# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 1</td>
<td>Introduction: The case for resilience planning</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>The case for resilience planning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>About this document</td>
<td></td>
</tr>
<tr>
<td>Section 2</td>
<td>East Bayfront Precinct: Adding resilience to the plan</td>
<td>5</td>
</tr>
<tr>
<td>Section 3</td>
<td>Local Area Risk Analysis: Preparing a comprehensive risk profile</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Risk to Performance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Risk to Function</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Business and Market Risks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Risk to Adaptability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Risks to Re-Investment</td>
<td></td>
</tr>
<tr>
<td>Section 4</td>
<td>De-risking the Performance Promise of the New East Bayfront</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>A Truly Mixed Use Community</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sustainability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Affordability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quality of Services</td>
<td></td>
</tr>
<tr>
<td>Section 5</td>
<td>Mapping East Bayfront Resilience Challenges</td>
<td>13</td>
</tr>
<tr>
<td>Section 6</td>
<td>Resilience Planning: The process</td>
<td>21</td>
</tr>
<tr>
<td>Section 7</td>
<td>Conclusion: Planning for North America’s first ‘Resilience Zone’</td>
<td>23</td>
</tr>
</tbody>
</table>
The case for resilience planning

‘Resilience’ has emerged as a new area of planning interest, specifically within the context of climate change and related extreme weather events. As a new area of interest, resilience planning frameworks are still in the early stages of development. Even the definition of resilience in the urban context is still evolving.

The framework presented in this document has been designed by The Next Practice (TNP) with two distinct objectives in mind. The first objective is to approach resilience in a way that results in the creation of additional value in urban places and assets—and that does not just impose new costs. Much as has been demonstrated by the emergence of green building as a new area of market-based performance, the objective is to make resilience an investment worthy priority for the public and private sectors alike.

Resilience is of course already an area of concern in both the public and private sectors. Costly catastrophes such as Hurricane Katrina in New Orleans and Hurricane Sandy in New York/New Jersey have been catalysts for concern in the arenas of property management, utilities, insurance, community development, infrastructure, habitat restoration, as well as urban planning.

However, current approaches to resilience planning that are related strictly to climate adaptation have not triggered proactive investments to prevent such losses. Extensive study was made of exposures to extreme weather events in New Orleans and New York prior to the Katrina and Sandy catastrophes. In neither instance did this planning, nor any other property market signals, instigate significant measures to prevent hundreds of fatalities and tens of billions in property and business losses, including the complete failure of entire city districts.

These and other disruptive events, such as major floods (e.g., Calgary and Toronto), fires (e.g., San Diego, Sydney), power failures (Northeast Canada and USA 2003), and heat waves (France 2003) have highlighted the need to create market incentives for more proactive risk management in urban...
The recent focus on climate change risk is building capacity in local governments for improved risk assessment. But this paper suggests that addressing climate risks should not be an end in itself. As the East Bayfront case indicates, climate and other catastrophic risk challenges are critical catalysts for fuller introduction of Enterprise Risk Management into urban planning, local economic development planning, and development project management.

As the range of urban risk exposures increases, the second objective of the presented resilience planning framework is to ensure that ‘resilience’—in other words, the de-risking of urban places—is applied comprehensively and not only as a special topic related to catastrophic risks.

Over the last decades, other costly burdens have also been imposed on communities, local governments, and the business sector by diverse urban risks, often concentrated in specific districts or areas. These include public health risks, property market risks of both a systemic and regional nature, the loss of major employers, and aging infrastructure. Added to this is the further, endemic risk that development projects do not deliver their promised performance benefits and economic value. The engagement of stakeholders in urban risk management will be more effective if focused on the full array of exposures confronting any particular city area, including the area’s performance risks.

For this reason, the following approach proposes the inclusion of resilience elements in urban plans at the precinct or district scale. The resilience element of a plan would address the risk profiles of precincts and their resident and business communities comprehensively. These comprehensive profiles would be used to identify and prioritize measures to de-risk places and to manage remaining exposures and vulnerabilities. The ultimate objective is to ensure that the resulting ‘resilience zones’ can more predictably deliver promised benefits to users and anticipated returns to investors, relative to alternative locations. If well communicated, such a resilience zone should secure additional competitive advantage.

Resilience planning takes place within the context of significant legacy risk management practices. Environmental assessments, development permitting, building codes, licensing regimes, emergency services and public health standards, financial due diligence etc. have each been designed to address historically prioritized risks. However, when (re)developing unique sites, to serve unique functions, with unique performance ambitions, these redeveloped places assume unique risks that may not be fully taken into consideration by existing risk management standards and procedures. Furthermore, the fractured nature of the urban development process often encourages the passing on of unmanaged risks to the public sector and downstream users, rather than collaboration to reduce them. This was amply illustrated by the 2007-2008 financial and property market crisis in the United States and Europe.

The collaborative pursuit of preventative measures occurs when stakeholders believe that tangible benefits will accrue to them, in particular because the market will recognize resilience as a form of competitive performance. The following framework has been developed to both incent and support the development of resilience as a distinct performance benefit at precinct, neighborhood, and district scales.

About this document

This document explores the use of resilience planning as an element in district, precinct and other local area plans. The described approach is illustrated by using Toronto’s East Bayfront precinct plan as a case example. The East Bayfront plan and regeneration project is referenced for indicative purposes only.

Extensive planning studies were commissioned by Waterfront Toronto and the City of Toronto for the East Bayfront precinct, reflecting high standards. Related to these extensive risk identification and analyses have been undertaken. However, when considering the resilience of a precinct, more comprehensive and extensive risk analysis is required than is the convention for projects of this kind.

This document does not present recommendations about the resilience priorities and requirements for the East Bayfront precinct, as these would need to be based upon risk analyses and stakeholder engagement activities that have not been commissioned. For the sake of clarity, the document also is not associated with the East Bayfront planning and design work of Urban Strategies Inc., Koetter, Kim & Associates, or Phillips, Farevaag, Smallenberg. It is in no way derivative of their works.

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Section 2

East Bayfront Precinct: Adding resilience to the plan

As an extension of Toronto’s important media industry cluster, home to prominent institutions, and as a new mixed income residential community and destination recreation area, East Bayfront can be the North American leader in a new type of urban performance: resilience. The East Bayfront precinct can offer built-in assurance to investors, owners, tenants, residents, and users that its unique functions, attractions, benefits, and valuations will be secured against major risks for decades to come.

Tremendous resources have been and will be invested to design and deliver a new precinct with best-of-class performance. The addition of a resilience element to the East Bayfront vision and plan would ensure that its promised performance as a location of choice would be reliably delivered for decades to come.

Located on a waterfront in a flood plain area along a dense multi-modal transportation corridor, during a time of substantial adjacent redevelopment projects, and of market, demographic, and climate changes, the mixed use precinct will bear a unique risk profile. The preparation of an East Bayfront resilience plan element would support delivery of the precinct’s promised open space amenities, affordability, and green and transit-oriented performance and at the same time make it a flagship demonstration of resilient urban development of international significance.

The following pages offer a conceptual outline of the issues and process used for preparing such a planning element or Resilience Plan.
Map 5: East Bayfront Existant (source: Google Maps 2015)
Map 6: East Bayfront Master Plan (source: Waterfront Toronto)
Map 7: East Bayfront: Land Use (source: MMM Update - March 2013)
Section 3

Local Area Risk Analysis: Preparing a comprehensive risk profile

The Next Practice’s (TNP) Local Area Risk Analysis (LARM) framework supports stakeholders to identify the wide range of risk exposures associated with a planned area and, importantly, with the delivery and maintenance of the area’s performance promises to investors, service providers, residents, tenants and visitors.

The LARM framework applies concepts of Enterprise Risk Management (ERM) to places. ERM is now widely used as a core practice in corporate management, because it focuses risk management on the achievement of the organization’s business objectives within an environment of complex and manifold risks. Similarly, LARM approaches district-scale risk management as a practice not only to avoid risks, but also to reduce impediments to the achievement of local economic development, policy and place-making objectives. The aim is to use risk assessment and risk management planning to reinforce the guarantee of a premium location for residents and/or businesses relative to other location choices.

Historically, risk management in development planning has concentrated, sometimes exclusively, on site risk (e.g., flooding, environmental impact), risks and liabilities associated with legacy uses (e.g., contamination, rail corridor), and on the financial risks of the immediate investment project. Longer-term risks to the fulfillment of promised performance are not typically given substantial attention in planning and design. A great deal of what is articulated in visions, strategies, and plans may not be supported by a risk management strategy. The underlying assumption is that such performance risks have been implicitly addressed in zoning, building and licensing standards. However, especially when projects incorporate relatively new forms of performance, the legacy standards are rarely adequate. In fact, standards may themselves be a risk to promised performance.

The first step in LARM analysis is preparing an inventory of risks that will be faced by the current and future owners, service providers, businesses, households, and visitors/customers. Risks are identified and explored in five areas:

**RISKS to PERFORMANCE**

These are risks to the key performance promises of the precinct as defined in the precinct plan. Risks to performance are primarily managed through measures associated with design, staging/delivery, and ongoing property and place management, including both asset operations management, leasing, and place-making or ‘curation’ of the promised resident, business and activities mix. Examples of performance risks are provided in the next section.

**RISKS to FUNCTION**

These are risks to the basic function of the precinct including disruption of utilities and services, risks to efficient access and egress, and emergency events. Risks to function are primarily managed through design, utilities upgrades, the establishment of redundancies, and emergency planning and services provision that are tailored to a precinct’s unique risk exposures. Maintaining the capacity for safe failure is a minimum objective. Examples of possible risks to function in the East Bayfront precinct might be:

- Flood risk
- Power outages
- Inadequate infrastructure capacity
RISKS to ADAPTABILITY
These risks arise from inflexible design, technology choices, capitalization, contracts, and regulation of activities, which prevents the adaptation of physical assets and space, and of precinct activities and business models to changing markets, technologies, social trends, and the natural environment. Examples of possible risks to adaptability in the East Bayfront precinct might be:

- Design that creates inflexible, but underutilized spaces that cannot easily be converted to fuller uses (e.g., an unactivated plaza between two privately owned commercial buildings dedicated to underground parking access)
- Dependencies on legacy infrastructure and grid networks
- Insufficient land allocation for new utilities or infrastructure
- Fixed design of residential units for one demographic

BUSINESS and MARKET RISKS
These risks arise from disruptive changes in markets that undermine anticipated returns on property investments as well as the industries and businesses clustered in a precinct. Business and market risks may be managed by diversifying individual business exposures through collective investments and the pooling of risks, including through insurance and other financial instruments. Examples of possible business/market risks for retailers and for media-related companies in the East Bayfront precinct might include:

- Risks of commercial unit vacancies (including property tax risk)
- Currency risk exposure for companies dependent upon export markets or foreign inputs
- Cost inflation risks
- Equipment and power supply risks
- Risks associated with technology change, including new on-line business models which enable the outsourcing of design and production, on-line retail, on-line distance education
- Labor supply/talent risks
- Malicious computer risks, e.g., hackers, viruses etc

RISKS to RE-INVESTMENT
These risks are risks to capital access or to the attraction of capital for investment in new technology, infrastructure, building improvements, or redevelopment, including poor management of financial exposures of anchor businesses, and of local stakeholder relations. Risks to re-investment are primarily managed through the creation of pooled financing mechanisms, such as special assessments, or district utilities or redevelopment entities with access to capital markets. Examples of possible risks to re-investment in the East Bayfront precinct could be:

- Risks of maintenance and retrofit re-investments in large residential buildings, in particular by condominium associations in the instance that widely used building materials (e.g., glass ‘skins’) are not durable
- Risks of poor precinct-scale management, governance and investment promotion mechanisms
- Risks of underinsurance (e.g., in the instance of catastrophic events)
De-risking the Performance Promise of the New East Bayfront

Most area and redevelopment plans give considerable importance to unique performance features, not only to implement policy but to attract investment, sales, tenancies, and political/public support. However, it has become commonplace that delivered projects underperform relative to their marketed, ambitious promises. Conversely, projects that fulfill or exceed their performance promises can secure international reputational value that provides immediate and longstanding economic returns to places and their assets as well as to the city and to the project’s planners, designers, and developers.

The East Bayfront precinct plan outlines four particular areas of distinctive performance, i.e., the precinct’s “performance promise.” Among other risk areas, a resilience plan element for East Bayfront would address these key aspects of promised community character:

- A Truly Mixed Use Community
- Sustainability
- Affordability
- Quality Services

This section identifies examples of risks specifically associated with these performance ambitions, which would be further evaluated through a resilience planning exercise.

A Truly Mixed Use Community

Mixed use communities bear risks specifically associated with each of the major uses (e.g., business, recreation, entertainment, family residence) as well as with the conflicts and incompatibilities that can arise when different user groups pursue their objectives in the same densely used location.

East Bayfront risk exposures that may be associated with the in situ mix of uses could include:

- Personal safety risks associated with the dense mix of automobile, public transit, industrial rail, pedestrian, cycling, and rollerblading modes of mobility along one busy and narrow corridor
- Noise disturbance associated with residence in an area of heavy weekend visitor/tourism use
- Conflicts over uses of public space and facilities as both neighborhood amenities, employee and student amenities, and city-wide recreation amenities

Sustainability

The East Bayfront precinct plan places a strong emphasis on both social and environmental sustainability performance. Risk exposures may include:

- Delay or unstable political and financial support for the costly Lower Don flood control and naturalization projects
- Delayed build-out of public transit services
- Increased traffic congestion and idling and associated air quality problems, in particular in identifiable intersections
- Risk to residential affordability (see below)
- Risks to accessibility by families of diverse backgrounds (and not only younger singles and couples at the early stages of their careers)
Providing a mix of affordable and market housing sites across the waterfront

Among the near-term risks to the success of these measures is the securing of program funding to achieve the 20% target for affordable rental housing. Another risk may be the ability to secure a school and community centre for the precinct in light of extensive pressure on the school board to close schools, liquidate properties, and address a large city-wide capital maintenance backlog.

Most of the measures to establish affordability focus on the through delivery and early establishment stages of the precinct. However, the risks to affordability extend well beyond these early stages and are likely to increase with the success of the precinct, as delivered according to plan. Measures are needed to maintain affordability once units are re-sold on the market. This specifically applies to the 5% mix of ‘low end of market’ market housing, and objectives to provide a live-work precinct for lower paid service employees. Affordability maintenance in the context of rising downtown prices may require maintaining part of the housing stock under co-op, shared equity, or life-lease schemes, as well as measures to contain monthly maintenance fees and utilities charges, provide access to affordable food and other retail options, and to reduce commuting requirements and costs.

Quality Services

The precinct plan includes a full complement of emergency, educational, and recreational services and facilities. A Resilience Plan element would consider issues such as:

- Special training, staffing and protocols for such services, so that they are most responsive to the unique features and uses of the precinct in different seasons
- Services and facilities capital and operating funding in light of budgetary constraints
- The adaptability of facilities to respond to demographic changes or unexpected demographic patterns in the precinct

Affordability

The current precinct plan already includes measures to reduce and mitigate risks associated with housing affordability. These affordability measures are also directly linked to the precinct’s ambition as a diverse, mixed-income residential community. Among these is the establishment of a special institutional mechanism, the Waterfront Housing Trust. Other measures include:

- Providing family services at the earliest possible opportunity, including excellent day care, community and school facilities
- Encouraging the creation of larger housing units and giving priority to families with children in the allocation of those units
- Seeking community support and sponsorship for senior housing, long-term care facilities, and housing for downtown workers

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The initial, comprehensive identification and prioritization of risks at early stages of the planning effort enables the incorporation of risk reduction measures from the project’s outset. These risks can be mapped to highlight particular areas of current and potential risk concentration, meriting tailored measures.

The following maps provide an indicative illustration of the range and spatial concentration of risks in the planned East Bayfront project and precinct. The maps are indicative only. The maps do not represent a list of prioritized risks based on likely incidence and impact.

The plan maps illustrates types of risks associated with the East Bayfront location and its planned uses and elements, including its stated performance promises. The maps provide examples of the spatial location of these exposures (see indicative Map 8). A fuller risk mapping exercise, involving all the key stakeholders, would produce a clear indication of the typical clusters and concentrations of the prioritized risk exposures in the precinct (see Maps 8 and 9). Such an identification of high risk locations would trigger discussions of possible risk management measures and/or plan adjustments.

The sectional maps (Maps 10-13) are indicative of the possible spatial concentration of risks in a risk hotspot area, i.e., a major intersection on the multi-modal Queens Quay Boulevard corridor. Four sectional maps are presented to differentiate those risks that are typically considered in the preparation of a precinct plan (according to existing project assessment standards and planning procedures in North America) and those that are not consistently evaluated in standard North American practice. The first sectional map (Map 10) illustrates the combination of all of these types of possible risk in one location, emphasizing the need for a specific Local Area Risk Management approach for an area of that nature.
Map 8: East Bayfront Precinct: Map of Local Area Risks (indicative)

SYMBOLS LEGEND
- Current Industrial Uses
- Developed Buildings of the Precinct Plan
- Proposed Build-out as per Precinct Plan
- Unoccupied areas
- Vacant ground floor retail
- Community Facilities (school, recreation)
- Flood area in arrow side
- Traffic jam
- Poor air quality

RISK ICONS LEGEND

PERFORMANCE
- Air quality issues
- Delays in project delivery, staging problems
- Nuisance
- Risks of non-activated 'no man's land' spaces
- Potential loss of affordability for priority demographics
- Accident prone areas
- Traffic congestion on main corridors
- Archaeological / Heritage risks
- Impacts on aquatic environment
- Habitat / Species risks
- Food safety risks

RISKS TO FUNCTION
- Flood risk
- Grid stress / Power outages
- High winds
- Emergency services
- Extreme heat events
- Inadequate infrastructure capacity
- Rainfall

ADAPTABILITY TO CHANGE
- Inflexible spatial plan
- Old legacy infrastructure
- Large single purpose buildings
- Design for residential units for one demographic

BUSINESS / MARKET RISKS
- Risk of commercial unit vacancies
- Currency risk exposure for companies dependent upon export markets or foreign inputs
- Project financial risks
- Malicious computer risks
- Hazardous material risks

RE-INVESTMENT
- Nondurable building materials
- Poor precinct-scale management
- Chemical contamination

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Loblaw's
George Brown College
Corus Entertainment
Redpath Sugar Factory

Combined sewage and storm water
Congested intersection
Rush hours
Delays and transit extension
Elevated expressway
Traffic lights
Small format retail
Rush hours
Rail line area
Adjoining heavy traffic
Potential delay in flood control infrastructure
Weekends / nights
Storefronts
Flood infrastructure
Public facilities delays
Housing for senior citizens
Traffic lights
Elevated expressway
Rail trails area
Small format retail
Media Industry risks
Rush hours
Rush hours
Rush hours

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A. Area-wide Risk Management Priorities
These are risks to the performance of the entire precinct, relative to its plan and for all owners, residents, tenants, and users.
- A1. Dead zones
- A2. Delivery delay

B. Risk Hotspot Locations
These are concentrations of diverse and potentially cascading risks within specific places within the precinct. Risk hotspots are places that will likely be most challenged in terms of performance, management, and risk of failure.
- B1. The intersections

C. User Group Risk Clusters
These are the unique mixes of risk exposures specific to particular owners, tenants, residents, or users.
- C1. Media Industry
- C2. Seniors
Map 10: Sectional rendering of a risk ‘hotspot’ area, Queens Quay corridor, East Bayfront, Toronto

This map illustrates the possible concentration of different types of risk at a potential ‘risk hotspot’ area in the planned East Bayfront precinct.
Map 11: Established risk management areas, Queens Quay corridor East Bayfront, Toronto (indicative).

These are risks that are already factored in existing planning and development procedures, including environmental impact assessment.
Local governments have placed increasing focus on a new range of risk exposures associated with climate change. This map illustrates how climate-specific exposures contribute to the risk profile of a hotspot area in the precinct plan.
In addition to the established risk management areas and recently identified (although not yet predictable) climate change exposures, each local area is exposed to a wider range of risks unique to its location, use, users, and promised performance.
Resilience Planning: The process

The preparation and mapping of a comprehensive risk profile does not typically provide project proponents and planners with sufficient support to prepare a risk management strategy for the area, including risk reduction, mitigation, and transfer measures. For this reason, a distinct resilience plan element is recommended as part of any precinct plan.

After identifying and prioritizing the risks in each LARM category, a resilience planning process engages stakeholders and provides technical support to quantify the severity of these risks (i.e., likelihood x impact). Further evaluation of priority risks is then used to identify risk hotspot areas within the precinct and the associated vulnerabilities of specific user groups and concentration of exposures at specific time periods. On this basis a resilience planning element—a set of policy, service and other spatially defined measures—can be prepared for the precinct plan.

In conventional risk and climate adaption planning, not only are many non-catastrophic and important performance-related risks ignored, but risks are also often evaluated individually. Their impacts are treated as distinct from other risk exposures and the combined impacts they may have, together. In the context of specific places with overlapping infrastructures and uses and multiple performance promises, risks interact to determine outcomes. Failures arise from the cascading effects of one inadequately managed risk upon other risk exposures. For this reason, resilience planning identifies hotspot areas and systemic weaknesses in the context of the unique place and its uses (see Map 9). These hotspots are identified by preparing at least three risk mapping components. These components are:

<table>
<thead>
<tr>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
<th>Stage 4</th>
<th>Stage 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to the Resilience Zone approach</td>
<td>Participatory risk identification workshop using LARM framework</td>
<td>Risk analysis &amp; mapping Workshop with planning &amp; design group</td>
<td>Policy, market &amp; cost-benefit analysis of measures Workshop with planning &amp; design group</td>
<td>Prepare Resilience Plan Resilience Zone branding &amp; communications strategy</td>
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<td>Leadership consultations</td>
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Figure 2: A Resilience Zone planning process
6.1 The spatial concentration of priority risks. As illustrated in the above plan and detailed sectional maps, this component highlights specific areas in a precinct where risks coincide, thereby meriting further location-specific planning, design, and management analysis in the preparation of the resilience element.

6.2 Types of risk by project stage, e.g., from planning and design, to earthworks and delivery, to sale and leasing, to management and servicing. As illustrated in Figure 3, risk exposures increase and decrease in severity during different stages of the project from delivery through to its occupation and operation. This component guides the formation of timely responses and dashboard estimation of changing risk management priorities over the lifecycle of the project and the occupied precinct.

6.3 Types of exposure of different user groups (e.g., residents, businesses, services providers, recreational visitors). This component highlights the unique exposure profiles of different groups of users within the precinct, which are used to guide each group's active engagement in managing the unique risks of the precinct.

The mapping of these components in a more detailed precinct risk profile enables the fuller analysis of hotspots. These analyses are used to support stakeholder engagement and planning discussions to prepare the resilience element—the plan of measures for risk reduction, mitigation, or transfer (i.e., via insurance) that will enable the fulfillment of the precinct's promised performance. The measures typically include policies and regulations, financing arrangements, physical designs and products, institutional reforms and business or management model innovations, and education and communications activities.

Figure 3: Illustration of risk profile by project stage
Concluding Planning for North America’s first ‘Resilience Zone’

The Next Practice proposes the preparation of a resilience plan element for the East Bayfront precinct both to ensure fulfillment of the precinct’s vision and promise, and to establish the project as a national and global model for market-oriented resilience development practice.

As indicated, the process for preparing such a resilience plan element would involve a series of stakeholder planning, analysis and design workshops, each informed by efficient technical analyses of the key issues identified. In addition to the final Resilience Plan for the precinct, the process would also establish a risk management dashboard to be monitored during the course of the project’s execution.

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