeed. We believe that it is critically important for public policies to align with this vision and provide continuous support. The successful implementation of the project will depend on the active involvement of both the central government and local administrative bodies, particularly in providing investment and financial support, developing infrastructure, strengthening transportation links, and establishing legal frameworks such as the technology free zone. In this context, public-private cooperation is not a matter of choice, but a necessity.

The ASO Technology Base will mark a new milestone in Ankara’s high-technology driven development and serve as a model initiative in Türkiye’s green and digital transformation journey.

“

This project aims to address today’s needs and, at the same time, establish an ecosystem where future generations will work, produce, live, and compete on a global scale.

”

I would like to thank Mr. Esen Çağlar, Managing Partner of the Policy Analytics Lab (PAL), with whom we collaborated on this valuable study; as well as Research Manager Mr. Fırat Çetin, and Prof. Dr. Olgu Çalışkan from the project team, and the entire PAL team. I also extend our sincere thanks to Professor Dr. Nuri Yavan and Professor Dr. İbrahim Semih Akçomak for their academic contributions to this work.

Finally, I would like extend my sincere gratitudes to our Chamber’s Secretary General and ASO Teknopark Inc. General Manager, Prof. Dr. Mehmet Cansız, who has worked devotedly from the conceptual stage of the ASO Technology Base to this concrete phase; as well as to ASO Deputy Secretary General and ASO Teknopark Inc. Deputy General Manager Dr. Ahmet Dinçer, our Entrepreneurship and Innovation Manager Ms. Seda Aydın, Entrepreneurship and Innovation Coordinator Ms. Damla Çıldır, Entrepreneurship and Innovation Assistant Specialist Ms. Buse Yılmaz, and all ASO staff who contributed to this effort.

Executive Summary

A Next-Generation Manufacturing Model for Türkiye's High-Tech Future

What Türkiye Needs: A Model That Integrates R&D and Manufacturing

Over the past twenty years, R&D activities in Türkiye have gained significant momentum, with the private sector taking a leading role in this transformation. R&D expenditures increased 11 fold during this period, while the private sector's share rose from 29% to 65%. However, during the same period, the desired leap in high tech exports and productivity per employee has not been achieved. For this reason, Türkiye requires an integrated model that fosters R&D and simultaneously encourages high value-added production and exports.

ASO Technology Base has been designed precisely to meet these needs as an advanced technology manufacturing district where industry and R&D are planned together and where production and innovation are integrated. Launched under the leadership of Ankara Chamber of Industry (ASO), this initiative combines the models of Organized Industrial Zones (OIZ) and Technology Development Zones (TDZ), creating a next-generation technology development zone that will serve as a model for Türkiye.

Why Ankara and why Temelli?

In addition to being Türkiye's second-largest industrial city, Ankara has emerged as the fastest-growing metropolis in industrial employment, expanding by 97% over the past 15 years. Industrial employment rose from 202,000 in 2009 to 397,000 in 2023, an average increase of about 15,000 new jobs each year.

As the capital of Türkiye, Ankara is home to 21 universities, numerous public research institutions, technoparks, and a growing network of Organized Industrial Zones (OIZs), making it one of the most concentrated and diversified R&D and manufacturing ecosystems in the country. This strong institutional and physical infrastructure is further supported by a highly qualified workforce. From engineering and basic sciences to social sciences and health technologies, Ankara hosts a broad spectrum of well-educated

human capital, providing a strategic advantage for industry and technology-based development.

All this potential makes it strategically meaningful to position the ASO Technology Base within the Temelli-Alcı corridor, on a well-planned site covering 1.2 million square meters. As it integrates with Ankara's R&D capacity, skilled workforce, and industrial infrastructure, this next-generation technology development zone will serve as a concrete example of a sustainable, high value-added, and innovation-oriented development model for Türkiye.

ASO Technology Base is located at the center of the Temelli Industrial Basin, one of the fastest growing regions of Ankara. Designed to interact directly with major industrial zones such as the Başkent OIZ, Anadolu OIZ, Dökümcüler OIZ, and ASO's 2nd and 3rd OIZs, it stands at the core of a new spatial framework where industry is redefined through knowledge and technology.

With the driving role that the ASO Technology Base is set to play, the Temelli industrial region is expected to become a strategic center in which industry and R&D are fully integrated. In the near future, it could take on a role similar to the science and technology corridor created over time by the ODTÜ-Bilkent-Hacettepe axis in Ankara.

An Innovative Spatial Configuration

ASO Technology Base moves beyond the traditional technopark concept by integrating manufacturing, R&D, design, and office functions within a single physical structure through a modular spatial design. Ground-floor production spaces and upper-floor offices, and R&D units are planned with the flexibility to meet firms' scalable growth needs both horizontally and vertically.

These structures will be supported by technology transfer offices, incubation centers, simulation and testing laboratories, research institutes dedicated to university-industry collaboration, digital and green transformation centers, and model factories, rather than being limited to physical infrastructure alone.

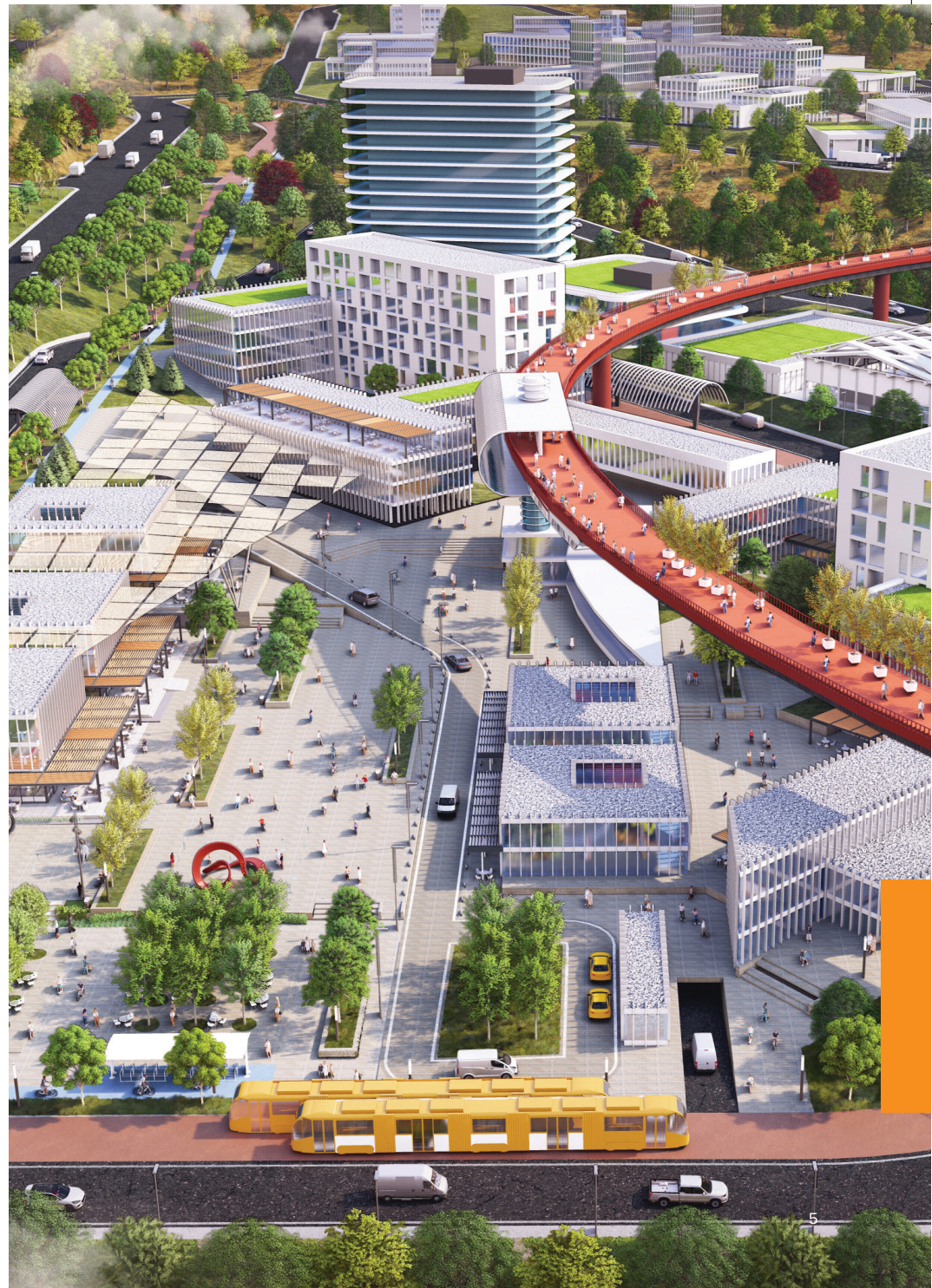
Additionally, the establishment of a “high-technology free trade zone” within the ASO Technology Base is planned. This free zone will offer a competitive and attractive investment environment for firms integrated into global value chains, serving as a strategic platform that strengthens Türkiye’s position in international high-tech exports.

A Social, Urban and Sustainable Living Space

ASO Technology Base is planned as a vibrant living environment as well as a thriving industrial and tech zone. The project includes cafés, restaurants, marketplaces, a festival area, and an experience center to support employee socialization and creative interaction.

A 630-unit technology residential neighborhood, an international-standard college, a hotel, and dormitories will meet the housing, health, and daily needs of R&D staff and other highly skilled personnel, creating a powerful attraction center in Ankara for the creative workforce.

From an environmental perspective, ASO Technology Base is built around a net zero emissions goal. Solar energy systems will supply 28% of its power needs, with the aim of increasing that share over time. Furthermore, smart buildings, waste-management systems, and circular-economy principles will minimize environmental impact, while carbon-neutral internal transit solutions, such as electric trams and a monorail, will ensure sustainable mobility within the district.



Transformative Impact for Türkiye and Ankara

ASO Technology Base aims to provide a next-generation development model that Türkiye needs, rather than just serving as a manufacturing complex through its framework that promotes high value-added manufacturing, integrates R&D with real-world production, and physically brings universities and industry together.

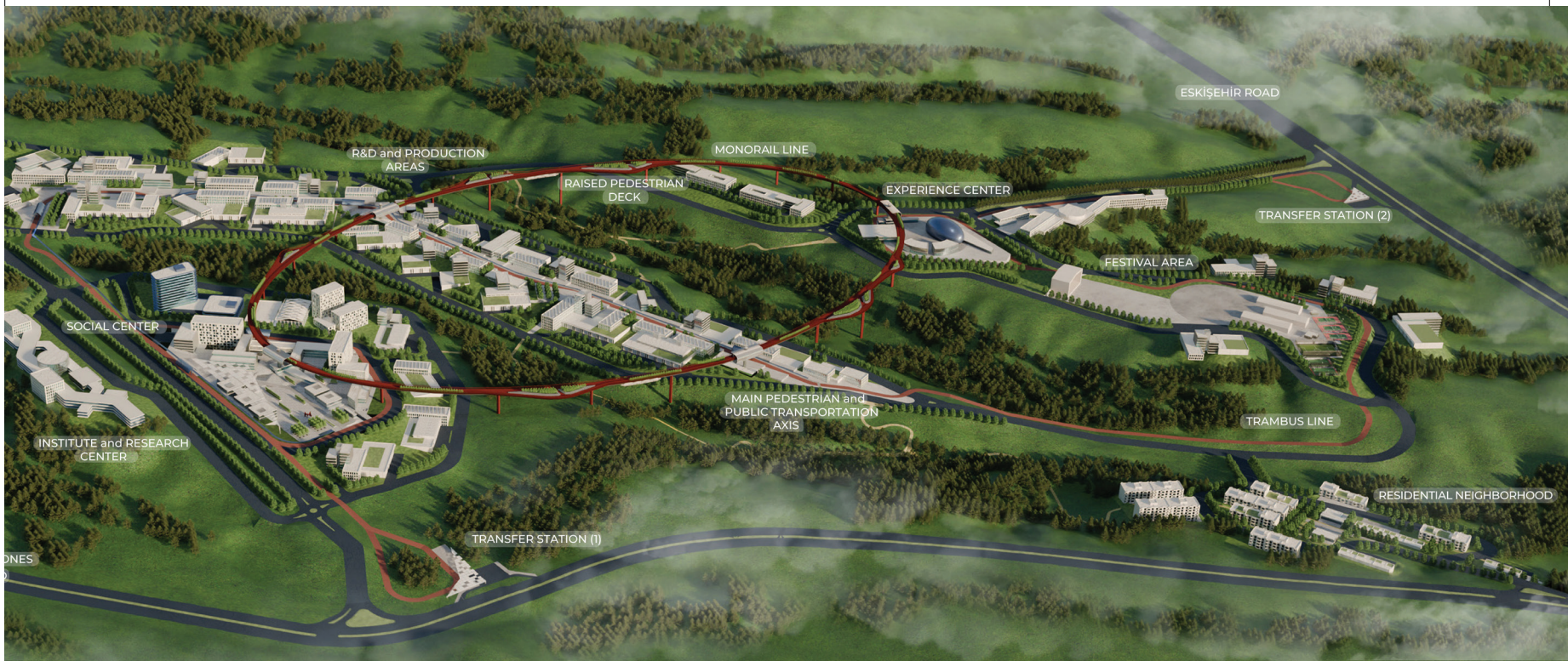
The base will be developed in three stages on a total site area of 1.2 million square metres. It is planned to provide 440,000 m² of usable space with a construction footprint of 193,000 m². The total investment is estimated at US \$296.7 million, of which 73% will be financed by ASO through internal funding and national and international credit, while the remaining 27% is expected to be covered by investor firms through external financing. Due to uneven terrain and the scattered nature of buildable parcels, a multi-stage approach is unavoidable for the construction of the project. Therefore, the master plan organizes development into three interlocking stages, each broken down into coordinated sub-stages that together form a seamless whole. The planning process; covering design, tendering, construction, and the integration of social amenities, is scheduled to be completed within an eight-year period starting in 2026.

Once operating at full capacity, ASO Technology Base is expected to host more than 800 companies and create over 18,000 skilled jobs. With its high technology focus, the base aims for an annual export volume exceeding US \$1.5 billion. In this context, the project will:

- Generate a significant leap in Türkiye's technology exports,
- Elevate Ankara's industrial and R&D growth to a new level,
- Form the core of spatial and social transformation in the Temelli Industrial Basin
- Ensure the implementation of Türkiye's sustainable industrial policies in practice.

The ASO Technology Base will enhance Türkiye's competitiveness in the global economy and help the country integrate more firmly into high-value international value chains. Through this innovative initiative, the manufacturing and innovation ecosystem of the future will take shape around Ankara, serving as a strategic milestone in Türkiye's technological transformation.





Key Metrics and Expected Economic/Social Impacts

Project Area



1,2 million m²

Planned Building Footprint



193 thousand m²

Projected Usable Space



440 thousand m²

Total Investment Requirement



US \$296,7 million

Investment required for first sub-stage of Stage 1: US \$96.1 million

Number of Firms



843 firms (Industry, R&D and Software)

Employment Increase



Employment for 18,347 people
Growth at Ankara's TDZ and R&D center employment: 52%

Export Increase



US \$1.5 billion in exports
Ankara's high-technology export growth: 86%

Foreign investors can be attracted for 27% of the investment (Build-Operate-Transfer)

Expected annual rental income upon project completion: US \$30.3 million

Scope

Scope

ASO Technology Base has been envisioned as the main campus of the ASO Technopark, which became operational at the end of 2019.

ASO Technology Base is planned for a 1.2 million square meter site owned by ASO Technopark Inc., located within Temelli, Alçı Village in Ankara's Sincan district. This site was declared as the ASO Technopark Technology Development Zone in the Official Gazette No. 26822, published in 2008.

As the first step toward establishment, the "ASO Technology Base Feasibility and Concept Master Plan Preparation" project was launched. The study aims to create a high-technology industrial zone that fosters high-value-added production, exports, and skilled employment.

In line with its mission to improve Ankara's competitiveness in high-tech manufacturing by introducing a new technopark model, the project has produced three core outputs that illuminate the base's establishment and development process:

- Component 1: Current State Analysis
- Component 2: Concept Master Plan
- Component 3: Development Strategy and Roadmap



The study was supported by desk research, data analysis, and design workshops, as well as by fieldwork. As part of the fieldwork, stakeholder interviews were conducted with 22 experts from public institutions and TDZ/production ecosystems; additionally, in depth interviews were held with 20 firms focused on high value-added production and R&D.

Outputs

Component 1: Current State Analysis

- Supply/demand analyses: sectoral specialization, foreign trade, technology and the entrepreneurship ecosystem
- Needs analyses: Fieldwork findings, conceptual framework, and focus technology areas.
- Financial and economic pre-feasibility: financial model and public benefit framework
- Implementation examples for functions and amenities

Component 2: Urban Design Master Plan Report

- Site surveys and international examples
- Plan components: design principles, macro-spatial structure, system configuration, land use, transportation and access network, design morphology
- Building typologies and prototypes
- Project visuals

Component 3: Development Strategy and Roadmap

- Rationale and key figures for each project stage
- Financing, investment, and revenue scenarios
- Firm admission and compliance approach
- Risks and risk-management strategies
- Priority actions

All details of the components included in this study are presented in the ASO Technology Base Next-Generation Industry and Technology Ecosystem Feasibility Report.

Introduction

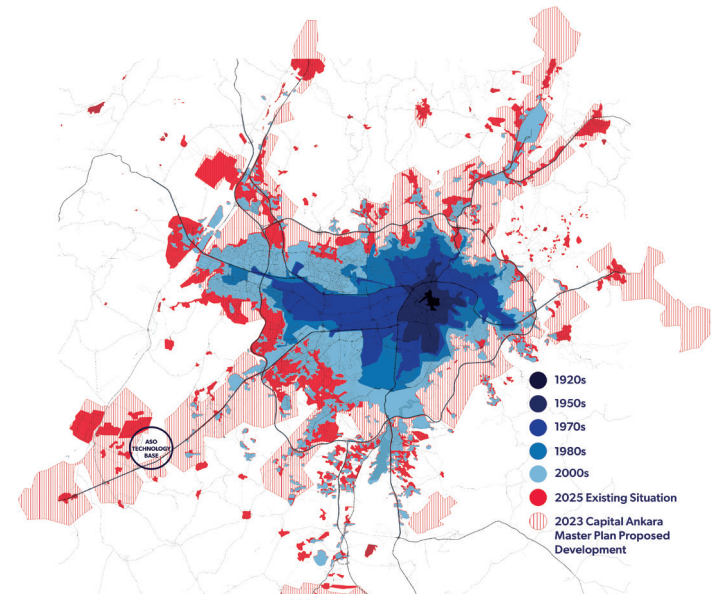
The ASO Technology Base will be developed on a 1.2 million square metre site owned by ASO Technopark Inc. in the Temelli Industrial Basin of Ankara's Sincan district. Designated as a Technology Development Zone (TDZ) in the 2008 Official Gazette, the area will feature modern infrastructure and facilities that support the project's expansion and innovation goals.

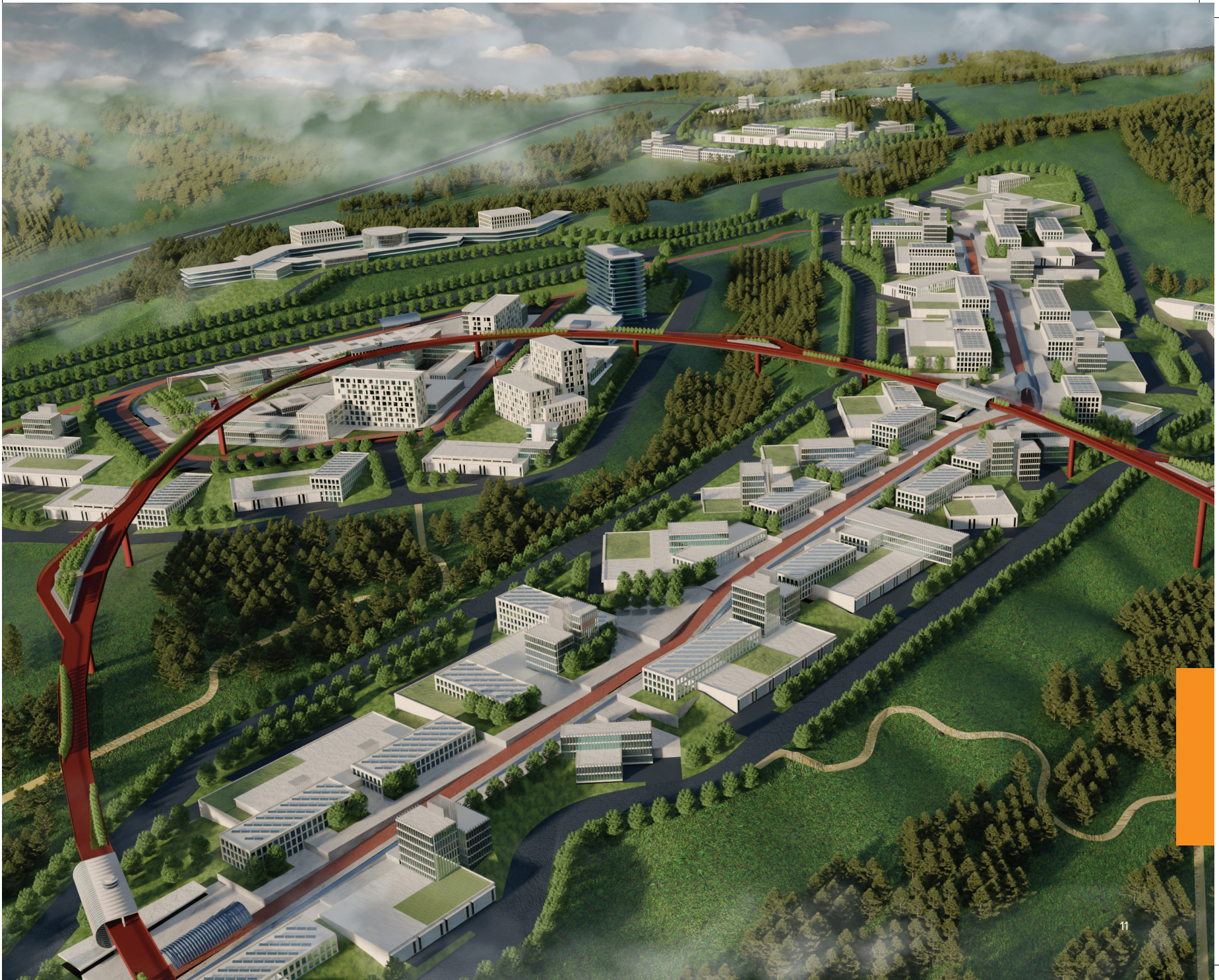
The ASO Technopark, currently operating in ASO's 1st OIZ, offers 3,750 m² of leasable office space as well as 950 m² of workshop space within a 10,000 m² facility. Having reached full capacity by 2023, the technopark houses 59 companies and 290 staff as of the first quarter of 2025, making a significant contribution to the region's technology ecosystem.

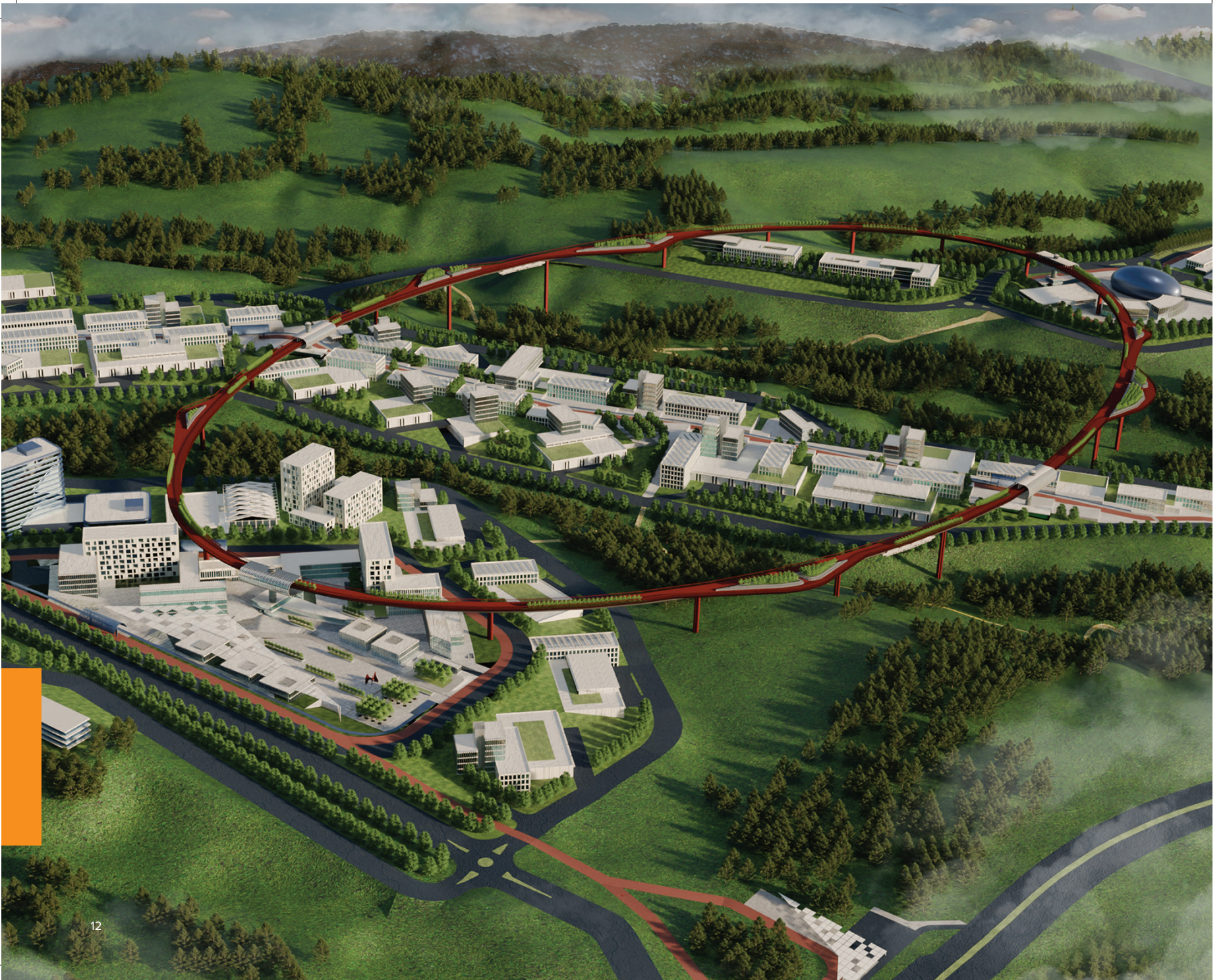
The project site lies 40 km from Ankara city center, 20 km from the Western Ring Road, and 6 km from Temelli Malıköy. It sits within a growth corridor that includes the TOKİ Turkuaz, the Çankaya University campus, and the Yukarıyurtçu neighborhood. Moreover, it is surrounded by major industrial zones such as the Başkent OIZ, Anadolu OIZ, and ASO 2nd and 3rd OIZs, close to the Ankara-Eskişehir Highway. This location makes the ASO Technology Base part of one of Ankara's rapidly expanding centers of industry and employment.

The ASO Technology Base is strategically located at a point that aligns with both Ankara's century-old urban morphology and its developing industrial infrastructure.

Figure 1: Ankara's Spatial Development







Fundamental Approach

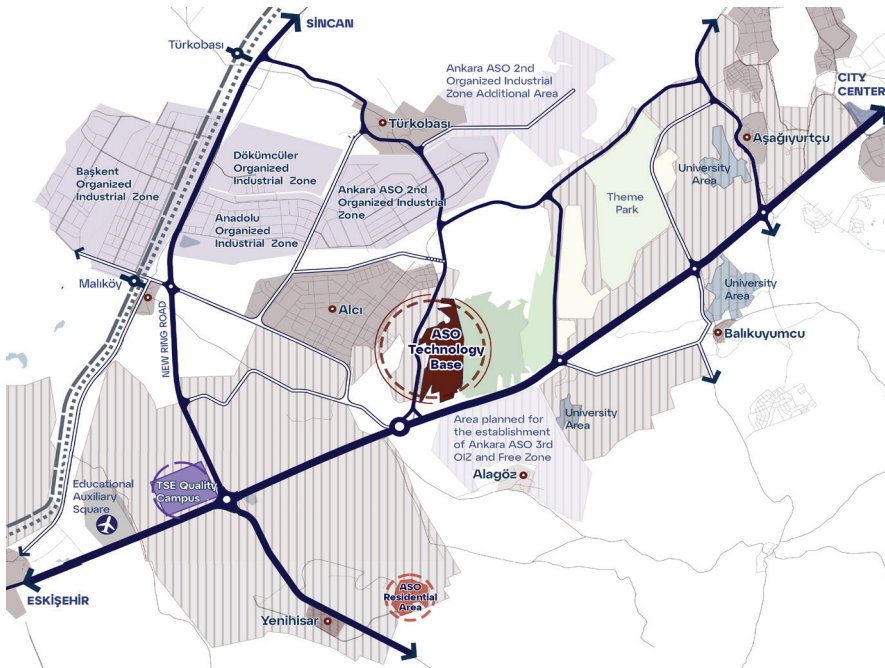
ASO Technology Base aims to create an exemplary model for next-generation, R&D and export oriented high technology production zones by blending Türkiye's nearly 60 years of Organised Industrial Zone experience with 25 years of Technology Development Zone practice.

To this target, the "Feasibility and Concept Master Plan Preparation" project was launched to guide the Base's establishment. Its goal is to boost Ankara's competitiveness in high technology while offering Türkiye an innovative technopark model.

The project introduces a "neighborhood" approach which is a pedestrian friendly, city integrated campus that merges research and production while meeting social, cultural, and recreational needs in harmony with nature.

The master plan overcomes the limitations of existing technoparks and draws inspiration from leading global examples, adapting the concept of an innovation campus and science technology park to Türkiye's and Ankara's specific context. This plan was developed with a keen understanding of local conditions, converting constraints into opportunities and embodying an intelligent, pragmatic design philosophy.

Figure 2: Project Area Surroundings - I



Activities Within the Project Scope



1. Desk Research: Comprehensive research and data analysis, using both public and private sources, were conducted to identify opportunities in Ankara's industrial and innovation ecosystem, evaluate demand for a manufacturing-oriented technopark, and define the functions such a zone should include.



2. Cost-Benefit Estimates: The approximate investment required for the construction of the ASO Technology Base was calculated and core investment scenarios were prepared. Firm numbers, employment, and export impacts were also estimated, based on metrics obtained from studies and interviews maintaining alignment with the concept of the master plan.



3. Stakeholder Interviews: In-depth discussions were held with representatives of 22 regional and national organizations. Findings from the desk research were reviewed, and the opportunities and risks of the proposed model were assessed with public authorities, technopark managers, OIZs, and subject-matter experts.



4. Company Interviews: Meetings were held with 20 high-value-added manufacturing firms operating in Ankara. These interviews evaluated the base's design and explored companies' spatial needs as well as ecosystem expectations across different sectors.



5. Design Research: By examining manufacturing and R&D spaces both globally and locally, fundamental design models for building units were identified. These studies informed urban planning and enabled the ASO Technology Base to be designed in line with global trends and practical, applicable units.



6. Pre-Demand Survey: A survey was conducted to 45 candidate companies; 37 indicated they would consider moving in. The responses helped the assessment of functions and amenities, highlighting firms' priorities and technology focus areas.

Why ASO Technology Base?


1.1. Why A New TDZ Model?

Türkiye has experienced a significant rise in R&D investments over the past 20 years.

R&D expenditures in Türkiye


| | | |
|--------------------------|---------------------------|--|
| 2002 US \$1,2 billion | 2023 US \$16,1 billion |  13,4 fold increase |
|--------------------------|---------------------------|--|

Ratio of R&D expenditures to GDP


| | | |
|--------------|--------------|---|
| 2002 0,5% | 2023 1,4% |  2,8 fold increase |
|--------------|--------------|---|

The private sector has taken a leading role in this R&D transformation.

Share of the private sector in R&D expenditures

| | | |
|-------------|-------------|---|
| 2002 29% | 2023 65% |  2,2 fold increase |
|-------------|-------------|---|

R&D personnel in TDZs and R&D centers

| | | |
|-------------|---|---|
| 2002 300 | 2024 205 thousand* <small>*118K in TDZs and 87K in R&D centers</small> |  683 fold increase |
|-------------|---|---|

Although R&D activities in TDZs and R&D centers have advanced rapidly, their impact on exports has remained limited.

Exports per employee

| | | | |
|--|-------------------|--------------------|---|
| Türkiye (manufacturing industry) | 2002 US \$7 K | 2023 US \$30 K |  4,3 fold increase |
| TDZs | 2002 US \$13 K | 2023 US \$19 K |  1,5 fold increase |
| South Korea (manufacturing industry) | 2002 US \$32 K | 2023 US \$124 K |  3,9 fold increase |

Türkiye has made significant progress in R&D over the past 20 years:

- Total R&D spending rose from US \$1.2 billion in 2002 to US \$16.1 billion in 2023, a nearly 13 fold increase. However, R&D still only accounts for 1.4% of GDP, well below the OECD average (3%) and South Korea (5.2%).
- The private sector's share of total R&D expenditure climbed from 29% to 65%.
- R&D personnel (full-time equivalent) reached 205,000, of whom 118,000 work in Technology Development Zones (TDZs)

Two main policy instruments have driven the private sector's R&D transformation in Türkiye:

- **TDZs**, first appeared in 2001 under Law No.4691 at ODTÜ Teknokent. Today there are 91 technoparks, hosting more than 11,000 firms that have carried out over 70,000 projects and employ over 118,000 people.
- **R&D Centers**, were introduced under Law No.5746, initially supporting firms with at least 50 R&D employees (later lowered to 15). By the end of 2024, 1,330 R&D centers employed around 87,000 personnel and had executed more than 80,000 projects.

- In 2023, exports per employee in Türkiye's Technology Development Zones (TDZs) stood at around US \$19,000, below the manufacturing-sector average. At ODTÜ Teknokent, the country's top performer in exports, the figure was only US \$37,000.
- Across Türkiye's manufacturing sector, exports per employee rose from US \$7,000 in 2002 to US \$30,000 in 2023. Over the same period, South Korea's figure grew from US \$32,000 to US \$124,000.
- By 2023, TDZs had benefited from an estimated US \$4.1 billion in tax incentives (PAL estimate). Yet their cumulative exports for 2002-2023 totalled only US \$10 billion.

These numbers show that Türkiye needs a more effective model, one that increases value added in industrial exports, fosters innovation, and strengthens international competitiveness. The ASO Technology Base aims to meet this need and play a stronger role in Türkiye's R&D transformation.

- **While TDZs play a key role in the R&D and entrepreneurship ecosystem, they have not delivered the expected impact on exports.**
- **However, the first article of the TDZ Law emphasizes the goal of "shaping the country's industry into an internationally competitive, export-oriented structure."**
- **Meeting that goal now clearly calls for a next generation TDZ model that prioritizes exports by boosting high-technology production in Türkiye.**



1.2. Why Ankara?

Ankara is the ideal location in Türkiye to pilot a next-generation industrial and technology zone. The city combines a high quality of life with rapid industrial expansion and a strong tech-development infrastructure. Due to these advantages, Ankara offers the greatest potential in Türkiye for bringing the creative class together with industry and technology.

The economy of Ankara is rapidly developing and is becoming the most suitable place for value-added manufacturing.



Population expected to reach 10 million

Province attracting the most internal migrants
First in attracting highly educated migrants



Leads Istanbul and İzmir on the quality of life index and is second nationwide after Antalya



Industrial employment growth 2.6 times that of Istanbul

97 % increase in manufacturing employment (2009-2023)



Province with the highest R&D intensity

R&D spending per employee is three times Istanbul's (2023)
One in every three R&D centers opened nationwide (2019-2024) is in Ankara



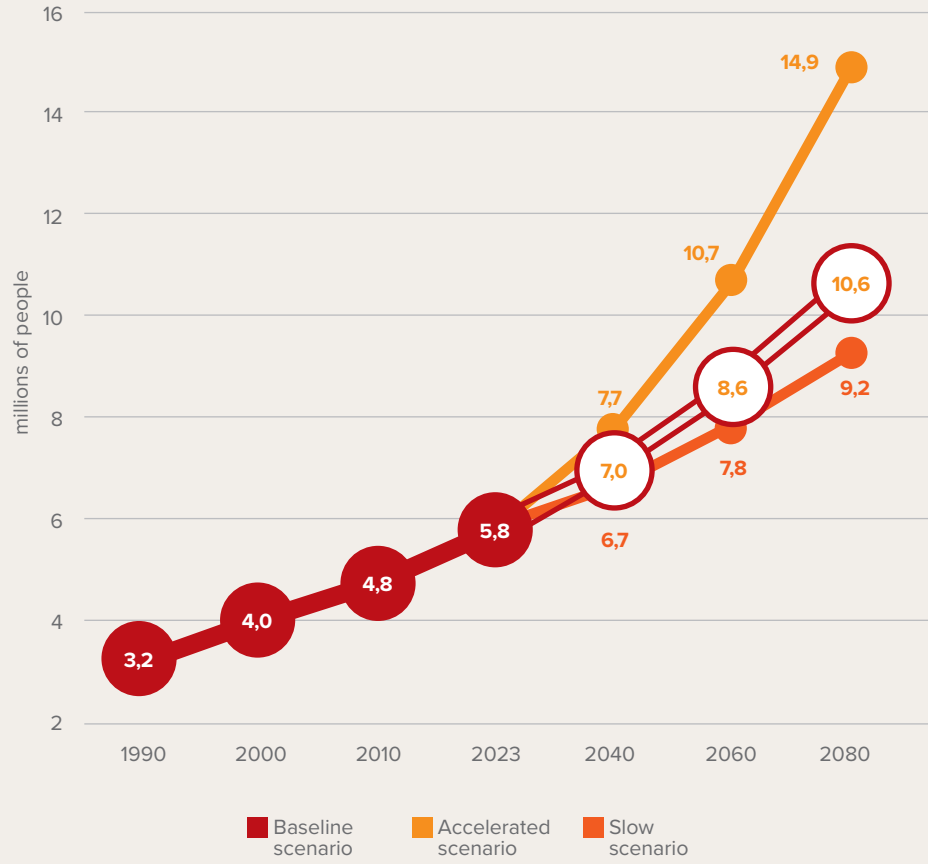
Increase in export potential

Share of Türkiye's exports up from 4% to 5.1% (2002-2023)
Average annual volume growth of 10.6% (2002-2023)

Population Growth and Migration Potential

- Under current scenarios the population of Ankara, which stood at 5.8 million in 2023, is projected to reach 7 million by 2040 and approach the 10 million threshold before 2080.
- In recent years, Ankara has recorded the highest net internal migration of any Turkish province. Between 2010 and 2023, the city gained roughly 1 million residents, 40 percent of that increase came from internal migration. It is worth noting that, while Istanbul's population declined by a net 444,000 through migration between 2016 and 2023, Ankara's grew by 164,000 in the same period. Unlike Türkiye's other major metropolises, Ankara does not face a major earthquake risk, which could accelerate future inflows.
- Ankara excels at attracting qualified internal migrants: 36% of newcomers from 2010 to 2023 held university degrees, compared with 28% in Antalya, 32% in İzmir, and 27% in Istanbul.
- According to the Socio-Economic Development Index (SEGE), which aggregates eight components, Ankara ranks first nationwide in education and health, and second (after Antalya) in overall quality of life. Istanbul places fifth in education, tenth in health, and fifth in quality of life.

Figure 3: Ankara's Population Projection (millions of people)



Source: TÜİK, PAL analysis

Table 1: Provinces with the Highest Net Internal Migration (2010-2023)

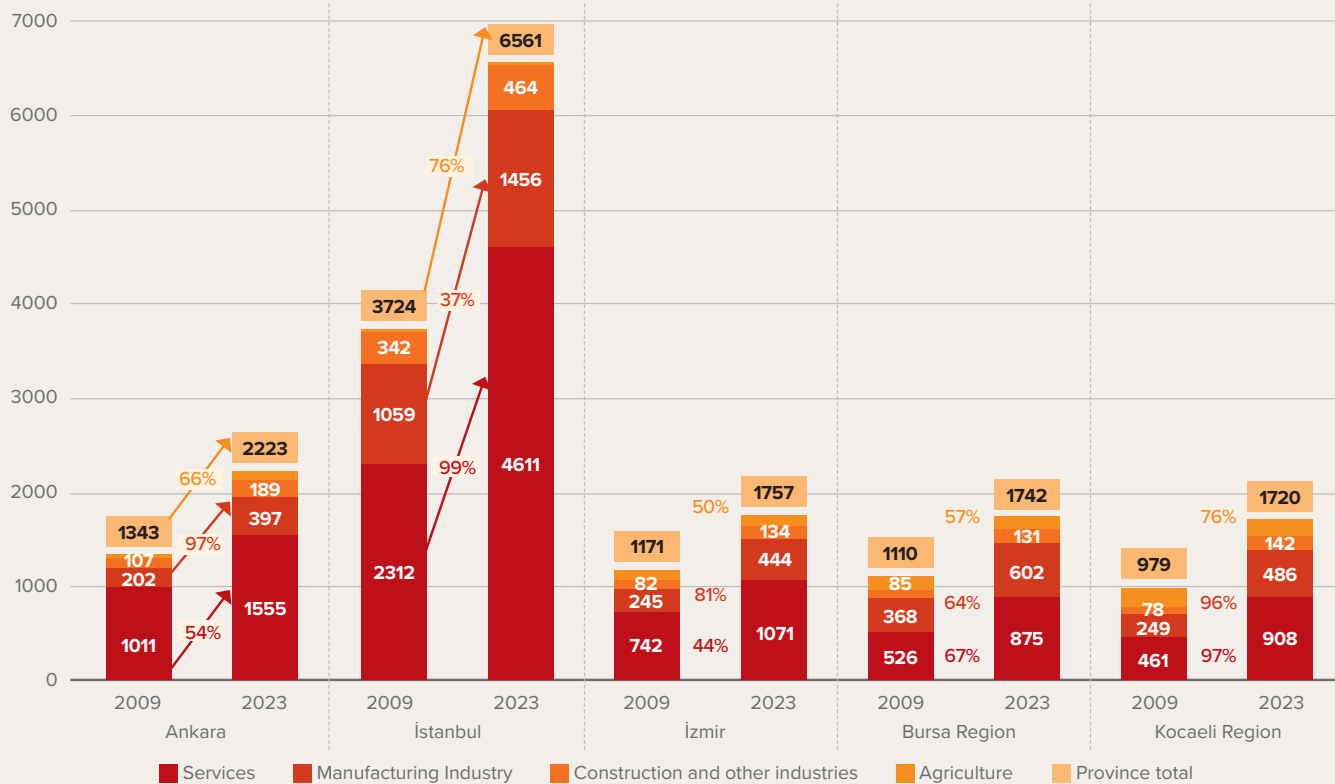
| Provinces | Net migration, thousand people (top 10 provinces) | University graduates as a share of incoming migrants (%) |
|--------------|---|--|
| 1. Ankara | 415 | 36 |
| 2. Antalya | 293 | 28 |
| 3. Kocaeli | 260 | 25 |
| 4. İzmir | 255 | 32 |
| 5. Tekirdağ | 253 | 22 |
| 6. Bursa | 212 | 29 |
| 7. Muğla | 150 | 34 |
| 8. Eskişehir | 95 | 30 |
| 9. Sakarya | 89 | 25 |
| 10. Aydın | 87 | 30 |

Source: TÜİK, PAL analysis

Development of the Industrial Sector

- Between 2009 and 2023, Ankara's industrial employment grew by 97%, making it the province with the largest increase. Over the same period, industrial employment rose by 37% in Istanbul, 81% in İzmir, and 65% nationwide. Ankara's total employment rose by 66%, and one out of every three new jobs created in the city was in manufacturing.
- Between 2009 and 2023, Ankara's industrial GDP grew by 184%, the fastest rate among all provinces. By comparison, the figure for Istanbul was 74%.
- Ankara's industrial expansion has been driven by productivity-based growth. A key productivity indicator which is manufacturing GDP per worker, rose from US \$30,000 in 2009 to US \$44,000 in 2023, averaging 2.9% annual growth. With this level, Ankara surpasses both Istanbul (US \$35,000) and İzmir (US \$40,000).

Figure 4: Sectoral Employment and Growth Rate in the Five Largest Provinces (2009–2023, thousands of people)



Source: TÜİK, PAL analysis

Ankara's Westward Expansion

- The ASO Technology Base is situated at a strategic point that aligns with both Ankara's century-old urban organization and its industrial infrastructure.

- Ankara, with its fast-growing population and employment, is now spatially expanding towards Temelli Industrial Basin. The site of the ASO Technology Base, which lay on the outskirts of the city center in the early 2000s, now has the potential to evolve into a strategic hub, similar to the ODTÜ, Bilkent, and Hacettepe corridor. This corridor was once located at the city's edge but has since become part of its core.

Figure 5: Ankara's Urban Development Pattern

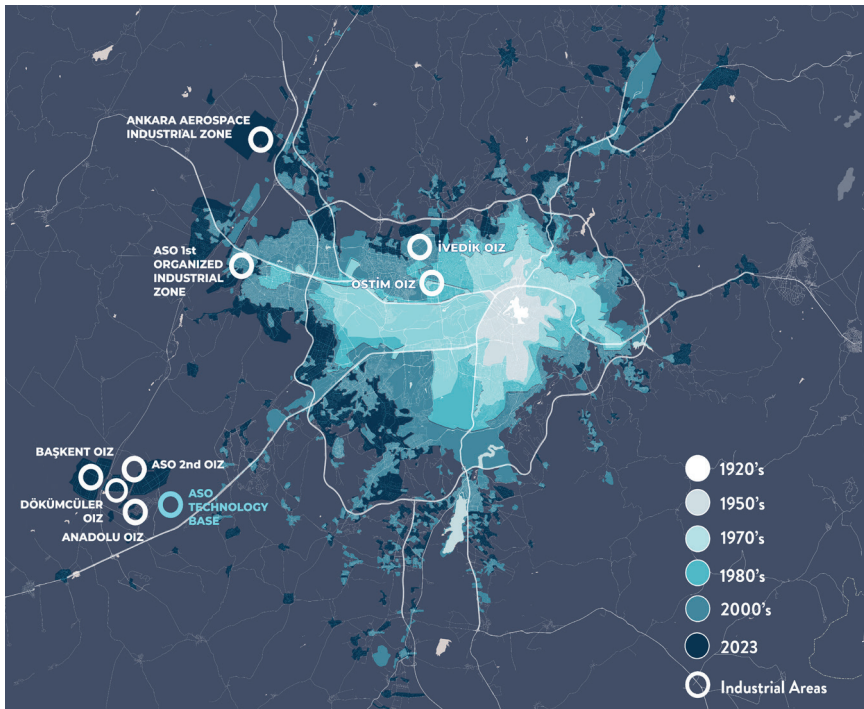
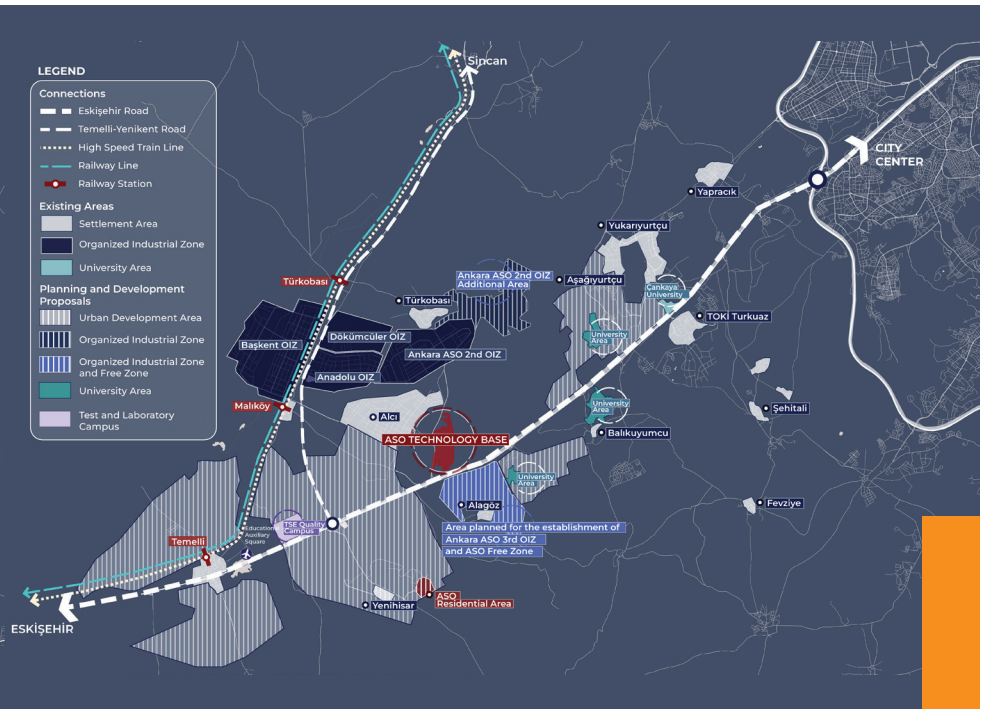


Figure 6: Project Area Surroundings – II



What Will the ASO Technology Base Include? Model, Functions, and Amenities

ASO Technology Base Concept

ASO Technology Base is planned as an innovative TDZ that aims to lead Türkiye's high-tech, R&D-driven industrial transformation. Thanks to its strategic position in the Temelli Industrial Basin, the project seeks to promote high-value-added production and support export-oriented economic growth.

In the design process of ASO Technology Base special consideration was given to the spatial requirements of companies engaged in project-based or small-scale manufacturing, with a focus on R&D and engineering and the production of high value-added products. Accordingly, the ASO Technology Base Concept Master Plan was developed with a flexible, scalable design approach.

The spaces are designed to allow firms to combine horizontal production areas with vertical office floors. Modular ground-floor production units start at 250 m² and can be merged to create up to 5,000 m², giving companies adaptable, sustainable options as they grow.

The base's modern infrastructure is designed to meet the needs of not only technology-based firms but those of the creative class as well, raising employment, boosting the area's capacity to attract national and international investment, and making a significant contribution to Türkiye's transition toward a knowledge based economy.

This section first sets out the core features of the proposed model. Subsequently, it explores the project's identity under three main categories; High Technology Production, High Quality of Life, and Green Zone. Latter section describes the characteristics of firms that will be located in the base, the essential functions of different buildings, the spatial approach, and the concept master plan. Finally, it assesses the impacts the project is expected to generate under various parameters.

2.1. Recommended Model

ASO Technology Base offers a multifaceted ecosystem that merges the functions of a Technology Development Zone and an Organized Industrial Zone within a hybrid structure. While supporting collaboration among R&D, innovation, and industry through its advanced technological infrastructure, social spaces, and eco-friendly solutions, it aims to provide a modern living and working environment that meets the needs of both the employees and the firms.

TDZ Identity

- The Base's innovative hybrid model combines the functions of an TDZ and that of an OIZ.
- It has incentive schemes designed to attract qualified firms to the zone based on export performance, value added, and regional contribution.
- It is open to global integration through a technology free-zone status for international firms.

Physical and Spatial Structure

- It provides production and office spaces that can scale both horizontally and vertically.
- The planned space incorporates R&D and training infrastructure, including incubators, laboratories, and university-affiliated institutes.
- The base has a multifunctional setup with social facilities such as cafés, restaurants, housing, hotels, shopping venues, and event centers.

Sustainability and Environmental Focus

- The ASO Technology Base is designed to meet a zero carbon emission target through renewable energy, smart buildings, and circular economy practices.
- Eco-friendly transport options, including electric trambuses, a monorail, and charging stations are provided.
- A strong emphasis was placed on recreational green spaces, afforestation zones, and carbon-sink areas.

Innovation and Collaboration

- Industry-university collaboration will be cultivated through research institutes and training programs.
- It aims to become a specialized cluster center in critical and strategic fields such as green technologies, artificial intelligence, and automation.

Social Life and Employee Focus

- While the base adopts the neighborhood concept including walkable spaces, public transportation, housing, and health and education services, it offers a high quality of life with recreational areas and social amenities.



Project Identity

High-Tech Production

1. Technological Infrastructure and Digital Solutions

- ASO Technology Base will offer shared technology infrastructures such as cloud-computing resources, cybersecurity centers, and data-analytics laboratories to support companies in their digital transformation journeys.
- Common digital platforms and Industry 4.0 solutions will be developed to boost integration and efficiency among firms.
- Smart manufacturing technologies, automation systems, and simulation tools will speed up innovation processes.

2. International Collaboration and Investor Support Mechanism

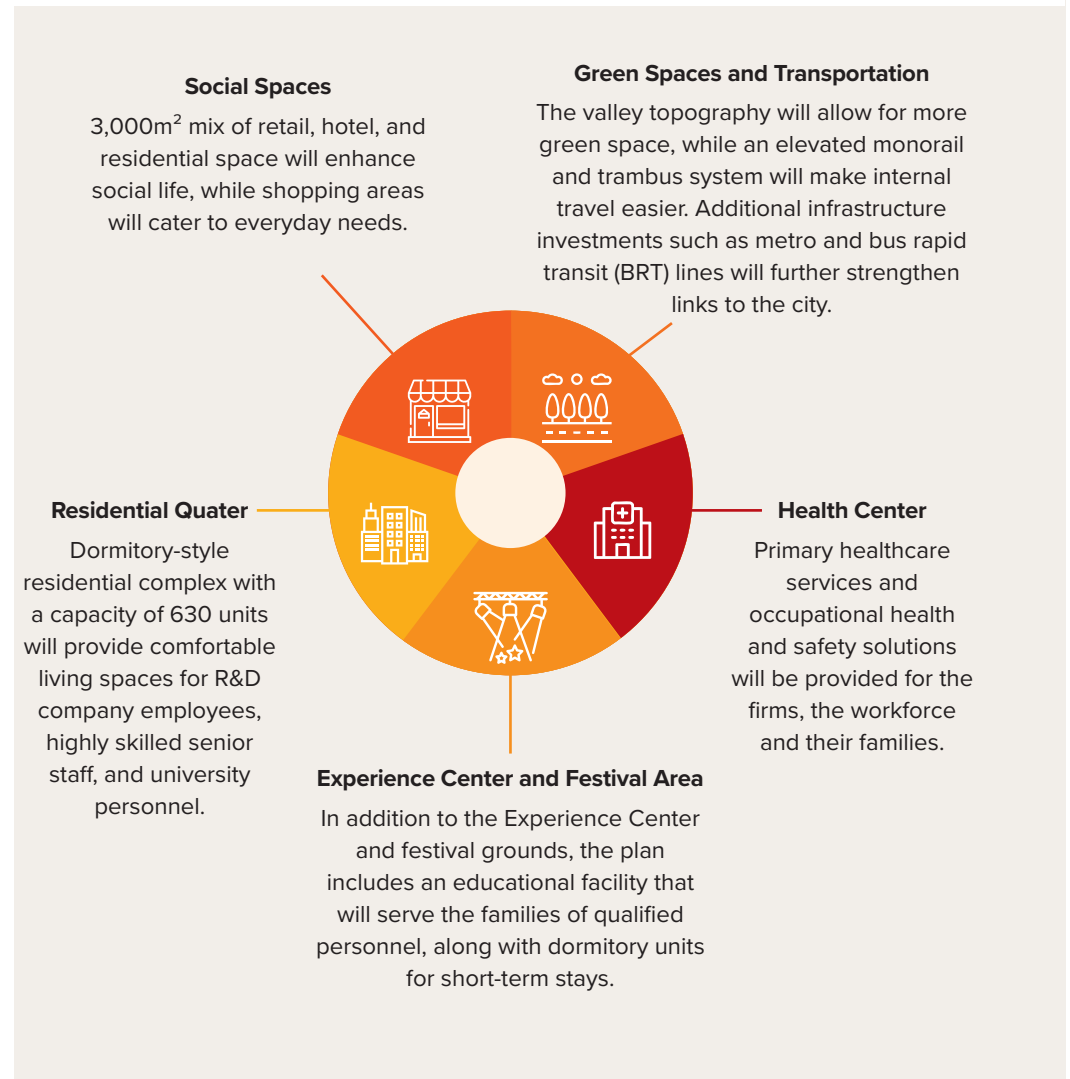
- Custom support packages will be created for foreign investors, making the zone more attractive through dedicated financing and incentives.
- Partnerships with international technology clusters and research networks will be established to enhance the zone's global competitiveness.
- For entrepreneurs and firms in the Base, international trade fairs, demo days, and B2B events will be organized to support their access to global markets.

3. Inclusive and Social Innovation Ecosystem

- Dedicated support programs for women entrepreneurs, young engineers, and start-ups will be launched at the ASO Technology Base
- Social innovation centers integrated into the zone will promote projects that generate public benefit (such as accessibility solutions).
- Shared workspaces, innovation camps, and training programs will be organised for entrepreneurs and employees.

High Quality of Life

ASO Technology Base seeks to draw the creative class by offering a high quality of life. Planned around a neighborhood concept that integrates technological production with social life, the zone highlights generous green areas, smart transport solutions, and ample social amenities:



Green Zone

Renewable Energy Use

Solar panels will supply 28% of the site's annual energy demand. In the longer term, additional capacity will come from off-site solar photovoltaic investments, while the remaining need will be met through clean energy purchases.



Smart and Energy Efficient Buildings

Buildings will meet green-certification standards, using sensors and natural daylight to minimise consumption.



Firm-Selection Criteria

High-emission, high-waste producers will be excluded; low-emission firms will be prioritised.



Eco-Friendly Transport Infrastructure

Carbon-free options, including electric trambuses, an elevated monorail, and ample charging stations will serve the site.



Circular Economy Solutions

An industrial symbiosis network will be promoted across the Temelli Industrial Basin, with the installation of Zero-waste facilities, complete recycling infrastructure, and rain-water harvesting systems.



Green Technologies and R&D

A dedicated green-tech cluster will be created, with incentives to attract firms specializing in sustainable solutions.



Monitoring and Advisory Services

Carbon and water footprints will be tracked, while companies receive guidance and technical support for circular-economy transitions.



Landscaping and Afforestation

200,000 m² of green space will expand local carbon sinks; and the landscaping will be designed in harmony with the climate and the topography of the region.



Technological and sectoral focus: Alignment with local, national, and global priorities

Rather than having a specialization in predetermined sectors, ASO Technology Base will adopt a flexible, mission-driven approach designed to make the Base a catalyst for Türkiye's transition to high technology. The project's overall goal is to help transform Ankara's industry into an R&D and export-oriented, high value-added structure. Accordingly, three key company profiles emerge as priorities for the Base:

- Firms that drive technological breakthroughs in Ankara's strongest industries like electronics, medical devices and products, composites, aerospace, construction machinery, and similar fields.
- Companies, research centers, as well as energy and climate tech firms that support the green transition and decarbonization.
- International firms that align with the Base's mission and principles, whether they already operate in other parts of Türkiye or plan to invest in the country.

Main space-allocation options for firms

The Concept Master Plan has been designed to accommodate the workspace needs of firms locating in the ASO Technology Base, which fall into three main categories:

- Companies who lease modular production units together with office space
- Companies leasing office space only
- Large firms leasing land long term (30-50 years) and building their own facilities

Additional areas will be reserved for uses such as testing centers, research institutes, commercial premises, and accommodation.

Selection Criteria for Companies That Will Be Located in the Ankara Technology Base

Five essential criteria are recommended for assessing the general qualities that firms are expected to possess in order to be admitted to the base:

| Selection criteria | Selection rationale | Alternative criteria |
|--|--|---|
| Average sales value per kilogram | Advanced Manufacturing & High Value Added | <ul style="list-style-type: none"> • Emphasis on R&D, patents, utility models, and other intellectual-property assets • Distinctive features such as advanced materials and embedded software |
| Export share in turnover and exports per employee | Internationalisation and Exports | <ul style="list-style-type: none"> • Clear perspective on global competitiveness • Concrete plan or commitment to raise the export share of sales steadily |
| Human-capital development commitments (through incubators and seminars) | Qualified Employment | <ul style="list-style-type: none"> • In-house R&D department and staff • Having a mission to offer multidisciplinary work methods and good working conditions to employees • Ambition to grow in both the quality and quantity of its workforce |
| Annual Emissions | Net-Zero Target | <ul style="list-style-type: none"> • Environmentally conscious, circular-economy practices, • Limited resource consumption and a declared net zero goal • Generation or use of clean energy |
| Having a multiplier effect | Collaboration with the Ecosystem | <ul style="list-style-type: none"> • Capacity to contribute positively to the ecosystem of the base • Positive externalities for the surrounding economy • Ability to attract its own high-quality supply chain to the base • Strong links with universities and research centres |

Negative List

Alongside producers of high-value-added goods, the ASO Technology Base will host office tenants and research centers. While sectoral diversity is welcome, it is critically important to maintain a “negative list” that specifies the types of companies that will not be admitted. Firms falling under the following pre-defined categories, for example, would be excluded:

- Companies whose product sells for less than US \$25 per kilogram and that have no business plan to raise that figure
- Companies that require large amounts of resources (water, electricity, etc.)
- Companies whose business model rests largely on low-wage labor

Characteristics of Companies to be Located in the ASO Technology Base

The primary requirement for candidate companies to locate in ASO Technology Base is that they engage in high value-added production and are export-oriented. These characteristics determine those firms most suited to the Base, regardless of sector or scale. The Pre-Demand Survey carried out for the project also provides an understanding of the main traits of companies interested in participating.

Types of Companies Expected in the Base

- Firms of varied sectors and sizes
- Manufacturing firms
- R&D firms
- Software companies

Priority Sectors for Manufacturing Firms

- Electronics
- Medical devices
- Testing solutions
- Aerospace
- Energy
- Composit materials
- Automation systems







Prominent Sectors for R&D and Software Firms

- Internet of Things (IoT)
- Software Development
- Automation
- Artificial Intelligence

Firms Showing Strong Interest in Locating at the ASO Technology Base

(According to the pre-demand survey);

82% of the firms surveyed (37/45) are inclined towards being located in the ASO technology Base

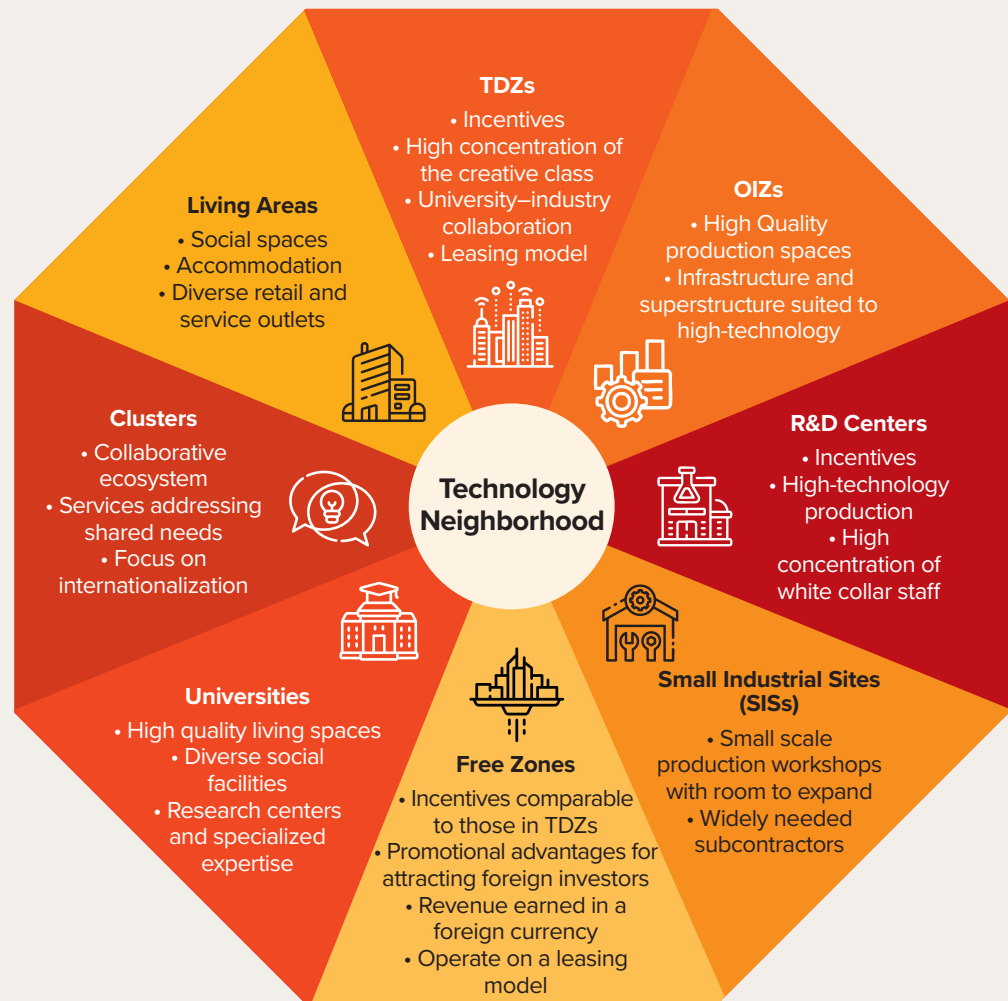
| Average Employee Number  152 | Average Sales Value per Kilogram  167 \$ | Common Production Method  Project Based and Batch Production | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|-----|---------|----|-----|---------|---|-----|-------------|----|-----|--|--------------|----|-----|-------------|---|-----|-------------|---|-----|--------------|---|-----|---------------|---|-----|---|--|----|-----|---|----|-----|-----------------|----|-----|----------------------------|---|-----|------------|---|-----|---------------------|---|-----|
| Distribution by number of Employees <table border="1"> <tr><td>1-49</td><td>20</td><td>55%</td></tr> <tr><td>50-149</td><td>10</td><td>28%</td></tr> <tr><td>150-249</td><td>2</td><td>6%</td></tr> <tr><td>250 & above</td><td>4</td><td>11%</td></tr> </table> | 1-49 | 20 | 55% | 50-149 | 10 | 28% | 150-249 | 2 | 6% | 250 & above | 4 | 11% | Distribution by sales value per kilogram (USD) <table border="1"> <tr><td>1-10</td><td>6</td><td>27%</td></tr> <tr><td>11-50</td><td>6</td><td>27%</td></tr> <tr><td>51-200</td><td>5</td><td>23%</td></tr> <tr><td>201-500</td><td>1</td><td>5%</td></tr> <tr><td>500 & above</td><td>4</td><td>18%</td></tr> </table> | 1-10 | 6 | 27% | 11-50 | 6 | 27% | 51-200 | 5 | 23% | 201-500 | 1 | 5% | 500 & above | 4 | 18% | Project-Based and Batch Production* <table border="1"> <tr> <td>Project-based production (Customised and one off production)</td> <td>26</td> <td>70%</td> </tr> <tr> <td>Batch Production (small-batch orders for a variety of products)</td> <td>16</td> <td>43%</td> </tr> <tr> <td>Mass Production</td> <td>10</td> <td>27%</td> </tr> </table> <p>*A company may select more than one type of production</p> | Project-based production (Customised and one off production) | 26 | 70% | Batch Production (small-batch orders for a variety of products) | 16 | 43% | Mass Production | 10 | 27% | | | | | | | | | |
| 1-49 | 20 | 55% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50-149 | 10 | 28% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 150-249 | 2 | 6% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 250 & above | 4 | 11% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1-10 | 6 | 27% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11-50 | 6 | 27% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51-200 | 5 | 23% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 201-500 | 1 | 5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 500 & above | 4 | 18% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Project-based production (Customised and one off production) | 26 | 70% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Batch Production (small-batch orders for a variety of products) | 16 | 43% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mass Production | 10 | 27% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Average R&D Personnel Ratio  37% | Average Facility Size  4.100 m² | Location of Companies  Temelli and OSTİM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Distribution by R&D Personnel Ratio <table border="1"> <tr><td>0%-10%</td><td>10</td><td>28%</td></tr> <tr><td>11%-29%</td><td>9</td><td>25%</td></tr> <tr><td>30%-49%</td><td>4</td><td>11%</td></tr> <tr><td>50% & above</td><td>13</td><td>36%</td></tr> </table> | 0%-10% | 10 | 28% | 11%-29% | 9 | 25% | 30%-49% | 4 | 11% | 50% & above | 13 | 36% | Distribution by production-facility size (m²) <table border="1"> <tr><td>1000 & under</td><td>10</td><td>32%</td></tr> <tr><td>1000 - 3000</td><td>7</td><td>23%</td></tr> <tr><td>3000 - 6000</td><td>4</td><td>13%</td></tr> <tr><td>6000 - 10000</td><td>4</td><td>13%</td></tr> <tr><td>10000 & above</td><td>6</td><td>19%</td></tr> </table> | 1000 & under | 10 | 32% | 1000 - 3000 | 7 | 23% | 3000 - 6000 | 4 | 13% | 6000 - 10000 | 4 | 13% | 10000 & above | 6 | 19% | Location of Companies <table border="1"> <tr><td>OIZs in Temelli</td><td>8</td><td>22%</td></tr> <tr><td>OSTİM Teknopark & Teknopark Ankara</td><td>7</td><td>19%</td></tr> <tr><td>OSTİM</td><td>5</td><td>14%</td></tr> <tr><td>ODTÜ Teknokent & Cyberpark</td><td>4</td><td>11%</td></tr> <tr><td>ASO 1. OSB</td><td>5</td><td>14%</td></tr> <tr><td>Other (Outside OIZ)</td><td>8</td><td>22%</td></tr> </table> | OIZs in Temelli | 8 | 22% | OSTİM Teknopark & Teknopark Ankara | 7 | 19% | OSTİM | 5 | 14% | ODTÜ Teknokent & Cyberpark | 4 | 11% | ASO 1. OSB | 5 | 14% | Other (Outside OIZ) | 8 | 22% |
| 0%-10% | 10 | 28% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11%-29% | 9 | 25% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30%-49% | 4 | 11% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50% & above | 13 | 36% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1000 & under | 10 | 32% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1000 - 3000 | 7 | 23% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3000 - 6000 | 4 | 13% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6000 - 10000 | 4 | 13% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10000 & above | 6 | 19% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OIZs in Temelli | 8 | 22% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OSTİM Teknopark & Teknopark Ankara | 7 | 19% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OSTİM | 5 | 14% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ODTÜ Teknokent & Cyberpark | 4 | 11% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ASO 1. OSB | 5 | 14% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other (Outside OIZ) | 8 | 22% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

The tables are based on 37 firms that expressed a willingness to locate in the ASO Technology Base; however, because some respondents skipped certain items, the number of observations varies across questions.

Demand

- The ASO Technology Base has been tailored to meet the R&D based, advanced manufacturing needs of industrial firms.
- According to the survey, 82% of respondents find it attractive to locate here.
- Demand of Firms Showing Strong Interest in Locating at the Base is highest for flexible production and office spaces, innovative mobility solutions, and social amenities. However, the current ecosystem lacks sufficient commercial facilities to meet these needs.
- While existing social amenities are somewhat better for firms, they still fall short of company expectations.
- As the workforce grows, so will demand for commercial and social spaces; the Technology Base is designed to meet these needs with cafés, restaurants, and leisure facilities.
- By relocating their R&D centers to the Base, firms will benefit from high-quality infrastructure that speeds up processes, strengthens collaboration, and fosters competitive solutions.

A Multifunctional TDZ: Key Functions of the Different Interfaces

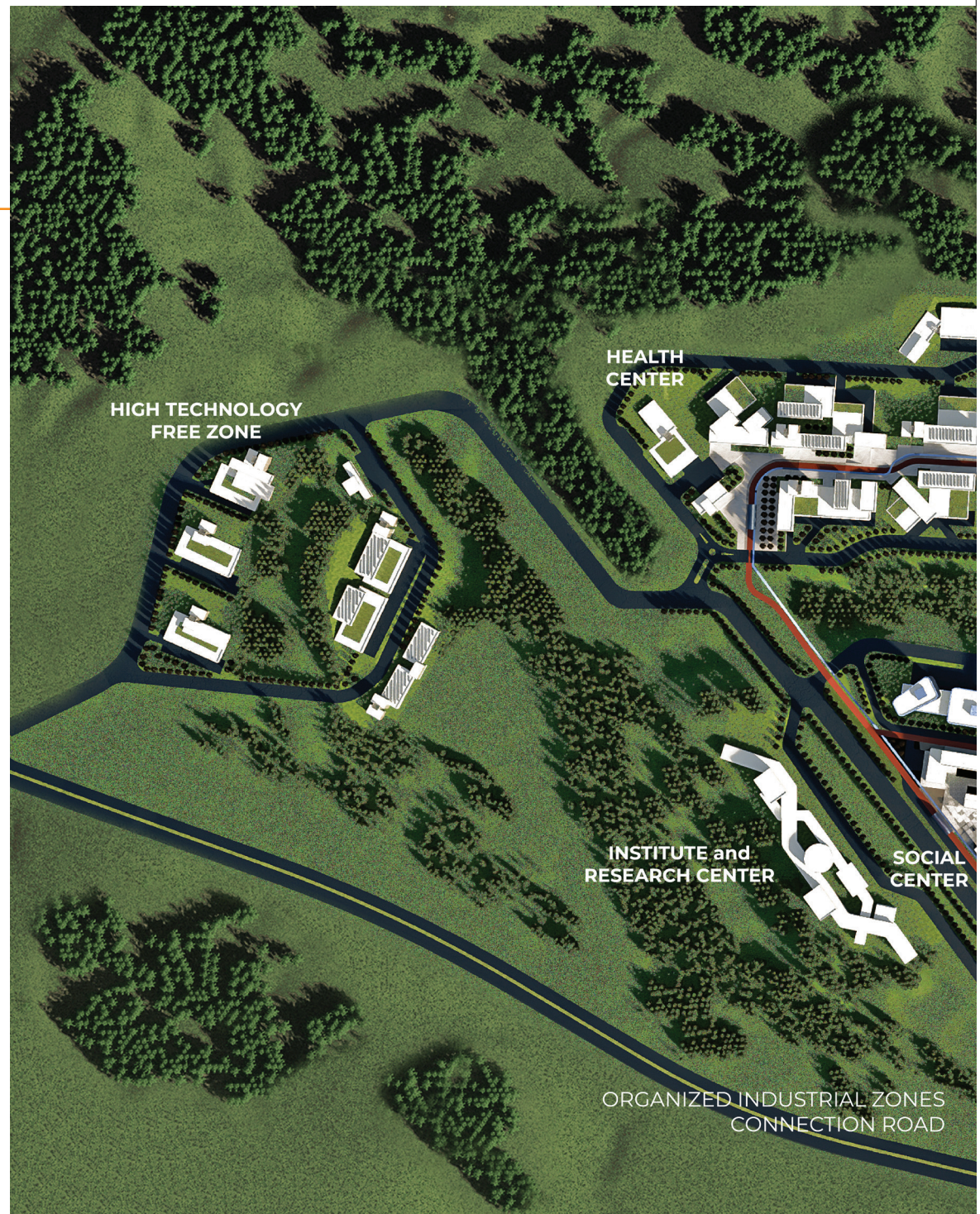


2.2. Spatial Approach

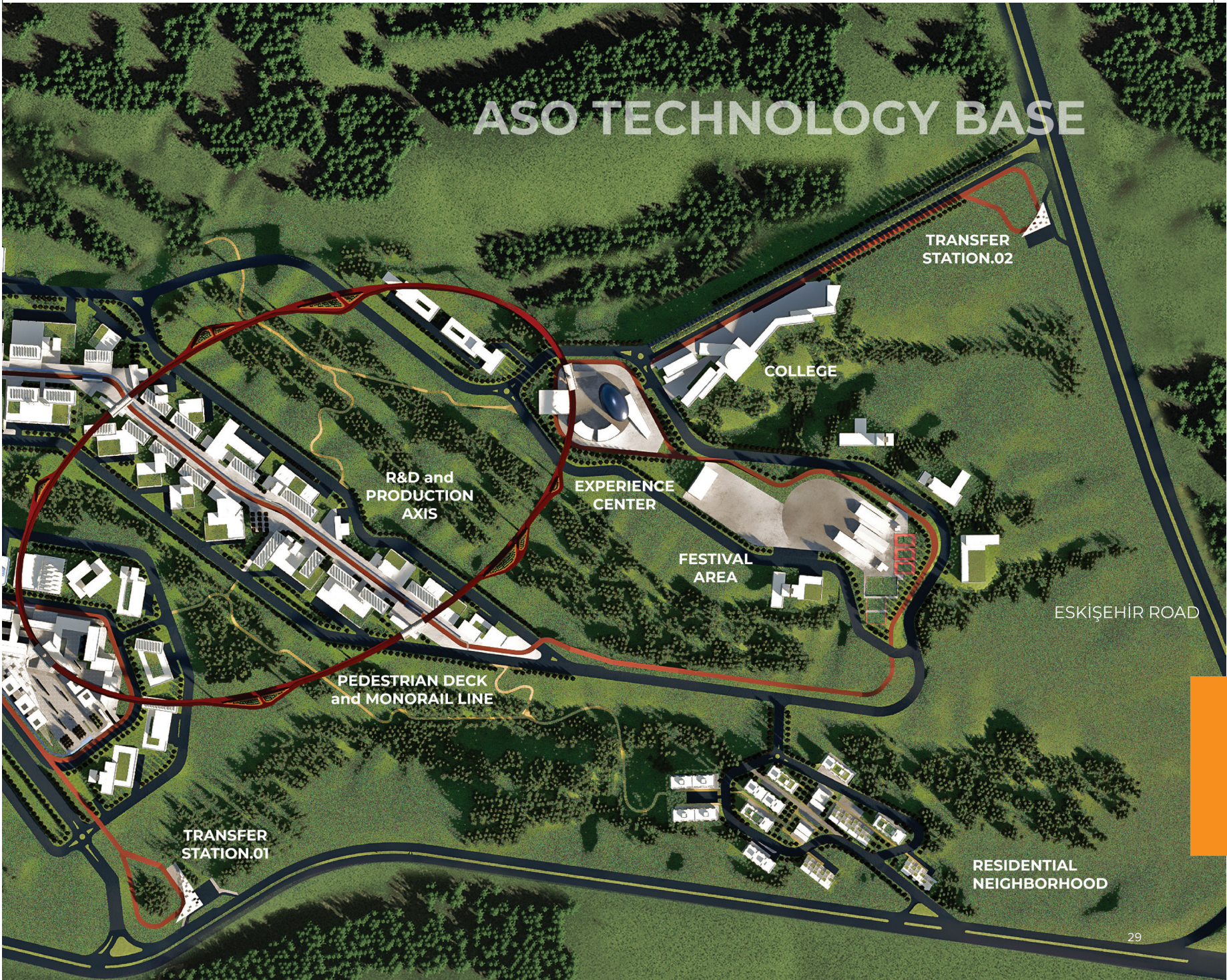
The ASO Technology Base Concept Master Plan is designed to build on the combined experiences of OIZ and TDZ models to carry them into a more advanced phase. The plan aims to define the unique character of the base by framing spatial diversity within a typological framework and aspires to be recognized among contemporary design examples.

With its integrated layout and innovative design, the Base supports R&D and manufacturing activities and presents a spatial vision that harmonizes with the natural environment. The base creates a distinctive spatial structure, a cohesive, polycentric, mixed-use perimeter settlement, supported by trambus and monorail public-transport systems. Drawing inspiration from nature, green spaces are arranged in a dividing “wing” pattern formed by valleys and ridges, ensuring the integration of urbanized and natural areas.

A site-sensitive design approach adopted, with the footprint aligned with topographical and contextual data. The result is an interwoven pattern that merges natural features with urban development. Limited developable land calls for a dense, compact layout; setback distances have therefore been minimized and high-density segments created. Vertical building forms add diversity to the visual character of the urban landscape.



ASO TECHNOLOGY BASE



TRANSFER STATION.02

COLLEGE

R&D and PRODUCTION AXIS

EXPERIENCE CENTER

FESTIVAL AREA

ESKİŞEHİR ROAD

PEDESTRIAN DECK and MONORAIL LINE

TRANSFER STATION.01

RESIDENTIAL NEIGHBORHOOD

LEGEND

□ Project Area Border

LAND USES

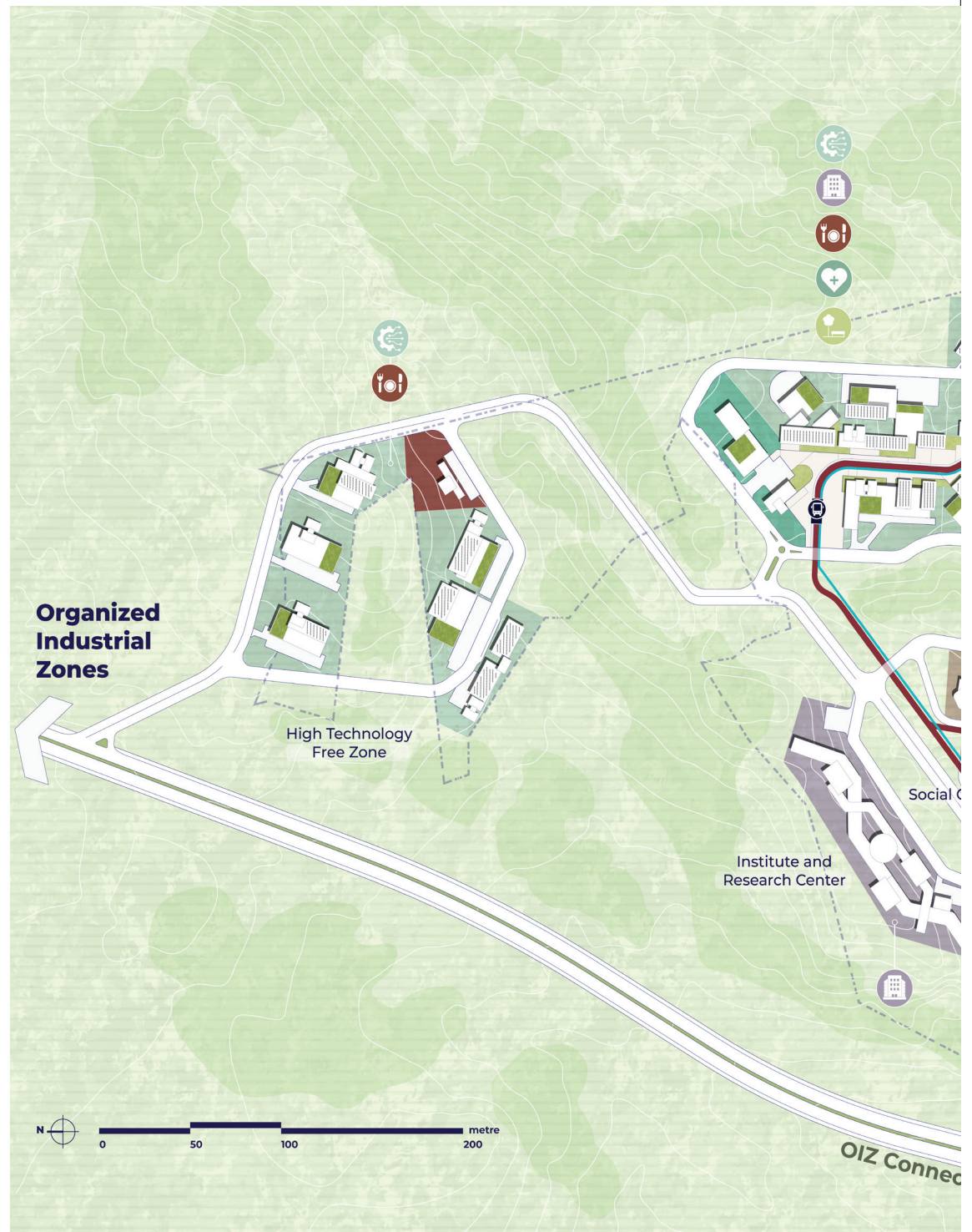
- R&D / Production
- R&D
- Education and Research
- Commerce, Accommodation and Housing
- Cafe and Restaurant
- Culture and Recreation
- Health
- Housing

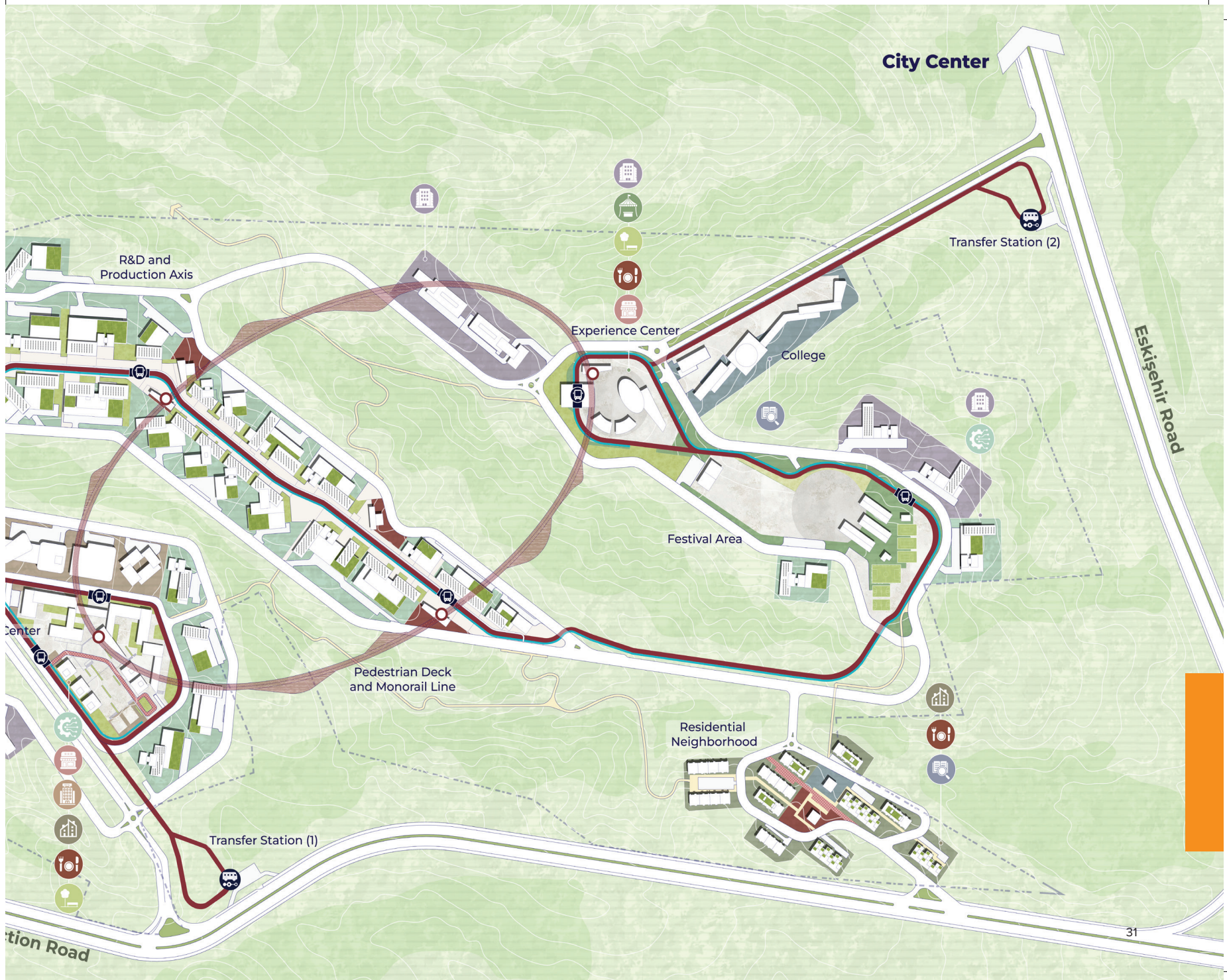
TRANSPORT and CONNECTIVITY

- Intercity Main Artery
- Urban Connection Road
- Primary Collector Road
- Secondary Collector Road
- Access Road
- Shared Space
- Main Pedestrian and Public Transport Axis
- Pedestrian Path
- Bicycle/Scooter Path
- Monorail Line
- TramBus Line
- Ⓜ Monorail Station
- Ⓜ Transfer Station

OPEN SPACES

- Green Area
- Hard Surface
- Green Roof
- Sports Field





2.3. Main Building Units and Functions

ASO Technology Base will be delivered in three stages. Sited on a 1.2 million m² plot, the Base will occupy a 193 thousand m² construction footprint and provide around 440 thousand m² of usable floor space. Detailed construction units of the project and their functions are summarized in this section.

Production and Office Areas

Upon completion of the project, 263 thousand m² of the Base's total 440 thousand m² of usable space will be allocated to production floors and offices. These spaces are purpose-built to support the growth of local industrial companies and start-ups. Designed with flexibility in mind, their modular units can be expanded horizontally or vertically to meet tenants' needs. Production and office blocks of different sizes can be combined or divided as necessary.

Once the facilities reach full capacity, they are projected to generate roughly 18 thousand jobs. The completion of production and office spaces in all stages is expected to require a capital investment of approximately US \$127.5 million.

Figure 7: Stages of Project Implementation – I



Table 2: ASO Technology Base - Usable Area Breakdown

| Structure type | Usable Area (m ²) | Percent |
|-------------------------------|-------------------------------|-------------|
| Manufacturing | 103,295 | 23% |
| Office/R&D | 159,822 | 36% |
| Institute and Research Center | 39,816 | 9% |
| Housing | 50,400 | 11% |
| Hotel | 19,025 | 4% |
| Educational Institutions | 16,181 | 4% |
| Cultural/Event Area | 13,502 | 3% |
| Retail | 12,526 | 3% |
| Cafe/Restaurant | 7,356 | 2% |
| Dormitory | 7,154 | 2% |
| Health | 6,946 | 2% |
| Administrative | 3,500 | 1% |
| Total | 439,523 | 100% |

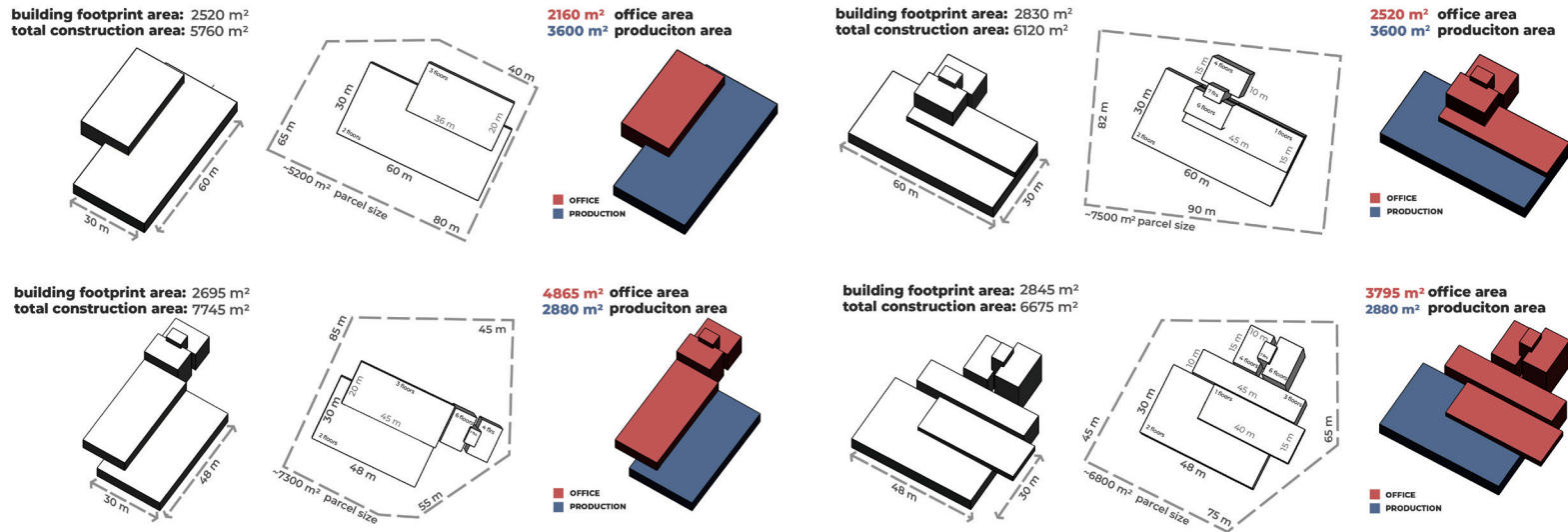
The construction of the first stage of the project is expected to begin in 2026, and if all investments continue uninterrupted, it is predicted to be completed in 2033. The construction period for each sub-stage is determined as three years.



Figure 8: Prototype Specifications for R&D/Production Building Concepts – I



Figure 9: Prototype Specifications for R&D/Production Building Concepts – II

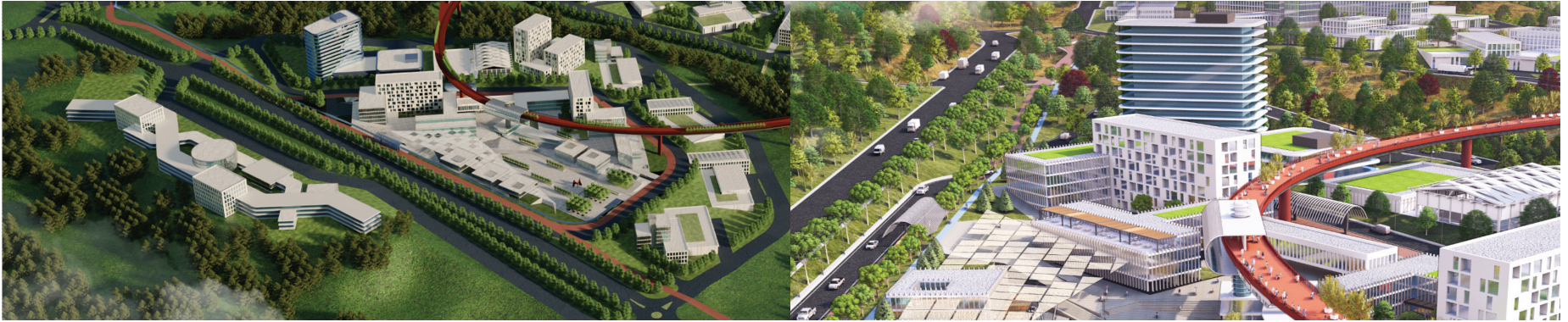


Institute and Research Center

Designed to ensure strong integration with universities, this facility will comprise 40,000 m² of total indoor area. It will feature classrooms, testing centers, research laboratories, clean rooms, dedicated institutes, and incubator spaces.

Hotels

Two hotels with a combined 19,025 m² of floor space are planned to meet accommodation demand from the Base and surrounding industrial zones. One will operate as a luxury five star hotel; the other as a three-star mid-range option.



Residential Areas

Housing designed to meet the needs of employees will be provided on two sites totaling 50,400 m² and offering around 630 individual units. The goal of these buildings is to serve the employees of companies in the area and function as high-quality staff accommodation.

Festival and Event Area

Covering 13,502 m², this cultural and event area will host everything from industry gatherings and student camps (summer, space, technology) to tech festivals and concerts. Its location is intended to draw visitors from across Ankara and the wider country.



Dormitory

Planned to be built adjacent to the educational facility, the dormitory will provide 7,154 m² of housing for interns and vocational-training students. It will also accommodate participants in summer camps and other events.



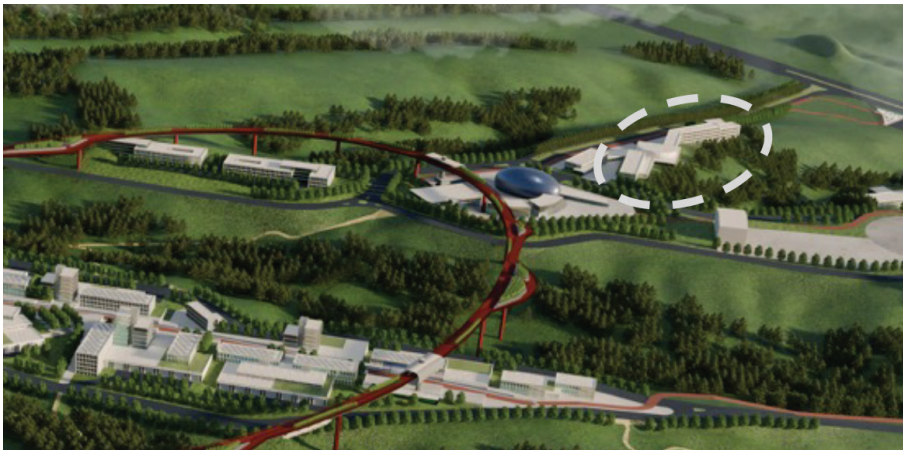
Commercial Buildings & Café/Restaurant

The area will include a shopping center of about 10,000 m² along with commercial services, primarily cafés and restaurants. Located near the office and production areas, these facilities will cover a total of 20,000 m².



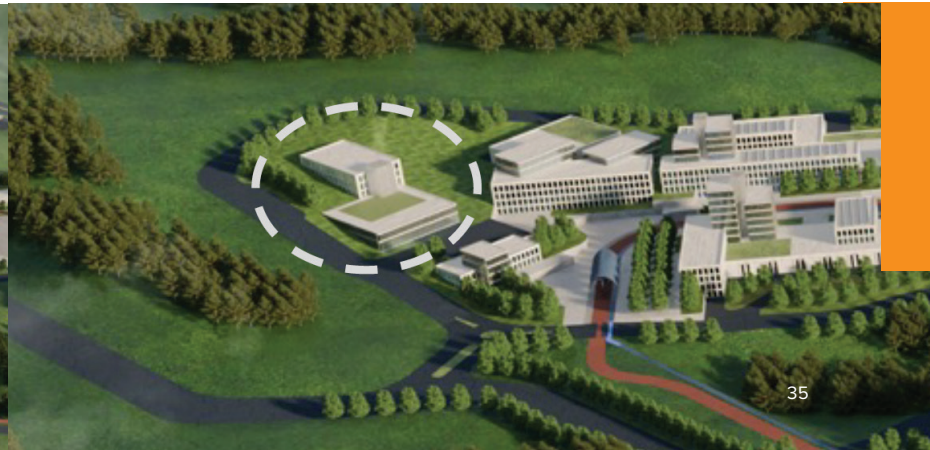
International Education Institute

The educational institution, equipped with international diploma programs (such as IB, AP, etc.), is designed to serve the children of the creative class professionals that are aimed to be attracted to the area. The school, with 16,181 m² of indoor floor space, will serve the wider Temelli Industrial Basin.



Health Center

A primary-care center covering 6,946 m² is planned. Beyond meeting work related health and safety needs, it will provide high-standard basic healthcare services.



2.4. Anticipated Impact of ASO Technology Base

Social Impacts:

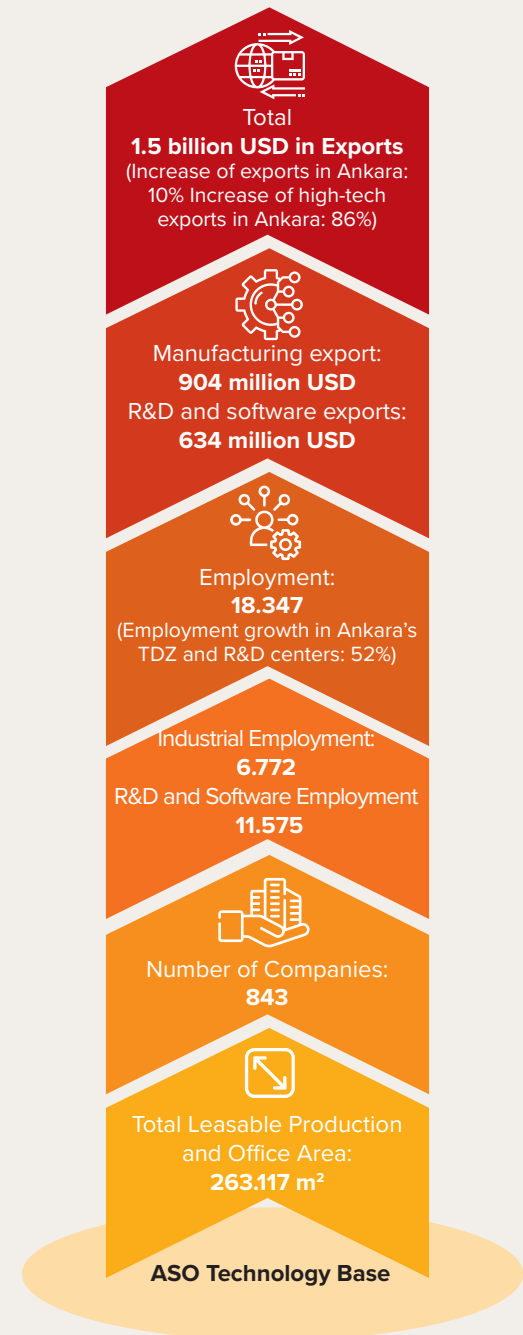
- By attracting highly qualified workforce, the “creative class”, the project will spur positive socio-economic change in Ankara.
- Quality of life amenities, modern housing, and services such as top-tier education and healthcare will make the area a magnet for immigration and strengthen the city’s appeal.
- The area, with its high living standards, will attract R&D personnel and other specialists, creating value not only for industry but also in terms of social well-being.

Environmental and Spatial Impacts:

- The project is planned around sustainable urban growth strategies.
- Its strategic location on the Eskişehir Highway corridor will align seamlessly with Ankara’s main urban growth axis.
- Modern infrastructures and eco-friendly designs will allow industrial and residential zones to expand together in a fashion that will minimize environmental impacts.
- Moreover, by emerging as a new center of attraction on Ankara’s spatial development map, the project area will add momentum to the urban transformation of the Temelli Industrial Basin and its surroundings.

Economic Impacts:

- By clustering high value added sectors and firms, ASO Technology Base will make a significant contribution to the regional and national economy.
- If the targeted export volume and employment figures are reached, employment in Ankara’s TDZs and R&D centers could increase by 52% based on 2024 projections, while Ankara’s exports could rise by 10% compared to the 2024 volume.
- More than 800 firms, including about 130 manufacturers, will operate on site, generating jobs for 18,000 people.
- Exporting high-tech products will boost Ankara’s international competitiveness and turn the area into a hub for technology-based start-ups.
- The presentation of shared R&D and business platforms will encourage cross-border collaboration and make it easier for companies to enter new markets.





Implementation

3.1. Design Principles and Implementation Stages

Plan Components

With its authentic approach and its defining principles, the master plan aims first and foremost to create spatial conditions that ensure ecological and social sustainability. The ASO Technology Base is conceived as an integrated ecosystem where innovative solutions are developed, R&D is carried out, and education and production coexist. It is designed to work in harmony with nature, use resources efficiently, minimize its carbon footprint, and prioritize social inclusion. With that purpose, the plan incorporates spatial design solutions that directly advance several UN Sustainable Development Goals, in particular:



Quality Education

Ensuring inclusive and equitable quality education and promote lifelong learning opportunities for all



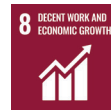
Gender Equality

Safe, inclusive public areas that address the needs of all gender groups.



Affordable and Clean Energy

Solar panels on buildings to generate renewable power.



Decent Work and Economic Growth

Workplaces that create high quality jobs and foster sustainable economic activity.



Industry, Innovation and Infrastructure

Sustainable industrial zones equipped with resilient infrastructure and cutting-edge technology.



Sustainable Cities and Communities

Inclusive, safe, resilient and eco-friendly living areas that promote sustainable urbanisation

Design Principles

Guided by the UN Sustainable Development Goals, the master-plan approach is concretized in five core design principles. Together they create a holistic framework that minimises the campus's ecological footprint while maximizing user experience and spatial quality.

Construction in harmony with nature

- Minimal intervention in the site's natural topography
- Leveraging natural terrain to enhance spatial quality (viewpoints, slope-hugging buildings, monorail alignment)
- Visually and physically sustainable infrastructure design

Proximity and Interaction

- Terraces, pedestrian decks and plazas that encourage interaction between different social and professional groups
- Integrated layout of production, research and living areas
- Spaces that spark innovative and fruitful encounters

Mixed-use Spaces

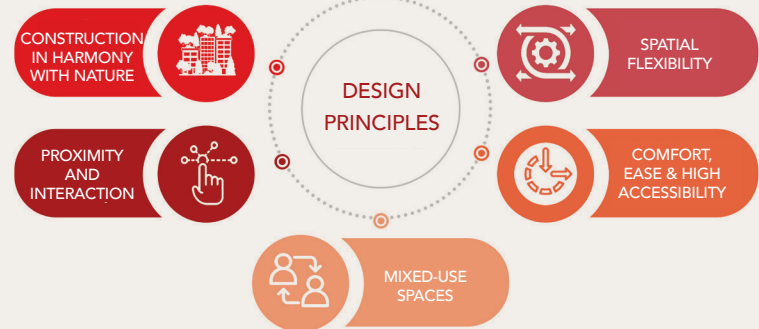
- Blended zones for production, R&D, housing, education, culture and health
- Horizontal and vertical integration of functions
- Venues offering modern, multi-purpose activity options instead of having a sole purpose

Spatial Flexibility

- Modular buildings and adaptable layouts that can be repurposed for different events
- R&D / production complexes sized to suit firms of varying scales and needs
- Spaces that are able to be reconstructed with minimal intervention

Comfortable, Easy and High Accessibility

- Walkable, accessible areas that keep car traffic to a minimum
- An urban-space model that combines mobility and recreation
- Alternative links to the city plus innovative transport solutions such as monorail, trambus and e-scooter networks



Implementation Stages

It is an undeniable fact, in terms of investment risks, that a 124-hectare area cannot be developed in a single stage. In this context, structuring the development process of the site within mutually supportive phases constitutes the core planning strategy. The irregular, dynamic and formation of the project site, along with the fragmented structure of the buildable sub-parcels, is a key factor shaping the phasing strategy.

The planning and design team therefore divides the project into three main stages, each broken down into sub-stages with its own set of priorities.

The assessment of the project's implementation stages takes into account the ongoing design efforts, estimated timelines for tendering and construction, and the planned social infrastructure. Accordingly, the development process is envisioned as a coordinated, three-stage plan spanning eight years from 2026 onward.

Figure 10: Projected Stages of the Construction Schedule

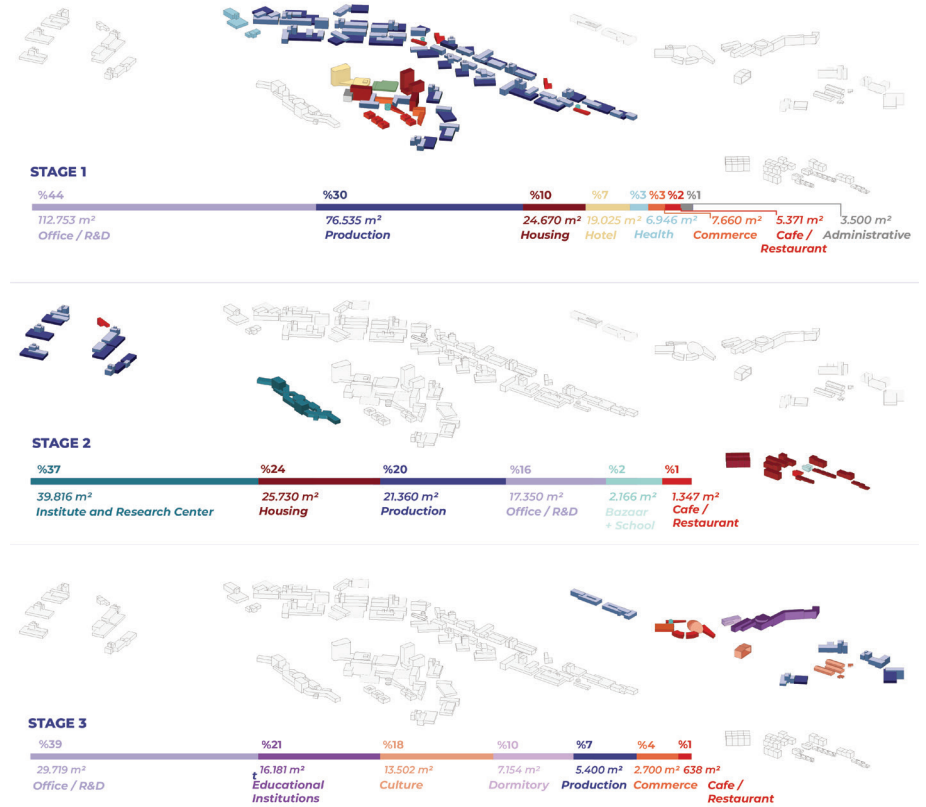
| | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|-----------|------|------|------|------|------|------|------|------|
| Stage 1-A | ■ | ■ | ■ | | | | | |
| Stage 1-B | | ■ | ■ | ■ | | | | |
| Stage 2-A | | | ■ | ■ | ■ | | | |
| Stage 2-B | | | | ■ | ■ | ■ | ■ | |
| Stage 3 | | | | | ■ | ■ | ■ | ■ |

Stage 1

The first stage is expected to be completed within a maximum of four years from when construction begins. The first sub-stage (1-A) focuses on the site's "heart," the central district. Here, social, commercial, office, hotel, and residential functions are laid out in mutually reinforcing sequences that will unfold in accordance with the project's initial investments.

To keep the scheme manageable and fully implementable, the R&D and production zones along the central spine will be delivered in the first two sub-stages. As Stage 1 becomes operational, the base's first tram bus ring service will also begin operating.

Figure 11: Stages of Project Implementation - II

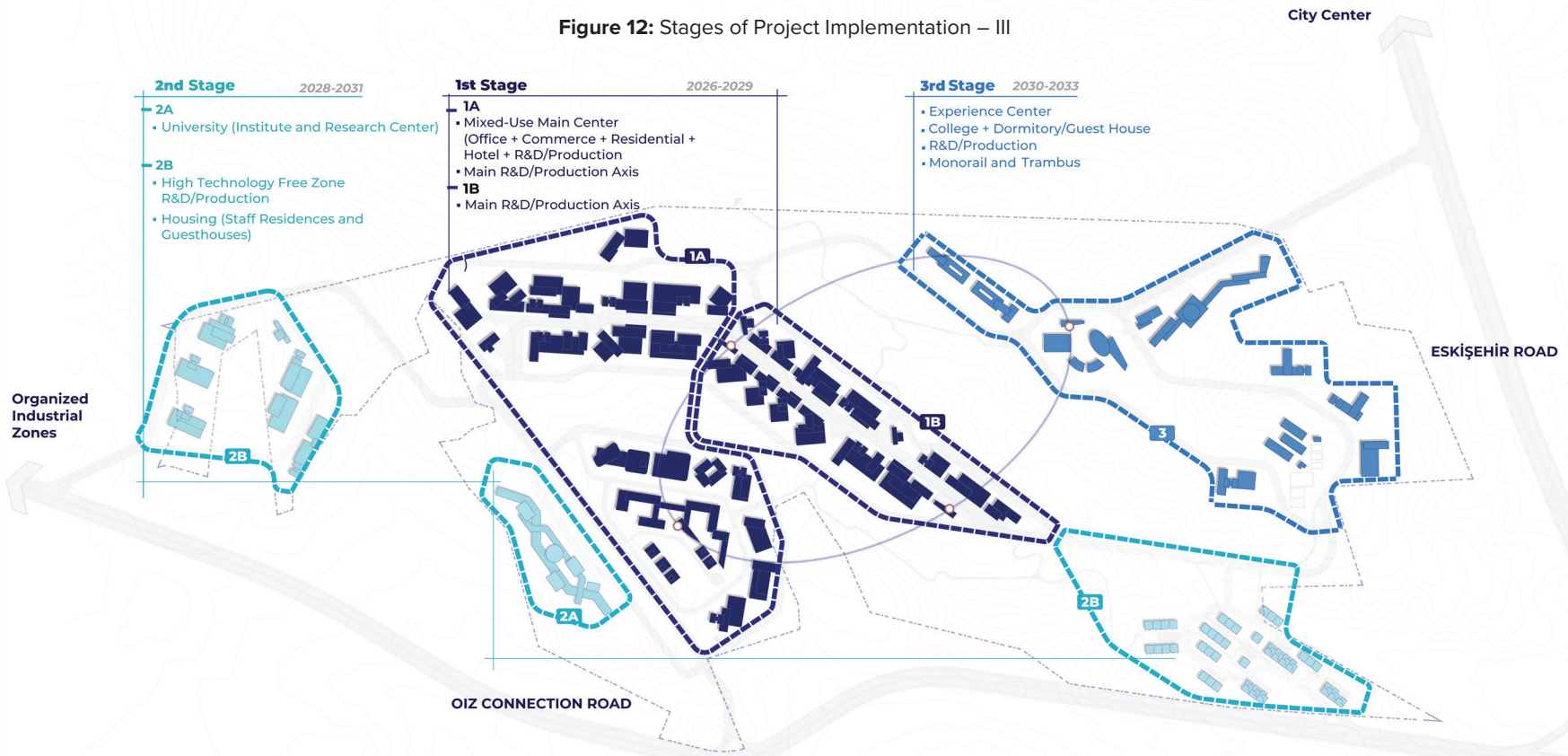


Stage 2

The first sub-stage (Stage 2-A) of the second stage is the Institute and Research Center that will also house a university-dedicated model factory and incubator hub. Its other core element is a residential cluster of staff accommodation and permanent housing (Stage 2-B). In addition to the rental apartments planned in the mixed-use core, a lodging quarter in the south-west will attract researchers, academics, and on-site engineers by providing a support amenity that helps sustain the first-stage investment.

This sub-stage also plans to integrate a six-parcel free economic zone with R&D/production block, located off the central spine because of topographic obstacles, into the development. A shuttle service will connect this area to the main district and the residential areas, ensuring full integration with the base.

Figure 12: Stages of Project Implementation – III



Stage 3

The third stage of the project aims to integrate the “Science and Technology Experience Center” into the site, with the goal of opening the Technology Base to the public and generating public value. This area will include the Experience Center building, an open-air performance space, experience tents, and sports fields. It will be supported by an education and dormitory area located to the east of the site. Thus, the area will be made attractive for young people, thereby making the financial return on investment largely attainable. In addition, the connection between sub-areas will be provided by the trambus line.

The third stage will also include the development of R&D/production facility parcels, marking the point at which the Technology Base is expected to reach its full research and manufacturing capacity.

With the implementation of the third stage, the three ridges on which the project area is situated will be connected by an elliptical monorail route, ensuring spatial continuity between the different areas of the base. This investment is expected to become the symbolic element of the ASO Technology Base, contributing to its final branding process.

Accordingly, the initial stage of the project prioritizes the development of central functional areas (office and commercial spaces) and the R&D and production parcels located in the core area. Once the central area is established, residential capacity will be expanded in parallel with the development of new R&D and production areas. Finally, the integration of the Experience Center, the addition of educational institutions and dormitories will define the site’s active transport need.

Table 3: Building Footprint Distribution of Program Areas

| Use of Space | Area Size (m ²) | Percentage of Total Area (%) |
|--------------------------|-----------------------------|------------------------------|
| Production | 49,248 | 27 |
| Office/R&D | 49,329 | 27 |
| Trade | 3,027 | 2 |
| Cafe/Restaurant | 6,012 | 3 |
| Culture | 2,889 | 2 |
| Hotel | 3,761 | 2 |
| Health | 2,650 | 1 |
| Institute and Research | 9,568 | 5 |
| Educational Institutions | 3,100 | 2 |
| Dormitory | 2,096 | 1 |
| Administrative | 700 | 0 |
| Housing | 8,180 | 4 |
| Indoor Recreation Area | 210 | 2 |
| Outdoor Recreation Area | 2,350 | 1 |
| Public Open Space | 38,580 | 21 |
| Total | 192,814 | 100 |

Table 4: Distribution of Program Areas in the ASO Technology Base

| Use of Space | Total Construction Area (m ²) | Percentage of Total Area (%) |
|-------------------------------|---|------------------------------|
| Production | 103,295 | 23 |
| Office/ R&D | 159,822 | 36 |
| Trade | 12,526 | 2 |
| Cafe/Restaurant | 7,356 | 2 |
| Culture | 19,025 | 4 |
| Hotel | 6,946 | 2 |
| Health | 3,500 | ~1 |
| Administrative | 50,400 | 12 |
| Housing | 39,816 | 9 |
| Institute and Research Center | 13,502 | 3 |
| Educational Institutions | 16,181 | 4 |
| Dormitory | 7,154 | 2 |
| Indoor Recreation Area* | 1,032* | - |
| Outdoor Recreation* | 2,350* | - |
| Total | 439,523 | |

Table 5: Usable Area Shares under the Concept Master Plan (%)

| Usable Space, m ² | Stage 1-A | Stage 1-B | Total for Stage 1 | Stage 2-A | Stage 2-B | Total for Stage 2 | Stage 3 | Total |
|------------------------------|------------------|---------------|-------------------|------------------|---------------|-------------------|---------------|----------------|
| Production Space | 45,715 | 30,820 | 76,535 | | 21,360 | 21,360 | 5,400 | 103,295 |
| Office/R&D | 61,139 | 51,614 | 112,753 | | 17,350 | 17,350 | 29,719 | 159,822 |
| Research Institute | | | | 39,816 | | 39,816 | | 39,816 |
| Housing | 24,670 | | 24,670 | | 25,730 | 25,730 | | 50,400 |
| Hotel | 19,025 | | 19,025 | | | | | 19,025 |
| Educational Institutions | | | | | | | 16,181 | 16,181 |
| Culture/Event Area | | | | | | | 13,502 | 13,502 |
| Trade Center | 3,040 | 4,620 | 7,660 | | 2,166 | 2,166 | 2,700 | 12,526 |
| Cafe/Restaurant | 5,371 | | 5,371 | | 1,347 | 1,347 | 638 | 7,356 |
| Dormitory | | | | | | | 7,154 | 7,154 |
| Health | 6,946 | | 6,946 | | | | | 6,946 |
| Administrative | 3,500 | | 3,500 | | | | | 3,500 |
| Free Zone* | | | | | 40,876 | 40,876 | | 40,876* |
| Parking* | 10,775 | 18,675 | 29,450 | 8,325 | 28,100 | 36,425 | 20,525 | 86,400* |
| Rooftop & Façade PV* | 19,884 | 19,257 | 39,141 | 7,630 | 7,539 | 15,169 | 8,551 | 62,821* |
| Indoor Recreation Area* | 320 | | | | | | 712 | 1,032* |
| Outdoor Recreation Area* | | | | | | | 2,350 | 2,350* |
| Total | 169,406 | 87,054 | 256,460 | 39,816 | 67,953 | 107,769 | 75,294 | 439,523 |
| | 2026-2029 | | | 2028-2031 | | 2030-2033 | | |

*Parking areas, solar power systems (SPPs), the free zone, and open/closed recreational areas are not included in the total leasable area (439,523 m²) and have been calculated separately. Within the free zone, there are 21,360 m² of production space, 17,350 m² of office space, and 2,166 m² of commercial space.



System Framework

Main Axis, Focal Points, and Character Areas

The plan is spatially organized through a system composed of primary structural axes, focal points, and character areas. Within this system, the axes and focal points establish the structural framework of the region.

In line with the site's topographic conditions, the diversity of the spatial fabric generates its own intrinsic character, creating not only spatial differentiation but also perceptual richness, thereby diversifying user experience. In this context, four distinct character areas emerge, each contributing to the overall pattern of building footprints and density surfaces defined by programmatic units.

Parcel-Based Functional Distribution

As stated in the design principles, the principle of multiple program options emerges as a key factor generating a building stock and development pattern characterized by functional diversity. This condition manifests itself in various forms at both the building and parcel levels.

Accordingly, in terms of parcel-based functional differentiation, mixed-use parcels have been designated within the focal areas defined as the main center and experience center, while R&D/production activities are positioned around them.

At this point, it should be noted that the average parcel size plays a significant role in enabling programmatic diversity. Particular attention has been paid to configuring the parcel sizes designated for R&D/production complexes in a way that supports such functional variety.

Structure-Based Program Pattern

Land use represented at the building scale functionally characterizes the texture with higher resolution. In this context, multi-functional buildings are primarily defined as R&D/production facilities and building complexes located in the central area.

Similarly, university research institutes and incubation centers, coded as a type of composite megaform, are considered multi-functional building complexes. The predominance of such structures enables a pattern of functionally mixed-use across the overall urban fabric.

Figure 13: Plan System Framework Based on Main Axes and Focal Points

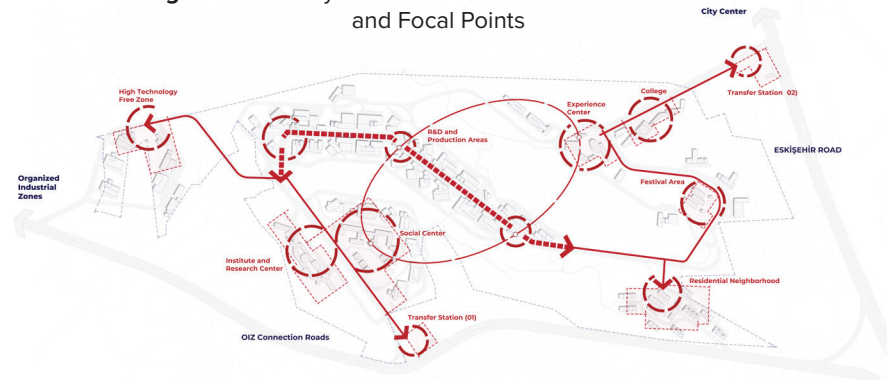
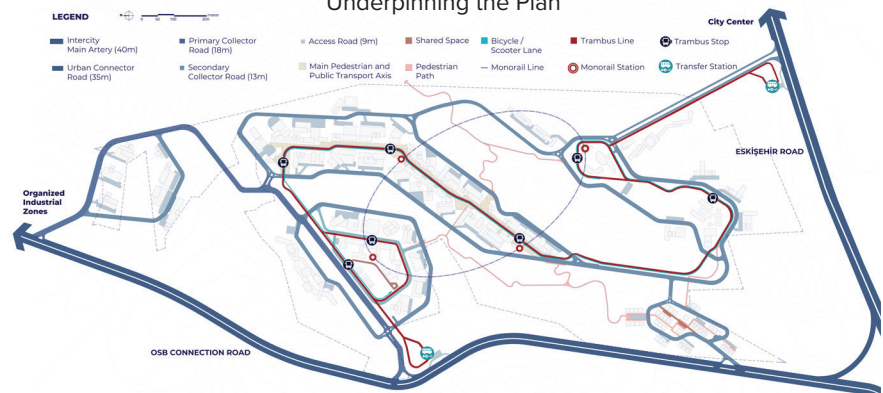


Figure 14: Parcel-Based Distribution of Functions Served by the Spatial Units Within the Area



Figure 15: Transportation and Accessibility Network System Underpinning the Plan



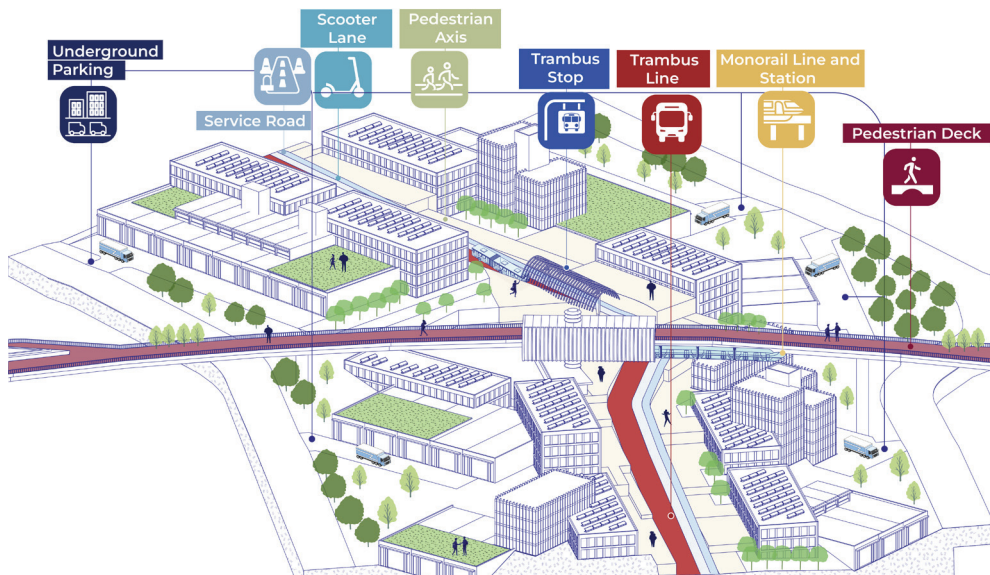
Transportation Accessibility Network

The transportation network of the project area has been designed to align with the topographic structure and to integrate the fragmented plan layout revealed through spatial texture analysis. A dynamic road geometry was adopted to minimize land transformation, prevent continuous high-speed traffic, and reduce excavation work.

The area is connected to the OIZs to the north and nearby residential neighborhoods via an 18 meter wide arterial road. The internal circulation is composed of 14 meter wide collector roads and low speed, shared residential streets. The primary spine functions as a tree lined boulevard accommodating pedestrian circulation and a trambus line. The collector roads are specialized routes designed for freight and passenger traffic, providing access to underground parking and production spaces located at lower levels. At the lowest hierarchy, the shared streets and residential lanes serve as pedestrian and vehicle routes where the speed limit is kept very low. The main spine feeding this system has been designed as a tree-lined boulevard (allée) that accommodates both pedestrian movement and the trambus line.

The element that structurally integrates the road network is the elliptical monorail route that continues on the upper level and provides stops at four separate points. While this system carries monorail cabins below, its upper surface is functionalized as open space, viewing platform, and landscape axis. Parallel to the trambus that will pass on the road dedicated to this network, a bicycle route accompanies it. Additionally, underground parking lots aim to take advantage of the sloped structure of the terrain while simultaneously preventing open parking lots where motor vehicles are the dominant visual element, thus enabling a compact building arrangement.

Figure 16: Cross-Section of the Transportation Network Along the Main Axis



Programmatic Spatial Structure

| | | |
|---|-------------------------------------|---|
| Spatial Integrity | Monolithic Area | |
| | Multi-parcel Coordination | ■ |
| Position within the Urban Context | Integrated with the Existing Fabric | |
| | Internally Enclosed/Isolated | ■ |
| Location within the Urban Area | Center | |
| | Inner Belt/Transition Zone | |
| | Periphery | ■ |
| Urban Transportation Infrastructure | Commuter Rail | ■ |
| | Tram | ■ |
| | Metro | |
| | Bus | ■ |
| On-site Access Modes | Automobile | ■ |
| | Tram | |
| | Trambus | ■ |
| | Monorail | ■ |
| | Service Vehicles | ■ |
| | Bicycle/Scooter | ■ |
| | Pedestrian | ■ |
| Program of Uses Outside R&D and Production | Housing | ■ |
| | Commerce | ■ |
| | Accommodation (Hotel) | ■ |
| | Education (University, College) | ■ |
| Trade and Office Center Configuration | Single Center | |
| | Multiple Sub-Centers | ■ |
| Green Space System | Focal Area | |
| | Periphery/Edge | |
| | Fragmented / Dispersed | |
| | Diffused / Spread | |
| | Separating "Wing" | ■ |


3.2. Investment Requirement and Financing Options

International Partnerships for a Special Economic Zone

Why International Financing?

-  Securing Resources for Growth and Development
-  Supporting International Cooperation
-  Increase in Competitiveness
-  Strong Financial Structure

Why International Partnership?

-  Global Talent and Expertise
-  Know-How Transfer
-  Market Expansion
-  Risk Diversification
-  Startup–International Network Matching

Potential International Financing Providers

EBRD (European Bank for Reconstruction and Development)

- In 2022, Türkiye was the country in which the EBRD invested the most.
- Since 2009, the total amount of investments made in Türkiye has exceeded 19 billion euros.
- 86% of these investments have been directed towards the private sector.
- A significant portion of these funds has been directed towards strategic areas such as green transition, infrastructure projects, transportation, and banking.

IFC (International Finance Corporation-World Bank)

- It has the opportunity to make direct investments or to become a shareholder in projects.
- Türkiye ranks as the third largest recipient of investments. A total investment of US \$9 billion is targeted in Türkiye by 2026.
- Investments in Türkiye are focused on large scale infrastructure projects such as city hospitals, airports, and ports.

EIB (European Investment Bank)

- The investments have been focused on strategic priorities such as climate, environment, innovation, digitalization, SMEs, and sustainability.
- The financial support provided to Small and Medium Sized Enterprises (SMEs) ranges between 5 and 100 million euros.

AIIB (Asian Infrastructure Investment Bank)

- The investments focus on the development of green infrastructure, the strengthening of regional cooperation, and the implementation of technology driven infrastructure projects.
- As of 2022, a total of US \$5 billion of the financing was provided from country-backed sources, while US \$1.9 billion came from non-country-backed sources.
- The energy sector stands out as a significant area of investment for Türkiye.

ADB (Asian Development Bank)

- Investments are primarily made in areas such as the environment, digital technology, agriculture, logistics, and regional partnership.
- In 2022, US \$1.1 billion was invested in infrastructure.

Investment Requirement

The total construction investment required for the ASO Technology Base is projected to be US \$296.7 million for the entire building stock. Of this amount, US \$215.1 million will be financed through instruments provided by the Ankara Chamber of Industry (ASO). The remaining US \$81.6 million is planned to be financed with contributions from external investors.

Financing Model:

- 1. External Investment (Build-Operate-Transfer Model):** Firms will construct their own facilities and operate within the area as low-cost or rent-free tenants. Additionally, buildings such as hotels, educational institutions, and hospitals will be constructed and operated by external investors.
- 2. ASO Investment:** The resources provided by ASO will be used for the construction of buildings that will generate rental income. These resources will be obtained through public-private partnerships, international funds and loans, EU grants, and domestic loans.

Table 6: Total Investment Requirement (Millions of USD)

| Million USD | Stage 1 Sub-stage A (Stage 1-A) | Stage 1 Sub-stage B (Stage 1-B) | Stage 2 Sub-stage A (Stage 2-A) | Stage 2 Sub-stage B (Stage 2-B) | Stage 3 | Total | |
|---|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------|--------------|---|
| Construction investment required | 96.1 | 47.1 | 22.9 | 37.6 | 93.0 | 296.7 | 27% External investment (Build–Operate–Transfer) 73% ASO Investment |
| External Investment | 35.9 | 14.7 | - | 15.4 | 15.6 | 81.6 | |
| ASO Investment | 60.2 | 32.5 | 22.9 | 22.1 | 77.4 | 215.1 | |

Scenario 1: International Loan Utilization and Investment Scenario for the First Stage

The total investment required for the first stage (Stage 1-A and 1-B) of the ASO Technology Base is estimated at US \$143.2 million. According to the proposed scenario, 65% of this amount (US \$92.7 million) will be covered by ASO investment, while the remaining portion will be financed by the private sector through external investment using the build-operate-transfer model.

In this section, scenario-based return projections have been developed for the US \$80 million international loan and investment intended to meet ASO's financing needs. This scenario presents a loan utilization projection that is independent from Scenario 2, which is outlined on the following page.

Assumptions adopted in the scenario development:

- **Financing Source:** It is projected that an \$80 million loan will be secured from international financial institutions, with a 2 year grace period and a repayment term of 10 years (at an interest rate of SOFR +4%). As of April 2025, the 30 day average SOFR rate has been calculated at 4.3%. It is assumed that the loan will be utilized in two equal tranches during the 1st and 2nd years.
- **Responsibility for Facilities:** The construction and operation of the hotel and healthcare facilities are the responsibility of private sector investors.

- **Revenue Stream:** Leasing activities for each building area will commence starting from the third year after construction is completed, and related rental income is expected to increase over time. In the 3rd year, during the first year of rental operations, 25% of the office and production spaces will be leased, rising to 50% in the 4th year, 75% in the 5th year, and reaching full occupancy (100%) from the 6th year onward. The average monthly rental rate is projected at US \$14 per square meter for the first 11 years.
- **Operating Expenses:** For services such as security and landscaping provided by the ASO Technology Base, operating expenses have been estimated at 7% of the monthly rental income per square meter.

According to the developed scenario:

- **Payback Period:** The payback period of the investment is calculated to be 9 years, at which point all financing costs will have been repaid and the project will start to yield cumulative profits.

This scenario provides a baseline approach for assessing the financial feasibility of the first stage of ASO Technology Base. During the implementation of the Base, the effective use of international financial resources aims to minimize investment risks.

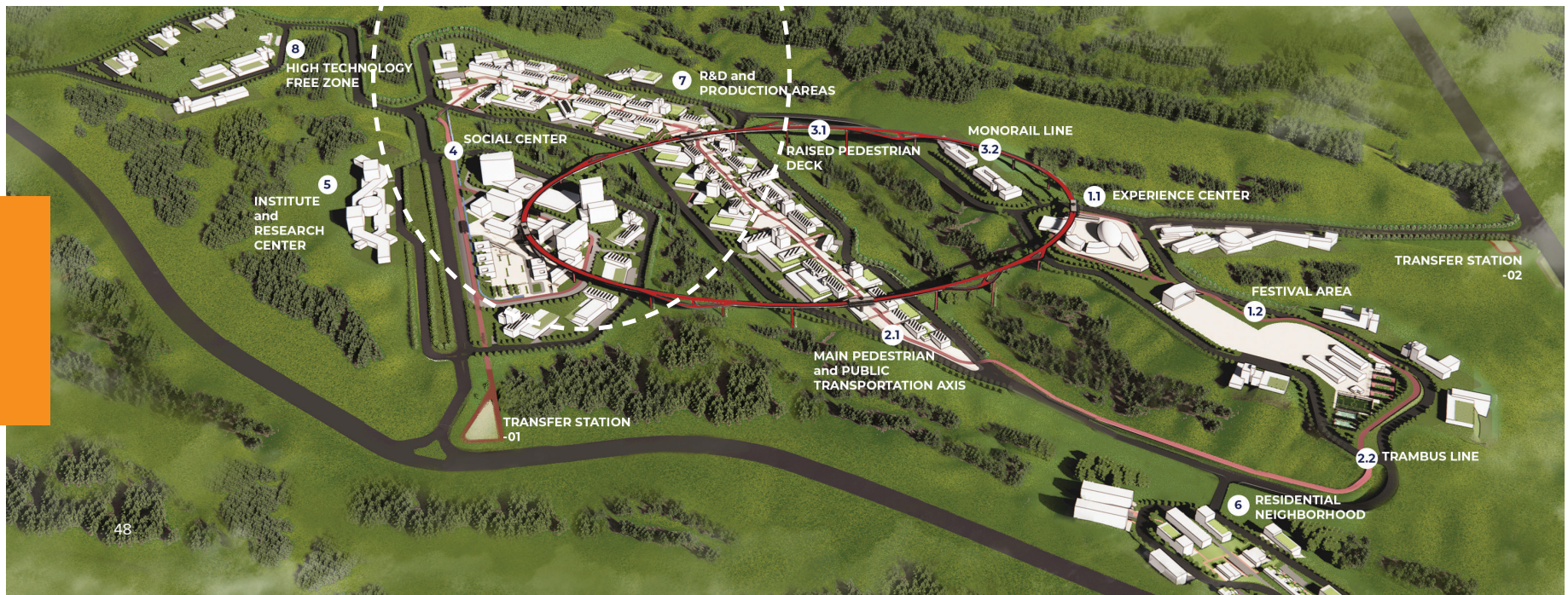
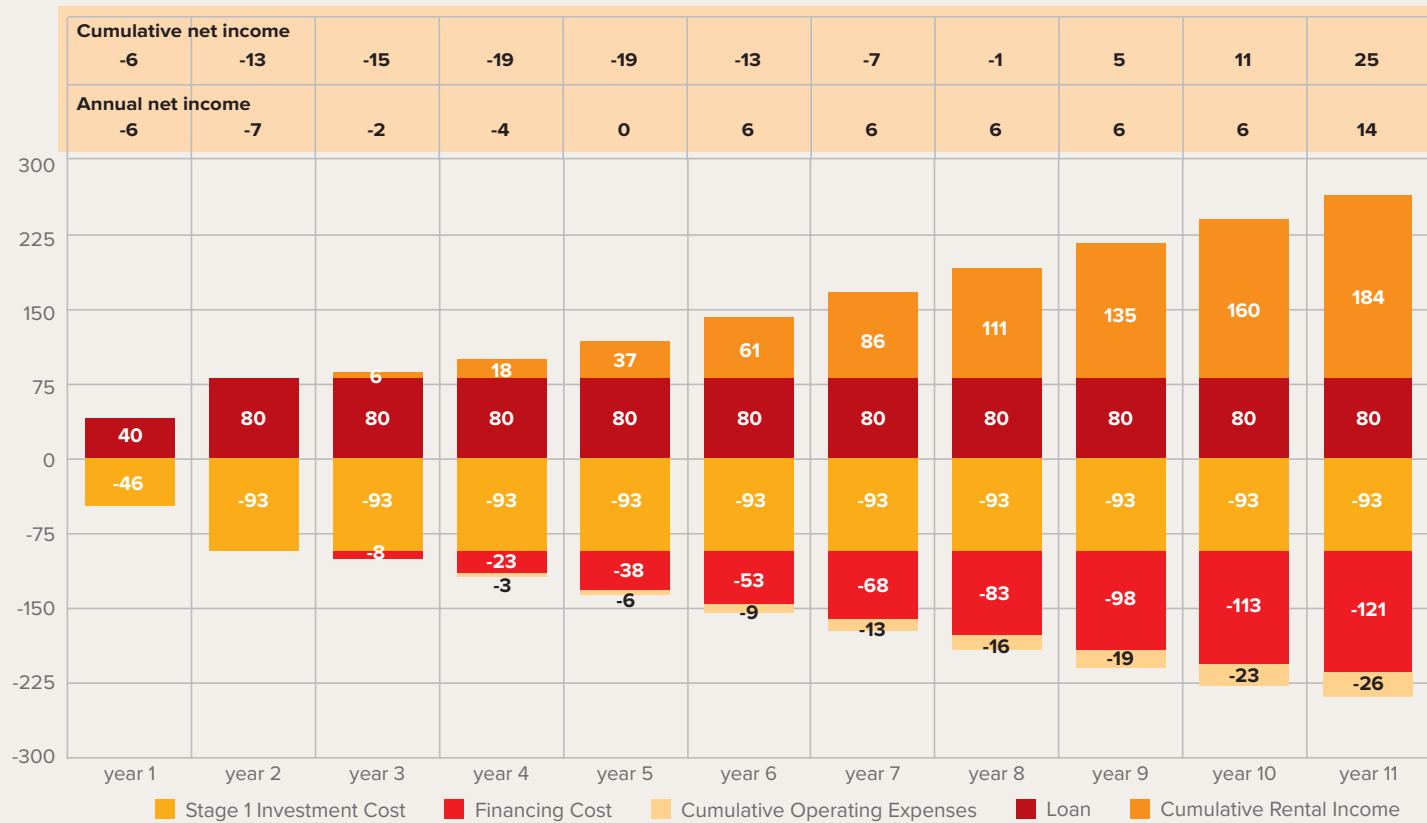


Figure 17: Investment Scenario for Stage 1, Financed with International Credit



*Due to decimal rounding, there may be discrepancies between total values and their subcomponents.

Table 7: Investment Scenario for Stage 1 Financed with International Credit (Key Indicators)

| | Millions of USD |
|--|-----------------|
| Stage 1 Total Investment Required for construction (ASO investment) | 92,7 |
| International Loan | 80 |
| Financing Cost (Principal + Interest) | 120,8 |
| Annual Gross Rental Income* | 24,6 |
| Annual Operating Expenses* | 3,3 |
| Annual Net Rental Income* | 21,2 |
| Cumulative Net Income by the End of Year 9 | 5,1 |
| Cumulative Net Income Over 10 Years | 11,2 |

*When all office and production spaces are fully leased



Scenario 2: Payback Period for Investment Across All Stages

The total investment requirement for all stages of the ASO Technology Base is estimated at US \$296.7 million. Of this amount, US \$215.1 million will be covered by ASO through instruments such as loans and partnerships, while US \$81.6 million will be financed through external investment based on the build-operate-transfer model.

A return on investment projection has been developed for the US \$215.1 million to be financed internally, based on construction costs and rental income. Once all stages are completed, the annual net rental income is projected to reach US \$30.3 million.

Assumptions adopted in developing the projection:

- This scenario presents an independent return on investment projection, separate from Scenario 1 presented on the previous page.
- The construction of the stages is assumed to begin consecutively. It is also assumed that the construction process will proceed as projected in Figure 10, presented in Section 3.
- Rental income is assumed to be generated starting from the second year following the completion of each respective sub-stage.
- Net rental income has been used in the projection, taking into account the anticipated operating expenses.
- Loan utilization and financing costs have not been included in the projection.
- Rental income calculations include production and office spaces, as well as residential and commercial areas.
- Construction costs include building and infrastructure expenses (such as electricity, natural gas, heating, etc.). Environmental landscaping (such as greenery, irrigation, drainage, lighting, etc.) is not included.

According to the developed scenario:

- Rental income from all stages of the ASO Technology Base is expected to cover the total investment cost by the end of the 12th year. (If construction begins in 2026, the region's net income is projected to turn positive by the end of 2037.)
- If implemented in 2026, the ASO Technology Base is projected to generate a cumulative net rental income of US \$320 million and a net profit of US \$105 million by the end of 2040.

Figure 18: Payback Period for Investment Across All Stages

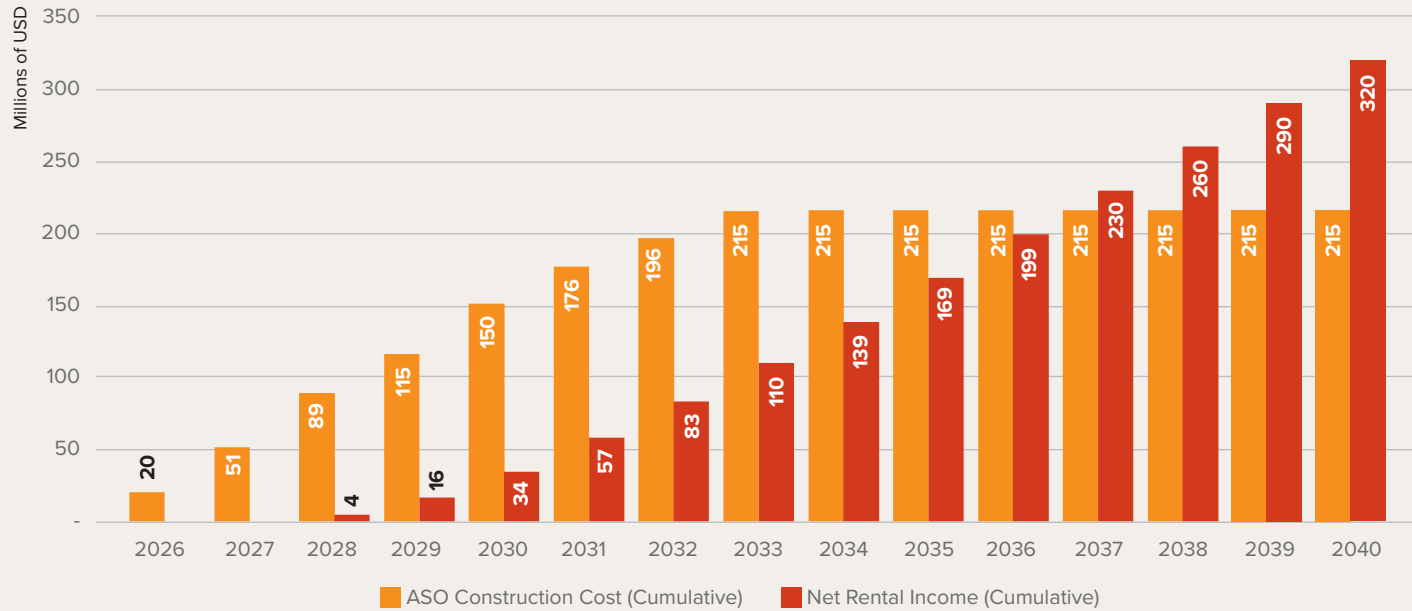


Table 8: Economic Contribution by Project Stages

| | Stage 1-A | Stage 1-B | Stage 2-A | Stage 2-B | Stage 3 | Total |
|--|-----------|-----------|-----------|-----------|---------|----------------|
| Firms (manufacturing) | 62 | 42 | - | 16 | 7 | 127 |
| Firms (office) | 274 | 231 | - | 78 | 133 | 716 |
| Total number of firms | 336 | 273 | - | 94 | 140 | 843 |
| Employment (mfg) | 3,311 | 2,232 | - | 838 | 391 | 6,772 |
| Employment (office) | 4,428 | 3,738 | - | 1,257 | 2,152 | 11,575 |
| Total Employment | 7,739 | 5,970 | - | 2,095 | 2,543 | 18,347 |
| Exports (manufacturing) (million USD) | 410.5 | 276.8 | - | 167.7 | 48.5 | 903.5 |
| Exports (office) (million USD) | 164.0 | 138.4 | - | 251.4 | 79.7 | 633.6 |
| Total exports (million USD) | 574.5 | 415.2 | - | 419.1 | 128.2 | 1,537.1 |

3.3. Implementation Strategy

Current Incentives and the Future of Incentives

The incentives provided under the scope of TDZ framework were initiated with Law No. 4691 in 2001 and initially set to remain in effect until 2013. In 2011, this period was extended until 2023 through a new regulation, and later, with the enactment of Law No. 7263 in 2021, the validity of these incentives was further extended to 2028. The incentives support R&D, design, software activities, and promote entrepreneurship through regulations such as venture capital funding.

In recent years, within the scope of tax reform, the incentives for Technology Development Zones have come under scrutiny, with proposals such as the removal of income exemptions being discussed but ultimately rejected. Emphasis is increasingly being placed on the need for TDZs to ensure their sustainability independent of public incentives. Considering the 118,000 jobs created by the TDZ ecosystem in Türkiye, the potential risks of completely removing TDZ incentives, compared to the anticipated fiscal gains, represent a public policy issue that must be approached with careful consideration.

In the upcoming period, while a complete termination of public incentives in TDZs is not expected, there is a growing likelihood of a shift toward more selective incentive mechanisms and an increase in the obligations imposed on firms operating within TDZs. In this context, ASO Technology Base is being designed to maintain its competitive edge and develop a sustainable incentive mechanism, even in case of reduced government support.

Pilot Implementation for a Next Generation Incentive Mechanism

Taking into account the potential reduction in current incentives, ASO Technology Base has built its long-term strategy on three main pillars:

1. Addressing Physical Gaps in the R&D Ecosystem
2. Integrating the Functions of OIZs and TDZs
3. Developing New Incentive Instruments

1. Addressing Physical Gaps in the R&D Ecosystem

- In addition to modern office spaces, high-quality social living areas will be constructed to attract highly qualified talent to the base.
- Core features include metro and public transport connections, high quality housing projects, social facilities, sports complexes, and recreational areas.
- High-quality infrastructure will be provided to improve the living standards of professionals known as the creative class, in order to encourage innovation processes.
- Besides workspaces, the integration of recreational elements that promote environmental sustainability and improve quality of life is prioritized.

2. Integrating the Functions of OIZs and TDZs

- High quality production spaces will be designed to support both high value-added manufacturing and R&D activities.
- Modular and flexible structures will provide infrastructure that accommodates firms' horizontal and vertical growth needs.
- This hybrid model, which combines production and innovation processes, will accelerate the production cycles of the firms while increasing their innovation capacities.
- The base aims to merge the advantages of OIZs and TDZs, focusing on value added production and advanced technologies.

3. Developing New Incentive Instruments

- Incentives such as reduced rental rates for office and production spaces will be offered based on firms' performances.
- Support elements like housing, hotels, sports centers, and social amenities will be provided to enhance employees' quality of life.
- Internationalization programs, knowledge-sharing events, and industry cooperation will be promoted to strengthen the global competitiveness of firms.
- A performance-based incentive mechanism will be tested as a pilot at the micro level within the ASO Technology Base. In accordance with their achievements, participating firms will be offered incentives at various levels.

Focus Areas

The primary goal of the ASO Technology Base is to attract firms engaged in high value added production and those with strong export potential to the base. The selection criteria for firms and the prioritized sectors are as follows:

Selection Criteria:

- Sales value per kilogram
- Export ratio within total sales and export value per employee
- Emission levels
- Commitments to human capital development (such as participation in incubation centers and training programs)

Priority Sectors:

- **Manufacturing:** Electronics, medical devices, green energy, aerospace, composite materials.
- **Services:** Internet of Things (IoT), automation software, artificial intelligence (AI).

Survey results highlight spatial technologies, robotics, the Internet of Things (IoT), and precision manufacturing as leading areas of focus.

| Types of Candidate Firms: | Technology Fields |
|--|---|
| <ul style="list-style-type: none"> • Different sectors and scales (Hybrid) • Firms producing high value added products or services with an export orientation • Manufacturing firms • R&D firms • Software companies | <ul style="list-style-type: none"> • Mechatronics, automation, and robotic technologies • Machine to machine communication, Internet of Things (IoT), etc. • Integration of embedded systems into products • Precision manufacturing technologies • Software systems for production and management • Big data and artificial intelligence applications • Modeling and simulation technologies • Additive manufacturing and 3D printing technologies • Technologies for user safety • Advanced materials and nanotechnology • Space related technologies and space mining • High speed vehicle and machine systems • Quantum computing (data encryption, materials science, and optimization applications) • Biotechnology and digital health technologies |
| Priority Sectors for Manufacturing Areas: | |
| <ul style="list-style-type: none"> • Electronics • Medical Devices • Testing Solutions • Aerospace and Aviation • Green Energy • Composite Materials • Automation Systems • Machinery, Metal, and Metallurgy • Chemical and Pharmaceutical Industries | |
| Priority Sectors for Office Areas: | |
| <ul style="list-style-type: none"> • Internet of Things (IoT) • Automation Software • Artificial Intelligence (AI) • Data Science • Web and Mobile Application Development | |



Industrial Capacity of Ankara and Temelli



Technology Entrepreneurship Capacity of Ankara



National Development Plan Priorities



Global Trends



ASO Technology Base Preliminary Demand Collection Survey

Risks and Risk Management Strategies

- ASO Technology Base Project aims to implement a new technopark model in Türkiye.
- Despite offering various advantages with its innovative approach, the project also involves internal and external risks.



Risks and Risk Management Strategies



1. Risks Arising from Location and Distance

1st Risk Area: Failure to Attract Investors to the Region

Risk Management Strategies:

- Strengthening public transportation infrastructure
- Highlighting the advantages of high quality technopark (TDZ) zones

2nd Risk Area: Inability to Attract Qualified Workforce to the Region

Risk Management Strategies:

- Expanding commercial, social, and recreational facilities
- Developing attractive housing projects
- Establishing partnerships with universities
- Offering incentive packages for employees
- Promoting remote and hybrid work models



2. Regulatory Risks

3rd Risk Area: Challenges Related to the Production Oriented Technopark (TDZ) Model

Risk Management Strategies:

- Initiating efforts for regulatory amendments
- Excluding mass production activities from the scope until regulatory changes are implemented
- Providing support with consulting and guidance

4th Risk Area: New Regulations Incentives for Technoparks (TDZs)

Risk Management Strategies:

- Adoption of performance-based next-generation incentives
- Addressing gaps in the R&D ecosystem
- Access to national and international funds and support mechanisms

- Some examples of these risks include a decline in investor interest, legal obstacles, economic fluctuations, environmental impacts, and social integration challenges.

- Effective management of these risks is critical to the success of the project. Below is a summary of the main risks the project may face, along with strategic approaches to address them.



3. Governance-Related Risks

5th Risk Area: Governance Capacity of the Managing Company

Risk Management Strategies:

- Enhancing the capacity of the managing company
- Increasing the institutional capacity of Ankara Chamber of Industry
- Establishing an advisory board
- Involving key stakeholders in the project and ensuring a broad yet manageable partnership structure



4. External Risks

6th Risk Area: Macroeconomic and Financial Risks

Risk Management Strategies:

- Utilizing multiple financing models
- Prioritizing export oriented business models

7th Risk Area: Advancement of Artificial Intelligence and Transformation of the Workforce

Risk Management Strategies:

- Creating multifunctional living spaces that go beyond traditional work environments

8th Risk Area: Risks Related to International Financing

Risk Management Strategies:

- Utilizing multiple financing models
- Highlighting the region's alignment with the Sustainable Development Goals (SDGs) to enhance its attractiveness

3.4. Priority Actions

Actions for Planning, Project Development, and Investment



Conducting Feasibility and Technical Studies

Feasibility and technical analyses will be carried out for the infrastructure and facilities required by the project, enabling the early identification of risks and the efficient use of resources.



Lobbying Activities for Transportation and Infrastructure

To accelerate transportation and infrastructure investments, cooperation will be established with public institutions and local administrations. Lobbying efforts will be carried out to support the integration of metro and bus lines, while prioritizing energy and digital infrastructure projects.



Architectural Competition for the Project's Master Plan

To enhance design quality and encourage innovative projects, an architectural competition will be organized based on the draft master plan. Selected projects will be implemented in line with the overall concept.



Accessing Finance from International Financial Institutions

International funding will be obtained through collaboration with institutions such as the EBRD and the EU, as well as private sector investors. The investments that will enhance the economic potential of the region will be integrated into the project.



Promotional Activities Targeted at International Management Companies

The project will be promoted through international fairs, conferences, and cooperation platforms to attract foreign companies and encourage their investment.



Initiation of Afforestation Activities

Tree planting will begin in areas planned as green spaces before any construction takes place, so that a well-established green landscape can be created.

Actions Related to Legislation and Governance



Ensuring Legislative Amendments and Approvals

Necessary legislative amendments will be made to ensure the uninterrupted progress of the project, and collaboration with regulatory institutions will be established to support the hybrid technopark (TDZ) model.



Defining Admission and Performance Criteria for Firms

In addition to setting firm admission and performance criteria, lease agreements and guidelines will be documented in a way that favors high tech companies. The established conditions will include procedures for taking precautions in cases of low performance and providing incentives for high performance.



Partnership Agreements for University Functions

University collaborations will be established in the areas of education, R&D, and technology transfer. These partnerships will enable the development of centers of excellence and expand internship opportunities for students.



Establishing a Partnership with an International University

A strategic partnership will be formed with an international university to enhance academic capacity and support innovation projects.



Establishing an Incubation Partnership

To expand the entrepreneurship ecosystem, a partnership will be established with a successful incubation center, providing mentorship and financial support to startups.



Partnerships with TSE and Testing Centers

Collaborations will be established with testing centers and the Turkish Standards Institution (TSE) to accelerate firms' product development processes and provide testing opportunities that meet national and international standards.



Cooperation Protocols with Other Infrastructures in the Ecosystem

Joint projects and training programs will be developed in collaboration with public stakeholders, OIZs, technoparks, and universities to create synergy within the ecosystem.



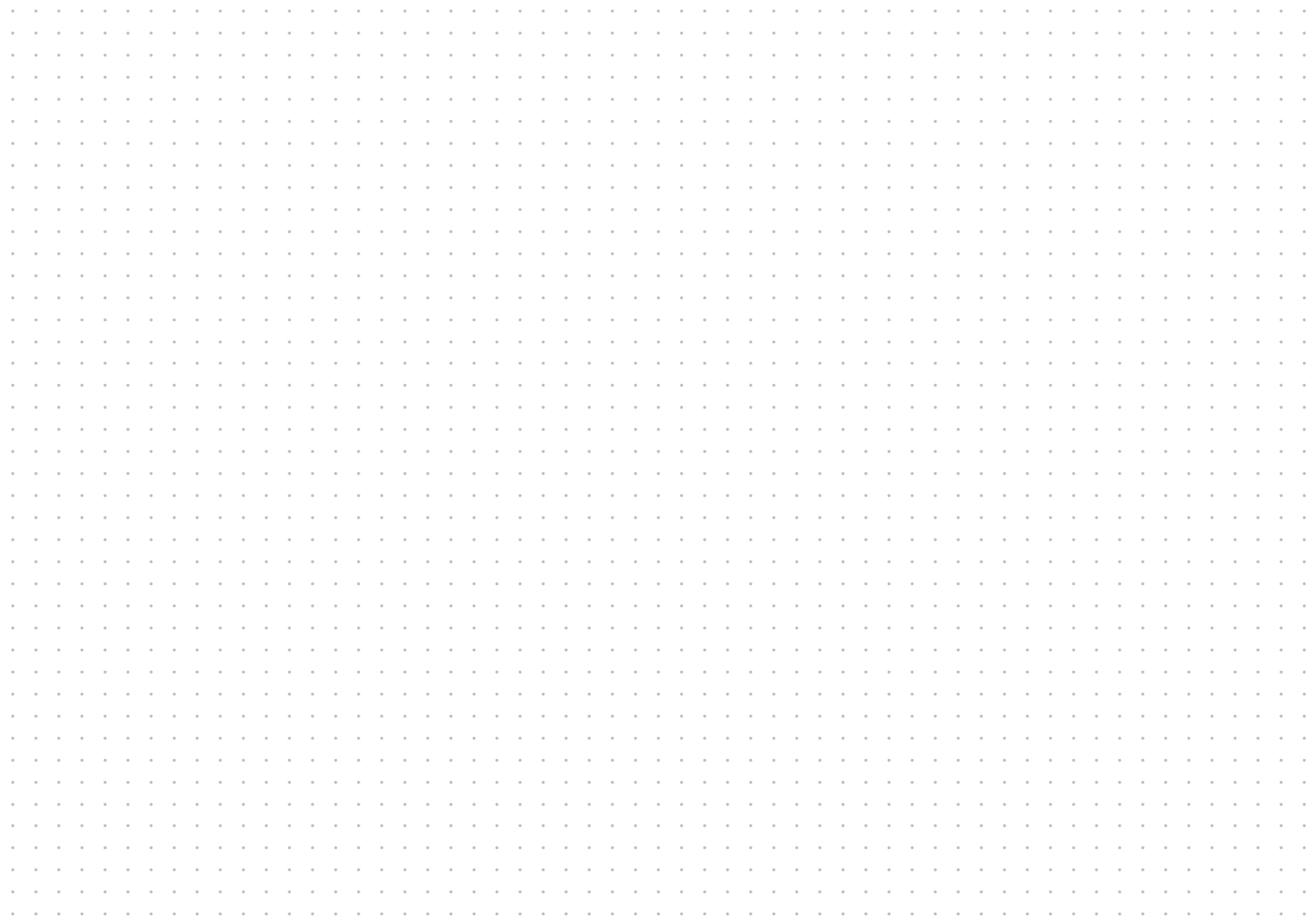
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