# **Module 3:** Assessing Risk

Now we will determine how likely each hazard is and how severe its impact would be on your operations.

**The goal:** translate data and perceptions into clear priorities for action.



# Climate Resilience Action Plan Steps

Note that we're not predicting disasters; we're identifying vulnerabilities so you can prepare wisely!



0

**Asset Inventory**

List the assets that can contribute to your financial well-being or the success of your business.



1

**Understand Exposure**

Evaluate business assets and their exposure to climate-related hazards.



2

**Assess Vulnerability and Risk**

**Identify the business assets most vulnerable and at-risk to climate-related hazards.**



3

**Investigate Options**

List strategies to reduce the greatest climate-related risks to vulnerable assets.



4

**Prioritize and Plan**

Design an implementation plan for the strategies that are most likely to reduce vulnerability and risk.



5

**Take Action**

Implement and communicate the plan with employees (if applicable). Monitor. Iterate.

# **Vulnerability** and the State of Vermont

First, let's looks at how the state assesses risk and the tools they have available.

# State of Vermont's Hazard Ranking and Vulnerability Assessment System

- The state's assessment looks at not just physical infrastructure, but also people, the natural environment, and the economy.
- **Your organization is a part of this ecosystem;** therefore, you should at least understand and try to align your resilience plan with Vermont's broader resilience strategies.
- This assessment also helps inform and reinforce local climate resilience plans.

# The State of Vermont Identifies Vulnerabilities in Four Categories:

1



**Built Environment**

2



**People**

3



**Natural Environment**

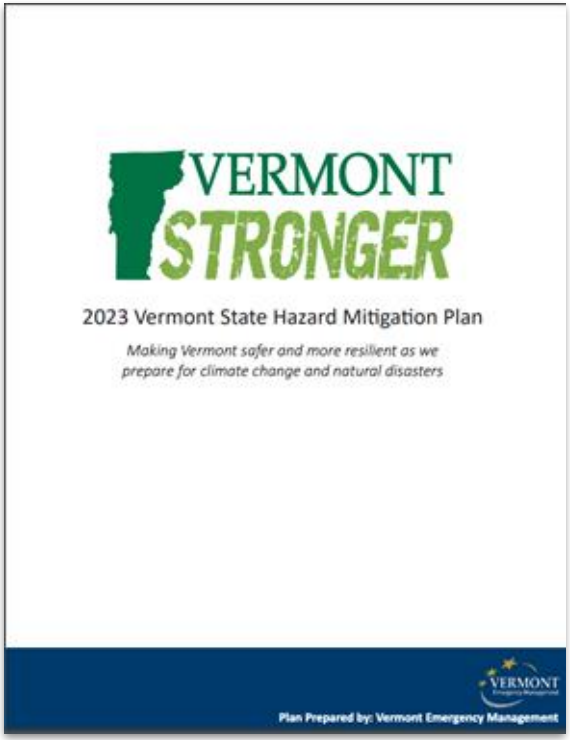
4



**Economy**

# Here's How Vermont Ranks Hazards

Combining likelihood and impact.




**Hazard Assessment Ranking Criteria:**

**Likelihood Scale:**

1. **Unlikely** (<1% per year)
2. **Occasionally** (1–10% per year)
3. **Likely** (>10% per year)
4. **Highly Likely** (>75% per year)

**Impact Scale:**

1. Low impact
2. Major impact

**2023 Plan:** https://vem.vermont.gov/plans/SHMP

**2026 Updates:** https://vem.vermont.gov/document/vermont-state-hazard-mitigation-plan-annual-report-2025

# Why Local Plans Matter



**Your business depends on your community's infrastructure.**

**Local Emergency Management Plans (LEMP)**

**Local Hazard Mitigation Plans**

- ✓ Provide coordination and resources during recovery
- ✓ Integrate Vermont's state hazard framework into your plan

**You can find the local plans that have been filed with the state at https://vem.vermont.gov/plans**

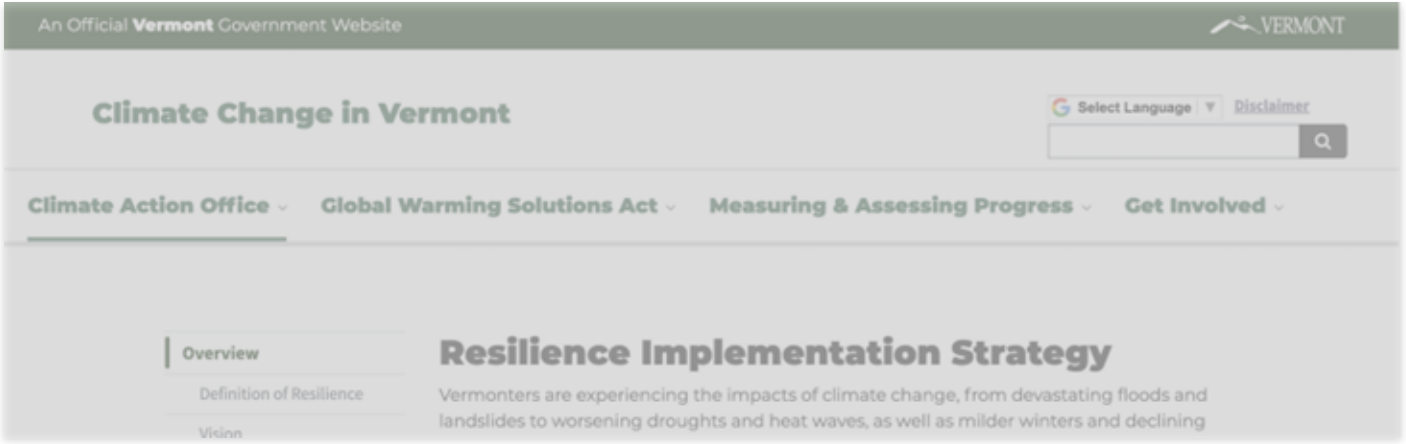
# Taking Action: Vermont's Resilience Implementation Strategy

(Released in September 2025)

**Build and Adapt to Climate-Related Hazards**

**Priority Actions to Protect Communities**

**Strengthen Infrastructure, Economy, Natural Environment**




**Checkout https://climatechange.vermont.gov/resilience-strategy/overview to learn more.**

# Examples from the Vermont Resilience Implementation Strategy

## Economic and Environmental Sustainability

This core component acknowledges the interconnectedness of climate resilience and Vermont's economic stability. This component includes actions that support businesses and working lands enterprises in adapting to changing climate conditions.



**Opportunities and Actions**

**Opportunity 9: Support Vermont businesses, especially small and underserved businesses, in building capacity to prepare for, respond to, and recover from climate-driven disasters, while also advancing economic diversification and adoption of climate-resilient business practices.**

**Build capacity to prepare for, respond to, and recover from climate-driven disasters.**

- **Farm and Forestry Security Special Fund**
- **Logging efficiency**
- **VEDA Disaster Recovery Loan Fund**
- VEDA also supports renewable energy, energy-efficiency, and resiliency projects in C-PACE Districts

- **Climate Outdoors Workforce Initiative - Climate Resilience Jobs**
- **Business Climate Change Needs Assessment**
- **5 Year Resilient Workforce Development Plan**
- **Peer Learning Networks focused on Climate Adaptation**
- **Business technical resources and tools**

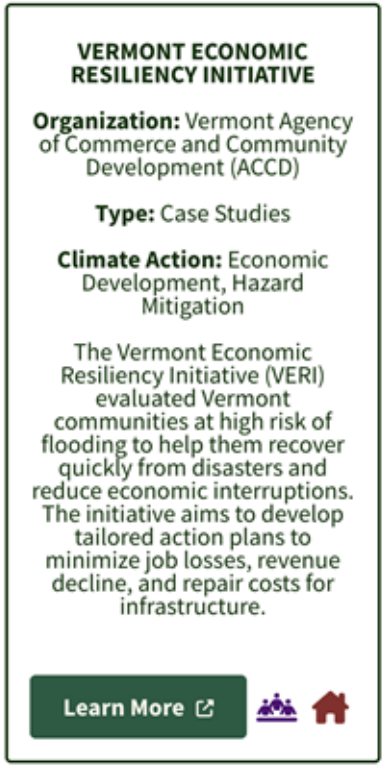
# Vermont's Climate Toolkit

Vermont's one-stop, searchable local and regional climate planning hub!

[https://climatechange.vermont.gov/climate-toolkit](https://climatechange.vermont.gov/climate-toolkit)



# Example from the Vermont Climate Toolkit




➔ Vermont Economic Resiliency Initiative (VERI)

**Tool Types:**

- ➔ Case Studies
- ➔ Data
- ➔ Education/Outreach
- ➔ Financial
- ➔ Planning
- ➔ Technical Assistance

**Tools for Business:**

- Floodproofing for Businesses
- Case Studies
- Dealing with Debris 101
- Reducing Disaster Debris
- Green Infrastructure 101
- Green Landscaping
- River Corridor Protection
- Preparation Matters to Business
- Business Continuity Planning
- Disaster Preparation for Farms
- Insurance Checklists for Business

# Example from the Vermont Climate Toolkit




## Disaster Recovery Loan Fund

- The VEDA Disaster Recovery Loan Fund provides financial assistance to Vermont businesses, farms, foresters, and not-for-profit organizations to help them recover from damage caused by disasters by repairing or replacing damaged property, inventory, or working capital.

## Eligible Disasters

- A disaster must be declared for the Disaster Recovery Loan Fund to be activated. That happens one of two ways. A disaster must be:
- declared by the Governor of Vermont or President of the United States, or
- declared by VEDA in consultation with the Vermont Secretary of Commerce and Community Development; Vermont Secretary of Agriculture, Farms, and Markets; and the Vermont Commissioner of Forests, Parks, and Recreation.

# Example from the Vermont Climate Toolkit




Business continuity planning can be defined as “planning to ensure the continued availability of essential services, programs, and operations; including all the resources involved.” Business continuity planning prepares an organization to respond to an interruption of essential business functions and provides the guidelines to fully recover operations, services, and programs.

- Vermont Business Preparedness Workbook
- Vermont Flood Resiliency Planning Resources
- FEMA Business Preparedness Sample Business Continuity Plan

# Estimating Your Risk

Probability & Matrices

# From Hazard Exposure to Risk

**Risk equals likelihood plus consequence.**

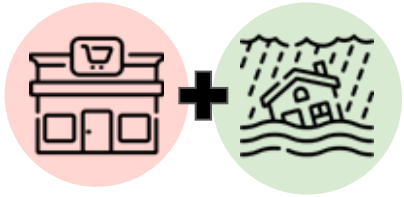
**Estimating risk can sound technical, but it comes down to two simple questions:**

1. **How likely is something to happen?**
2. **How big of a problem would it be if it did?**

**It's not just about how bad something could be - it's also about how probable it is.**

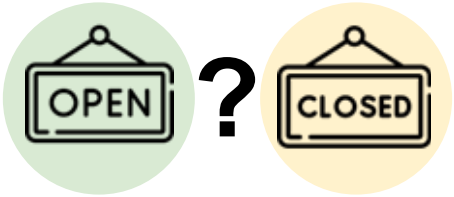
**The next few slides walk you through that intersection - pairing your asset-hazard data with operational realities.**

# From Hazard Exposure to Risk



## Asset-Hazard Pairing

Pair each of your priority assets with **climate-related hazard(s)** that are likely to affect it




## Consequence

Understand whether and how you can operate after being impacted by a **climate-related hazard**

# From Hazard Exposure to Risk



**Likelihood of a Hazard Event**

×




**Consequence for Business Continuity**

=

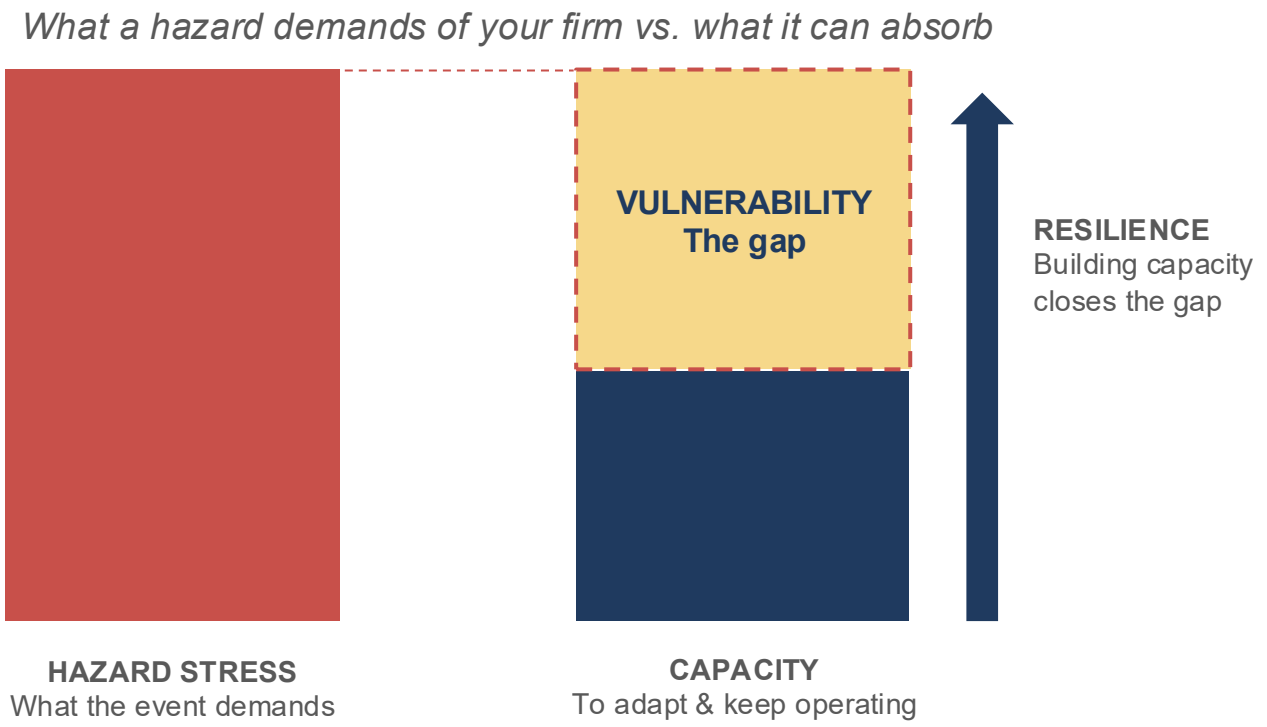
**Risk**

***Possibility** of Climate Hazard Impact on Business*

- This diagram shows how we combine probability and consequence to define overall risk.
- For example, a flood that's rare but would shut you down completely may still rank as a higher risk than a heat wave that's frequent but manageable.
- Our challenge is balancing both - what's most likely and what would hurt most.

# Vulnerability Is the Gap

Vulnerability is the gap between the hazard and your ability to adapt or continue operating. Think about where your systems are fragile - where one failure could cascade.



# Two Ways to Estimate Risk: Qualitative vs Quantitative

## Qualitative

**Simple | Fast Understandable**

**Less Precise**

- Experience & informed judgment
- Words/categories (low, high)
- Team discussion, observations, & expert insight
- Data is limited or incomplete

## Quantitative

**Precise Detail-focused**

**Takes More Data, Time, & Expertise**

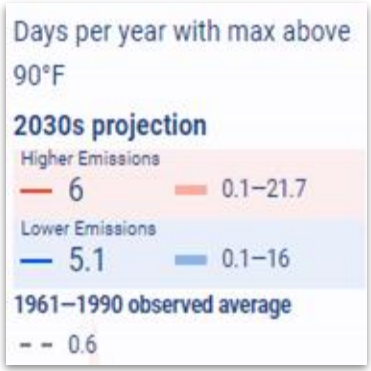
- Numbers & data
- Actual figures (% chance, $ impact)
- Data, calculations, & sometimes software
- High-stakes or financial planning

# Identifying Potential Climate Hazard Exposure

- Let's return to identifying hazard exposures, using both Climate Explorer and FEMA's Risk Index.
- Use these tools to confirm — or challenge — what you already believe about your location.
- This combination of data and lived experience is what makes your plan both credible and actionable.

**Temp Changes in My Business Location**

From Climate Explorer website



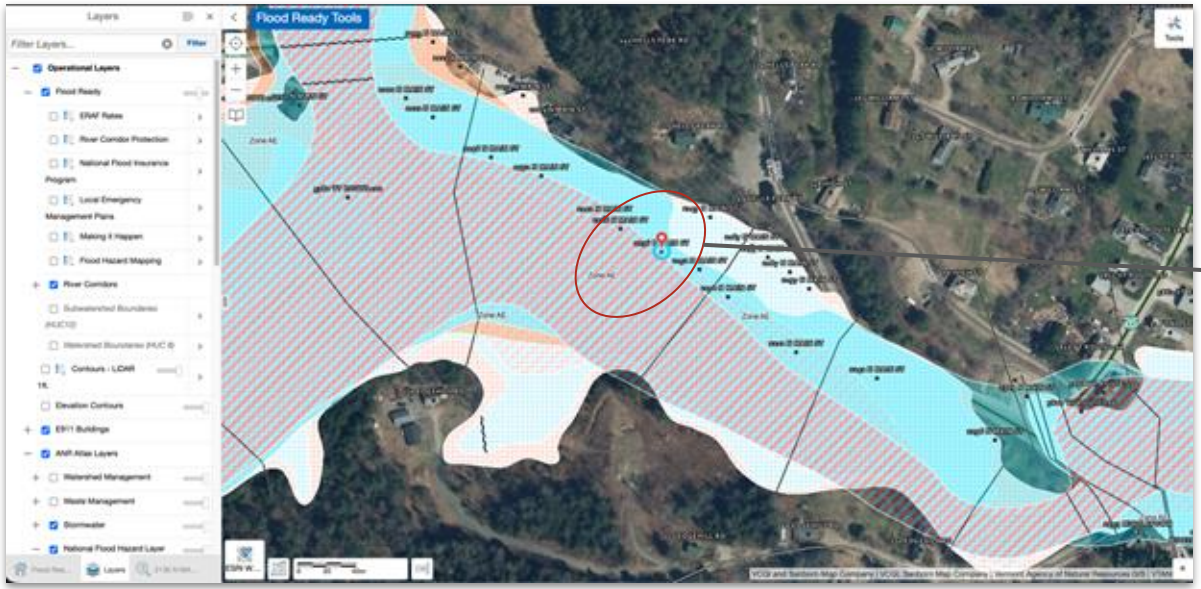

**Potential Hazard Exposure**

Extreme Heat

# Identifying Potential Climate Hazard Exposure

As an example, here we've entered the address for our fictional business *Pete's Pick & Pack* in Londonderry.

**From Flood Ready VT website**




**Potential Hazard Exposure**

River Flooding?

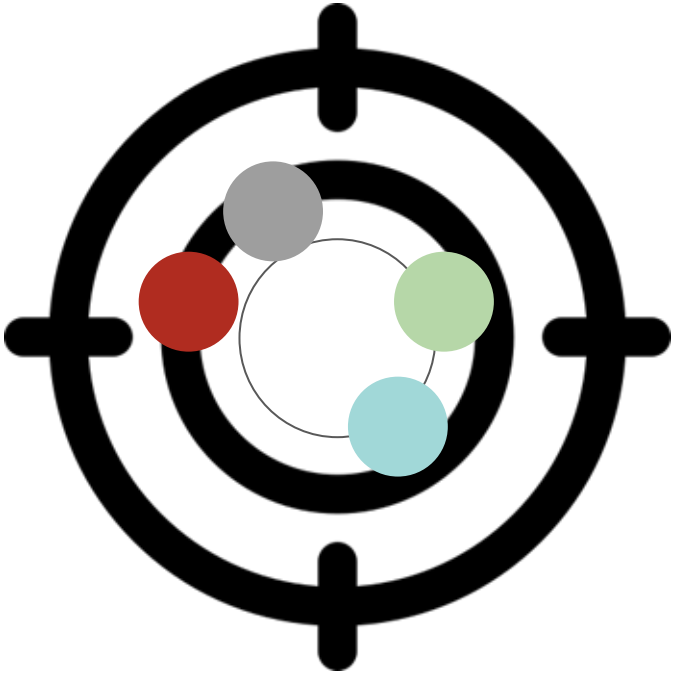
# Identifying Potential Climate Hazard Exposure

These datasets may not reflect the very latest local conditions, but they help us to **start asking the right questions.**
For example:

- Are we located in an area with higher modeled flood exposure?
- Are there nearby infrastructure or access vulnerabilities?
- Are there social or economic factors that might affect workforce or customer resilience?

Think of these databases as **risk conversation tools** that help you move from a general sense of uncertainty to a clearer picture of where to focus attention.

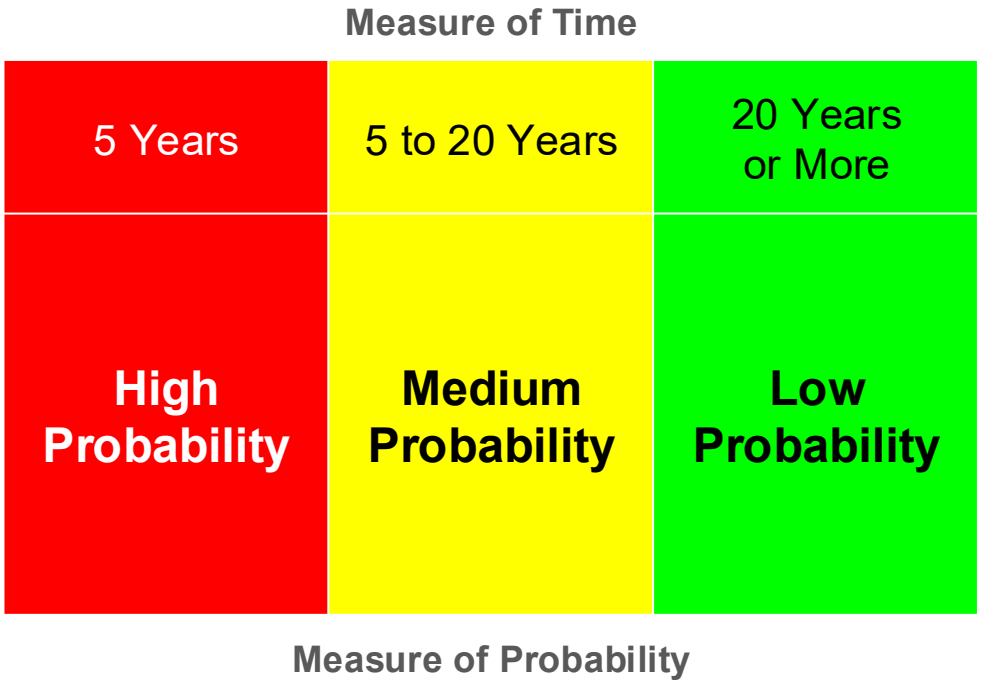
# Truths About Risk Assessment



- ➔ Estimating hazard risk is <u>not</u> an exact science. Even experts debate projections and probabilities - so don't get hung up on perfection.
- ➔ The goal is consistency, not precision - apply the same lens to all hazards so you can compare them fairly.

# Measuring Probability

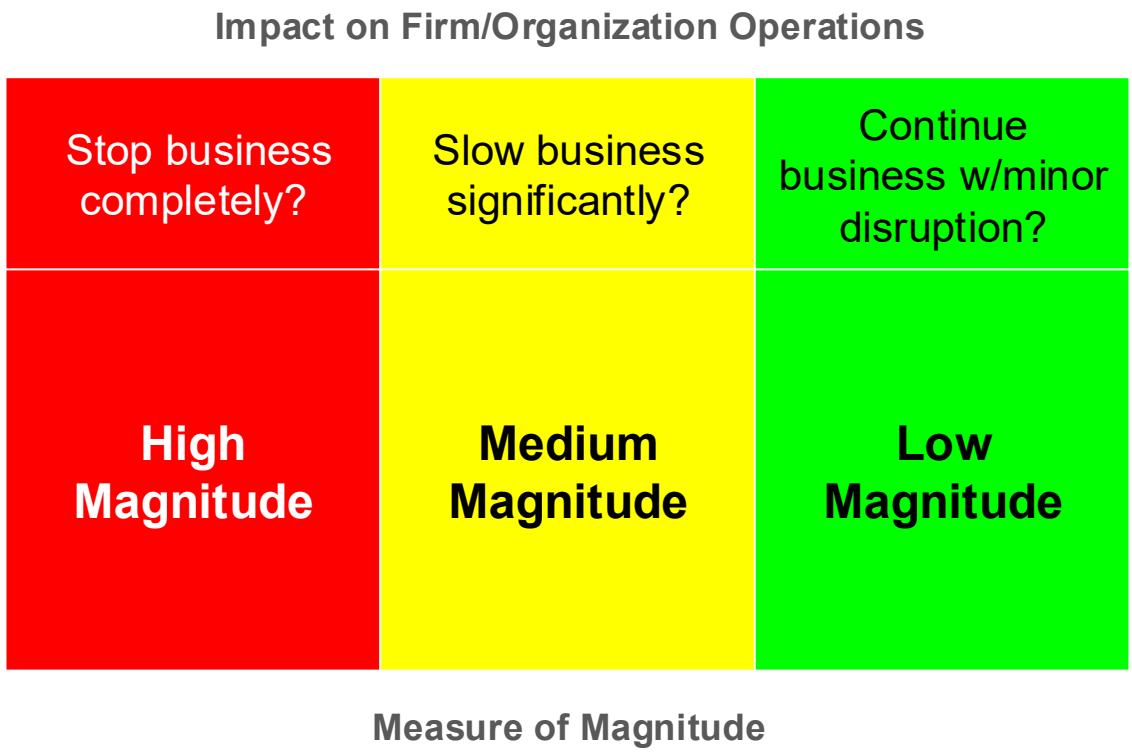
➔ **Probability** = the likelihood of a hazard occurring



# Measuring Magnitude

Would it shut you down completely, cause a slowdown, or just be a minor hiccup?

➔ **Magnitude** = severity of impact on your firm/ organization if the hazard occurs

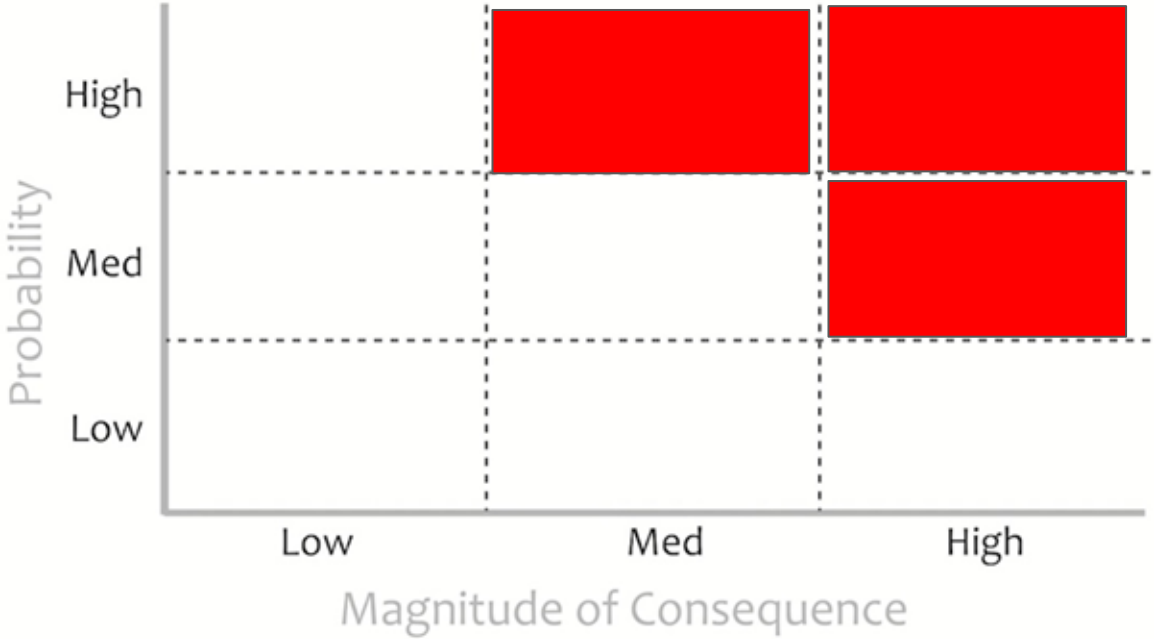


# Risk Matrix

Combining **magnitude** and **probability** gives you a visual risk profile.

Plot your asset-hazard pairs on the grid in your workbook.

This is where your priority investments start to reveal themselves - high-risk assets deserve attention first.



# Let’s use Pete’s Pick & Pack as an example:




## Step 1: Create Asset-Hazard Pairs

| Asset-Hazard Pairs |
| --- |
| Inventory Storage Room - Flooding |
| Inventory Storage Room - Extreme Storms |
| Staff - Extreme Heat |
| Staff - Extreme Storms |
| Electric, etc. Utilities - Extreme Storms |
| Electric, etc. Utilities - Flooding |

# Step 2: Complete the Asset Exposure Table

### Probability Measurement

| | | |
|---|---|---|
| 5 Years | 5 to 20 Years | 20 Years or More |
| **High Probability** | **Medium Probability** | **Low Probability** |

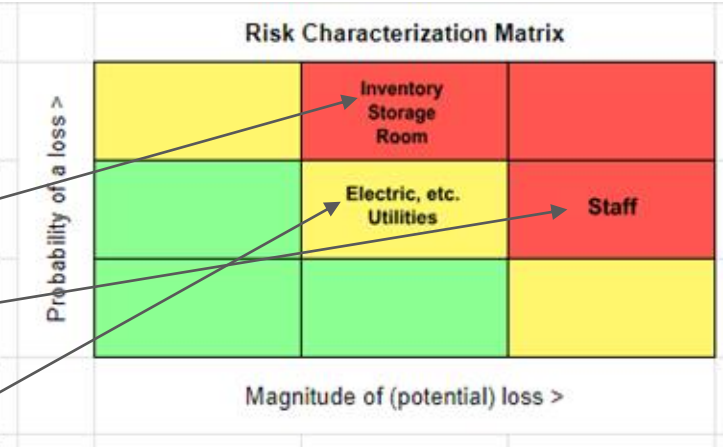
### Magnitude Measurement

| | | |
|---|---|---|
| Stop completely? | Slow significantly? | Continue w/minor disruption? |
| **High Magnitude** | **Medium Magnitude** | **Low Magnitude** |

| Most Vulnerable Priority Assets | Probability of a Loss (high, med, low) | Magnitude of the Loss (high, med, low) |
|---|---|---|
| Inventory Storage Room | High | Medium |
| Staff | Medium | High |
| Electric, etc. Utilities | Medium | Medium |
| | | |
| | | |
| | | |
| | | |

# Step 3: Plot on the Risk Matrix

| Most Vulnerable Priority Assets | Probability of a Loss (high, med, low) | Magnitude of the Loss (high, med, low) |
|---|---|---|
| Inventory Storage Room | High | Medium |
| Staff | Medium | High |
| Electric, etc. Utilities | Medium | Medium |




- Assets with both **high probability of a loss and high magnitude (impact)**, like the inventory storage room, fall in the red zone—meaning they are at the greatest risk.
- Lower-risk items, like utilities in this case, appear in yellow or green.



# Let’s practice!

Choose one of the business scenarios from the next few slides, then follow the steps to practice!

# Example Business Scenarios

## Supper Den

*LLC Partnership*

### Restaurant

*1. Older main-street restaurant in a dense downtown block near the river*
*2. Village center restaurant near the lake in a seasonal tourism area*

**Location 1:**
**Greensboro**
Leased building
1 story
15 employees

**Location 2:**
**Windsor**
Leased building
1 story
10 employees

**Assets:**
Employees
Point of Sale
Kitchen equipment
Cold storage
Dry storage
Dining tables and chairs
Papergoods
Plates, cups, silverware
Cleaning equipment

## APlus Accounts

*3 Partners*

### Professional Accounting Firm

*6 room office on second story of historical building*

**St. Johnbury**
Leased office space in multi-tenant buildling
30 employees

**Assets:**
Employees
Computers
Office furniture
Bookshelves
Tables
Artwork
Copy machine

# Example Business Scenarios



## Ben's Books

*2 owners*
*Small Biz Loan*

**Retail**

*1. Historic downtown storefront near the river with basement storage*
*2. One-story retail building along a state highway on slightly higher ground*

**Location 1:**
**White River Junction**
Leased building
2 levels (includes basement)
5 employees

**Location 2:**
**Morrisville**
Owned building
1 level
3 employees

**Assets:**
Employees
Inventory
Computers
Office furniture
Bookshelves
Tables
Racks
Artwork
Lighting



## ArtPart

*Family Biz*
*No debt*
*Considering expansion*

Light Manufacturing of Specialized Paint Brushes

*Small warehouse/manufacturing site on flat land in a river valley*

**Johnson**
Own 2 buildings
- 1 office, 1 story
- 1 warehouse/manufacturing facility

15 employees: 10 FT, 5 PT

**Assets:**
Employees
Computers
Office furniture
Bookshelves
Raw materials
Inventory ready for sale
Shipping materials
Drills, sanders
Pickup truck

# Example Business Scenarios

## Hillside B&B

*Family Business*

### Bed and Breakfast

*Rural hilltop inn at the end of a long private driveway surrounded by woods*

**Peacham**
Restored house on 10 acres
Owned
4 employees FT
2 employees PT

**Assets:**
Employees
Computers
Furniture
Bedding
Papergoods
Kitchen equipment
Dining Tables and chairs
Gardening and landscaping tools

## The Smith

*50 year old Non-Profit with endowment*

### Art Museum

*Standalone historic buildling with parking lot in downtown*

**Newport**
10 employees FT
Volunteers

**Assets:**
Employees
Computers
Office furniture
Chairs, tables, benches
Fine art and crafts
Display cases
LED screens
AV equipment

# Let's practice!

Using your chosen business scenario, **start researching the business location** to identify a hazard exposure using one of these tools:

https://crt-climate-explorer.nemac.org/ (The Climate Explorer)

https://bit.ly/40woVQz (FEMA Resilience Analysis and Planning Tool)

**Identify** up to three of the business' highest priority assets. They may or may not be on the card. Add them to the Asset Exposure Table in your workbook.

| Most vulnerable priority assets | Probability of a Loss Low/Medium/High | Magnitude of the Loss Low/Medium/High |
|---|---|---|
| 1. Type here | | |

# Let's practice!

**Rank probability of Loss** for each asset on your Asset Exposure Table. How likely is each asset to be impacted by a climate disruption?

**Indicate magnitude** for each asset on your Asset Exposure Table. If impacted, how big of an effect will it have on the business operations?

| Most vulnerable priority assets | Probability of a Loss Low/Medium/High | Magnitude of the Loss Low/Medium/High |
|---|---|---|
| 1. Type here | | |

# Let’s practice!

**Plot your asset/hazard pairs** on the Risk Characterization Matrix to visualize vulnerabilities.

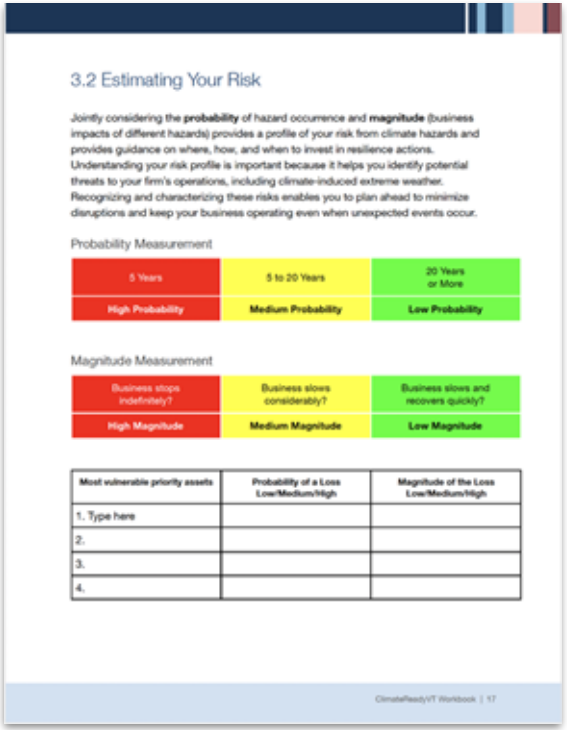
**Consider the following:**

- What hazards should this business focus on?
- What assets are critical to continuity of operations that they might need to focus on protecting?

| | Low Magnitude | Medium Magnitude | High Magnitude |
|---|---|---|---|
| High Probability | | | |
| Medium Probability | | | |
| Low Probability | | | |

# Try it Yourself in the Workbook!

## Module 3



### 3.2 Estimating Your Risk

Jointly considering the **probability** of hazard occurrence and **magnitude** (business impacts of different hazards) provides a profile of your risk from climate hazards and provides guidance on where, how, and when to invest in resilience actions. Understanding your risk profile is important because it helps you identify potential threats to your firm's operations, including climate-induced extreme weather. Recognizing and characterizing these risks enables you to plan ahead to minimize disruptions and keep your business operating even when unexpected events occur.

Probability Measurement

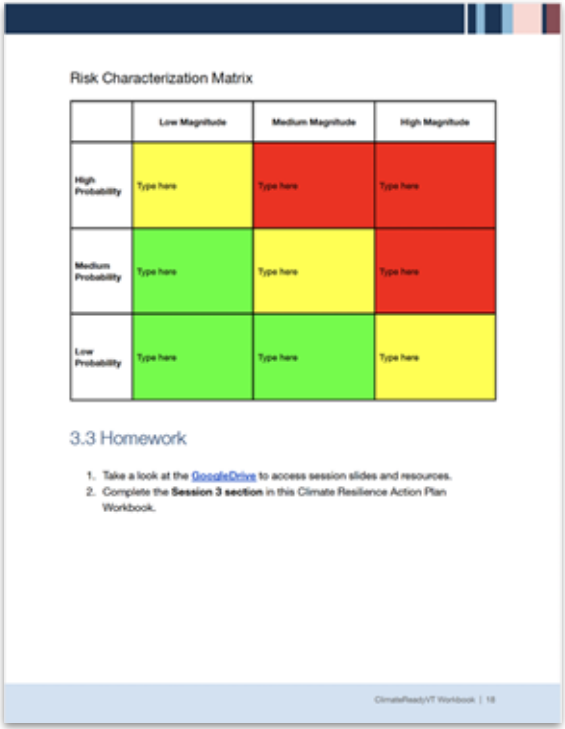
| 5 Years | 5 to 20 Years | 20 Years or More |
|---|---|---|
| **High Probability** | **Medium Probability** | **Low Probability** |

Magnitude Measurement

| Business stops indefinitely? | Business slows considerably? | Business slows and recovers quickly? |
|---|---|---|
| **High Magnitude** | **Medium Magnitude** | **Low Magnitude** |

| Most vulnerable priority assets | Probability of a Loss Low/Medium/High | Magnitude of the Loss Low/Medium/High |
|---|---|---|
| 1. Type here | | |
| 2. | | |
| 3. | | |
| 4. | | |

ClimateReadyVT Workbook | 17



Risk Characterization Matrix

| | Low Magnitude | Medium Magnitude | High Magnitude |
|---|---|---|---|
| High Probability | Type here | Type here | Type here |
| Medium Probability | Type here | Type here | Type here |
| Low Probability | Type here | Type here | Type here |

### 3.3 Homework

1. Take a look at the GoogleDrive to access session slides and resources.
2. Complete the **Session 3 section** in this Climate Resilience Action Plan Workbook.

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**A spreadsheet version is also available here!**

# Turning Risks into Actions

Bridging the Gap: This is the shift from analysis to doing - where resilience becomes operational.

# Climate Resilience Action Plan Steps



0

## Asset Inventory

**List the assets that can contribute to your financial well-being or the success of your business.**



1

## Understand Exposure

Evaluate business assets and their exposure to climate-related hazards.



2

## Assess Vulnerability and Risk

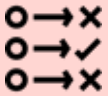
Identify the business assets most vulnerable and at-risk to climate-related hazards.



3

## Investigate Options

**List strategies to reduce the greatest climate-related risks to vulnerable assets.**



4

## Prioritize and Plan

**Design an implementation plan for the strategies that are most likely to reduce vulnerability and risk.**



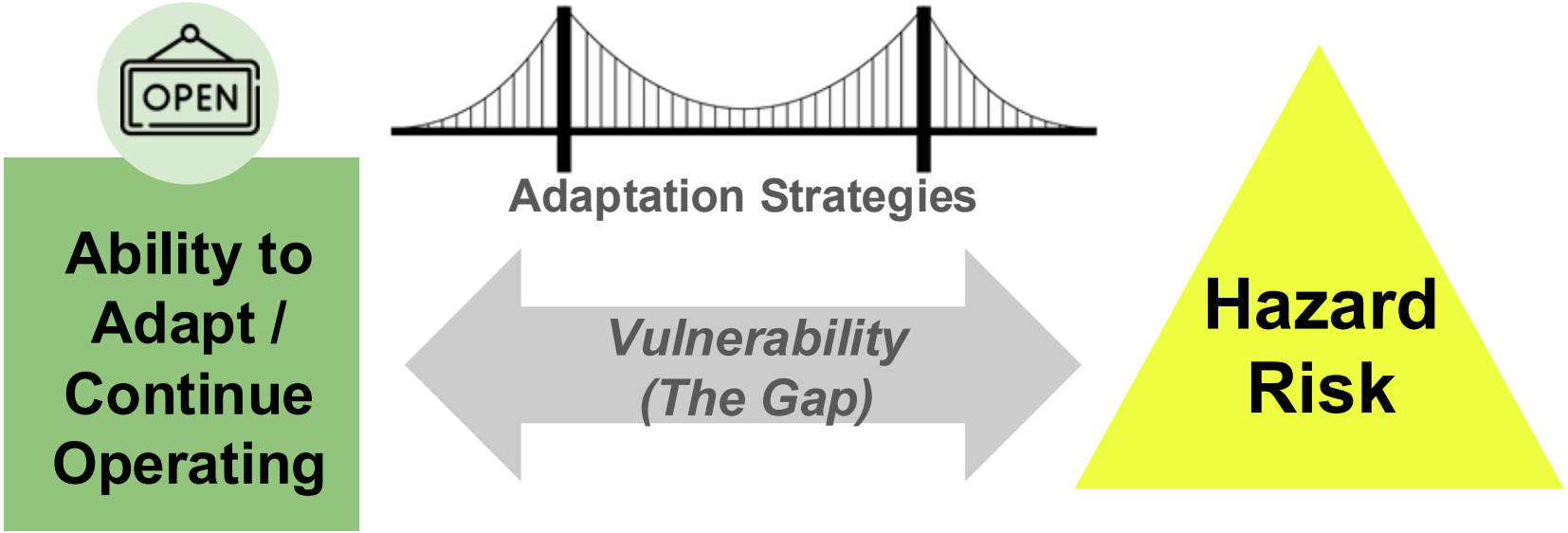
5

## Take Action

Implement and communicate the plan with employees (if applicable). Monitor. Iterate.

# How Do You Bridge the Gap?

The gap between hazard and resilience is vulnerability — and the bridge is adaptation. Every step - even a small one - helps close that gap.



# Tailoring Risk Estimates for Your Unique Situation

There's no one-size-fits-all resilience plan.



### Customize Timeframes

Do your probability timelines reflect the actual frequency of severe weather in your location?



### Consider Your Unique Business Assets

How are your different priority assets each vulnerable to different types of hazards?



### Account for Building and Location Factors

What are your unique structural and location risks, like proximity to flood-prone areas or a high-wind zone?



### Evaluate Past Impacts

How have prior severe weather events affected your business? How would you characterize your business resilience in those instances?

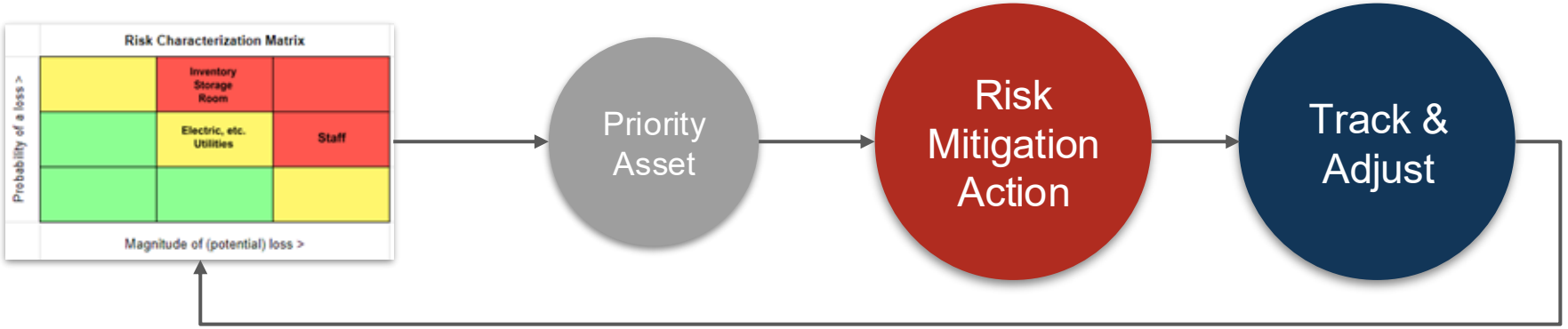


### Update Based on Business Changes

If your operations or assets change, will you revisit and update your hazard probability timeline estimates to remain reliable?

# Shifting from Analysis to Action

Remember, resilience is iterative - it's about continuous improvement.




***Resilience Check-ins***

# Risk Mitigation Action – What Could That Look Like?

You don't have to do it all! Choose what's achievable and high-impact.
Think of this as your "menu" of possible resilience investments.

**Technology Investments**
Backup power systems, water sensors, data redundancy/cloud storage





**Infrastructure Upgrades**
Elevate utilities, install flood barriers, reinforce storage areas

**Staff Preparedness**
Training, safety protocols, cross-training for critical functions







**Operational Changes**
Diversify suppliers, update emergency procedures, shift to remote-capable operations

**Partnerships & Resources**
Mutual aid agreements, collaboration with municipalities, grant funding

# Track and Adjust

**Track your metrics, measure your progress, and adjust as conditions evolve.**

**Baseline & Targets**
Set clear resilience indicators (e.g., downtime, cost avoided, service continuity)

**Performance Metrics**
Track key measures like staff readiness scores, emergency response times, reduced insurance claims

**Regular Resilience Check-ins**
Schedule quarterly or annual reviews of action effectiveness

**Continuous Improvement**
Update the risk matrix to reflect changing climate risks and business conditions

**Feedback Loops**
Gather staff and community input, adjust actions based on lessons learned

# Creating a Climate Resilience Action Plan

# Climate Resilience Action Plan Components

Here's what your Climate Resilience Action Plan will include:

- Assets
- Priority level
- Action
- Cost
- Timing
- Supportive resources

**Your completed plan should be simple but powerful** and ready to share with funders, boards, or staff so that they understand your priorities clearly.

# Example




| A | B | C |
|---|---|---|
| **Priority Level** | **Asset to be Adapted/Strengthened** | **Action/Investment** |
| High | Inventory Storage Room | Build new flood-resistant inventory room in upper level of current building |
| Medium | Utilities | Install backup generator(s) adequate to run facility for 48 hours |

| D | E | F |
|---|---|---|
| **Estimated Cost** | **Timing** | **Resources for Support** |
| $250,000 | End of Next FY | VtSBDC, Small Biz Grants, VBSR Peer Council |
| $20,000 | End of Current FY | GMP, VtSBDC |

# Key Questions to Consider

*When should I implement an action or make an investment? Are there dependencies to consider?*

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Priority Level | Asset to be Adapted/Strengthened | Action/Investment | Estimated Cost | Timing | Resources for Support |
| 2 | High | Inventory Storage Room | Build new flood-resistant inventory room in upper level of current building | $250,000 | End of Next FY | VtSBDC, Small Biz Grants, VBSR Peer Council |
| 3 | Medium | Utilities | Install backup generator(s) adequate to run facility for 48 hours | $20,000 | End of Current FY | GMP, VtSBDC |
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*Is an action actually a series of steps? Is there an optimal sequence that maximizes my resiliency?*

*What resources are available to help me plan and pay?*