

Development vision TIR centre in the Port of Brussels

Summary note



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Background to the contract

The TIR Centre is a unique logistics building complex with huge potential to support the city and its citizens in a sustainable transition of mobility and supply of the Brussels Capital Region. TIR is short for Transport International Routier, which refers to the role of supporting international road transport. However, the future of the TIR centre is different.

The aim of this contract is to arrive at a sustainable development vision with business plan for the TIR centre that supports the vision of the Port and the Region in the area of urban logistics and circularity, by taking the following actions into account:

1. **Sustainable Urban Logistics** that keeps heavy transport out of core areas and provides more efficient and sustainable logistics to and from the city.
2. **Sustainable (employee) mobility** for all journeys to and from the TIR centre. The ambition is to avoid too many journeys, make them more sustainable, make them green, and make traffic safer. These ambitions will benefit both the TIR centre and the neighbourhood.
3. **Circular Flows in terms of electricity, heat and water consumption.** The TIR centre has the potential to be self-sufficient in water, electricity and heat, and can help provide useful uses for residual flows to and from the city.
4. **Build an Ecosystem around sustainable logistics at the TIR Centre** that provides space for companies focused on services facilitating sustainable logistics. These include Value Added services and Logistics. Proposing additional services can further enhance the value for incumbent companies.
5. **A Sustainable Spatial Organisation** of the site focuses on more depaving and greening, as well as creating a pleasant working environment while respecting the existing infrastructure. Sustainable spatial organisation also means a secure site where traffic flows are organised safely and where there is perimeter control, where it is known exactly who is within the perimeter, in the event of an emergency and/or to avoid intrusion.

The contract to devise a redevelopment vision for the TIR buildings builds on the conclusions of the 2040 Master Plan and, more specifically, the TIR Mini-Master Plan approved by the Board of Directors of the Port on 25 October 2019. This Master Plan featured an analysis based on a market survey of TIR users, and made a number of policy recommendations to further develop the TIR centre into a centre for sustainable urban distribution and small-scale production.

Process management

To guide the process for the current contract, a steering committee and a guidance committee were set up, and met 3 times (after each phase of the contract). The steering committee was made up of representatives from the Port of Brussels, Brussels Mobility, perspective.brussels and the City of Brussels; the guidance committee consisted of representatives from the Port of Brussels, perspective.brussels, Brussels Mobility, the Urban Development Agency, Brussels Environment, hub.brussels and Team Bouwmeester.

The development plan for the TIR centre includes 3 phases. The first phase focuses on benchmarking what is possible on the site using a desktop survey, stakeholder interviews and a market survey. These learning points were incorporated into several scenarios: the first scenario represents a minimum-minimum change, the second a major transformation to a two-floor full logistics building and the third scenario a maximum transformation with a third additional floor for logistics. In addition, 3 more variants (scenario 4- ABC) were given shape, which evaluated an integration of the city services at the TIR centre. The scenarios provide the framework for the Eclectic Multicriteria Analysis (EMCA) in Phase 2. This EMCA is an impact analysis, comparing the different scenarios. Phase 3 sets out the vision for the TIR centre, whereby clearly demarcated actions are discussed by theme.

During the process, there were several interviews with internal experts associated with the Region and Port, and external experts such as developers, energy and water experts, to support the development of the vision.

The study focused on **internal vision development** for the Port, which was given form in consultation with regional partners. It does not yet include generating support among the neighbourhood, surrounding companies and incumbent companies. Indeed, it is advisable to first develop a vision from within the Port and its immediate stakeholders, and then start a participatory process: the Port and the neighbourhood, companies and other stakeholders, who may have a future role at the TIR centre, can come into contact with, and reinforce, each other in this process.

Phase 1: international examples and potential for the TIR centre

In Phase 1, it became clear that the TIR Centre has huge potential as an urban logistics centre, thanks to its location and transformation potential of the buildings. On the one hand, it is less than 3 km from the Grand Place in Brussels, which offers opportunities in terms of city logistics. For example, compared to Schaerbeek-Vorming, which is significantly further from the centre in relative terms, the TIR centre offers potential for cargobikes to supply the city. On the other hand, it can be connected to the water and is easily and safely accessible for heavy transport via the A12 and the Havenlaan.

The TIR centre still does not adequately play its role as an urban distribution centre. bpost is already a good example of an incumbent company with a clear profile for urban distribution. A clear reorientation as an urban distribution centre can ensure that heavy transport is kept out of the city, through consolidation. Long-term storage, which is currently on floors R+1 and R+3, also represents a non-ideal use of the site. Long-term storage of goods with low rotation would be better organised on the outskirts of the city. The connection to the waterway can further develop the TIR centre into a veritable bimodal logistics centre.

The potential to make the site more sustainable in terms of mobility, energy, water, heat, materials and sustainable design was also highlighted. For example, the TIR centre can be linked to the water, traffic can be made safer by separating traffic flows on and around the site, and the site can become an ecosystem where all the companies that locate there reinforce each other. We can highlight examples here such as the water-based two-floor logistics centre Amsterdam Citylogistics Hub, the mixed logistics project of Hôtel logistique Quai Bercy in Paris and the covenant on sustainable urban logistics in Groningen: these projects show that flanking policies are important to develop an urban logistics centre. With Prodock in Amsterdam, we are also seeing how a self-reinforcing ecosystem can contribute to the long-term transformation of the Port and its stakeholders. Examples within Brussels, such as the Bigh farms, show how the large roof areas can be put to good use in the sustainable transformation of the site.

These focus points were incorporated into various scenarios, with the first scenario representing a minimum change, the second involving a major transformation into a fully-fledged two-floor building, and the third representing a maximum transformation with an additional third floor for logistics and workshop space. The fourth scenario involves an integration of city services (the public commons, central purchasing services and roads) into the TIR centre. 3 variants of the latter scenario were then developed.

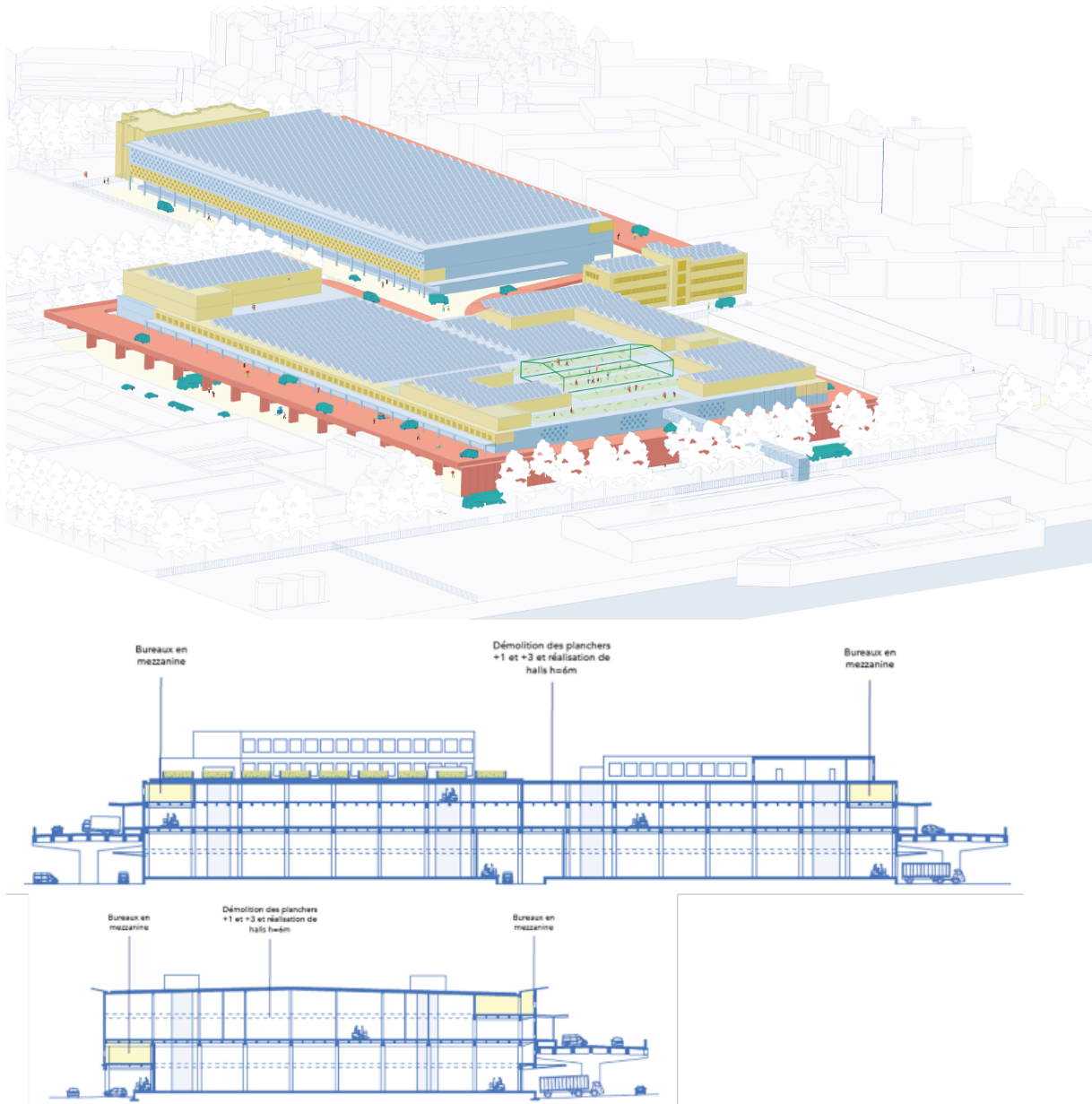


Figure 1 Scenario 1 - significant renovation of the current TIR Centre with a 6-metre clear working height on the ground floor.

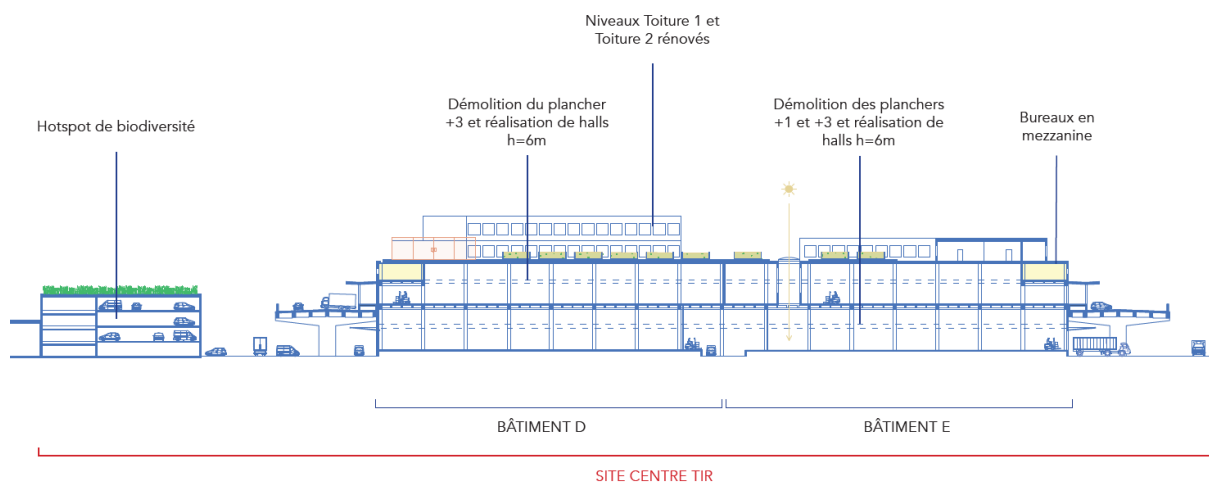
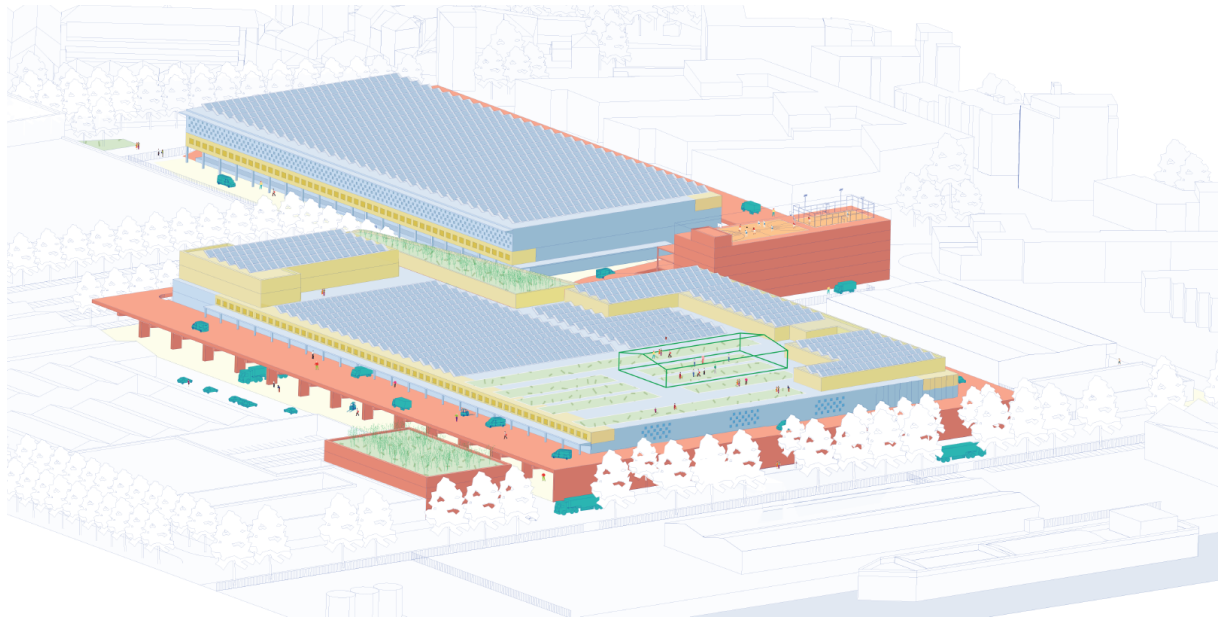


Figure 2 Scenario 2 - significant renovation of the current TIR Centre

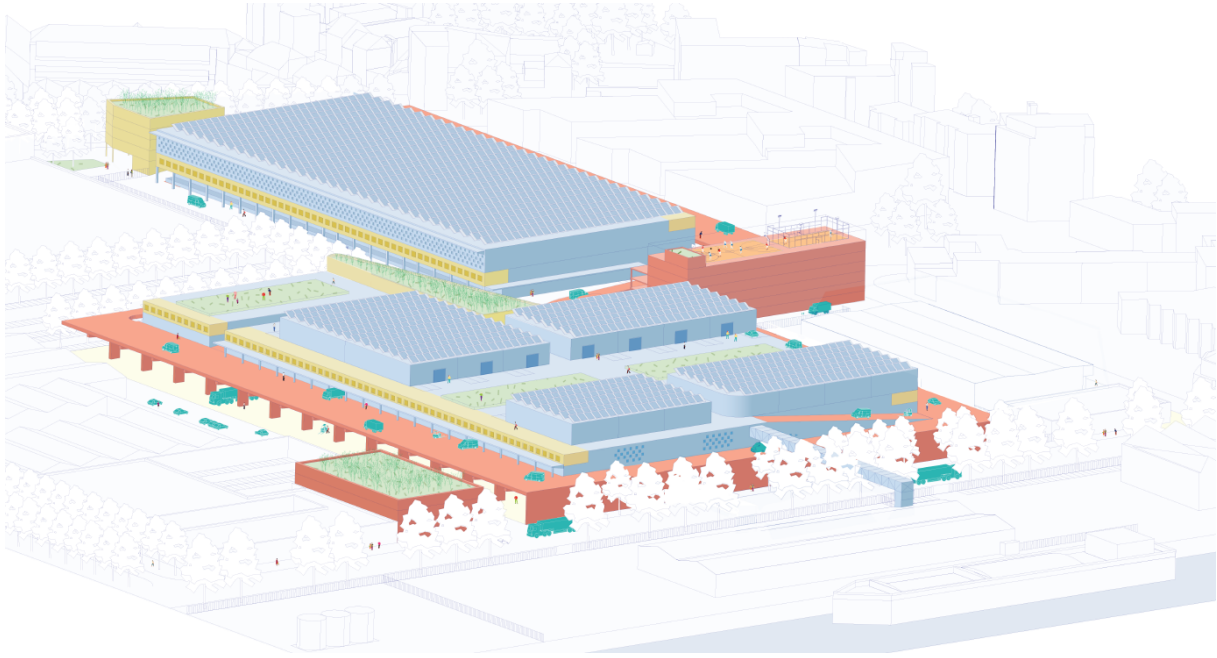


Figure 3 Maximum scenario with additional logistics floor

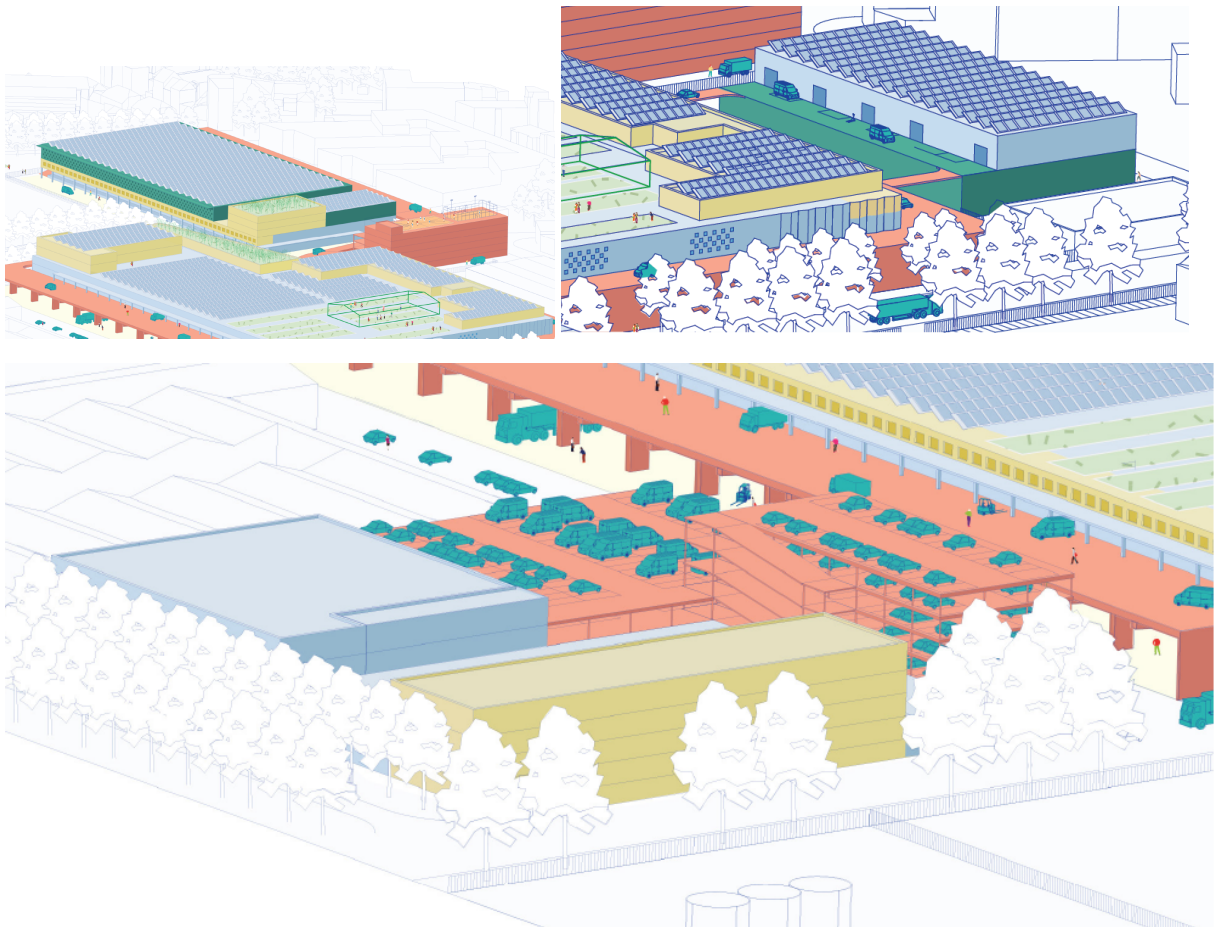


Figure 4 the three variants of scenario 4

Phase 2 evaluate scenarios via EMCA analysis

In order to understand the strengths and weaknesses of the different scenarios, and make it possible to identify the preferred scenario(s), an Eclectic Multicriteria Analysis (E)MCA was carried out. This involved evaluating the scenarios for the redevelopment of the TIR centre on an exhaustive set of 25 criteria, with the following four stakeholders as a starting point:

1. The project developer, project investor and project manager
2. The user(s) of the project
3. The government or governments
4. The local community

When the results are consolidated via the EMCA software, the following visual representation of the weighted criteria is obtained (see Figure 18):

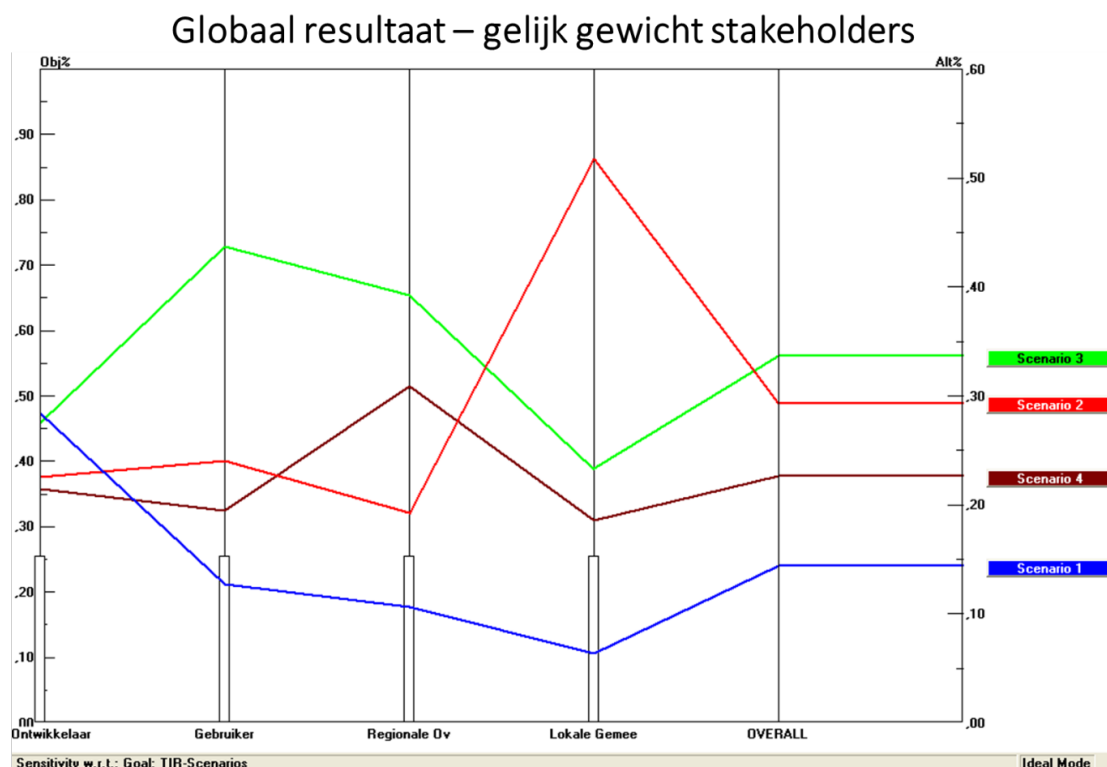


Figure 5 Overall result - equal weighting stakeholders

The overall analysis with equal weighting for all stakeholders shows that scenario 3 is preferred by almost all stakeholders. Only scenario 2 scores significantly better with the local community, as it is possible here to add more facilities that also benefit the neighbourhood (for example, extending a square up to the new fire station). The strengths of scenario 3 are that it capitalises on market demand, and offers (extension) flexibility to users, it has a smaller mobility impact, and offers potential for clustering. Finally, scenario 3 offers the best allure and image, which could put the Port of Brussels on the map in terms of sustainable development and make a stronger contribution to the Region's policy objectives. Scenario 3 not only has significant technical challenges, but the costs are also relatively high relative to the benefits.

Scenario 2 is close behind: among other things, the more straightforward technical challenges (no third floor for logistics), and above all the local community mean that scenario 2 scores significantly better, given the better opportunities to embed the project locally and develop shared facilities. Scenario 4 scores very well in third place, among other things for criteria that are important to the Region: the range of services that can be expanded together with city services and the contribution to a sustainable transition of the Region, as the services can rely on a sustainable supply of water, electricity and heat.

Scenario 1, on the other hand, scores the lowest overall, as it addresses the challenges of sustainable transformation the least. Some exceptions are the criteria linked to the developer/investor, such as the (short-term) return.

Scenario 3 is not entirely satisfactory and, as a possible preferred scenario, still has some areas of concern that need further analysis. The investment cost is higher per square metre, meaning that the Return On Investment is lower. Working with a third floor for logistics represents the biggest technical and programme-related challenge.

This scenario will be less self-evident for existing users, as they will have to transform along with it. Both Scenario 3 and Scenario 2 create the least amount of jobs. Scenario 3 explicitly targets larger users who can occupy large surface areas, and who tend to have relatively lower employment per square metre, due to economies of scale. On the other hand, it is possible to organise more efficient mobility, as larger companies automatically create more logistical bundling. As a result, the impact of mobility in and around the site is the most limited in Scenario 3. Consequently, there is a trade-off between job creation on the one hand and the impact on mobility (both freight and passenger mobility) on the other.

Phase 3 : Development vision and action plan.

In order to shape the development strategy of the TIR centre in line with the overall vision of the master plan, the work is geared toward clear actions. These actions can be considered individually, to ensure the TIR centre undergoes a sustainable transition. However, different actions will have an impact on each other. For example, the initial actions for internal support, control and steering create a foundation from which the transition can start.

The actions are defined in accordance with the themes of the Be-Sustainable framework for sustainable neighbourhoods, namely:

1. Overall vision
2. Project management and participation during the redevelopment
3. Living environment - Economic and social vitality
4. Spatial planning
5. Physical environment
6. Mobility - logistics
7. Nature
8. Water
9. Energy streams
10. Materials

Once the Port has developed a vision, the Be-Sustainable framework makes it possible to work with stakeholders to seek broader support for the actions in the master plan. It can also lead to the project growing further, with input from stakeholders.

Overall vision TIR 2.0 (synthesis scenario)

The TIR centre is in an ideal location to facilitate urban logistics for the Region, by serving as a place of consolidation and processing of goods flows in and out of the city. As such, the TIR centre can play an important role in reducing heavy traffic towards the city centre, and makes traffic safer for the entire Region.

By integrating the various lessons learned from scenarios 2-3-4, a **synthesis scenario** was formed, in which a two-floor logistics building is built in accordance with scenario 2, and there is an extension next to the TIR centre, by integrating the Febetra site into the operations of the TIR centre.

The synthesis scenario puts forward a programmatic mix that is fully in line with the ambitions for the redevelopment of the TIR buildings, taking into account the sustainability requirements and the liveability of adjacent neighbourhoods. The mix of functions and their respective surface area is shown in the table below:

Function	Surface area in m ²
Logistics area (from 1,400 m ² - 12,400 m ²)	50,600
Logistics small-scale (up to and including 500 m ²)	2,500
Office area connected to logistics (directly)	5,145
Office space connected to a Business centre (for companies without connecting offices, and companies in the logistics chain)	7,200
Urban Farm	6,000

Urban production	3,000
Total economic area	74,445
Mobility Hub 1 + existing parking spaces in parking garage	240 + 98 = 338 covered places 62 places in open air

To ensure the best chance of attracting modern logistics service providers in the long term, it is important to raise the logistics areas to 6 m free working clearance in all buildings. While this reduces the leasable space, it will ensure that overall rental income can increase for the site.

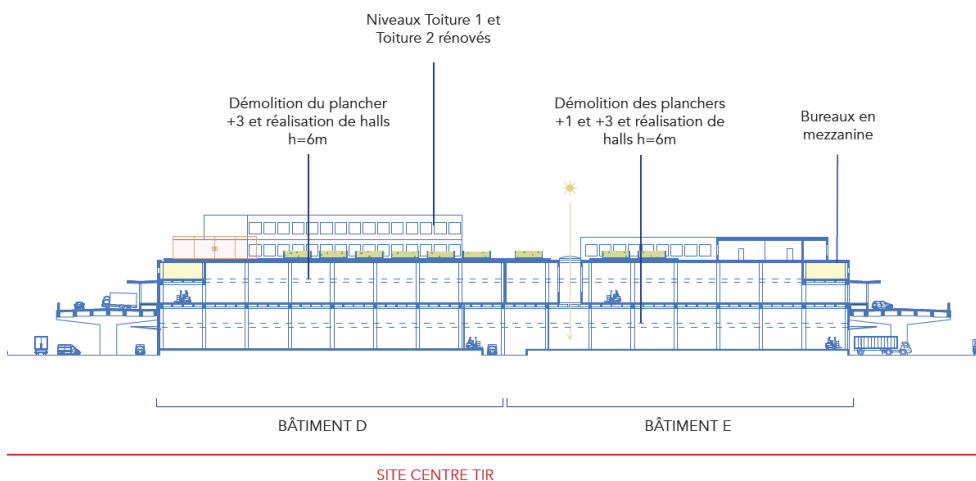
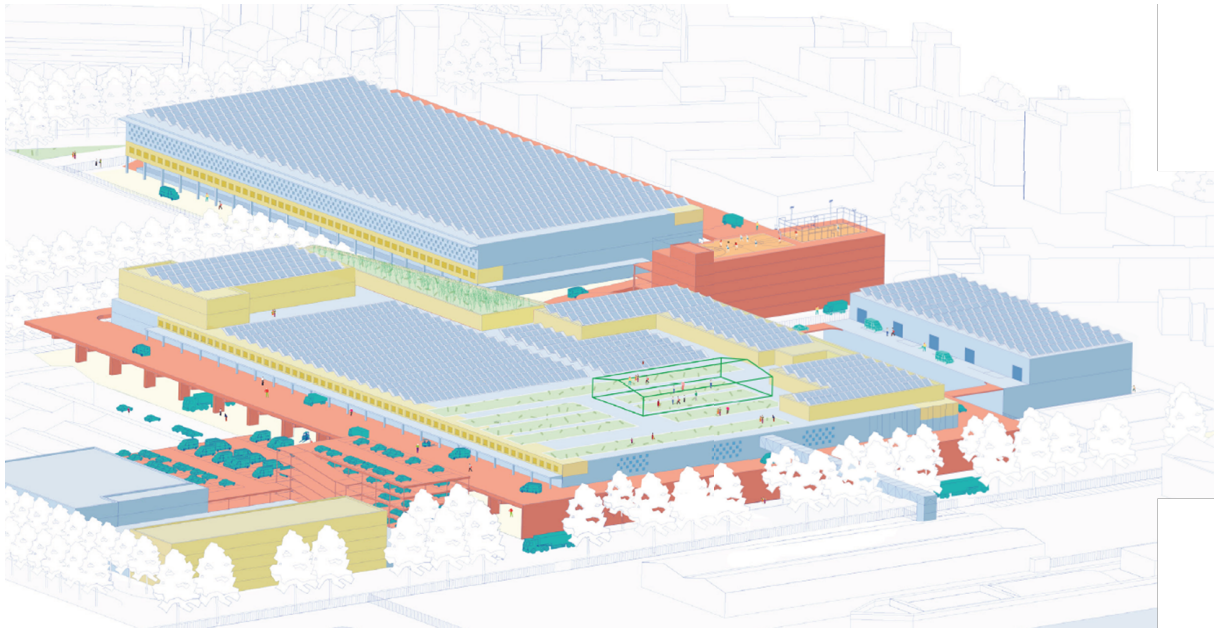


Figure 6 Synthesis scenario

The different types of activities can be more in line with the ambitions set out by the Port. As a result, the TIR centre will be one of the few modern logistics sites in Europe with two floors of usable and fully-fledged logistics space, located at an ideal distance from the centre. The ground-level floors are ideal for giving form to crossdocking operations, as front and rear loading and unloading can be carried

out in a transit movement. The overhead locations mean that working with crossdocking via a front and back system is not possible, but this could in principle be possible via a U-movement. By installing a pallet **conveyor system** that connects to the canal, the TIR centre can help make logistics in the Region more sustainable.

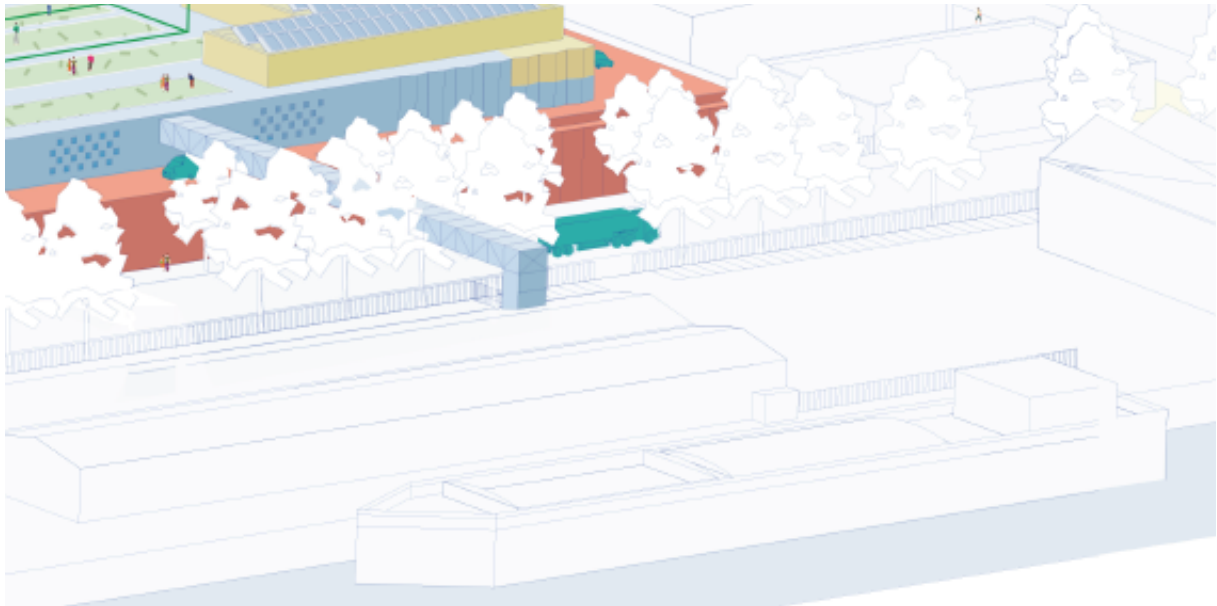


Figure 7 Conveyor system

The TIR centre intends to play a **pioneering role in the climate transition** by using rainwater sustainably, providing for in-house sustainable electricity consumption and tapping into sustainable sources of heat (heat grid, residual heat, CHP), etc. The TIR centre can become a **safe & secure place thanks to its segregated logistic courtyards and a more logical internal circulation**. To ensure the long-term success of TIR, it is important to develop support facilities. By ultimately integrating the **Febetra site**, it is possible to shape a supporting circular studio space adjacent to the current TIR building.

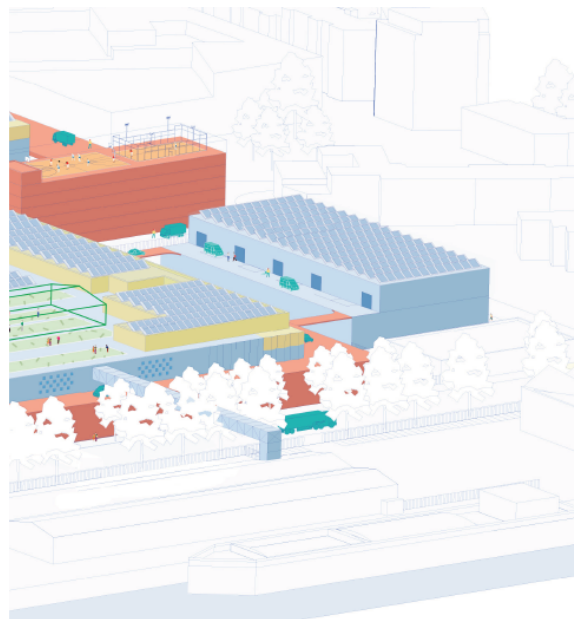


Figure 8 Integration of Febetra site into the operations of TIR 2.0 as circular hub and hub for smaller logistics players (+500 m²)

This will free up logistics and studio space for businesses on the ground floor. It is also possible to integrate the services of Febetra in the central business centre of the TIR centre, which integrates the office spaces of building D+E (northern cluster) into a single hub of services, which can be used: company restaurant, shared meeting rooms, etc. In addition to the studio space and the central business centre, the **urban farm** will also make a significant contribution to the sustainable transition of the TIR centre. Indeed, it offers the possibility to consolidate short-chain food at the TIR centre. The urban farm is a good example of how sustainable logistics and urban food supply can go hand in hand. The 6,000 m² urban farm contributes to the ecosystem of the TIR centre, as it sustainably reuses rainwater, and can use waste heat.

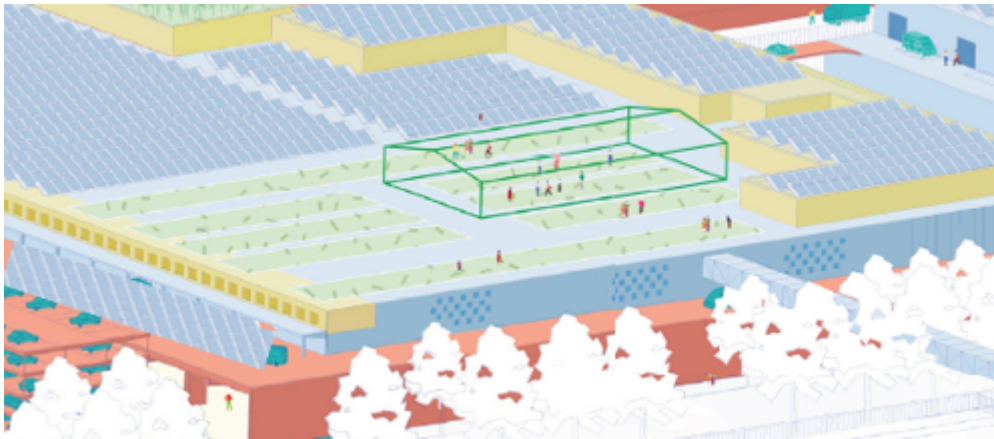


Figure 9 view of urban farm on roof of building D+E

The TIR centre can also play a role by **focusing on the neighbourhood**. The redevelopment of the TIR site offers opportunities to redesign the public space so that the neighbourhood has more access to additional green space, as well as a slow road that helps connect to the Tour&Taxis site. The ambition is to have at least 10,000 m² of green space, of which 5,000 m² will be accessible to the neighbourhood 24/7. The Northern Square at the level of Building C can then become a new meeting place for the neighbourhood. The central mobility hub will also offer space for shared mobility, but can also serve as parking for the neighbourhood if there is residual capacity. The roof of the **mobility hub** can be set up to house sports facilities, among other things, that can be used by both employees and local residents.

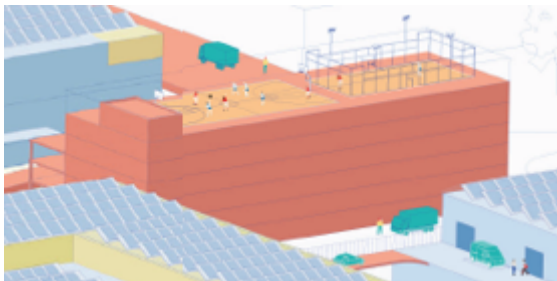


Figure 10 Mobility hub and facilities for the neighbourhood on the roof.



Figure 11 Greening of the site

Space for city services. By housing city services on the Citroën site, there can be complementarity in terms of sustainable water and energy consumption. However, these calculations are not included in the transformation of the current TIR site.

When all functions are taken together (excluding the city services aspect) the result is a new total area per function of 77,930 m², or a reduction of 51,920 m².

Business plan The complete transformation of the TIR centre will cost around €77 million. The estimated rental income will generate a gross return of 7%. However, when all operating costs are also taken into account, the return over 25 years falls to 5.2%, or 6.2% over 30 years. The IRR calculation takes into account the following costs:

- An investment corresponding to 5% of the original investment cost every 10 years
- A community manager who facilitates collaboration in accordance with the action plan
- Asset management costs (the rental and management of funds) at around 3% of rental income
- Property management, at around 3% of rental income
- Repairs, at around 1% per year, or €52,365 per year.
- Insurance: around €100,000 per year
- Property tax of €224,936 / year (about 1/24th of the rental income, but is usually higher)
- Maintenance of conveyor, €51,750 per year
- Cleaning of common areas, €52,000 per year (1x per week)
- Excludes water, heat and energy (this is in a separate business model)
- Inflation of 1.5%
- Occupancy rate of 97%

Based on the above-mentioned operational costs and the calculated investment costs (see table below), an internal rate of return (IRR) of 5.2% over 25 years and 6.2% over 30 years can be achieved.

Phasing of actions/business lines	Investment costs	Annual Income	Gross return
Building C	€14,746,349	€1,242,390	8.4%
Building D+E	€28,607,015	€2,223,690	7.8%
Building F	€4,860,800	€412,500	8.5%
Business centre	€10,620,000	€828,000	7.8%
Mobility Hub A with sports facilities	€8,237,500	€228,000	2.8%
Greening of Northern Square site (including demolition of Building A and replacement of viaduct)	€1,301,900		
Greening of central square + central low-traffic path	€600,000		
Green facades building central axis C + D and E	€460,980		
New paving site	€800,000		
Conveyor System	€1,035,000	€155,250	15.0%
Urban Farm	€5,400,000	€270,000	5.0%
Water Community - water audit: study and guidance on investments	€75,000		
Energy Community - energy streams research	€75,000		
	€76,819,544	€5,359,830	7.0%

Action Plan Development vision

Action 1 appoint a project manager (internal or external). Put together a project team with legal, economic and technical expertise. Given the difficulty of this project, it is necessary to work with experts: they can initiate and drive top-down dynamics for the implementation of the development vision, and set up control mechanisms to monitor implementation.

Action 2 addresses the legal/financial structure of the project and the finetuning of the programme of development. Different degrees of collaboration and phasing are possible here. A market survey (sub-action 2.1) can provide more insight into the type of collaboration that market participants are open to. The development vision has identified several building blocks, which the Port can also already work with individually.

If it is decided to launch the master plan all at once, there is a good chance that an external partner will have to be found to finance the project.

However, there are 5 degrees in which an external partner can be involved according to the familiar abbreviation DBFMO:

- Design: the design and shaping of the actions
- Build: building, implementing the actions
- Finance: providing pre-financing for the project, after which, for example, through a lease, the building can be made available back to the Port.
- Maintain: maintaining the building, such as building technologies.
- Operate: operating the site.

Here the Port can opt for a long leasehold/right of superficies/ long-term concession, PPP structure where we enter into a shared company (the Port must hold at least 50% of the shares by statute), an in-house development that the Port finances itself.

In-house development from within the Port can be started if we decide to work in phases within certain themes. These themes are briefly discussed in the action plan below. We advise against selling the site because, even with conditions, this offers the Port limited opportunities to pursue the development vision.

Project management and participation before, during and after redevelopment

- Action 3: **appoint a community manager** to shape the collaboration models between stakeholders bottom-up, such as facilitating logistical collaboration between tenants/users, ensuring sustainable employee mobility, shaping shared facilities such as the central business centre and leisure infrastructure, point of contact building management/public space, and facilitating collaboration with the neighbourhood and following up energy & water community operations.
- Action 4: **BIM environment** for continuous monitoring. In addition to a community manager, who keeps track of the types of collaborations and projects, a BIM (Building Information Model) provides a digital overview of how the TIR centre is evolving. Initiated projects should therefore ideally be accessed digitally in one place.
- Action 5 **convey the new identity of the TIR centre** - for example, via the new name: Brussels Urban Logistics Consolidation Centre or BULC² is an example of how a new name can help convey a new identity. This can also be achieved by connecting projects related to sustainable logistics to the site as well.

Living environment - Economic and social vitality

The third action theme revolves around strengthening the local urban and economic fabric of the TIR site through the following actions:

- Action 6: Shape the structure for the operation of the Ecosystem TIR (possibly through a NPO). In addition to a community manager, operational structures need to be set up that facilitate the TIR centre ecosystem.
- Action 7: In addition to interaction, certain physical interventions will have to be made within the ecosystem to develop the common facilities for the TIR centre along with the companies and neighbourhood. The central logistics business centre, leisure facilities, the urban farm, the mobility hub and the circular hub comprise the main physical interventions that can be started separately and support the ecosystem for the TIR centre. It is important here to conduct an analysis into which facilities will be accessible to whom.
- Action 8: seeking additional funding for sustainable transformation can facilitate the transition of the TIR centre (including through European grants).
- Action 9: Drafting the Selection Guide and legally embedding the vision in contracts to new tenants/users will ensure that the business development plan is also adapted to the new vision.

Spatial planning + physical environment

Action 10: By setting up a Be-Sustainable track, the development vision of the Port can be further refined through a process together with stakeholders from the neighbourhood and the Region.

Action 11 Sustainability Label. To put the TIR centre on the map, it may be useful to pursue BREEAM certification. This is the most well-known and recognised certificate internationally. This may include pursuing both a BREEAM community and building-level BREEAM for the TIR Centre.

Action 12: There are various solutions to achieve a flexible interior structure. The synthesis scenario opts for a structure which is as open as possible: other avenues are proposed here that may still be envisaged.

Sustainable logistics and mobility

Coordination by the community manager will also be important for the theme of logistics and mobility, to make sustainable logistics and mobility possible. If the Port wants to significantly improve the safety and sustainability of both logistics and worker mobility compared to the current situation, Action 13, which clarifies the role of the community manager within this theme, is essential. Sustainable logistics already start with the remodelling of the TIR centre: action 14 stipulates that the water must be used as much as possible during the remodelling to bring materials in and out. Once the new TIR centre is operational, sustainable operational logistics means that strong thematic approach will be needed to realise urban distribution at the TIR centre. In Action 15, the choice was made to take a strong thematic approach to develop certain types of urban distribution in which, in addition to the consolidation of parcel flows, the development of urban distribution focused on hospitality/freshness is a priority (see also brewery LaSenne and the Urban Farm as potential customers). But construction logistics, which builds on the needs of the Brussels Construction Consolidation Centre, also offers excellent opportunities. In contrast, developing urban distribution that focuses on retail or pharma is seen as more challenging. Shaping value added services (which can facilitate the operations of logistics companies on the site), will also help put the TIR centre on the map as a destination for urban logistics.

Developing the circular hub is an important aspect in this regard, but offering a flexible cross-docking platform can lure additional logistics customers. Action 16: focusing on facilitating the connection to the water via a conveyor system for palletised transport can play an important role in improving logistics to and from the site, especially when construction logistics are also envisaged.

Moreover, site safety can be greatly enhanced by allowing only movements for loading and unloading on the site and keeping all employee mobility at the mobility hub. In addition, the central access to the offices ensures safe connection to the offices (see Action 17)



Figure 12 circulation site TIR

In addition, the mobility hub facilitates central parking management (action 18) and can also serve as a central charging point for vans and cargo bikes. A limited loading island may still be envisaged for delivery trucks if capacity requires it. The community manager will play an important role in coordinating mobility and logistics policies on and around the site.

Nature

In the nature theme, achieving the ambition of achieving a minimum level of greening of 10% is the most important aspect. Action 19 includes drawing up a planting and depaving plan. The focus of the greening here is regional greenery.

Making water management more sustainable

To start a water community, a clear view of the current pipelines is necessary, as well as a sizing study to further shape the potential flows for the water community. This is explained in Action 20.

Making energy flows more sustainable

The first steps here are to make a preliminary study to select the types of technologies and to connect with the Bpost mobility hub or loading island (action 21). The TIR site also has the potential to connect to the heat grid in Brussels or build its own heat and power supply through a CHP. The site can be made more self-sufficient by expanding renewable energy production there, through additional solar panels or by envisaging hydrogen (with CHP) applications.

Materials

Actions 22-25 in theme 9 address the use of sustainable materials in the renovations, finding a use for the dismantled materials and using them as building materials for the SIAMU barracks. This can be facilitated by, for example, a kind of materials registry for the TIR centre, which describes all the materials that will be brought in and taken out of the TIR project and incorporated into a demolition monitoring plan with an asbestos inventory.

Conclusion

This development plan seeks to address the challenges and ambitions for the transformation of the TIR centre into a veritable urban distribution centre. The proposed synthesis scenario offers an optimal mix of spaces for logistics activities (both large and smaller users), circular economy (studio spaces) and a business centre with shared facilities. The redevelopment offers opportunities to develop a real ecosystem, with users collaborating around integrated water management, energy production and consumption, and urban distribution (including reverse logistics). Urban agriculture and facilities for neighbourhood residents (sports facilities, nursery) can also find a place here, based on a more in-depth analysis of real needs and a participatory process with the neighbourhood. Central parking management through a mobility hub, with facilities such as electric charging stations and shared vehicles, will make it possible to reorganise internal circulation at the TIR site and the depaving and greening of a central square. To shape the TIR ecosystem, a community manager can act as a central point of contact to form the connection between the Port and TIR users. Ultimately, the TIR centre can become a bimodal urban distribution centre, by connecting to the waterway via a conveyor system.

The proposed development plan and action plan (25 actions) are building blocks to work step by step toward the goal of a sustainable logistics centre for urban distribution. Going through all the actions will take at least 5 years and require various forms of expertise that can be found within the Port and among its stakeholders, complemented by external financial and legal expertise.

For the implementation of the development vision and the elaboration of a PPP construction, it is proposed to start with the following 2 actions:

Action 1 - appoint a project manager (internal or external). Put together a project team with legal, economic and technical expertise. Given the difficulty of this project, it is necessary to work with experts: they will initiate and drive top-down dynamics for the implementation of the development vision, and set up control mechanisms to monitor implementation.

Action 2 addresses the legal/financial structure of the project and the finetuning of the programme of development. Different degrees of collaboration and phasing are possible here. A market survey with the private sector can provide more insight into the form and modalities of PPP cooperation that market parties are open to.