DIGITAL SOLUTIONS FOR URBAN RESILIENCE IN LATIN AMERICA

CASE STUDIES
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This publication was edited by Luis Bonilla Ortiz-Arrieta and Nicole Ponce with the support of members of the Resilient Cities Shaping a Digital World program’s General Coordination team.

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R-Cities
Digitalization offers an opportunity for our generation to make progress toward rebuilding better and more resilient cities. Resilient Cities Network is committed to helping governments and city dwellers anticipate, adapt and grow within a context of various economic, social and climate-related challenges. In partnership with Visa, we have developed the Resilient Cities Shaping a Digital World program as an example of how focusing on digitalization strategies through a resilience lens can be instrumental in reinforcing urban management and in joining up the efforts of urban stakeholders to solve the urgent issues facing Latin American cities. We encourage the community of urban actors to take advantage of the lessons learned, methodologies and recommendations to build digital and resilient cities.

Eugene Zapata Garesché
Global Director, Strategic Partnerships – Head, Latin America and the Caribbean Resilient Cities Network

Visa
The payments industry has seen dramatic changes in recent years, with digital payments rapidly gaining ground across the globe. In this new world of commercial transactions, every person and every device they interact with presents an opportunity. Visa is committed to helping governments and citizens meet our cities’ current challenges, and to strengthening their economies through inclusive digitalization. Thanks to the Resilient Cities Shaping a Digital World program that we have created with Resilient Cities Network, we are innovating to support these transformations, thus providing answers to help develop resilient cities. By applying an open methodology with a focus on problem-solving, and by using various tools, we urge the entire community to accelerate the roll-out of proven digital solutions to boost cities’ resilience.

Aida Esteban Millat
Head of Urban Mobility and Smart Cities LAC Visa
MESSAGES FROM PARTICIPATING CITIES

Diego Monraz
Minister of Mobility, 
State of Jalisco

Our joint initiative with Visa and Resilient Cities Network is contributing to the construction of a more resilient public transport network. By incorporating open payments, the “Mi Movilidad” system is creating more and better alternatives for users, increasing the service’s efficiency and generating opportunities to reduce the environmental impact of public transport in the Metropolitan Area of Guadalajara and soon throughout the state of Jalisco. Thus, Jalisco becomes the only state in Latin America to have an Integrated Transportation System with open payments.

Magda Guimarães de Andrade
Systems Analyst, Electronic Governance Company of Salvador (COGEL), Investment Coordinator and Startup Accelerator / Office of Innovation, Municipal Secretariat of Innovation and Technology (SEMIT).

The partnership between the Municipality of Salvador with Resilient Cities Network and Visa to develop the training program for e-commerce and digital developments for entrepreneurs forms part of the “Digital Citizenship Ecosystem: Democratizing Knowledge” project, which won the LATAM Smart City Awards 2021 in the category of Equality and Collaboration. This joint project has allowed us to make progress toward productive digital citizenship and has contributed to Salvador’s development as a Smart City.

David Jácome
Chief Resilience Officer, Secretariat of Planning, Metropolitan District of Quito

Through the Resilient Cities Shaping a Digital World program, the Metropolitan District of Quito, together with Resilient Cities Network and Visa, is strengthening commerce in the city by facilitating the buying and selling of produce, prioritizing small-scale producers and small and medium-sized businesses, as well as local production. This is preparing the urban economy to handle future acute shocks through digital strategies.
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**LIST OF ACRONYMS**

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<tr>
<th>Acronym</th>
<th>Definition</th>
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<tr>
<td>ABT:</td>
<td>Account-based ticketing</td>
</tr>
<tr>
<td>AGRU PAR:</td>
<td>Participative Urban Agriculture Project</td>
</tr>
<tr>
<td>AMG:</td>
<td>Metropolitan Area of Guadalajara</td>
</tr>
<tr>
<td>CAF:</td>
<td>A Latin American development bank</td>
</tr>
<tr>
<td>CBT:</td>
<td>Card-based ticketing</td>
</tr>
<tr>
<td>CRF:</td>
<td>City Resilience Framework</td>
</tr>
<tr>
<td>DMQ:</td>
<td>Metropolitan District of Quito</td>
</tr>
<tr>
<td>EMV:</td>
<td>Interoperability standard for payment cards, developed by Europay, MasterCard and Visa</td>
</tr>
<tr>
<td>ICTS:</td>
<td>Information and communication technologies</td>
</tr>
<tr>
<td>INEC:</td>
<td>National Institute of Statistics and Surveys</td>
</tr>
<tr>
<td>IOT:</td>
<td>Internet of Things</td>
</tr>
<tr>
<td>LGBTQI+:</td>
<td>Lesbian, gay, bisexual, transgender, queer and intersexual</td>
</tr>
<tr>
<td>MPOS:</td>
<td>Mobile Point of Sale</td>
</tr>
<tr>
<td>NFC:</td>
<td>Near-field communication</td>
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<tr>
<td>PDTCI:</td>
<td>Smart City Technology Directory Plan</td>
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<tr>
<td>PMS:</td>
<td>Payment Management System (Back Office)</td>
</tr>
<tr>
<td>PNBV:</td>
<td>National Welfare Plan</td>
</tr>
<tr>
<td>RCF:</td>
<td>Resilient Cities Framework</td>
</tr>
<tr>
<td>R-CITIES:</td>
<td>Resilient Cities Network</td>
</tr>
<tr>
<td>SDGS:</td>
<td>Sustainable Development Goals</td>
</tr>
<tr>
<td>SECIS:</td>
<td>Department of Sustainability and Resilience, Municipal Prefecture of Salvador</td>
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<td>SEMIT:</td>
<td>Department of Innovation and Technology, Municipal Prefecture of Salvador</td>
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<td>SMBS:</td>
<td>Small and Micro Businesses</td>
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<td>SMES:</td>
<td>Small and Medium-Sized Enterprises</td>
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<tr>
<td>TFL:</td>
<td>Transport for London</td>
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<tr>
<td>GVA:</td>
<td>Gross Value Added</td>
</tr>
<tr>
<td>VSAM:</td>
<td>Virtualization Secure Access Module (Visa)</td>
</tr>
<tr>
<td>WUF:</td>
<td>World Urban Forum</td>
</tr>
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</table>
Digitalization is a trend that is increasingly permeating urban systems. The multiple effects of the COVID-19 pandemic have accelerated this process, making it a defining issue for the future of cities.

In February 2020, Resilient Cities Network (R-Cities) and Visa announced that they would collaborate on developing digital solutions to the resilience challenges facing Latin American cities. Following up on this commitment, we set up the Resilient Cities Shaping a Digital World program. Its first edition was launched in June 2020, just as the COVID-19 pandemic was disrupting cities around the world and when digitalization was becoming an integral part of people’s lives and institutional operations, from distance learning and remote working to e-commerce and online socialization. Within the space of a few months, digitalization had become an essential part of life, though not equally for everyone. Social inequality became digital inequality, forcing cities to wake up to this new challenge. This situation has turned digitalization into a key aspect for the post-COVID-19 recovery and for strengthening cities’ resilience to a pandemic that has upended cities.

The program’s first edition was split into three phases: understanding, solving and scaling. In the first phase, a study was published on the main digitalization trends in the Latin American region and the windows of opportunity for cities to build more resilient urban systems. In the second phase, the program focused on three cities: the Metropolitan Area of Guadalajara in Mexico, the Metropolitan District of Quito in Ecuador and the Municipality of Salvador in Brazil. Accompanying these three cities, Visa and R-Cities moved forward with the design and development of digital strategies to address the resilience challenges facing various aspects of city management, such as mobility, local commerce, employability and education.

This document seeks to share lessons learned and solutions developed by the program with cities, local governments, and stakeholders in urban areas of Latin America and the Caribbean in order to improve the understanding of the relationship between digitalization and urban resilience. This will help us expand the knowledge of designing digital solutions for resilience and to generate ideas and recommendations for decision-makers.

Through this practical approach, Visa and R-Cities are working to help cities anticipate, adapt and benefit from digital trends in order to become more resilient: closing inequality gaps, stimulating economic prosperity, increasing health and safety, and building capabilities to adapt more effectively to the challenges of climate change.
01_ DIGITALIZATION AS AN ACCELERATOR OF URBAN RESILIENCE
The COVID-19 pandemic’s many effects have accelerated the trend toward urban systems’ digitalization; although Latin American societies had already been moving in this direction for some decades, digitalization is now a key factor in conceiving better ways to rebuild our cities.

Ongoing crises related to financial, social, climate and health issues place daily pressure on cities to make them more resilient. By urban resilience, we refer to the capacity of a city’s communities, institutions, companies and systems to survive, adapt and grow in the face of a complex array of chronic stresses and the constant exposure to acute shocks.

These chronic stresses relate to shocks that are gradually impairing how cities function: high unemployment levels, inefficient public transport systems, endemic violence, water stress, ageing infrastructure, and so on. Acute shocks refer to sudden impacts caused by events such as earthquakes, floods and pandemics that pose an immediate threat to cities.

In recent decades, digitalization has proved its capacity to improve urban systems (such as communications, mobility and commerce), and furthermore, during the pandemic it has been critical in keeping essential public services in operation. Looking ahead to the future, the challenge of building smart cities – whose governments, through inclusive digitalization, make progress toward implementing technologies to improve residents’ lives – will become a cornerstone for the resilient reconstruction of urban systems.
The swift transition to digitalization is a window of opportunity for Latin American cities, provided they can take advantage of it to build more inclusive, equitable and sustainable societies. By incorporating resilience into managing the digital transition strategically, we can improve the design of programs and projects that are able to tackle several challenges simultaneously: anticipating problems, mitigating risks, improving services, optimizing resources, safeguarding digital security, and ultimately laying the foundations for properly functioning urban systems in the future.

**How does digitalization accelerate urban resilience?**

Digitalization is a core element of the smart city concept and a key issue is ensuring that the investment in digital innovations and technologies can help improve city residents’ well-being, economy and the urban environment, with a special focus on the most vulnerable communities. An effective digitalization process – in other words, one that is inclusive and maximizes cities’ potential – helps reinforce urban systems’ resilience through improved design and management to become stronger, more responsive and quicker to adapt. As such, digitalization increases the integration of IT systems for more joined-up decision-making among stakeholders. This makes city management more inclusive by opening up effective spaces for participation of actors within the urban ecosystem, placing special emphasis on the most vulnerable sectors. The digitalization of urban operations also increases the speed, iteration and proof of prototype solutions in a resourceful way.

City management also becomes more robust through digitalization because, by strengthening strategies, functionalities and processes, urban systems can cope with chronic stresses. As a result, systems also incorporate redundancy, adding important capability to react to acute shocks. Furthermore, the increased reflexive capacity enabled by the improved data collection, monitoring and analysis through urban systems’ digitalization strategies makes it possible to learn from experience.

Finally, digitalization increases the flexibility in cities’ operations, providing information, tools and capabilities to adapt more effectively to shifting contexts.
How to incorporate digitalization into urban resilience

The shift toward cities’ digital transformation offers an opportunity to create more resilient cities. To this end, cities must introduce a resilience lens when devising digitalization strategies, and incorporate digital approaches and tools when planning strategies in line with municipal budgets.

The Rockefeller Foundation and Arup developed the City Resilience Framework methodology in 2015 as a systematic approach to urban resilience. This Framework defines four categories for a city’s essential systems: health and well-being; economy and society; infrastructure and environment; and, finally, leadership and strategy.
An analysis through a resilience lens makes it possible to identify the many ways in which digitalization can accelerate the construction of urban resilience. Steps toward digitalization that incorporate this approach generally have the potential to produce a high resilience dividend, understood as the net social, economic and physical benefits achieved through a well-planned, managed and monitored initiative with resilience-based approach. In this way, cities can anticipate risks, overcome stresses, adapt to trends and optimize strategic resources to use innovative means of maximizing many positive impacts on urban systems as a whole.

In that sense, digitalization initiatives (such as guaranteeing proper internet access to homes, strengthening local commercial networks through e-commerce and establishing digital communication mechanisms between local governments and city dwellers), when approached from a resilience perspective, can help tackle a broad range of urban challenges: ensuring continued public services, safeguarding individual rights, promoting new economic opportunities and adapting to climate change.

Based on the City Resilience Framework’s dimensions we can identify the intersections between digitalization and greater adaptability in urban environments.

**a. Leadership and Strategy**

Governments can take advantage of the shift toward digitalization to strengthen cities’ democratic governance. The opportunities for managing information and communication improves communication between authorities and residents, promoting citizen participation and accountability to help strategic planning, inclusion, the integration of systems and the robustness of city management systems.

### What can cities do?

- Develop open-government digital platforms
- Create methods to consult and communicate with the population
- Incorporate digital solutions in planning strategies
- Implement systems and digital infrastructure to manage public services
- Use results-driven planning systems
b. Health and Well-being

The COVID-19 pandemic’s effects have proved how digitalization can help keep essential services operating for city populations' health and well-being. Capitalizing on this initiative and making digitalization more universal and inclusive opens up opportunities for social innovation related to guaranteeing education services, health, mobility, employment, culture and so on.

What can cities do?
• Use information and communication technologies (ICTs) to transform education.
• Develop universal digital connectivity, concentrating on peripheral and vulnerable areas.
• Implement strategies for digital inclusion, digital citizenship and smart cities through a gender approach or by focusing on vulnerable demographic groups such as young people, migrants and senior citizens.
• Digitalize essential public services such as healthcare, social security, care systems, etc.
• Compile and analyze data to inform public policies, especially service provision.

c. Economy and Society

The digitalization of production chains and commerce increases the efficiency of economic processes, optimizes resources and expands markets. The economy’s digitalization, when planned from the perspective of protecting and creating jobs, also has the potential to increase social inclusion, add value and maximize human talent, ensuring that vulnerable populations are not excluded.

What can cities do?
• Boost the digitalization of businesses by incorporating technology into production processes, using online tax registration and filings.
• Increase e-commerce and digital payment mechanisms to strengthen local businesses.
• Implement labor-mobility and employee relocation strategies to protect employment and increase the economic, social and/or environmental value of work.
• Develop digital economies and the technological innovation sector with a qualified workforce ready to join this sector.
d. Infrastructure and Environment

Digital inclusion strategies help strengthen urban infrastructure by adding a critical layer of urban assets (everything from expanding energy and communications services to broadband networks and IT systems) that enable cities to become more resilient. This infrastructure also optimizes resources to minimize urban systems’ environmental impacts and to adapt to climate change.

What can cities do?

• Launch strategies to make digital infrastructure universal through “neutral networks” with a focus on peripheral and vulnerable areas.
• Use systems to optimize the management of natural resources and the functioning of related public services.
• Develop climate-monitoring and risk-management systems.
• Establish digital strategies to reduce waste and develop the circular management of raw materials.
02_ PRESENTATION OF THE RESILIENT CITIES SHAPING A DIGITAL WORLD PROGRAM
In February 2020, at the 10th World Urban Forum held in Abu Dhabi, Visa and Resilient Cities Network announced that they would work together on a digitalization program. The aim was to lead the way toward digital inclusion to improve cities’ resilience through the design of innovative solutions to respond to the most urgent urban challenges.

Visa – a leading electronic payments and technology company in collaboration with Resilient Cities Network, the leading urban resilience network – created this alliance to leverage the strengths of both institutions to help develop the Latin American region.

The program’s first edition had three basic components: understanding, solving and scaling.
2.1. Program Components

**Understanding**

Analyzing the general challenges of digitalization through the lens of urban resilience and encouraging Resilient Cities Network’s member cities to take advantage of the opportunities made available by digitalization.

Expected outcomes: Publication of the Concept Paper “Resilient Cities Shaping a Digital World” (July 27, 2020) and Digitalization Index (exclusively for the network’s member cities).

**Solving**

Supporting three cities to solve their digitalization challenges through a collaborative and innovative process.

Expected outcomes: Design of the solution: Co-creation and action plan to implement solutions in three cities.

**Scaling**

Amplifying the impact of the program, sharing lessons learned, strategies and action lines.

Expected outcomes: Publication of the case studies and findings of the program’s first phase and the organization of an International Forum in 2021.
2.2 Solving: Co-Creating Solutions

For the “Solving” phase, Visa’s team in collaboration with Visa’s Innovation Center and Resilient Cities Network team designed a methodology based on Design Thinking methods and, along with cities’ resilience teams, other government departments, specialists and various stakeholders, a series of virtual workshops were organized to provide a framework, and to develop and deliver solutions to challenges through cooperation and participation.

For this phase, the co-creation process was carried out as follows:
2.3 Identifying Challenges

In its first edition, the program worked with three cities from the region to help them solve their most pressing digitalization challenges in order to increase their urban resilience. The selection was made following an open invitation to Resilient Cities Network’s 17 member cities in the region.

The invitation requested the cities to present a digital-economy challenge linked to resilience. The challenges submitted were analyzed carefully by a selection committee formed by a panel of experts who assessed the cases based on the following criteria:

- **Relevance**: The project involves opportunities within the digital economy to strengthen resilience in areas such as urban mobility, robust databases and/or opportune response to COVID-19.

- **Commitment**: The project has the support of the key stakeholders within the urban ecosystem.

- **Time Frame**: The challenge can be solved in the short term (1-2 years) or in the medium term (3-5 years).

- **Impact**: The solution has the potential to improve citizens’ lives.

- **Transferability**: The challenge and its potential solution are replicable and relevant for other cities in the region.
2.4 Selected Cities

The three selected cities are:

- The Metropolitan Area of Guadalajara in the state of Jalisco in Mexico
- The Metropolitan District of Quito in Ecuador
- The Municipality of Salvador in Brazil

The challenges presented by these three cities stood out for their potential to generate a resilient and transformative impact with the potential to inspire other cities in the Latin American region.
03_ INCORPORATING RESILIENCE WITHIN INNOVATION PROCESSES
The resilience dividend refers to the capacity to leverage the multiple impacts of plans, programs and projects, increasing their contribution to society, the economy, the environment, among other issues related to urban systems. A resilience approach to innovation reveals a number of direct benefits and co-benefits (indirect or secondary benefits) that co-created solutions can generate in cities.

As the following graphic shows, this approach elevates the systemic potential of a solution that would otherwise have linear effects by releasing its ability to relate to many urban sub-systems. As a result, the solution achieves its maximum potential by generating various positive impacts in several dimensions, in turn strengthening the city’s resilience more holistically.
This section provides a practical description of how to incorporate resilience when identifying urban challenges and co-creating digital solutions, maximizing the resilience dividend for cities. This methodology was applied for the co-creation of solutions that form the Resilient Cities Shaping a Digital World program and, therefore, they focus on digital solutions. Nevertheless, we consider that they are easily adaptable for a wide range of urban projects.

The diamond method is a critical element of the “Framework for Innovation” developed by Design Council. It is used across the world to drive people-centered innovation processes that focus on the most complex economic, social and environmental problems of our time.

The idea of using the diamond process is to encourage iteration through divergent and convergent thinking. The former uses agile methodologies to enable a process of exploration (generating the greatest possible knowledge about the issue in question) and the latter enables the process of synthesis (taking all options toward a specific outcome).

The above graphic shows how the diamond method was used during the “Solve” phases of the Resilient Cities Shaping a Digital World program. The first diamond relates to a deep exploration of the challenge, the second to defining the solution and the third to synthesizing this solution’s systemic resilience. To reach the third diamond, which makes it possible to maximize the solution’s resilience dividend, it is necessary to consider the cross-cutting resilience approach for the entire process, hence the various recommendations of this section.

a. Identifying the Challenge

Identifying an urban challenge is the exercise of visualizing and synthesizing a particular (present or future) problem that the city wants to solve. However, cities are clearly facing a daily barrage of problems simultaneously, making it a challenge in itself to prioritize or select those most critical to build resilience.

In order to analyze the capacity of a challenge to maximize the resilience dividend for cities, it is essential to:

- **Categorize the identified challenges in terms of the expected outcomes and impact**, their scale and defining factors. This will make it possible to standardize the various challenges and make them comparable.
- **Prioritize the chronic stresses and acute shocks** facing the city. These can be pre-established in a resilience strategy or identified as part of the co-creation process.
- **Build a relational map**, linking the various challenges together and to the different chronic stresses and acute shocks that have been given priority. A key recommendation is to go beyond direct relationships and also identify secondary or indirect relational links, which will provide a deeper understanding of the potential impact of solving the identified challenges.
- **Improving the resilience capacity** of a city requires a holistic approach and, therefore, its implementation entails various aspects of city management, especially in regard to local government ministries, departments and agencies. In that sense, a suitable definition of the challenge also requires evaluating the government’s commitment to the solution. Gauging this commitment implies considering the various levels and areas of government, as well as the engagement of political authorities. Strong commitment is essential in order to effect systemic changes.
b. Analyzing the Challenge in Depth

The co-creation of innovative solutions requires an in-depth analysis of the challenge from various perspectives, making it possible to design a pathway for a series of emerging innovative solutions. In the case of design thinking methodologies, this analysis needs to be people-centered. The following section provides recommendations on how to incorporate a resilience lens within this process:

• Based on the relational map between the challenge and the portfolio of prioritized chronic stresses and acute shocks, it is possible to identify the various actors who are directly or indirectly related to the problem to be solved. This enables the creation of an ecosystem of critical stakeholders, which is the basis for a people-centered innovation process. It is also a practical means of defining who should take part in subsequent exercises.

• After defining and prioritizing the critical stakeholders related to the challenge, it becomes possible to map out their respective paths; in other words, to trace the line through which everyone connects to the defined issue. In terms of resilience, this traceability is an important means of identifying the critical points (or “pain points”) in the various urban systems related to the challenge. This approach enables a stronger systemic focus, an x-ray of the critical aspects of urban systems and, therefore, making progress toward defining the relevant local government teams to leverage a solution.

• Carrying out the above activities makes it possible to develop an in-depth solution to the challenge through a resilience lens. On that basis, the design thinking methodologies propose redefining the challenge, which is usually structured as a question that begins with “How might we . . . ?”. To guarantee the resilience perspective on the transition to the following (ideation) stage, it is important to incorporate resilience in the statement of the challenge to solve. At first glance, this might appear a minor detail; however, during the co-creation process, this question arises repeatedly. Therefore, including a resilience statement in the question keeps this aspect in the foreground throughout the process.
### CHRONIC STRESSES AND ACUTE SHOCKS FACING CITIES

#### STRESSES

<table>
<thead>
<tr>
<th>Stress</th>
<th>Description</th>
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<tbody>
<tr>
<td>Climate change</td>
<td>Shifting economic trends</td>
</tr>
<tr>
<td>Displaced populations</td>
<td>Unemployment</td>
</tr>
<tr>
<td>Crime and violence</td>
<td>Lack of affordable housing</td>
</tr>
<tr>
<td>Environmental degradation</td>
<td>Poverty</td>
</tr>
<tr>
<td>Insecure municipal finances</td>
<td>Energy insecurity</td>
</tr>
<tr>
<td>Lack of social cohesion</td>
<td>Aging infrastructure</td>
</tr>
</tbody>
</table>

#### SHOCKS

<table>
<thead>
<tr>
<th>Shock</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extreme heat</td>
<td>Economic crisis</td>
</tr>
<tr>
<td>Blizzard</td>
<td>Hazardous material accident</td>
</tr>
<tr>
<td>Cyber-attack</td>
<td>Terrorist incident</td>
</tr>
<tr>
<td>Disease outbreak</td>
<td>Infrastructure failure</td>
</tr>
<tr>
<td>Dust storm</td>
<td>Earthquake</td>
</tr>
<tr>
<td>Drought</td>
<td>Landslide</td>
</tr>
<tr>
<td>Fire</td>
<td>Power outage</td>
</tr>
<tr>
<td>Infraestructure failure</td>
<td>Severe storms</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Riot/civil unrest</td>
</tr>
</tbody>
</table>
c. Imagining the Solution

The ideation process kicks off with the generation of the greatest number of potential solutions. This is followed by the analysis, clusterization, and selection of the best option, and concludes in a solution statement, which is essentially a very concise wording, laying the foundation for the development of the solution blueprint by incorporating its main technical characteristics and contribution to the city's resilience. The following recommendations ensure a resilience focus is present in the solution:

- The co-creation phase begins with the search for inspiring experiences that might guide the ideation process. Here it is recommendable to review other cities' resilience strategies, the communities of practice or to make direct contact with Resilient Cities Network’s Resilience Directors. This approach will give access to a broad selection of resilience practices to source digitalization experiences that can address the defined challenge.

- Compiling a list of specific risks and opportunities for stakeholders makes it possible to consider the potential benefits and co-benefits of the solution and, in turn, becoming aware of potentially counter-productive effects in order to anticipate, correct, or, depending on the case, mitigate them. This is a particularly sensitive point for digitalization projects because it is vital to ensure that the initiatives are designed to reduce gaps and increase the possibilities of inclusion.

- Design thinking for innovation will bring the dynamic toward the production of multiple possible solutions before grouping them together and making a selection. To assess options through a resilience lens, the recommendation is to classify the solution portfolio based on the resilience qualities of each option and the potential to impact them directly or indirectly (or else to identify any potential negative effect). This will make it possible to outline the options’ systemic value and help identify which alternative(s) strengthen(s) the urban system(s) to be affected.

- Finally, it is important to assess the institutional stakeholders’ level of commitment. As mentioned above, ensuring the maximum resilience dividend requires the integration of a wide range of actors when deploying the solution.

HOW TO ASSESS A DIGITALIZATION PROJECT’S INCLUSIVENESS?

**PEOPLE-CENTERED:** Its design is based on the population’s present and future needs, demands, and capacities.

**PRIORITIZES THE VULNERABLE:** Places emphasis on effectively integrating the excluded.

**BUILDS MORE EQUITABLE RELATIONS:** Seeks to close gaps and level the playing field of interactions among different urban stakeholders.

**BROADENS HORIZONS:** Identifies windows of opportunity and takes advantage of them to make progress toward inclusion, sustainability and resilience.

**MANAGES RISKS:** Identifies and anticipates potential risks, establishing specific measures to prevent or compensate for them.

**EVOLVES OVER TIME:** Adapts to new situations, safeguarding the population’s inclusion over time.
### Checklist for Evaluating Resilience Qualities

<table>
<thead>
<tr>
<th></th>
<th></th>
<th><strong>Systems</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>REFLEXIVE</td>
<td>learn from past experience and inform future decisions</td>
</tr>
<tr>
<td>2.</td>
<td>ROBUST</td>
<td>designed, constructed and managed to absorb the impact of threats without sustaining significant damage or operation loss</td>
</tr>
<tr>
<td>3.</td>
<td>REDUNDANT</td>
<td>systems with planned unused capacity to respond to disruptions, extreme pressures or peaks in demand</td>
</tr>
<tr>
<td>4.</td>
<td>FLEXIBLE</td>
<td>can change, evolve and adapt in response to changing situations</td>
</tr>
<tr>
<td>5.</td>
<td>REDUNDANT</td>
<td>capable of quickly finding different routes to reach their goals and meet needs during shocks or tensions</td>
</tr>
<tr>
<td>6.</td>
<td>INCLUSIVE</td>
<td>emphasize the need for consulting and committing to local communities, including the most vulnerable groups</td>
</tr>
<tr>
<td>7.</td>
<td>INTEGRATED</td>
<td>joined-up systems that are aligned with decision-makers</td>
</tr>
</tbody>
</table>
d. The Solution’s Systemic Resilience Focus

After selecting, defining, and outlining its technical profile, the solution is analyzed through the resilience lens in order to identify the resilience benefit properly for it to be used as an instrument for planning, implementing, monitoring and evaluating city management. The resilience analysis reveals a precise view of the solution’s systemic value.

- First, it is crucial to provide a full list of the solution’s benefits and co-benefits, identifying the urban systems involved, directly or indirectly, the various stakeholders who will benefit, and the potential risks. Clusters of benefits and co-benefits are useful if the list ends up being too long (due to the level of detail).

- Classify the list of benefits and co-benefits based on the resilient systems’ qualities, depending on whether these make a direct or indirect impact. In this way, we can make an aggregate analysis of the measure that will help strengthen systemic resilience based on specific aspects.

- The list of benefits and co-benefits can be categorized based on the City Resilience Framework’s dimensions and sub-dimensions (depending on the information’s quantity and quality) which will be affected. This makes it possible to set the parameters to measure the solution’s performance in regard to the critical areas to strengthen the city’s resilience.

- Finally, the period of the impact made by the benefits and co-benefits is analyzed, in order to establish the short, medium, and long-term bases for a roadmap that can clearly define the deployment of the resilience dividend over time.
Using this methodology makes it possible to incorporate the resilience lens as part of the co-creation of solutions using agile methodologies. As shown in the city case studies in the following section, digitalization offers opportunities to address different kinds of urban challenge: mobility in the Metropolitan Area of Guadalajara in the state of Jalisco, Mexico; local commerce in Quito, Ecuador; and entrepreneurship and employment support in Salvador, Brazil.

The resilience focus triggers a wide range of benefits and co-benefits in terms of the economy, health, environment, infrastructure, equality (gender, segregation, etc.). These make a positive impact on various dimensions of the city, improving its different sub-systems, and therefore strengthening the adaptability of the population and the local government and turning the urban system into a safer and more resilient place to live over the long-term.
04_ CITY CASE STUDIES: IDENTIFYING AND CO-CREATING DIGITAL SOLUTIONS FOR URBAN RESILIENCE
Urban Mobility: Digital Technology for an Open Payments System

Digitalization to Support Local Businesses and Production

Education, Entrepreneurship, and Supporting Employment with a Focus on Digital Citizenship
URBAN MOBILITY:
Digital Technology for an Open Payments System
Metropolitan Area of Guadalajara, Jalisco (Mexico)
I. Innovative Public Transport System

The Jalisco state government has focused strongly on developing an inclusive and resilient mobility agenda. A key priority is to ensure a high-quality and dignified public transport service for users in the state and particularly in the Metropolitan Area of Guadalajara (AMG, by its acronym in Spanish).

To this end, the state government has implemented a policy called “Mi Movilidad” (“My mobility”) – an integrated public transport model designed to create a single, interconnected, efficient and high-quality system comprising various modes of transport in AMG and other cities such as Puerto Vallarta, Ciudad Guzmán and Tepatitlán de Morelos.

II. “Mi Movilidad”: High-Quality Public Transport

With “Mi Movilidad”, Jalisco is working to deliver high-quality public transport for millions of users.

To achieve this, the Jalisco state government has taken important steps toward articulating, reordering and regulating all of the city’s available modes of transport:

- Migration of owner-operated buses to transport companies
- Implementation of electronic payments systems for public transport
- Roll-out of the “Mi Movilidad” card and “Mi Pasaje” (“My ticket”) program
- Renewal of public transport fleets
- Development of external card recharging network

III. Additional Information

The system’s reach

Jalisco’s Integrated Mobility System enables the mobility of more than 2.5 million daily users in AMG and has a reach that goes beyond the capital, comprising AMG and three other cities in the state.
B. Defining the Challenge

How could we ensure an interoperable, inclusive, efficient, sustainable and safe digital experience of public transport for residents and visitors in the Metropolitan Area of Guadalajara and the rest of the state of Jalisco, making the city more resilient and equitable?
C. Defining the Solution

Modernizing Jalisco’s public transport by implementing a digital open payments system for a more agile, efficient, sustainable and accessible service.
I. Digital Transformation with Open Payments

Open payments systems for public transport can catalyze the growth of financial and digital inclusion of city dwellers by offering them the opportunity to participate in the digital ecosystem.

Apart from transforming the transport system, adopting open payments instead of cash in a closed-loop represents direct advantages for consumers, companies and governments. Digital payments are generally more convenient and reduce costs, are less labor-intensive and save time. They also generate information for continuous improvement and decision-making backed by data.

Digital payments can help companies grow and become more profitable; they also help governments tackle crime, increase tax revenue and deliver public services more efficiently.

D. Designing the Solution

II. Innovations for Open Payments

Enable the acceptance of bank payments as part of Jalisco’s Integrated Urban Mobility System (“Mi Movilidad”), complementing its existing functions.

- Complements and forms part of the “Mi Movilidad” system
- Agnostic, interoperable solution
- Open Payments Technology / Virtualization Secure Access Module (vSAM)
- The Urban Mobility System’s solution and integration eliminate the need to replace completely new validation terminals.
- vSAM is installed directly on existing validation terminals, reducing costs and implementation times.

III. Innovations for Solutions

How can we adapt the closed payments infrastructure to accept EMV or contactless transactions with an efficient solution?

- Using EMV® technology and Virtualization Secure Access Module (vSAM)
- This solution has three components: the Contactless reader (L1), Virtualization Secure Access Module (vSAM) and Back Office.

vSAM is an industry-leading hardware that, combined with optimized software, enables seamless integration with existing payment standards and public transport fare collection systems and makes it possible to accept open payments on transport systems.

vSAM is installed directly into the public transport systems’ existing validation terminals, replacing some of their components, thus eliminating the need to replace the old validation terminal entirely with more modern versions. This represents savings for transport operators and cuts down implementation times. Key benefits of the complete solution include:

- Reducing operating costs and improving operational efficiencies
- Eliminating queues for recharging cards
- Enables different fare types
- Visibility of usage data
- Based on EMV global standard
- Agnostic model (compatible with any payment card)
- Compatible with technologies such as Mifare Plus (SUBE-Argentina)
- Educates of the use of payment methods in other sectors
IV. Architecture: Integrated Multi-modal, Multi-operator System with Card-Based Ticketing and Account-Based Ticketing

The solution involves modernizing the fare-collection system of Jalisco’s Integrated Mobility System (“Mi Movilidad”) through a payment unit that includes an EMV L1 contactless reader and VSAM technology connected directly to a Back Office (PMS: Payment Management System) that sends bank payment transactions to Jalisco’s Central System and Clearing House. This ticket solution operates using the Account-Based Ticketing (ABT) system, supported by intelligence from Back Office (PMS) to provide access to the transport system for users paying with their bank cards.
E. Analyzing the Solution’s Resilience

The Solution’s Benefits

<table>
<thead>
<tr>
<th>For the city</th>
<th>For passengers</th>
<th>For the transport system</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Modernizes the state, following the trend in moving toward cashless cities</td>
<td>• Improves the experience for all users</td>
<td>• Reduces operating costs on the recharging network and in the issuing and management of closed-loop cards (London's transport system, TfL, reduced the cost of issuing tickets by 40%)1</td>
</tr>
<tr>
<td>• Supports digital and financial inclusion for Jalisco’s population and its most vulnerable groups</td>
<td>• Simplifies the travel experience for new users: tourists, students, business travelers, vulnerable groups</td>
<td>• Increases use of public transit (TfL reported an increase of 110,000 daily journeys)1</td>
</tr>
<tr>
<td>• Creates more livable and connected cities; improving people’s quality of life</td>
<td>• Restores users’ financial autonomy as money is not trapped on a closed-loop card</td>
<td>• Increases revenues and the possibility of reinvesting to improve the transport system</td>
</tr>
<tr>
<td>• Makes a positive environmental impact; reduces private vehicle use (carbon footprint)</td>
<td>• Promotes flexible and transparent fare types for users (integrated fares throughout the system and transfers)</td>
<td>• Increases data available for transport operators (better understanding of users)</td>
</tr>
<tr>
<td>• Provides health benefits by reducing physical contact of cash transactions</td>
<td>• Creates frictionless transfers between different modes of transport in the “Mi Movilidad” system with a single payment method</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Creates faster journeys by eliminating the time spent recharging cards and paying for tickets</td>
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</tr>
<tr>
<td></td>
<td>• Preferred payment method for users trying out contactless payments (frequency of use)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Reduces crowding in stations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Provides access to benefits such as discounts in neighboring businesses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Increases citizens’ safety by protecting their assets</td>
<td></td>
</tr>
</tbody>
</table>

**SOURCE**: Public Data, Transport for London (TfL), 2017

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**SDGs IMPACTED**

1. Good Health and Well-Being
2. Industry, Innovation and Infrastructure
3. Decent Work and Economic Growth
4. Reduced Inequalities
5. Sustainable Cities and Communities
6. Responsible Consumption and Production
7. Climate Action
8. Partnerships for the Goals
II. Dimensions and Qualities of a Resilient System

The figure analyzes the four dimensions of the solution’s impact by using resilience qualities, identifying areas of strength and opportunity.

**Key Qualities for a Resilient System**

- **Redundant**: Open digital payments systems complement other payment systems (cash, pre-paid cards, etc.) and strengthen the mobility system’s operation, increase safety and add capacity to maintain operations under different circumstances.

- **Resourceful**: The solution delivers a series of benefits and co-benefits that increase data quality, improving the flow of communication within the transport system and the coordination between stakeholders, preparing the city to adapt more effectively to current and future challenges.

**Higher-Impact Dimensions**

An analysis of the resilience qualities of the four aspects of the solution’s impact reveals the areas of greatest impact:

- **Health and Well-being**
  - In terms of health and well-being, the solution is **flexible** since open payments can easily adapt to changing circumstances, reducing the negative impact of future shocks and stresses.
  - **Redundant**, because it provides extra payment options, helping to reduce passengers’ transit times.
  - **Reflexive**, as it improves the management of information for better decision-making, improving the system’s efficiency.

- **Infrastructure and Environment**
  - In terms of infrastructure and environment, the solution is **inclusive** because it helps expand access to the banking system and digitalization for the most vulnerable sectors of society, and it is **resourceful** by adapting an open payments system to become part of the city’s pre-existing system without causing a major disruption, and
  - **Flexible** as it allows the system to evolve rapidly, based on changing situations.
III. Impact on the Solution’s Resilience Dividend and Urban System

The 12 themes of the City Resilience Framework make it possible to analyze the proposed solution in connection to the urban system, identifying areas with the most benefits and potential co-benefits.

Through this analysis we can observe and measure the solution’s potential resilience dividend, highlighting the critical areas to achieve a more complete outcome that maximizes the benefits for the population.
The solution’s analysis in the urban system’s context made it possible to identify and define several benefits and co-benefits, as presented below:

### Key Benefits

Analysis plot of the solution in response to the urban system. Each point refers to a benefit that makes an impact on a theme.

<table>
<thead>
<tr>
<th>BENEFICIO</th>
<th>THEME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shorter transit times thanks to the efficiency of the payment that will benefit users of public transport, and users of private transport will have more incentives to choose to take public transport.</td>
<td>Meets basic needs</td>
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<tr>
<td>The strengthening of information management will make it possible to optimize travel costs, plan trips and access other commercial benefits for users of public transport.</td>
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<tr>
<td>Recipients of subsidies will have faster and more direct access to this benefit.</td>
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</tr>
<tr>
<td>Fewer cash transactions increases health and safety (less contact), protects users (risk of robberies or theft) and helps households that use public transport to plan their spending.</td>
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<tr>
<td>The open payments system will help increase multi-level coordination between the various departments of the Jalisco state government.</td>
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</tbody>
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### KEY CO-BENEFITS
Analysis plot of the solution in response to the urban system. Each point refers to a co-benefit that makes an impact on a theme.

<table>
<thead>
<tr>
<th>THEME</th>
<th>Needs basic needs</th>
<th>Supports livelihoods &amp; employment</th>
<th>Safeguards public health</th>
<th>Builds cohesive &amp; committed communities</th>
<th>Stimulates economic prosperity</th>
<th>Maintains, creates and improves natural &amp; man-made resources</th>
<th>Guarantees the continuity of critical services</th>
<th>Supports reliable mobility &amp; communication</th>
<th>Promotes effective leadership &amp; management</th>
<th>Empowers a wide range of stakeholders</th>
<th>Encourages integrated, long-term planning</th>
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<tbody>
<tr>
<td><strong>CO-BENEFICIO</strong></td>
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<tr>
<td>Increases the financial inclusion of city dwellers, through the acquisition of useful banking products to pay for mobility.</td>
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<tr>
<td>Creates the opportunity for the integration of mobility services with other cities within Jalisco and in other states.</td>
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<tr>
<td>Expands the digitalization of SMEs.</td>
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<tr>
<td>Positive environmental impact due to less use of resources, optimized times and possible optimization of public transport.</td>
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<tr>
<td>Increased levels of digitalization in the city, with a positive impact on the economy, governance, accessibility and transparency.</td>
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</tr>
</tbody>
</table>
f. Action Lines to Deploy the Short, Medium and Long-Term Resilience Dividend

**SHORT AND MEDIUM-TERM**

1. Guarantee that the solution’s implementation does not increase fares for public transport users.
2. If the solution’s implementation entails employment restructuring, provide alternative training to personnel in order to avoid job losses.
3. Create an enabling environment for innovation and support new technological businesses through increased digitalization of SMEs and the development of training programs and financial inclusion.
4. Boost digitalization and financing of government transactions (payments, subsidies etc.).
5. Work toward improving the public transport system (greater connectivity, affordability etc.) through reinvestments and savings generated by the open payments system.

**LONG TERM**

1. Expand the levels of financial inclusion for city dwellers with programs to increase the size of the banked population and to promote inclusive financial tools.
2. Increase the integration of mobility services with other cities, within Jalisco and in other states.
3. Strengthen the governance of the data system with greater transparency, including a review of the data protection policy.
4. Improve the city’s data management system to inform public policies.
5. Generate a positive environmental impact by optimizing public transport.
6. Create the possibility of generating new public spaces (such as in former parking lots) after the optimization and inclusiveness of public transport.
7. Create incentives for the city to focus on green and equitable infrastructure.
DIGITALIZATION TO SUPPORT LOCAL BUSINESSES AND PRODUCTION
Metropolitan District of Quito, Ecuador
A. Snapshot: Focusing on E-Commerce

I. Quito: A Dynamic Center for Services

The Metropolitan District of Quito (DMQ, by its acronym in Spanish) is a dynamic center for services in Ecuador and its ecosystem of neighborhood stores and markets is equipped to offer the population access to essential products, while at the same time providing jobs, income and dynamic hubs in local neighborhoods.

According to the Economic Survey (INEC, 2010 in PNBV), 20% of Ecuador’s productive establishments and 45% of total sales are concentrated in the country’s capital.

Most jobs are created in businesses selling non-specialized products (general stores), specialized businesses and in food and lodging services. These three sectors account for 30% of total employment in the popular economy.

Furthermore, the DMQ has focused on inclusive economic diversification through urban agriculture programs as an area of opportunity for the city. Estimates suggest the city only produces 5% of its food requirements and its food system is highly vulnerable to weather, seismic and volcanic events (RUAF, 2017). Therefore, supporting these initiatives provides a potential boost for vulnerable economic sectors and an opportunity to work toward strengthening food security.

II. Covid-19 and New Economic Challenges

The coronavirus pandemic has increased levels of exclusion and the lack of access to essential products and services. Compounding this situation, limited connectivity within the popular economy resulted in lost opportunities for sales and offers of services that do not meet customers’ current quality requirements.

In this type of business:

- Only 3% of companies invest in training
- Only 7% have internet access

III. Employment Data

1 out of 2 residents in Quito are younger than 29, representing a sizeable pool of young talent that can contribute to the productive sector (DMQ 2015)

7.8% unemployment rate in 2017. However, the pandemic caused this figure to rise to 13.5% in 2021 (ENEMDU-INEC 2017, 2021)

18.6% youth unemployment (ENEMDU-INEC 2019)

23% of Ecuador’s Gross Added Value (GVA) is concentrated in Quito, the highest level by city (Quito Resilience Strategy)

89% of business establishments are microbusinesses

These establishments represent 2.3% of total sales and 36% of jobs (Quito Resilience Strategy)

Sources:
1. ConQuito-Desafio, Resilient Cities Shaping a Digital World
2. Resilience Strategy – Metropolitan District of Quito
b. Defining the Challenge

How can we accelerate the adoption of agile, user-friendly, safe and transparent digital tools so that small businesses are able to manage their finances and e-payments more easily, not only helping them to reactivate their businesses but also making them more resilient to future challenges?
c. Defining the Solution

By strengthening value chains, connecting small-scale producers and local businesses through the acceptance of digital payments and the implementation of digital tools for a better management of finances and inventories in important ConQuito initiatives, including the bioferias or bio-markets, working with urban farmers as part of the AGRUPAR program.
I. I. Participative Urban Agriculture Project (AGRUPAR)

AGRUPAR is a participative urban agriculture project supported by Quito’s Economic Promotion Agency (ConQuito) since 2005. The project aims to contribute to food security and sovereignty by developing small-scale agriculture centers in urban, peri-urban and rural areas. By doing so it is able to generate income and jobs, and better environmental management, inclusion and social equality for those most in need. The emphasis is on training and specialized technical assistance, alternative technologies, differentiated marketing systems such as bio-markets, adding value for surplus production and strategic public-private partnerships.

SOURCE: ConQuito

II. Bio-markets

The sales points for production surpluses from urban agriculture, known as bioferias or bio-markets, have a dual purpose: on the one hand, they connect sustainable food production, promoting the consumption of fresh, organic, seasonal and minimally processed foods as a strategy for food rescue and/or value added and, on the other hand, they also encourage responsible consumption as an expression of the right to the city and the right to food. They provide the main sales channel for Quito’s urban farmers. The direct sales model reinstates the producer-consumer model, promoting fair prices for both buyer and seller, under the motto “supporting healthy and fair production”, so that consumers understand how the food was produced, to answer questions such as: Where is their money going? How does their purchase benefit the economy of participating families? Where? By whom? How far the food has traveled?

- 100 individual and group ventures participating, mainly involving people in vulnerable situations such as senior citizens and women heads of household.
- Opportunity for economic development so that this produce can be sold at a reasonable price in the framework of local fair trade.

ConQuito is responsible for compliance with regulations, providing training and keeping records to ensure traceability. They also provide ongoing technical assistance.
IV. The Value of Co-Creation with the Local Community to Ensure the Success of a Digitalization Program

The next step in the design of a well-aimed digital solution for Quito’s small-scale producers will be to hold a series of workshops with urban farmers in order to identify the greatest barriers for their digitalization and the best ways of overcoming these obstacles and supporting farmers in their financial and technological development.

Digitalization Resilience Analysis of Small Businesses

I. Benefits for the Ecosystem

**Government**
- Service continuity in case of acute shocks (e.g. torrential rainfall, disease outbreaks, roadblocks)
- City’s link to the rural ecosystem
- Stronger links between the local government and citizens with more fluid interaction, data access to take better-informed decisions, etc.
- Increased formalization of small-scale producers and businesses

**Small businesses**
- Increased health and safety: decreased contact with card payments
- Access to digital and financial education to manage digital payments
- More effective use of technological tools, such as smart phones
- Access to benefits and discounts through electronic payments
- Simpler and more efficient payments to providers if they are banked, and access to microloans
- Improved business management systems. For example, less time invested in calculating profits, making deposits in person, etc.
- Less exposure to robberies by reducing the amount of cash kept on the premises

**Local economy**
- Safer reactivation of the local economy and greater operating capacity in the case of future social distancing or quarantine requirements
- Greater convenience, comfort and flexibility of payments for users
- Increased competitiveness and development of small businesses

SDG S IMPACTED

<table>
<thead>
<tr>
<th>SDG</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No Poverty</td>
</tr>
<tr>
<td>2</td>
<td>Zero Hunger</td>
</tr>
<tr>
<td>3</td>
<td>Good Health and Well-being</td>
</tr>
<tr>
<td>9</td>
<td>Industry, Innovation and Infrastructure</td>
</tr>
<tr>
<td>10</td>
<td>Reduced Inequalities</td>
</tr>
<tr>
<td>11</td>
<td>Sustainable Cities and Communities</td>
</tr>
<tr>
<td>12</td>
<td>Responsible Consumption and Production</td>
</tr>
<tr>
<td>17</td>
<td>Partnerships for the Goals</td>
</tr>
</tbody>
</table>
II. Resilience Analysis of Small Business Digitalization: Strengths and Opportunities

The graphic below analyzes the strengths and opportunities of digitalization based on the four dimensions identified in the City Resilience Framework (CRF).

Highest-impact dimension

Analyzing digitalization’s four impacted dimensions to measure its number of potential strengths and opportunities reveals the greatest impact areas:

**Economy and Society:**
- Greater convenience and flexibility of payments for users
- Increased competitiveness of these small businesses
- Access to benefits, discounts and microloans through the use of electronic payments
Several strengths and opportunities were identified and defined to analyze the resilience of digitalizing small businesses. The following table shows the key strengths and opportunities:

**KEY STRENGTHS**

Four key strengths were identified within each dimension

<table>
<thead>
<tr>
<th>HEALTH AND WELL-BEING</th>
<th>ECONOMY AND SOCIETY</th>
<th>INFRASTRUCTURE AND ENVIRONMENT</th>
<th>LEADERSHIP AND STRATEGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased health and safety; decreased contact through card payments</td>
<td>Greater convenience, comfort and flexibility of payments for users</td>
<td>Access to banking products and mPOS</td>
<td>Service continuity in case of acute shocks (such as torrential rainfall, disease outbreaks, roadblocks, etc.)</td>
</tr>
<tr>
<td>Less time invested in calculating profits, making deposits in person, etc.</td>
<td>Increased competitiveness and development of small businesses</td>
<td>Frictionless adoption of online sales and social networks</td>
<td>City’s link to the rural ecosystem</td>
</tr>
<tr>
<td>More effective use of technological tools, such as smart phones</td>
<td>Access to benefits and discounts through electronic payments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less exposure to robberies by reducing the amount of cash kept on business premises</td>
<td>Facilities for payments to providers if they are banked, and access to microloans</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Key Opportunities

Four key opportunities were identified within each dimension:

<table>
<thead>
<tr>
<th>Health and Well-being</th>
<th>Economy and Society</th>
<th>Infrastructure and Environment</th>
<th>Leadership and Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased digital and financial inclusion for Quito’s population and the city’s most vulnerable groups</td>
<td>Development and growth of small local businesses</td>
<td>Modernization of the dynamics of buying and selling products and services</td>
<td>Safer reactivation of the local economy</td>
</tr>
<tr>
<td>Formalization of the city’s informal businesses</td>
<td>Urban modernization and technological development, continuing the trend toward digitalization and cashless cities</td>
<td>Support to narrow the current digital divide</td>
<td></td>
</tr>
<tr>
<td>Creation of a community of entrepreneurs that encourages collaboration and innovation</td>
<td>Better management of household finances</td>
<td>Stronger links between local government and citizens with more fluid interaction, data access to take better-informed decisions, etc</td>
<td>Incentive to update current policies for a more seamless adoption of electronic payments in the future</td>
</tr>
</tbody>
</table>

The 12 themes of the City Resilience Framework make it possible to analyze the digitalization of businesses in connection to the urban system, identifying areas with the greatest impact to achieve a more complete set of results that maximize benefits for the population.

**RESILIENCE PERFORMANCE CATEGORIES**

- HIGH: [3]
- MEDIUM: [2]
- LOW: [1]

Themes with the greatest impact

**Highest-impact dimension**

Analyzing digitalization’s four impacted dimensions to measure its number of potential strengths and opportunities reveals the greatest impact areas:

- **Supports Livelihoods and Employment**
  - Supports the livelihoods of vulnerable groups, particularly senior citizens and mothers who are heads of households
  - Safeguards Public Health
  - Supply of fresh and organic produce for a healthier population
- **Builds Cohesive and Committed Communities**
  - Creates links of solidarity and trust among stakeholders
  - Stimulates Economic Prosperity
  - Reasonable prices within a fair-trade framework
- **Maintains, Creates and Improves Natural and Man-made Resources**
- **Promotes sustainable local practices that protect food systems and biodiversity**
- **Promotes Effective Leadership and Management**
- **Empowers small businesses to improve their financial management, with the potential for growth**
e. Action Lines to Deploy the Resilience Dividend In The Short, Medium And Long Term

**SHORT-MEDIUM TERM**

- Ensure that the solution’s implementation does not imply a significant cost for small businesses
- Use current programs to incentivize the creation of a community of traders and entrepreneurs that builds collaboration and joint learning
- Set the stage for innovation and promote new technological businesses by expanding SMEs’ digitalization and by developing technological and financial inclusion training courses and programs
- Strengthen digitalization and finance of government transactions (payments, subsidies etc.)
- Adapt current policies to actively promote the future development of small businesses

**LONG TERM**

- Contribute to the expansion of financial inclusion of the city’s residents with programs to increase levels of access to the banking system and to promote inclusive financial tools
- Strengthen governance of the data system with greater transparency, to include a review of the data protection policy
- Improve the city’s data management system to inform public policies
- Generate a positive environmental impact by promoting businesses with sustainable production models
- Possibility of creating inclusive public spaces for the sale of food that is attractive to customers
- Create incentives for the city to focus on green and equitable infrastructure
EDUCATION, ENTREPRENEURSHIP, AND SUPPORTING EMPLOYMENT WITH A FOCUS ON DIGITAL CITIZENSHIP

MUNICIPAL PREFECTURE OF SALVADOR, BRAZIL
I. Salvador: Capital of Multiple Identities and Creativity
Salvador is a capital of multiple identities, creativity and innovation, where sustainable and technological development supports people’s resilience, inclusion and integration.

Salvador is the city with the largest Black population outside the African continent; 50.8% of the city’s residents identify themselves as being Black. Their pluricultural identity has led to a prolific output of visual arts, dance, music, theatre, African culture, popular culture, literature, handicrafts, LGBTQI+ culture, material and non-material heritage, gastronomy and audiovisual productions.

II. Exclusion and Challenges for Digitalization and for Employment
In Brazil, 63% of employers face difficulties hiring trained personnel. This is largely due to a lack of suitably qualified candidates, basic technical and work skills, and experience.

The same difficulties affect the city of Salvador in its unemployment figures, but also in its struggle to attract investments. Therefore, investing in increasing the economically active population’s qualifications will help to make the economy most resistant and robust.

III. The City’s Digitalization Data

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>30%</td>
<td>Around 30% of the population still lacks regular internet access, for various reasons ranging from digital illiteracy to economic factors (high cost of connectivity packages and/or a computer)</td>
<td>Salvador Resilience Strategy</td>
</tr>
<tr>
<td>21.3%</td>
<td>21.3%: population living below the poverty line</td>
<td>Brazilian Institute of Geography and Statistics (IBGE)</td>
</tr>
<tr>
<td>20%</td>
<td>20%: area of the city without telecommunications coverage</td>
<td>PDTCI- Vertical do Telecomunicação</td>
</tr>
<tr>
<td>55.3%</td>
<td>55.3%: city residents with access to an adequately fast broadband connection</td>
<td>PDTCI- Vertical do Telecomunicação</td>
</tr>
</tbody>
</table>
B. Defining the Challenge

How can we promote productive digital inclusion to strengthen local development and support sustainable entrepreneurship to make Salvador a more resilient city?

**TENSIONS AND SHOCKS IN SALVADOR**

**Stresses:**
- Poverty and social inequality
- Unemployment
- Crimes and violence
- Irregular land occupation and use
- Lack of urban mobility
- Lack of access to proper education

**Shocks:**
- Landslides
- Disease outbreaks
- Floods
- Shortage of basic services

**COLLECTIVELY IDENTIFIED CHALLENGES**

- **Challenges facing digitalization** – lack of opportunities and access to digital media
- **Challenges facing companies** – employers have difficulty hiring due to a lack of candidates, rapid technical and work skills, and inexperience
- **Inclusion challenges** – social and economic exclusion inequality
- **Public service challenges** – need to integrate and optimized digitalized public services and the need to use a database to inform public policies

**INSTITUTIONAL STRUCTURE**

**SMART CITY TECHNOLOGY DIRECTORY PLAN** (currently under review)

**OBSERVATORIO SALVADOR**

Ecosystem of digital citizenship and active technologies

**RESILIENT CITIES SHAPING A DIGITAL WORLD**

How can we promote productive digital inclusion to strengthen local development and support sustainable entrepreneurship to make the city of Salvador more resilient?

**DIGITAL LITERACY**

The solution supports citizens’ integration in the digital ecosystem

**LITERACY AND PARTICIPATION**

The solution supports the empowerment and participation of citizens, companies and the public sector in the digital transformation

**PRODUCTIVE DIGITAL INCLUSIONS**

The solution supports entrepreneurship and helps cities to be economically active through digital inclusion

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C. Defining the Solution

By training to develop the necessary soft and hard skills needed to give backing to local talent, entrepreneurs and markets, working toward a smarter, more resilient and more inclusive urban development.
A partnership between Salvador’s government departments of Sustainability and Resilience (SECIS) and Innovation and Technology (SEMIT), in collaboration with Visa, Resilient Cities Network, Via Varejo, through its Marketplace and Fundação Casas Bahia and Hub Salvador, delivered a solution to Salvador’s digitalization challenge with the creation of a Free Digital School.

This school was set up to help Salvador narrow the digital gap by offering new opportunities and better tools to help develop historically excluded and vulnerable sectors. This has significant implications for the entire ecosystem as it addresses major challenges such as supporting inclusive digitalization, tackling high unemployment rates and reducing social inequalities.

D. Designing the Solution
I. Digital Transformation with a Digital School
An exploration of Salvador’s digital ecosystem’s greatest needs revealed three key areas for the project:
- Business digitalization
- Professional training for vulnerable demographic groups
- Digital platforms for communication

The solution’s structure includes a digital school linked to a marketplace and is divided into two parts: professional training and business digitalization.

II. Talent Booster
With the Talent Booster program, companies support the education of new talents and employ top candidates.

This program builds upon a past initiative called New Digital Program that was popular and had a successful outcome in Brazil. In this edition, upon completing the courses, 100% of participants found work.

III. Talent Booster Courses
How can we make sure that digital training will help Salvador to overcome its main challenges?

Two training courses:
- for programmers
- for market agents

The proposed solution comprises a hybrid training program: the trainers teach remotely using the Zoom platform, and students learn in-person at Hub Salvador – premises provided by Salvador’s local government, equipped with training infrastructure, high-quality WiFi and a computer for every student.

Training course 1: For programmers
To train developers, using new local knowledge based on the growing market demands for tech professionals.

60 hours of training divided into:
- 25 hours - soft skills
- 25 hours - hard skills
- 10 hours - projects

Training course 2: For market agents
To train consultants to support local business through technologies that enable them to sell online and accept electronic payment methods.

30 hours of training divided into
- 12 soft skills
- 12 hard skills
- 6 projects

In association with Marketplace Via Varejo, a Brazilian retail and logistics group.
IV. Self-Sustainable Solution

How to achieve a self-sustainable program?
The Salvador edition of the Talent Booster program was designed to be self-sustainable in order to multiply and scale its impact. This is possible thanks to cooperation with local tech companies in the private sector.

These companies benefit from the construction of a better digital ecosystem and well-trained employees, who are equipped to fill technological positions within the city. In exchange, they undertake a commitment to fund new editions of the program.

This approach makes it possible to connect the population to stable employment, and give the digital ecosystem the opportunity to grow and continue innovating toward becoming a smart and prosperous city.

V. The Process
The students selected to join the Talent Booster program complete their training with an end-of-course project that comprises all of their newly acquired knowledge. A job fair then gives students the opportunity to present their work to potential employers which make job offers in return.

When employing students, companies also make a financial contribution to the program.

In the New Digital Program edition that was similar to the Talent Booster program in Salvador, 100% of students found employment at the end of the course.
### I. Benefits of the Solution's Impact

#### For the government
- Training courses planned and managed through an inter-institutional approach improve coordination between various ministries and local government institutions.
- Digital inclusion and training boost access to governmental digital media.
- Consulting agents' support of local businesses strengthens community commitment and social cohesion.

#### For citizens
- IT skills offer new job opportunities for young, unemployed professionals.
- IT and digital systems training courses for vulnerable groups help close the digital gap in the city.
- The digitalization of small businesses helps vulnerable groups, mainly Black women who are heads of households, to access the digital economy through online sales and electronic payments.
- The consulting agents support the digitalization of small companies, strengthening the livelihoods of vulnerable groups.

#### For infrastructure and the economy
- Complete professional training in IT skills aims to increase the percentage of the population working in the ITC sector, boosting digital innovation and economic diversification.
- The use of electronic payments increases the level of insertion in financial markets, enabling access to capital, more formal employment and economic growth.
- SMEs' digitalization gives them access to new digital markets to sell their products and services, strengthening the city's economy and promoting innovation.
- Business digitalization increases the coverage and penetration of communication networks.

---

**SDGS IMPACTED**

- **1 No Poverty**
- **5 Gender Equality**
- **4 Quality Education**
- **9 Industry Innovation and Infrastructure**
- **10 Reduced Inequalities and Inequalities and Inequalities**
- **11 Sustainable Cities and Communities**
- **17 Partnerships for the Goals**
II. Qualities of a Resilient System

The graphic below analyzes the solution’s strengths based on resilience qualities. The key strong points and recommendations to reinforce the solution’s resilience vision are shared below.

Key strengths
An analysis of the solution based on resilience qualities highlights its key strengths.

**Robust solution:**
- **Benefit:** Digital inclusion of the most vulnerable groups, prioritizing Black women who are heads of households, young people and unemployed professionals.
- **Recommendation:** Guarantee the program’s continuity indifferent public spaces within the city, including in peripheral and vulnerable areas.

**Inclusive solution:**
- **Benefit:** Collaboration among various city stakeholders in the program’s design strengthens the integrated and collaborative planning and co-creation between the government, the private sector and citizens.
- **Recommendation:** Ensure the development of policies that support the creation of SMEs in Salvador to ensure that the workforce trained by this program supports the city’s development.
III. Analysis of the Solution’s Impact on the City Resilience Framework (CRF) and its Resilience Dividend

The City Resilience Framework (CRF) is divided into four main dimensions that cover the most critical issues for building a resilient city in the face of current and future challenges.

The factors are:
• Leadership and Strategy
• Health and Well-being
• Economy and Society
• Infrastructure and Environment

Key impact areas
An analysis of the solution’s four areas of impact to measure the number of potential benefits and co-benefits reveals the key impact areas.

**Economy and Society:**
- Digital systems and IT training for vulnerable groups, helping to narrow the existing digital gap in the city.
- Integral professional IT training aims to increase the percentage of the population employed in the ITC sector, boosting digital innovation and economic diversification.
- Using electronic payments increases levels of insertion in the financial markets, enabling access to capital and allowing for greater integration and economic growth.
Analysis of the Solution’s Impact on the Smart City Technology Directory Plan (PDTCI) and its Resilience Dividend

The PDTCI, currently under review before its official publication, was created with CAF’s financial support in order to catalyze and inform Salvador’s transformation from a Smart City perspective.

Among the various dimensions of the PDTCI, the most relevant ones were identified to use as the basis for this analysis:

- Digital literacy
- Digital performance and participation
- Productive digital inclusion

Key Impact Dimensions
An analysis of the benefits and co-benefits through the three key PDTCI pillars reveals a key impact area.

Digital performance and participation:
- Consulting agents support to small local businesses reinforces community commitment and social cohesion.
- The collaboration among various city stakeholders in the program’s design strengthens the integrated and joint planning and co-creation between the government, the private sector and citizens.
Several benefits and co-benefits were identified and defined to analyze the solution in the context of the urban system.

The key benefits and co-benefits are listed below:

### KEY BENEFITS

Analysis plot of the solutions in the context of the urban system. Each point corresponds to a Benefit of the Project with an impact on a factor of the CRF and PDTCI.

<table>
<thead>
<tr>
<th>Benefit</th>
<th>CRF Dimensions</th>
<th>KEY PDTCI Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Digital systems and IT training for vulnerable groups,</strong> helping to narrow the existing digital gap in the city.</td>
<td><img src="#" alt="Impact" /></td>
<td><img src="#" alt="Impact" /></td>
</tr>
<tr>
<td><strong>Integral professional IT training</strong> aims to increase the percentage of the population employed in the ITC sector, boosting digital innovation and economic diversification.</td>
<td><img src="#" alt="Impact" /></td>
<td><img src="#" alt="Impact" /></td>
</tr>
<tr>
<td><strong>Support from consulting agents to increase SMEs’ digitalization helps vulnerable groups, particular Black women who are heads of households, to participate in the digital economy through online sales and electronic payments.</strong></td>
<td><img src="#" alt="Impact" /></td>
<td><img src="#" alt="Impact" /></td>
</tr>
<tr>
<td><strong>Using electronic payments increases levels of insertion in the financial markets,</strong> enabling access to capital and allowing for greater integration and economic growth.</td>
<td><img src="#" alt="Impact" /></td>
<td><img src="#" alt="Impact" /></td>
</tr>
<tr>
<td><strong>The digitalization of SMEs gives them access to new digital markets</strong> to sell their products and services, strengthening the city’s economy and promoting innovation.</td>
<td><img src="#" alt="Impact" /></td>
<td><img src="#" alt="Impact" /></td>
</tr>
<tr>
<td><strong>Collaboration among various city stakeholders in the program’s design strengthens</strong> the integrated and collaborative planning and co-creation between the government, the private sector and citizens.</td>
<td><img src="#" alt="Impact" /></td>
<td><img src="#" alt="Impact" /></td>
</tr>
</tbody>
</table>
### KEY CO-BENEFITS

Analysis plot of the solutions in the context of the urban system. Each point refers to a co-benefit of the project with an impact on a factor of the CRF and PDTCI.

<table>
<thead>
<tr>
<th>CO-BENEFIT</th>
<th>CRF DIMENSIONS</th>
<th>KEY PDTCI DIMENSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Improve gender equality</strong> in the city, by supporting the training of participants that were selected taking into account gender balance and ensuring support for Black women and the digitalization of their businesses or companies</td>
<td>![CRF and PDTCI indicators]</td>
<td>![CRF and PDTCI indicators]</td>
</tr>
<tr>
<td>The solution has the potential to <strong>Facilitate access to digital services</strong> such as health, education, etc. To give the population a fuller understanding of how to use these services, and to allow for the government to take stock of the benefits and possibilities offered by creating digital public services.</td>
<td>![CRF and PDTCI indicators]</td>
<td>![CRF and PDTCI indicators]</td>
</tr>
<tr>
<td>The solution has the potential to <strong>support the expansion of financial instruments</strong> that promote financial and digital inclusion by providing access to payment methods and business digitalization.</td>
<td>![CRF and PDTCI indicators]</td>
<td>![CRF and PDTCI indicators]</td>
</tr>
<tr>
<td><strong>Democratize access by including new participants in the city’s entrepreneurship ecosystem</strong> can enable the creation of new organizations and businesses based on traditional knowledge to create beneficial solutions for society and the environment (for example, taking into account historical inequalities or climate change).</td>
<td>![CRF and PDTCI indicators]</td>
<td>![CRF and PDTCI indicators]</td>
</tr>
<tr>
<td>The solution will <strong>generate data for the city</strong> that, if properly managed, can inform about the practices of local governments to support moves toward formalization, incentive creation, etc.</td>
<td>![CRF and PDTCI indicators]</td>
<td>![CRF and PDTCI indicators]</td>
</tr>
<tr>
<td>The solution will generate data for the city that, if properly managed, can <strong>support business development focused on other priority areas for the city</strong>, such as renewable energies or green investments.</td>
<td>![CRF and PDTCI indicators]</td>
<td>![CRF and PDTCI indicators]</td>
</tr>
</tbody>
</table>
f. Action Lines to Deploy the Short, Medium and Long-Term Resilience Dividend

**SHORT-MEDIUM TERM**
- Guarantee gender, racial and social equality when selecting candidates.
- Guarantee that the solution’s model is institutionalized and linked to other programs in the city (training, internet-access programs, business startup programs, etc.).
- Guarantee the program’s continuity indifferent public spaces within the city, including peripheral and the most vulnerable areas.
- Guarantee that the information and data generated by the program are integrated with other data generated by the Municipality to inform public policies.
- Guarantee that the program helps the training of teachers in Salvador to ensure the courses’ continuity.
- Guarantee the development of policies that support the creation of SMEs in Salvador to ensure that the workforce trained by this program supports the city’s development.

**LONG TERM**
- Improve gender equality in the city, by supporting the training of participants that were selected taking into account a gender balance and ensuring support for Black women and the digitalization of their businesses or companies.
- Facilitate access to digital services such as health, education, etc. To give the population a fuller understanding of how to use these services, and to allow the government to take stock of the benefits and possibilities offered by creating digital public services.
- Support the expansion of financial instruments that promote financial and digital inclusion by providing access to payment methods and business digitalization.
- Democratizing access by including new participants in the city’s entrepreneurship ecosystem can enable the creation of new organizations and businesses based on traditional knowledge to generate beneficial solutions for society and the environment (for example, taking into account historical inequalities or climate change).
- Generate data for the city that, if properly managed, can inform about the practices of local governments to support moves toward formalization, new incentives, etc.
- Generate data for the city that, if properly managed, can support business development focused on other priority areas for the city, such as renewable energies or green investment.
05_ USEFUL RESOURCES
<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
<th>Description</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USEFUL RESOURCES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>City Resilience Framework</strong></td>
<td>Rockefeller Foundation and ARUP</td>
<td>Provides a holistic articulation of urban resilience, structured around critical dimensions and objectives for cities’ resilience. Available in English.</td>
<td><a href="https://resilientcitiesnetwork.org/urban_resiliences/city-resilience-framework">https://resilientcitiesnetwork.org/urban_resiliences/city-resilience-framework</a></td>
</tr>
<tr>
<td><strong>Community of Practice – Cities for a Resilient Recovery</strong></td>
<td>Resilient Cities Network and World Bank</td>
<td>A resource to access experiences and practice-oriented content to boost a resilient recovery in cities around the world. Available in English.</td>
<td><a href="https://resilientcitiesnetwork.org/communities/resilient-recovery/">https://resilientcitiesnetwork.org/communities/resilient-recovery/</a></td>
</tr>
<tr>
<td><strong>Recovery Dialogues in Latin America</strong></td>
<td>Resilient Cities Network and CAF</td>
<td>A space to compile experiences and best practice to draw up a roadmap for a resilient urban recovery in areas such as mobility, informal settlements, digital inclusion, local commerce, etc. Available in Spanish.</td>
<td><a href="https://www.caf.com/es/temas/c/ciudades/soluciones-urbanas/sesiones-de-intercambio/">https://www.caf.com/es/temas/c/ciudades/soluciones-urbanas/sesiones-de-intercambio/</a></td>
</tr>
<tr>
<td><strong>Transport: Resilience Point of View</strong></td>
<td>Resilient Cities Network</td>
<td>An analysis framework to construct resilient transport systems and to guarantee a mobility strategy that contributes to building resilience in a city as a whole. Available in English.</td>
<td><a href="https://resilientcitiesnetwork.org/urban_resiliences/transport-resilience-point-of-view/">https://resilientcitiesnetwork.org/urban_resiliences/transport-resilience-point-of-view/</a></td>
</tr>
<tr>
<td><strong>Resilient Energy and Mobility Transition Program</strong></td>
<td>Resilient Cities Network and Shell</td>
<td>Program for collaborative platforms to allow for the exchange of technical assistance, energy and mobility expertise and global city best practices to develop transition plans and accelerated investment in cities across North America and Europe. Available in English.</td>
<td><a href="https://resilientcitiesnetwork.org/programs/resilient-energy-and-mobility-transition-program-shell/">https://resilientcitiesnetwork.org/programs/resilient-energy-and-mobility-transition-program-shell/</a></td>
</tr>
<tr>
<td>Title</td>
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</tr>
<tr>
<td>MIO users can now use contactless cards and digital IDs to pay for their tickets directly at the turnstiles</td>
<td>Visa</td>
<td>In Colombia, Cali’s integrated mass transport system (MIO) now accepts payments from contactless cards and other NFC devices for paying fares, using more than 930 validation terminals. Available in Spanish.</td>
<td><a href="https://www.visa.com.co/about-visa/newsroom/press-releases/paga-viajes-mio-visa.html">https://www.visa.com.co/about-visa/newsroom/press-releases/paga-viajes-mio-visa.html</a></td>
</tr>
<tr>
<td>Metrobús will be able to pay fares using contactless cards and digital wallets</td>
<td>Visa</td>
<td>More than 600,000 users of Lines 1, 2 and 3 of Mexico City’s Metrobús can buy or top-up their Integrated Mobility cards and pay for their journeys quickly and safely using debit and credit cards, electronic wallets, CoDi and smart devices. Available in Spanish.</td>
<td><a href="https://www.visa.com.mx/acerca-de-visa/sala-de-noticias/notas-de-prensa/nuevas-formas-de-pago-en-metrobus.html">https://www.visa.com.mx/acerca-de-visa/sala-de-noticias/notas-de-prensa/nuevas-formas-de-pago-en-metrobus.html</a></td>
</tr>
<tr>
<td>Visa’s Innovation Center celebrates five years promoting innovations for future payments in Latin America and the Caribbean</td>
<td>Visa</td>
<td>It has been five years since Visa’s Innovation Center for Latin America and the Caribbean began to collaborate with financial institutions, businesses, governments and startups to discover, explore and co-create the next generation of payment technologies in the region. Available in Spanish.</td>
<td><a href="https://www.visa.com.mx/acerca-de-visa/sala-de-noticias/notas-de-prensa/centro-innovacion-celebra-cinco-anos.html">https://www.visa.com.mx/acerca-de-visa/sala-de-noticias/notas-de-prensa/centro-innovacion-celebra-cinco-anos.html</a></td>
</tr>
<tr>
<td>As the number of public transport users recovers, a new survey by Visa indicates that 9 out of 10 passengers around the world expect contactless payment options</td>
<td>Visa</td>
<td>Data from Visa’s “Future of Urban Mobility” survey reveals that 84% of public transport users expect to return to the pre-Covid-19 ridership levels. Available in Spanish.</td>
<td><a href="https://www.visa.com.mx/acerca-de-visa/sala-de-noticias/notas-de-prensa/pagos-sin-contacto-en-transporte-publico.html">https://www.visa.com.mx/acerca-de-visa/sala-de-noticias/notas-de-prensa/pagos-sin-contacto-en-transporte-publico.html</a></td>
</tr>
<tr>
<td>Title</td>
<td>Access to payments technology promotes digital inclusion and the recovery of micro and small-sized companies in Mexico</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Author</td>
<td>Visa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>A survey commissioned by Visa reveals that accepting digital payments has a positive impact for micro and small-sized companies, such as increased revenues. Available in Spanish.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Link</td>
<td><a href="https://www.visa.com.mx/acerca-de-visa/sala-de-noticias/notas-de-prensa/tecnologias-de-pago-recuperacion-economica-mexico.html">https://www.visa.com.mx/acerca-de-visa/sala-de-noticias/notas-de-prensa/tecnologias-de-pago-recuperacion-economica-mexico.html</a></td>
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</tbody>
</table>

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<thead>
<tr>
<th>Title</th>
<th>Increased use of e-commerce and debit cards in Latin America and the Caribbean</th>
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<tbody>
<tr>
<td>Author</td>
<td>Visa</td>
</tr>
<tr>
<td>Description</td>
<td>An analysis by Visa’s consultancy team shows that card-holders in Latin America and the Caribbean made more frequent online payments and used debit cards more often in December 2020 than before the pandemic. Available in Spanish.</td>
</tr>
<tr>
<td>Link</td>
<td><a href="https://www.visa.com.mx/acerca-de-visa/sala-de-noticias/notas-de-prensa/aumento-comercio-electronico-america-latina-caribe.html">https://www.visa.com.mx/acerca-de-visa/sala-de-noticias/notas-de-prensa/aumento-comercio-electronico-america-latina-caribe.html</a></td>
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