

A solutions
landscape for

Guadalajara

Mexico

The Urban Infrastructure Initiative – UII



wbcsd urban

Introduction

A group of experts from leading global businesses worked with officials from Guadalajara, Mexico, to develop a strategic plan for sustainable infrastructure for the city.

The companies are part of the Urban Infrastructure Initiative (UII), a unique project which provides multi-sector expertise to help transform a city's sustainability vision into effective action plans. In Guadalajara, five companies (ACCIONA, CEMEX, GDF SUEZ, Schneider Electric and Siemens) that are active in energy, materials, technology, transport and construction came together to propose practical solutions to the key challenges the city faces.

The UII team, made of local experts from each of the companies, proposed a catalogue of solutions which recognize the integrated nature of sustainability. The UII team, made by local experts from each of the companies, proposed a catalogue of solutions which recognize the integrated nature of sustainability. The local background of the professionals involved during the process ensured a deep understanding of the context and challenges that the city was facing and the possibility to move further into detailed solutions of immediate implementation. Specific measures include improving mobility, reducing violence and insecurity, revitalizing the historical center and transforming solid urban waste management. This document summarizes the proposals the UII team has delivered to the city.

The team created these solutions based on a series of workshops held in Guadalajara between June and July 2012. The workshops addressed key opportunities to tackle the city's sustainability challenges, plans and priorities –“the issues landscape” –which the UII team and city officials had identified in a previous dialogue.

Collaborating with city officials, as well as other stakeholders active in Guadalajara's urban development, demonstrated the value of incorporating early business input into the city's thinking. This enabled city representatives to consider a variety of ideas, and to engage with businesses collectively in a broad context –rather than just in relation to specific tenders.

Guadalajara is the first Mexican city to work with the UII. However, many of the specific solutions proposed in this document could be applied to other Latin American cities. They could also help other rapidly developing countries which are facing metropolitan-scale challenges, such as hurried, unplanned urban expansion and infrastructure under increasing pressure.



Guadalajara – plans for sustainable infrastructure

Guadalajara is Mexico’s second largest city, capital of the State of Jalisco and seat of the Municipality of Guadalajara. The Guadalajara Metropolitan Area includes six adjacent municipalities and has a total population more than 4.4 million. City officials have a vision to transform the city into a modern, sustainable metropolis that offers a high quality of life.

Guadalajara is experiencing the same challenges as other large urban Latin-American areas. For example, traffic congestion, insecurity, land use policies and waste disposal directly affect most of its inhabitants.

In addition, rapidly growing urban sprawl has put excessive pressure on existing infrastructure. This has adversely impacted everything from the quality of public transport to road networks, buildings, public spaces and waste disposal.

The impacts also go beyond purely environmental concerns to problems such as insecurity.

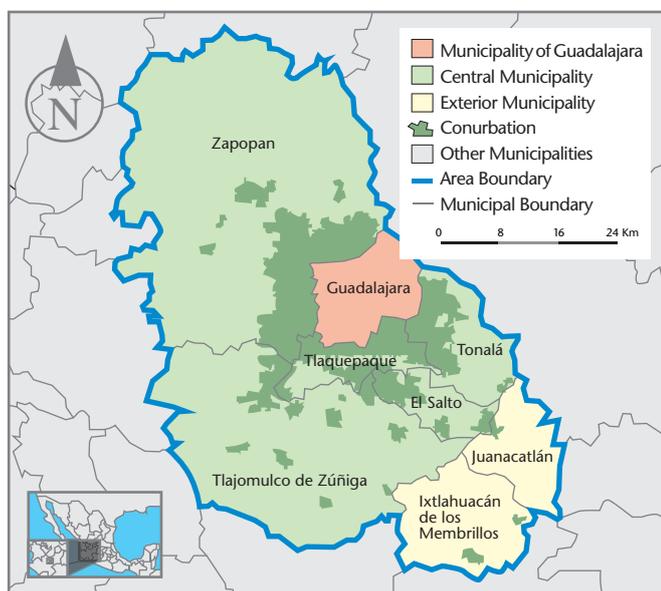
The city wants to use its influence on municipalities in the entire metropolitan area to invigorate and channel efforts toward an integrated and rejuvenated Guadalajara. However, the scale of the challenges at hand points to a clear need for a roadmap, which will guide successive administrations and establish the continuity needed to transform the city.

Figure 1: Population, density and area in Guadalajara’s Metropolitan Area (GMA)

Municipality	Population (hab)	Area (km ²)	Density (hab/km ²)
Guadalajara	1,469,140	187.91	7,818.3
Zapopan	1,225,003	893.15	1,371.5
Tlaquepaque	602,729	270.88	2,225.1
Tonalá	471,117	119.58	3,939.7
Tlajomulco de Zúñiga	404,197	636.93	634.6
El Salto	137,629	41.5	3,316.3
Ixtlahuacán de los Membrillos	41,039	184.25	222.7
Juanacatlán	13,215	89.08	14.9
Guadalajara’s Metropolitan Area	4.364.069	2.734	1.596

Source: INEGI 2010

Figure 2: GMA - Guadalajara’s Metropolitan Area



Issues landscape

A dialogue between city officials and the UII identified the key issues to address under the UII engagement. The dialogue identified the main problems that demand the city's attention and defined key areas where business input could help to develop new solutions to transform Guadalajara. These include four broad themes:



Mobility and logistics

The city needs a comprehensive vision to tackle inadequate public transport. The current public transport system encourages increased automobile use, which in turn has saturated insufficient road networks.

Buildings and Housing

Over the last 10 years, Guadalajara has lost more than 200,000 inhabitants to suburban areas. The city center requires repopulating to achieve increased density. As people have moved away, the housing stock in the city center has also deteriorated. In some areas, many homes and buildings are either empty or in poor condition—especially in District 1, the Metropolitan Center.



Security

Guadalajara's citizens share a perception that the city is insecure and has problems with violence. This is the result of multiple and complex factors like poverty, low educational coverage, marginal social benefits, lack of employment and limited local opportunities. In addition, community facilities are inadequate and in poor condition.

Waste

Currently, the city disposes of most waste without recovering any of its inherent value, losing significant potential for value creation. In addition, there is no adequate infrastructure for waste segregation.

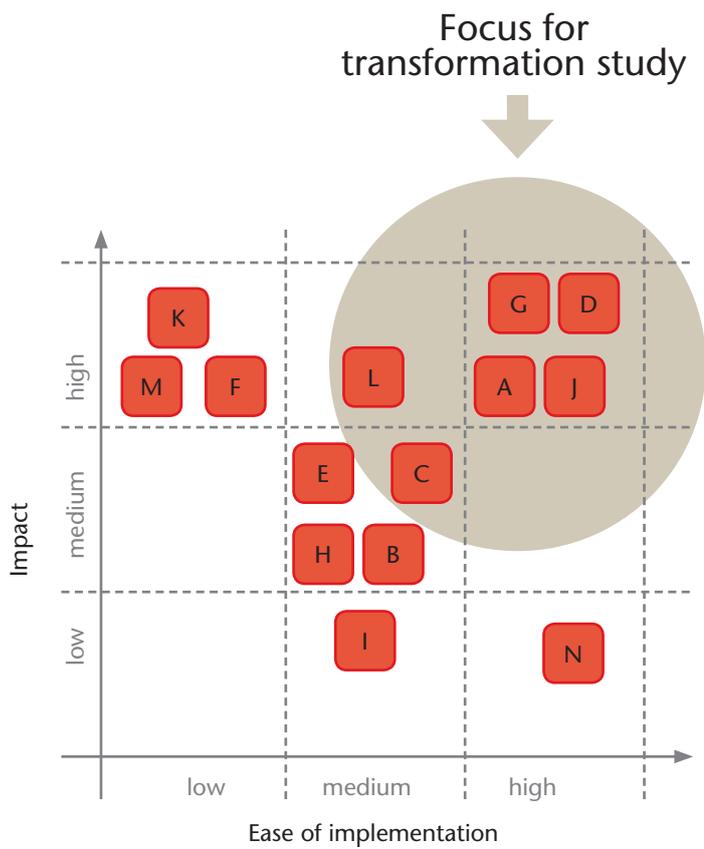


Figure 3: List of identified issues

- | | |
|----------|--------------------------------------|
| A | Mobility. White Book |
| B | Health. Health Growth Plan |
| C | Security. Community Centers |
| D | Buildings. Urban Development Plan |
| E | Buildings. Financing Schemes |
| F | Buildings. Linkage of Municipalities |
| G | Buildings. Repopulate City Centre |
| H | Buildings. Simplify Processes |
| I | Buildings. New Technologies |
| J | Energy and Waste. Biogas |
| K | Energy and Waste. Biodiesel |
| L | Waste. Integral Management |
| M | Water. Rainwater |
| N | Energy. Street Lighting |



Guadalajara... the commitment to sustainable infrastructure

The sustainability of cities cannot be achieved by isolated efforts, but requires the involvement of governments, society and business. Together, we can develop high-impact integrated solutions that generate immediate results for the people.

Guadalajara's transformation requires a modern and sustainable infrastructure program that ensures high quality of life, integrity, and safety. It is with this intention that Guadalajara has developed together with the UII a transformation plan for our city, with a comprehensive, modern and far-reaching vision.

Guadalajara's challenge, being the second largest city in the country with 1.469.000 inhabitants, is a transformation that places us among the most important cities in the world; with a vision and a mission focused on development and innovation, but above all, with one fundamental purpose: to make Guadalajara the best city to live in and enjoy.

Francisco Ayón López
Mayor of Guadalajara (2011-2012)



Solutions landscape

The UII companies and city officials combined their know-how and expertise to develop specific solutions at different levels in each of the four key themes identified.

However, Guadalajara is enormously complex, and city dynamics go beyond its own boundaries to affect other municipalities.

For this reason, the UII defined specific boundaries and worked at different levels to properly address each key themes.

For example, some solutions are related to the historical center of the city, while others address the Municipality of Guadalajara or even the Guadalajara Metropolitan Area.

Collectively, city officials and the UII team identified all intentions and ideas that would help the city move toward the proposed city model. They then grouped them under one of five main objectives:

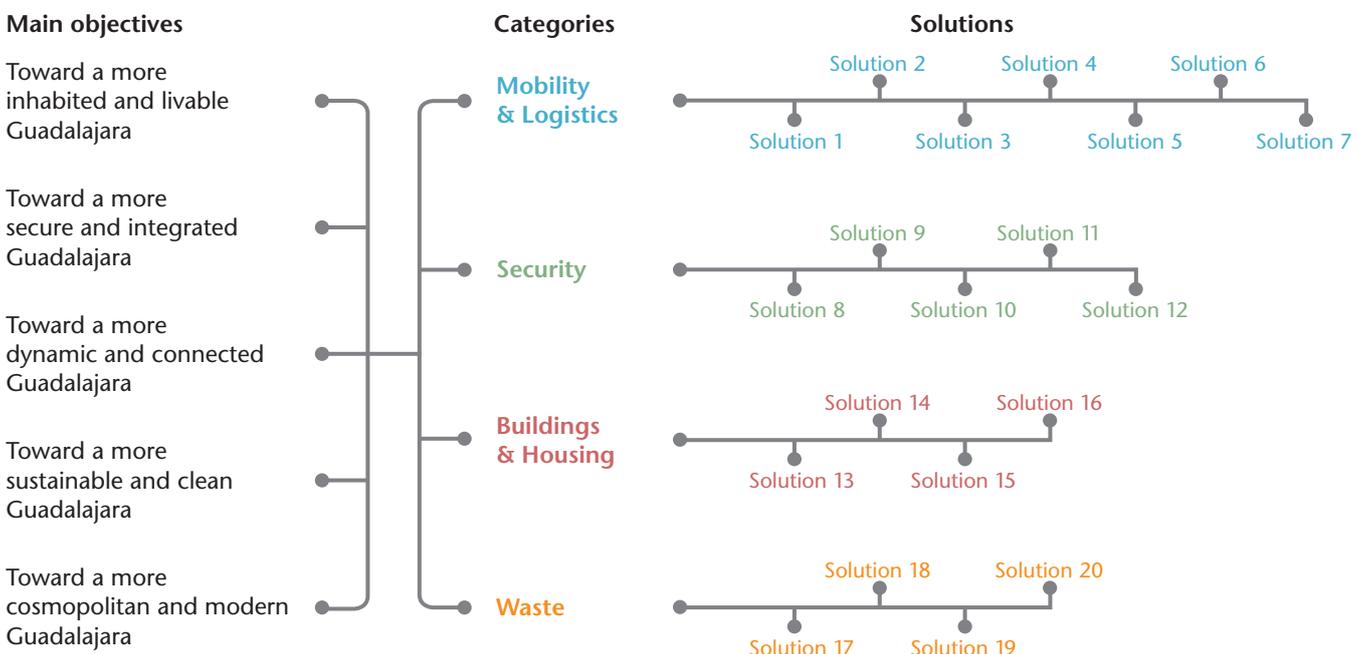
1. Toward a more inhabited and livable Guadalajara;
2. Toward a more secure and integrated Guadalajara;
3. Toward a more dynamic and connected Guadalajara;
4. Toward a more sustainable and clean Guadalajara;
5. Toward a more cosmopolitan and modern Guadalajara.

To accomplish these objectives, the UII team developed specific strategies in each of the four broad themes defined during the initial dialogue with the city (Mobility & Logistics, Security, Buildings & Housing, and Waste). A series of workshops, which dealt with specific problems as well as the whole project, provided a platform to jointly identify action related to each theme. The team then presented distinct initiatives and interventions in all four categories, which the team and the city explored and enriched collectively.

Box 1: 20 solutions for a sustainable Guadalajara

- Solution 1** Optimizing the legal framework and governance
- Solution 2** Creating a pedestrian and cycling network
- Solution 3** Expanding and modernizing the public transport system
- Solution 4** Analyzing optimal transport of goods
- Solution 5** implementing an integrated traffic management system
- Solution 6** Consolidating the existing road network
- Solution 7** Incorporating sustainable technologies into the vehicle fleet
- Solution 8** Creating self-construction programs and self-employment centers (CPAs)
- Solution 9** Transforming existing community centers and developing new centers
- Solution 10** Establishing a citizen participation program- *GuadalajaraConvive*
- Solution 11** Rehabilitating public spaces
- Solution 12** Relocating dwellings in high-Risk areas through a program of low-cost housing
- Solution 13** Setting up adequate zone development plans and regulatory frameworks
- Solution 14** Rehabilitating existing buildings
- Solution 15** Creating new housing in under-populated areas
- Solution 16** Revitalizing public spaces and urban facilities
- Solution 17** Segregating solid urban waste
- Solution 18** Using organic waste
- Solution 19** Treating construction and demolition debris
- Solution 20** Monitoring leachate contamination

Figure 4: Main objectives and categories





Mobility & Logistics Solutions

Guadalajara’s transport system needs to adapt to the city’s dynamic growth.

With economic and social activities increasingly spread throughout the city, daily commuting from the periphery to the center has substantially increased. As a result, mobility costs citizens more and more – in both time and money.

However, the lack of a comprehensive transport plan and the absence of a centralized technical body to support decision making limits the impact of individual mobility projects in the city.

While public transport supports some 2.8M journeys per day, a sub-optimal transport structure leads to an oversupply of service and overlapping routes. For example, 187 public bus routes go through the center of the city.

In the meantime, over the past 50 years, the number of private cars in the city has jumped 10,000%. This has saturated road infrastructure, creating traffic jams and high levels of pollution.

City targets are to reduce the share of individual transport, especially automobiles, by almost 25% by 2025 (from 27.7% in 2007 to 21.0% in 2025) and transfer this travels to collective and non-motorized transport; mainly public transport (5.9% increase by 2025) and bicycles (1.8% increase by 2025).

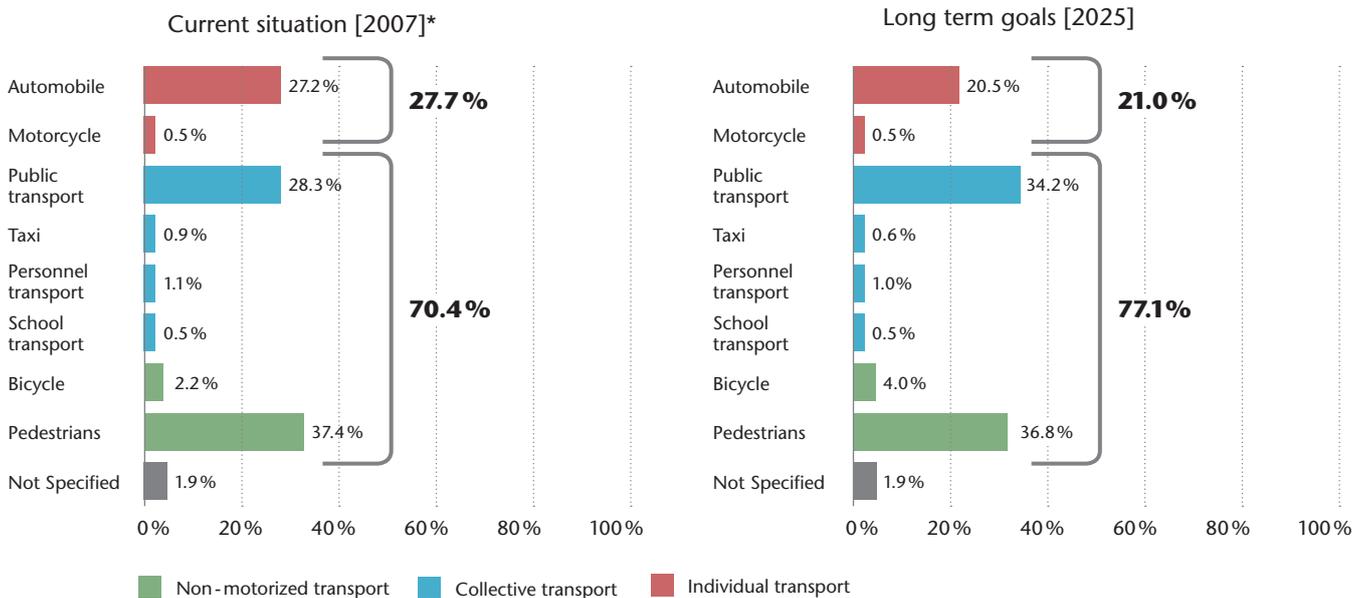
At the same time, existing conditions such as high speed roads, overpasses and frequent bus stops make cycling in the metropolitan area difficult. Guadalajara has 15 kilometers of bike lanes, but lacks a comprehensive strategy to include bicycles as a viable mode of transport in the city.

Mobility & logistics targets

Guadalajara needs to think about the mobility of the city as a whole, integrating existing studies and projects into a single vision for the entire transport system.

Mobility & logistics targets		2012	2025
Mobility & Logistics	Cyclists Tracks	15,5 km	122,0 km
	New Roads		45,5 km
	Conflictive Intersections at Existing Concentric Rings	13	0
	Bus Rapid Transit [BRT] operating with hybrid engines [50% diesel + 50% CNG]	0 of 47	100%
	Public Transport Buses operating with hybrid engines [50% diesel + 50% CNG]	0 of 4,500	100%

Figure 5: Travel distribution goals per person in the Guadalajara Metropolitan Area (GMA)



* Source: SEDEUR/OCOIT/CEIT/AU/IMO, based on results from EDMD, 2007

Solution 1 – Optimizing the Legal Framework and Governance

Designating an organization, which would act as the technical agency for the State Council of Roads, Traffic and Transportation would fill a gap in the current governance structure. This would:

- Create one organization with the authority to give advice and technical support on mobility.
- Establish one organization as the official source of information for the entire metropolitan area.
- Designate this organization as the body responsible for all technical studies and analyses to support decision making.
- Ensure one organization is responsible for developing the overall mobility strategy for the city.
- Planning and provision for Economically Weaker Section (EWS) housing.

Considerations

- The recently-created Metropolitan Planning Institute could play this role, complementing the existing structure in a very appropriate way.

Scope

- Guadalajara's Metropolitan Area



Solution 2 – Creating a Pedestrian and Cycling Network

A pedestrian and bicycle network would promote non-motorized transport, helping to stop the current trend of increased car use. Interventions include:

- A plan to execute existing preferential accessibility.
- Projects that prioritize restricted traffic and pedestrian areas.
- Specific actions to promote bicycle transport.
- A proposal to progressively implement traffic lanes exclusively for bikes.

Considerations

- The city has recently designed a plan for non-motorized mobility, but execution has not yet started.

Scope

- Municipality of Guadalajara



Solution 3 – Expanding and Modernizing the Public Transport System

Modernizing the Public Transport System for Guadalajara’s Metropolitan Area would allow coordinated measures to increase daily trips per person on public transport. The main actions to be included in the proposed plan are:

- Validating the mobility corridors selected for construction.
- Reorganizing bus routes.
- Defining service characteristics and vehicle type.
- Developing and expanding Light Rail and BRT (Bus Rapid Transit) routes.
- Integrating all public transport operations such as high density residential or business centers, will help to increase the use of Metro Rail and BRT.

Considerations

- There are numerous proposals and projects for public transport systems, but an articulated and comprehensive vision is lacking.

Scope

- Guadalajara’s Metropolitan Area



Solution 4 – Analyzing Optimal Transport of Goods

Developing a logistics management plan for heavy traffic in Guadalajara’s metropolitan area would improve integration of existing traffic flows. It would also enable coordinated projects to optimize the dynamics of freight movement—particularly when those movements involve the city’s main access roads. The main contents of this proposal include:

- Diagnosing and characterizing the current situation.
- Developing a system model.
- Forecasting traffic flow.
- Developing strategies and projects.
- Evaluating the economics.

Considerations

- The most recent studies on perishable goods flows for Guadalajara’s Metropolitan Area were conducted in 2000. Distribution patterns and intensity rates have likely changed over time and should be revised and updated.

Scope

- Guadalajara’s Metropolitan Area



Solution 5 – Implementing an Integrated Traffic Management System

A centralized traffic management system improves the utilization of road infrastructure. It also benefits the environment and reduces pollutants. The main requirements are:

- Identifying main existing road network.
- Developing a general conceptual scheme consisting of 3 concentric rings and two parallel traffic lanes (North-South and East-West) to optimize existing road network and expedite movements to the city center.
- Identifying problematic junctions and complex areas in need of detailed studies in each of the proposed concentric rings and parallel traffic lanes.
- Proposing action plans for the execution of the necessary works at each of the identified roads.
- Preventing accidents planning, land-use and code enforcement, and transport planning.

Considerations

- The city has already installed equipment in a wide area. This can be updated and integrated into a new traffic management system.

Scope

- Municipality of Guadalajara



Solution 6 – Consolidating the Existing Road Network

Consolidating and centrally managing the city's main road structure would generate more agile and continuous traffic.

Identifying the main existing routes and creating a conceptual scheme is the first step towards the creation of a comprehensive road network.

Studies that were developed as part of this proposal include:

- Identifying the main existing road network.
- Developing a general conceptual scheme consisting of 3 concentric rings and two parallel traffic lanes (North-South and East-West) to optimize existing road network and expedite movements to the city center.
- Identifying problematic junctions and complex areas in need of detailed studies in each of the proposed concentric rings and parallel traffic lanes.
- Proposing action plans for the execution of the necessary works at each of the identified roads.

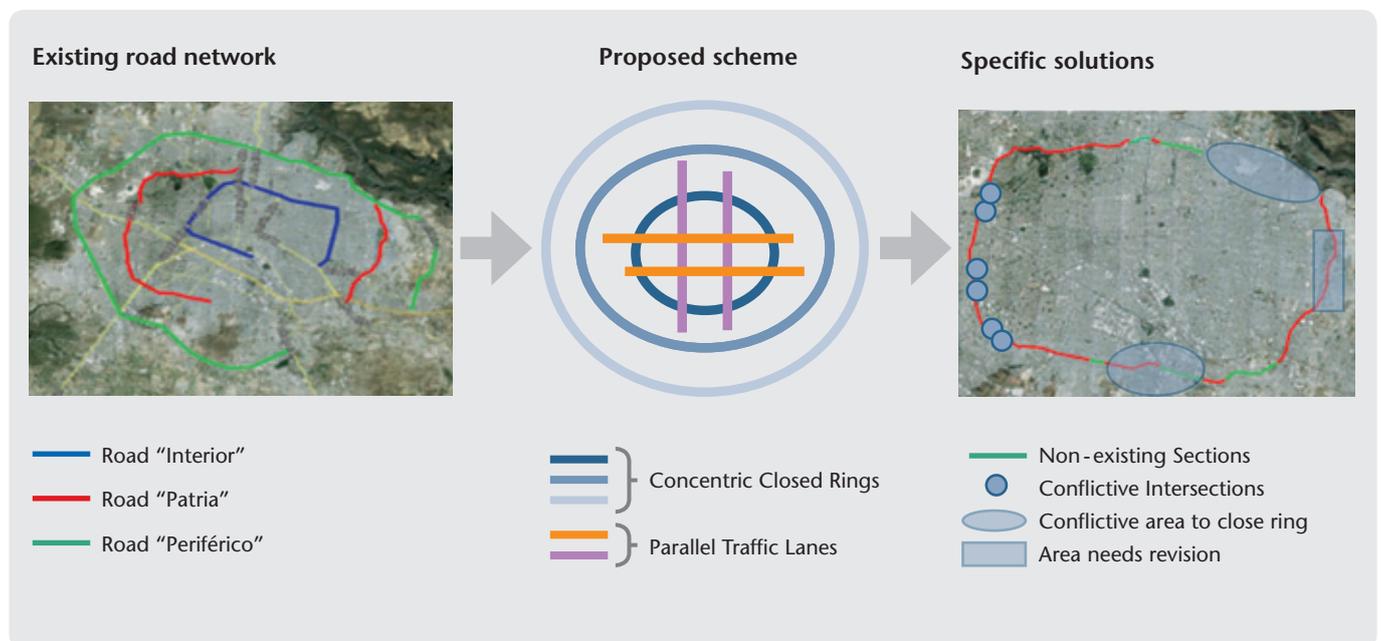
Considerations

- Developing new and refurbished road works provides an opportunity to develop new products and solutions that reduce transport impacts.

Scope

- Guadalajara's Metropolitan Area

Figure 6: Steps taken towards the consolidation of the existing road network.



Solution 7 – Incorporating Sustainable Technologies into the Vehicle Fleet

The city can reduce vehicle emissions and pollution by substituting fossil fuels. This proposal aims for 50% substitution by converting to hybrid vehicles, which would operate with 50% diesel and 50% compressed natural gas.

This transformation would take place via the following steps:

- Articulated trucks / BRT.
- Mass transit vehicles.
- Vehicles for transport of goods.
- Private vehicles.

Considerations

- During a second phase, the acquisition of all new units, either as replacements or for new routes, would be compressed natural gas vehicles.

Scope

- Guadalajara's Metropolitan Area





Security targets

A high perception of insecurity and violence blights the city.

Approximately 60% of the population considers most public spaces safe during the day. At night, however, 72% of the population thinks those same spaces are very unsafe.

As a preventive strategy, the city supports a network of Community Centers, which are located in the most disadvantaged areas. These Community Centers provide tools and programs to improve community cohesion and promote social development. However, the current physical infrastructure of most Community Centers is insufficient and in poor condition.

In addition, there is a growing demand for housing for poorer groups of people, and this is exacerbated by the need for improvements and extensions to existing dwellings. Today, a third of the population of the Municipality of Guadalajara live in dwellings that are either too small or of poor quality.

In addition, more than 52,000 people—representing about 13,500 homes—live in overcrowded dwellings or buildings that are in poor condition and/or lack basic services such as potable water and electricity.

Security Targets

Guadalajara wants to mitigate insecurity and violence through social investment, which directly and substantially improves quality of life—providing opportunities for children, young people and families who are vulnerable or at risk. As part of this program, it is particularly important to tackle poor housing in some suburban areas.

	Security targets	2012	2025
Security	Self-Employment Centers/Number of Improved or Expanded Homes	→	24 / 5,760
	Improved Existing Community Centers	→ 0 of 24	100%
	New Community Centers/Number of citizens benefited from its activities	→	4 / 60,000 hab
	Parks and public spaces rehabilitated	→ 0 of 7	100%
	Relocated Dwellings from Flood-prone Areas	→	9,000 units



Solution 8 – Creating Self-Construction Programs and Self-Employment Centers (CPAs*)

Collaboration is key to fighting poverty and housing scarcity. Through Self-Employment Centers (CPAs), an estimated 20 families per month could improve their financial situation and produce materials for the construction or extension of their homes.

Additionally, Self-Construction Programs could teach families the skills and knowledge needed to build, improve and/or expand their homes.

* CPAs “Centros Productivos de Autoempleo”

Considerations

- This concept would involve students and young professionals in the fields of Social Sciences, Civil Engineering and Architecture. The students would provide technical advice to families participating in the CPAs, and their participation would contribute to their educational or professional requirements.

Scope

- Municipality of Guadalajara

Solution 9 – Community Centers

Community Centers fight insecurity and violence through preventive strategies that provide knowledge, skills and opportunities. They also enable people to participate in economic and social activities and achieve a decent life.

Improving existing infrastructure, while creating new community centers in the most marginalized areas would improve and strengthen this important support network.

Considerations

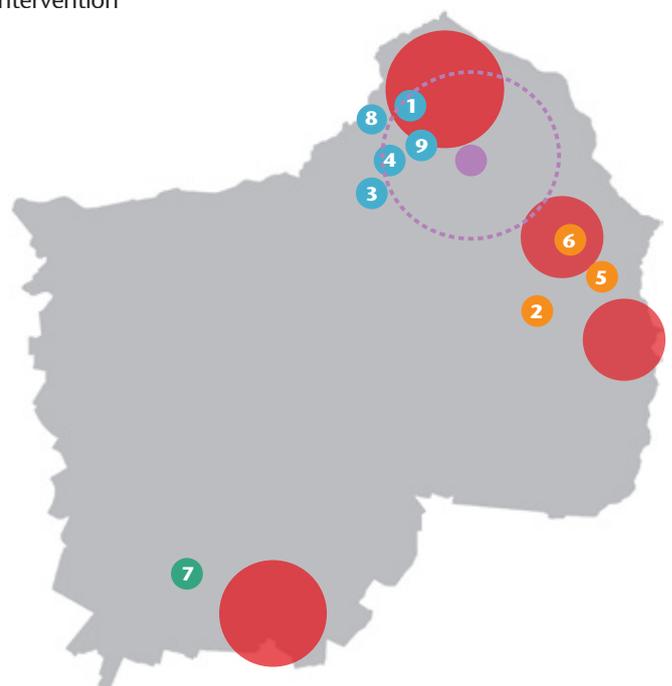
- To improve the social impact of such centers, the program would integrate a community education program. This would include educational, artistic, cultural and sporting activities that promote social and productive capacities.

Scope

- Municipality of Guadalajara

Figure 7: Priority community centers identified for intervention

- | | |
|---|-----------------------------|
| 1 | Lomas del Paraíso |
| 2 | Balcones de Oblatos |
| 3 | Independencia INFONAVIT |
| 4 | Rancho Nuevo |
| 5 | Heliodoro Hernández Loza |
| 6 | Tetlan Río Verde |
| 7 | Polanco Oriente (Ágora) |
| 8 | El Jagüey |
| 9 | Plaza Vecinal Independencia |
-
- Zone 3 Huentitan
 - Zone 4 Oblatos
 - Zone 7 Cruz del Sur
 - Areas with higher insecurity risk
 - Proposed location for a new community center (El Verde, El Planetario)
 - Influence area



Solution 10 – Establishing a Citizen Participation Program - *GuadalajaraConvive*

An organized, active civil society, in which citizens assume responsibility, helps develop strong legal and justice systems. It also helps develop strong citizenship.

A series of proposals would encourage the active participation of inhabitants both from the municipality and Guadalajara’s Metropolitan Area in projects to strengthen citizens’ skills and the social fabric. These projects include:

- Mapping and creating a directory for formal and informal civil society organizations.
- Establishing a platform for interaction among civil society organizations and the general public.
- Creating an Annual Citizens’ Summit to promote dialogue and agreement on a common agenda – with a shared vision for the city of Guadalajara.

Considerations

- The 1st Annual Citizens’ Summit for a Peaceful and Just Mexico, which took place in Mexico City in May 2012 constitutes a good precedent and reference for the development of a local event for the city of Guadalajara.

Scope

- Municipality of Guadalajara



Solution 11 – Rehabilitating public spaces

The quality of public spaces is shaped primarily by physical infrastructure (environmental characteristics) and the intensity of the social relationships that develop there (social characteristics).

This program would aim to revive areas that are neglected, deteriorated and scarcely used, and to reintegrate them into the structure of the both city and greater society.

The proposal includes different levels of intervention and identifies the priority public spaces to be tackled.

Considerations

- Citizens and civil associations should be involved in conserving and maintaining public recreational spaces in their neighborhoods.

Scope

- Municipality of Guadalajara

Figure 8: Rehabilitation of relevant public spaces

- | | |
|-----------|-------------------------|
| 1 | Bosque los Colomos |
| 2 | Barranca de Huentitán |
| 3 | Parque Rehilete Alcalde |
| 4 | Parque Agua Azul |
| 5 | Parque González Gallo |
| 6 | Parque Rubén Darío |
| 7 | Parque Morelos |
| 8 | Parque Ávila Camacho |
| 9 | Parque San Rafael |
| 10 | Parque El Dean |

- Protected natural parks
- Rehabilitated public spaces
- Public spaces that need rehabilitation



Solution 12 – Relocating Dwellings in High-Risk Areas Through a Program of Low-Cost Housing

The areas at greatest risk in the city are those likely to experience severe flooding during the rainy season. Relocating families living in these areas can prevent hazardous situations and mitigate the impact of natural disasters.

The UII recommends to gradually relocate these families at a rate of between 500 and 1,000 homes annually through a program of low-cost housing.

Considerations

- Low-cost housing schemes proposed considered basic dwellings with the capacity to gradually expand through self-construction systems; creating a link between this solution and solution 8 (Creating self-construction programs and self-employment centers).

Scope

- Municipality of Guadalajara

Figure 9: Priority areas for housing relocation

Settlement in risk area	Number of dwellings
1 Lomas del Paraíso	3,257
2 Tetlán Río Verde	5,998
3 El Zalate	3,442
4 La Campesina	1,527
5 El Retiro	4,056
6 Las Conchas	2,803
7 San Carlos	2,853
8 Quinta Velarde	2,549
9 El Dean	1,250





Building and housing targets

Over the last 10 years, Guadalajara has lost more than 200,000 people to the suburbs. The city needs higher population density to avoid under-populated areas and revitalize the city center.

The lack of available land in Guadalajara has sparked a debate about the need to develop vertically. However, there is no tradition of high-rise blocks in the region and therefore, little acceptance. Currently the city has about 370,000 houses, of which 315,000 are detached houses of 1 or 2 storeys.

The most tangible evidence of disrepair and depopulation appears in the central district (District 1 Metropolitan Center). In this area, 30% of properties are empty and an even higher percentage is in disrepair because they are occupied by people with very low incomes who cannot afford basic maintenance.

Furthermore, the city's needs—both in terms of constructing new homes and refurbishing existing buildings—provides a unique opportunity to address and introduce energy efficiency and related sustainability requirements into the city's building stock.

Buildings and housing targets

Guadalajara aims to reduce the current housing shortage, which is estimated at more than 100,000 units. The city requires social and middle class housing in areas with good accessibility and services.

In addition, the city plans to rehabilitate its existing building block in a smart way. This will take advantage of existing building space, while adding new interrelations between public and private space and promoting a mix of land uses, along with complementary economic activities to enrich the urban outline.

Guadalajara also has more than 11,000 empty plots, which are currently not fit for building and are not attractive to investors. The city plans to take advantage of part this land stock and use it to repopulate the city center.

Buildings and housing targets		2012	2025
Buildings and housing targets	Inhabitants of the Municipality of Guadalajara	1,500,000 hab	1,650,000 hab
	Occupied Dwellings	382,000 units	432,000 units
	Empty Plots	18,100	9,000
	Green & Open Space	555 ha	666 ha
	Maximum Distance to Public Park or Green Space	4 km	1 km



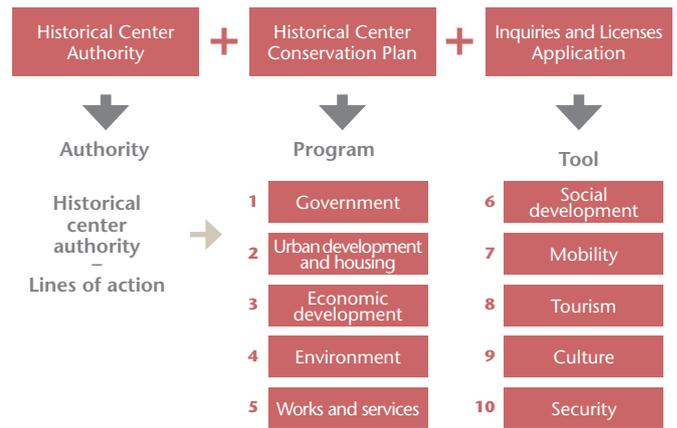
Solution 13 – Setting Up Adequate Zone Development Plans and Regulatory Frameworks

Before renewing the historic urban center, the city needs to establish rules and enforcement processes to improve the accuracy and certainty under the current regulations.

To restore urban, social and economic balance in the historical center, the city must first create an instrument to integrate all resources and powers in the area. The proposed interventions would create three coordinated elements:

- Authority: Establish an independent body to support government activities in the historic center of the city where all public administration departments would be concentrated.
- Program: Create a plan that integrates all systems and establishes guidelines for implementation.
- Tool: Develop an application that rapidly and efficiently processes inquiries, licensing and other paperwork.

Figure 10: Proposed structure and lines of action for the Historical Center Authority



Considerations

- Other cities, including Mexico City, have already implemented these types of initiatives with great success.

Scope

- Inner City (District 1 Metropolitan Center)

Solution 14 – Rehabilitating Existing Buildings

Smart rehabilitation would take advantage of the existing building stock and avoid expensive new buildings. It would restore buildings of high heritage and symbolic value and revitalize areas currently suffering from a high proportion of empty properties. It would also establish requirements and introduce new technologies and solutions to improve building performance and conserve resources (i.e. energy, water).

Proposed measures include:

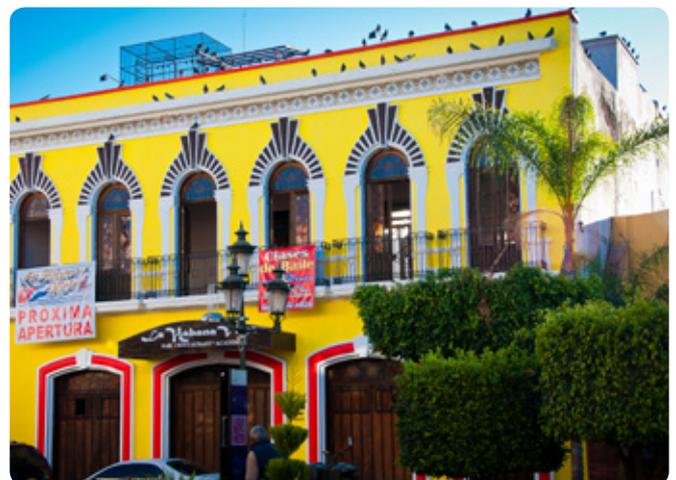
- Updating and completing the catalogue of existing buildings.
- Easing legal and administrative processes for changing building use.
- Creating economic incentives for all stakeholders to encourage investment.
- Adding specifications/requirements to improve energy efficiency.
- Establishing measures to conserve rehabilitated buildings and ensure they stay in good condition.

Considerations

- It is important that citizens identify with the city and that mechanisms exist to integrate owners into the process of building rehabilitation.

Scope

- Inner City (District 1 Metropolitan Center)



Solution 15 – Creating New Housing in Under-Populated Areas

The city should aim to increase population density in areas that already have adequate infrastructure services. Existing urban spaces and properties that have either been abandoned or underused provide the main opportunities to do this. This initiative identified:

- Areas of greatest potential for high-rise housing.
- Suitable housing prototypes, adapted to the requirements of the 21st century.
- Incentives that can be used to foster use and reuse of land.
- Distinctive, sustainable features that new construction should include.

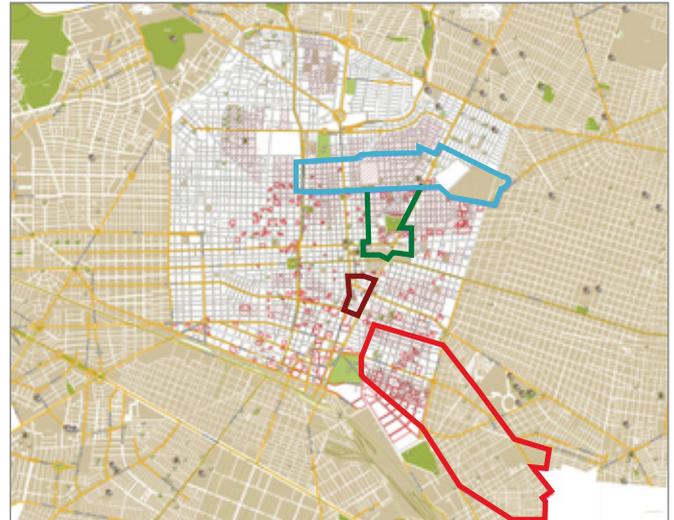
Considerations

- The city must update existing urban regulations to allow high-rise projects.

Scope

- Inner City (District 1 Metropolitan Center)

Figure 11: Areas with greatest potential for high-rise housing



1 Health Area

2 Parque Morelos – Plaza Tapatía Area

3 Main Station Area

4 González Gallo – García Barragán Area

Solution 16 – Revitalizing public spaces and urban facilities

Proper regulation of public spaces stops abuses and solves the problems associated with inappropriate use of squares and parks. Creating a regulation for the use of public spaces would also promote popular culture and local traditions.

The following interventions are proposed:

- Improving basic urban facilities such as public toilets, street furniture and street signage.
- Regulating and organizing informal commerce.
- Increasing public spaces by using small existing residual lots.
- Promoting projects to manage underused religious and cultural facilities.

Considerations

- It is important to raise community awareness of the abuse of spaces which, in the end, are community-owned.

Scope

- Inner City (District 1 Metropolitan Center)





Waste targets

With an average of 1.2 kg per capita of waste per day, Guadalajara has one of the highest rates of waste generation in the country.

More than 5,800 tons of waste are generated each day in the metropolitan area - 80% of all the urban solid waste in the State of Jalisco. The Municipality of Guadalajara by itself generates an estimated 1,800 to 2,000 tons of urban solid waste a day.

Additionally, the Municipality of Guadalajara generates an estimated 150m³ of construction waste every day. This waste is unavoidably dumped at unsuitable locations, because the State of Jalisco has no authorized sites for the disposal of such waste.

The city has begun to separate waste in the collection process, but concession companies do not have adequate infrastructure to achieve optimum recovery rates. Currently, only 5% of inorganic waste is recycled and only 0.05% of organic waste in the municipality is reused through composting.

Waste targets

Guadalajara is aware of the dimension of the problem and the negative impact it has on the environment. The authorities have recently permitted the current landfill to expand to an adjacent area in a bid to extend the lifetime of the landfill by 10 years.

In addition, the city aims to reduce the volume of waste to be disposed in landfill—while restoring and retrofitting existing facilities to make better use of the waste. In order to achieve significant results, the city must develop an integrated solution with multiple interventions throughout the entire waste flow.

Waste targets		2012	2025
Waste	Total Waste Diverted from Landfill	0,5 %	65 %
	Organic Waste Used as Compost	1 ton / day	850 ton / day
	Electricity Generated Using Biogas	0 kWh	645,000 kWh*
	Construction & Demolition Debris Properly Treated and Valorized	0 m ³ / day	150 m ³ / day
	Lifespan of Existing Landfill	17 years	57 years

*Energy Supply for 844 Dwellings



Solution 17 – Segregating Solid Urban Waste

A solid urban waste segregation plant would provide wide-ranging benefits. Concessionaires would likely improve their profitability, while sending less waste to landfill.

This proposal requires several studies:

- Analyzing the location of the segregation plant.
- Analyzing the segregation plant's economic viability.
- Studying the feasibility of using the rejected waste as recovered fuel.
- Identifying the basic equipment required.

Considerations

- The UII team has contacted the concessionaire, who has expressed both an interest and a willingness to move toward a solution beneficial to all parties.

Scope

- Guadalajara's Metropolitan Area

Solution 18 – Using Organic Waste

A composting and electricity-generating plant would reduce the volume of solid waste going to landfill. It would also provide environmental, economic and social benefits for the municipality.

This proposal requires the following studies:

- Analyzing organic waste sources and separation rates.
- Sizing the plant.
- Analyzing possible locations.
- Conducting market and investment research.
- Determining how to best use the electricity generated.

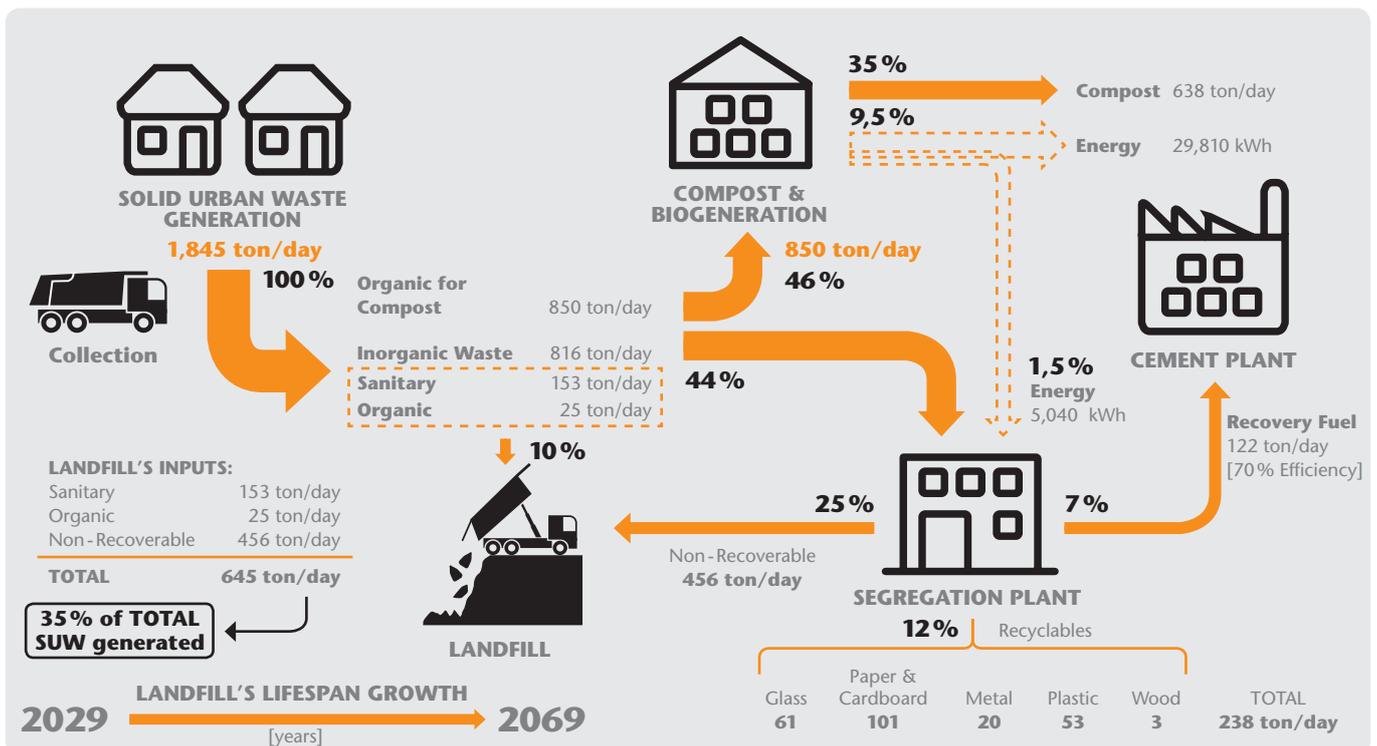
Considerations

- Currently the concessionaire owns a small-scale facility, which is not operating at 100% capacity.

Scope

- Guadalajara's Metropolitan Area

Figure 12: Valorization and utilization of Solid Urban Waste (SUW)



Solution 19 – Treating Construction and Demolition Debris

Proper treatment of construction and demolition debris enables the use of energy and material, while generating a very positive impact on the environment.

The first steps in formulating a plan for the proper disposal and containment of construction and demolition debris are:

- Diagnosing the current situation.
- Evaluating alternative material recycling schemes.
- Analyzing the possible location and the availability of the property.
- Listing requirements to process the permits.

Considerations

- Currently, no city in the State of Jalisco has regulated sites for the disposal of construction and demolition debris.

Scope

- Guadalajara’s Metropolitan Area.

Figure 13: Proposed location for treatment of construction and demolition debris



● Aggregate quarry of Poncitlan

Solution 20 – Monitoring Leachate Contamination

A thorough assessment of the impacts of leachates from landfill would end the current uncertainty and prevent a possible source of soil and water contamination.

The three main requirements are:

- Developing a monitoring and management plan.
- Defining the concession companies’ proper operations for managing and controlling leachate.
- Determining how to best use the electricity generated.

Considerations

- Currently the concessionaire owns a small-scale facility, which is not operating at 100% capacity.

Scope

- Guadalajara’s Metropolitan Area.

Integrated Solutions

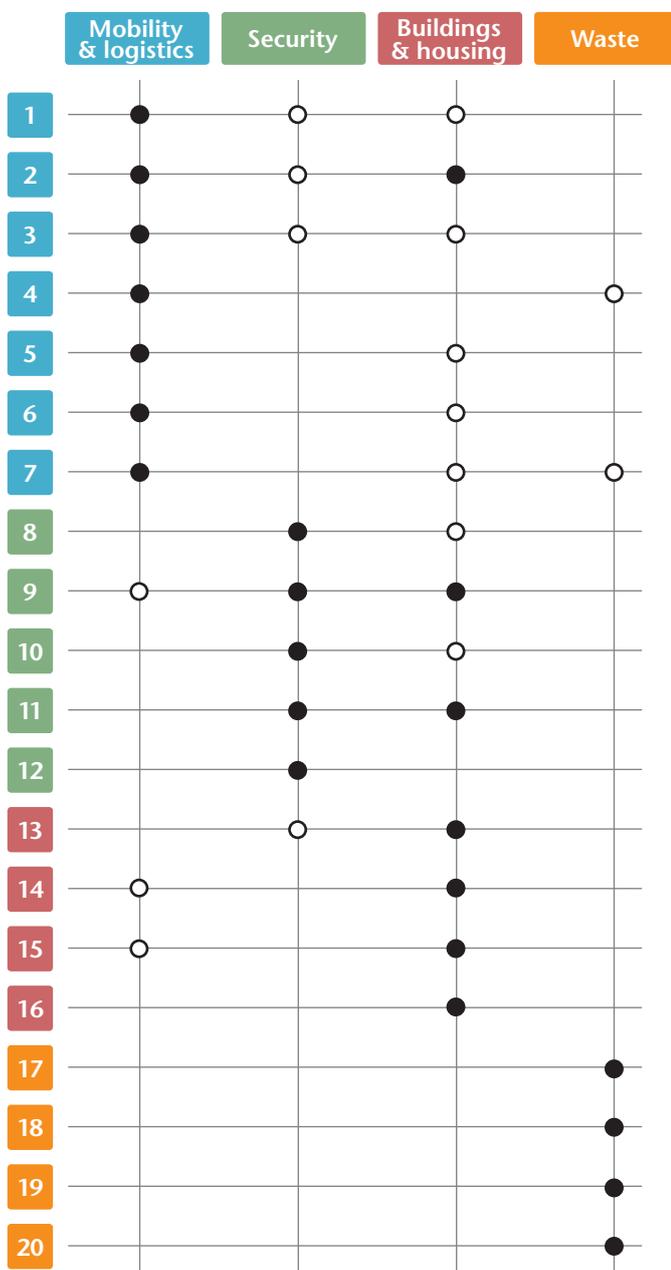
Using cross-sector expertise to turn Guadalajara’s vision into action.

The different challenges the city faces require tailor-made strategies that recognize the interconnections among these challenges. That’s why the UII developed all proposals using an integrated approach—with a system-wide view from the very start.

This approach generated cross-cutting solutions which not only respond to specific topics, but also tackle other issues

that either directly or indirectly contribute to the city’s overall transformation. The chart below shows both the direct and indirect contribution that each proposed solution makes.

Figure 14: Transversal approach of the proposed UII solutions



- Solution 1** Optimizing the legal framework and governance
- Solution 2** Creating a pedestrian and cycling network
- Solution 3** Expanding and modernizing the public transport system
- Solution 4** Analyzing optimal transport of goods
- Solution 5** implementing an integrated traffic management system
- Solution 6** Consolidating the existing road network
- Solution 7** Incorporating sustainable technologies into the vehicle fleet
- Solution 8** Creating self-construction programs and self-employment centers (CPAs)
- Solution 9** Transforming existing community centers and developing new centers
- Solution 10** Establishing a citizen participation program - *GuadalajaraConvive*
- Solution 11** Rehabilitating public spaces
- Solution 12** Relocating dwellings in high-Risk areas through a program of low-cost housing
- Solution 13** Setting up adequate zone development plans and regulatory frameworks
- Solution 14** Rehabilitating existing buildings
- Solution 15** Creating new housing in under-populated areas
- Solution 16** Revitalizing public spaces and urban facilities
- Solution 17** Segregating solid urban waste
- Solution 18** Using organic waste
- Solution 19** Treating construction and demolition debris
- Solution 20** Monitoring leachate contamination

● Direct contribution
○ Indirect contribution

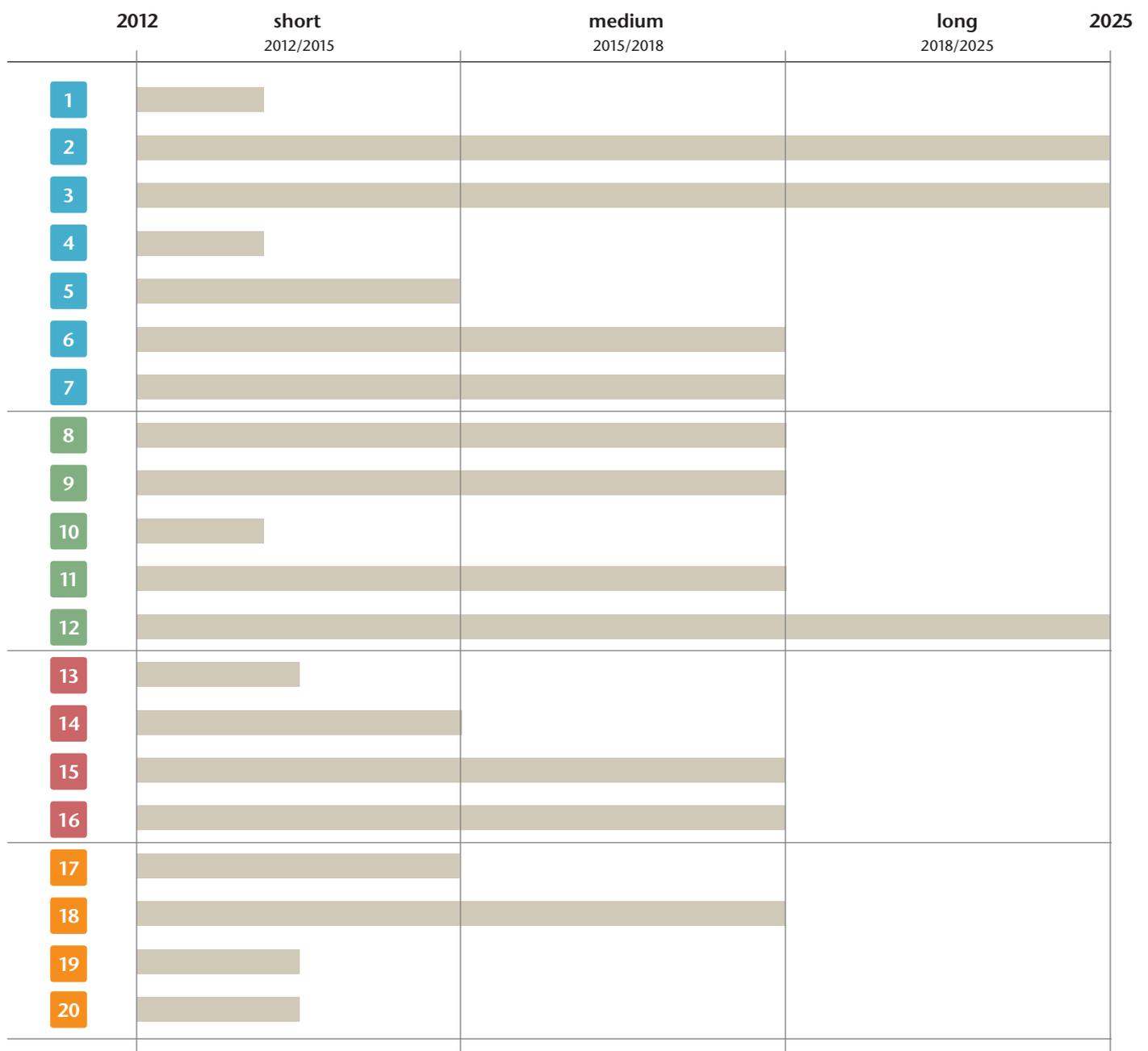
The way forward

An open plan, which the city can update and revise every 3 years.

City representatives have prioritized the UII proposals based both on their potential impact and their feasibility in Guadalajara—taking into account technical, political and economic factors.

The city and the UII team then developed a Plan of Action with milestones and deadlines aligned with the service periods of the municipal administrations.

Figura15: Plan of action of the proposed UII solutions





About the World Business Council for Sustainable Development (WBCSD)

The World Business Council for Sustainable Development is a CEO-led organization of forward-thinking companies that galvanizes the global business community to create a sustainable future for business, society and the environment. Together with its members, the council applies its respected thought leadership and effective advocacy to generate constructive solutions and take shared action. Leveraging its strong relationships with stakeholders as the leading advocate for business, the council helps drive debate and policy change in favor of sustainable development solutions.

The WBCSD provides a forum for its 200 member companies – who represent all business sectors, all continents and a combined revenue of more than \$7 trillion – to share best practices on sustainable development issues and to develop innovative tools that change the status quo. The Council also benefits from a network of 60 national and regional business councils and partner organizations, a majority of which are based in developing countries.

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Printer: Atar Roto Presse SA, Switzerland. Printed on paper containing 85.9% PEFC certified fiber and 3.2% FSC certified fiber. 100% chlorine free. ISO 14001 certified mill.

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ISBN: 978-3-940388-94-0

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