ArcGIS Solutions for Community Resilience

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Solutions Overview

...Leverage hundreds of ready-to-use maps, apps, and platform configurations to meet your needs, delivering innovation and best practices for your organization.
EXTENDING THE PLATFORM WITH SOLUTIONS

Ready to use workflows and apps that make implementation easier and sustainable.

ArcGIS for Emergency Management
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**What's New/Updated**

- Hazard Assessment and Analysis
- Hazard Vulnerability Analysis
- Mitigation Dashboard
- Mitigation Plan Status
- Mitigation Feedback
Disaster Resiliency

…the power or ability to return to the original form, position, etc., after being bent, compressed, or stretched; elasticity.
Overview

• Resilience standards and policies
• Current work
• Road Map
Comparing policy and standards

Community resilience has a range of standards that were investigated including:

- **FEMA**
  - **National Disaster Recovery Framework**
    - Provides guidance to a range of scales including local level
    - Focus on preparing for recovery
    - Links to the National Preparedness Goals

- **Draft Interagency Concept for Community Resilience Indicators and National Level Measures**
  - Geographic scope is focused upon the US
  - Focus on Community Resilience & urban communities
  - Links to the National Preparedness Goals

- **DIFD**
  - **Defining disaster resilience**
    - Geographic scope is international
    - Focus is on building resilience
    - Applied at a range of scales

- **NIST**
  - Case Studies of Community Resilience and Disaster Recovery
Resiliency Framework - Categories

- Bounce back better - a community can deal with future shocks and stresses better than previously.

- Bounce back - a community is able to return to their pre-existing condition.

- Recover but worse than before - a community recovers but worse than their previous state.

- Collapse - the community is catastrophically affected and their capacity to cope in the future is dramatically diminished
Steps to Resilience

NOAA
- Explore Hazards
- Assess Vulnerability and Risks
- Investigate Options
- Prioritize Plans
- Take Action

State of Colorado
- Educate and Engage
- Risk and Vulnerability Assessment Tools
- Local Resiliency Strategies
- Colorado Community Resiliency Partnership
- Mapping and Land Use Tools
- Develop State and Local Indicators

City of Boulder
- Connect and Prepare
  - Assess Economic Strength
  - Incentivize Businesses
  - Develop Impact Assessment Strategies
- Partner and Innovate
  - Create Citizen Science Strategy
  - Ensure Food System Resilience
  - Make Data Accessible
  - Crowd Source Solutions
- Transform and Integrate
  - Create Community Resilience Centers
  - Foster Climate Readiness
  - Build Sustainability Framework
  - Embed Resilience in Comprehensive Plan
  - Green Infrastructure and Ecosystem Management
City of Boulder, CO Action Plan

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<th>2016-2017 Resilience Actions</th>
<th>Resilience Challenge Area</th>
<th>Boulder’s Running Start</th>
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<td><strong>Strategy 1: CONNECT AND PREPARE</strong></td>
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<td>1.1 Make Resilience Accessible: Deploy a community driven, interactive “Mobile Resilience Lab”</td>
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<td>NEW!</td>
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<td>1.2 Activate Volunteerism: Develop a volunteer community preparedness training program.</td>
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<td>City of Boulder Fire Rescue’s Citizen’s Fire Academy</td>
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<td>1.3 Assess Economic Strength: Identify risks to future economic vitality.</td>
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<td>City of Boulder’s Economic Sustainability Strategy</td>
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<td>1.4 Prepare Businesses: Incentivize the use of continuity planning strategies with local businesses.</td>
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<td>Boulder Office of Emergency Management</td>
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<td>1.5 Connect for Rapid Recovery: Develop rapid post-disaster impact assessment capacity in partnership with the local business community.</td>
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<td>NEW!</td>
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<td>1.6 Foster Artistic Engagement: Engage the creative power of the arts to convey and involve people in complex risk and resilience themes.</td>
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<td>Boulder’s Community Cultural Plan</td>
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<tr>
<td><strong>FRONTIER 1</strong>: Invest in the Future: Prioritize city investments to promote community resilience and proactively address future risks.</td>
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<td>City of Boulder Capital Improvements Program</td>
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<td><strong>Strategy 2: PARTNER AND INNOVATE</strong></td>
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<tr>
<td>2.1 Put Science in the Hands of the Community: Create a “citizen science” program to foster the co-creation of knowledge.</td>
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<td>NEW!</td>
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<td>2.2 Ensure the Resilience of the Local Food System: Design and conduct a local food system assessment.</td>
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<td>City of Boulder’s Local Foods Initiative</td>
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<td>2.3 Make Data Accessible to All: Spur creative representation of data through investments in artistic visualization and knowledge display.</td>
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<td>Bold Measures, Boulder’s Community Dashboard (Coming Soon!)</td>
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<td>2.4 Crowd Source Solutions: Drive the creative use of community data through competitive challenges and hackathons.</td>
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<td>Understanding Risk Boulder</td>
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<td><strong>FRONTIER 2</strong>: Envision the Future of Energy: Develop a sustainable, secure, and equitable energy system.</td>
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<td>City of Boulder’s Energy Future</td>
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<td><strong>Strategy 3: TRANSFORM AND INTEGRATE</strong></td>
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<td>3.1 Create Community Resilience Centers: Ensure the continuity of all critical life-safety services at a network of community resilience centers.</td>
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<td>City of Boulder’s Climate Commitment</td>
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<td>3.2 Foster Climate Readiness: Build climate preparedness capacity across the city organization.</td>
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<td>Colorado’s Water Plan - Chapter 6, Water Supply Management for the Future</td>
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<td>3.3 Advance Sustainability with Resilience: Integrate resilience principles into Boulder’s Sustainability Framework.</td>
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<td>Boulder’s Sustainability Framework</td>
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<td>3.5 Manage Thriving Ecosystems: Develop an integrated approach to managing ecosystems and green infrastructure.</td>
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<td>City of Boulder’s Urban Forest Strategic Plan</td>
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<td><strong>FRONTIER 3</strong>: Create Adaptive Social Services: Reduce homelessness by designing an adaptive and predictive social service network.</td>
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<td>City of Boulder’s Human Services Strategy</td>
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Disaster Resilience Solutions

Colorado Office of Resiliency
NY Department of State
Coastal Resiliency Commission
City of Boulder
FERNLeaf/NEMAC

Community Resilience

Resilience can be defined as "The ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events." [National Academies of Sciences, 2012].

The aim of the community resilience template is to collate and present resilience information relevant to your jurisdiction(s). This information can then be accessed alongside hazards and vulnerability data.
Resilience Solutions

• Hazard Analysis and Planning
  • Evaluation of historical event information
  • Analysis of assets related to historical events
  • Facilitate planning and prioritization of projects

• Vulnerability Assessment
  • Inventory Assets
  • Data Aggregation
  • Analyze Community Vulnerability

• Community Mitigation
  • Mitigation Project Submittal, Monitoring, Community Plan Status, Plan Feedback

• Community Resilience
  • Community Resilience
  • Community Resilience Outreach
  • Community Resilience Dashboard
Resilience Solutions

- **Community Resilience** - pulls authoritative asset information together, and through a sequence of questions. Supports the analysis of information within each community. It also supports systematic mapping and monitoring the resilience of assets to enable cross-jurisdictional resiliency analysis.

- **Hazard & Vulnerability Assessment and Analysis** - used by emergency management staff to analyze potential vulnerabilities in their regions and share the results of their work with stakeholders within their organization and in their communities.
• **Resilience Outreach** - can be used by personnel to provide context and information surrounding the resilience initiatives. It enables governments and emergency management organizations to share information about resilience initiatives with their communities.

• **Community Impact Status**  - This dashboard can be used to present aggregated sentiment from constituents around disruption or impact of services to the citizens in order to be proactive. Measures impacts to the community based on previous events. By aggregating community reports, organizations can better understand how resilience can be improved and which areas can be more affected.

• **Community Resilience Status** - used to monitor asset resilience within communities, monitor community contributions and measure progress towards the resilience objectives.
Resilience Solutions

- **Community Impacts** - can be used by the public to report a variety of short, mid or long term impacts following a natural disaster. By reporting the ‘cascade’ effects of outages and closures on the community, organizations can better understand how resilience can be improved and which areas have been most affected.

- **Resilience Surveys** - used by field personnel to collect and update resilience information about assets in their community. Surveys can be done in a comprehensive manner, or focused on a particular shock or stress.

- **Community Mitigation** - enables organizations to submit, manage and track the status of mitigation projects and local mitigation plans. It facilitates the management of mitigation projects, funding status and enables organizations to submit projects around localities where vulnerabilities have been identified.

- **Mitigation Feedback** - enables constituents to proactively provide feedback on proposed mitigation projects and initiatives in the communities they live. It provides a way of soliciting feedback and gives citizens a voice in the work organizations are doing.
Resilience Solutions

Road Map

• Community Resilience - Web-Based Workflow
  • Simplified User experience

• 3D WebScene/Visualization (Beta)
  • View results of analysis
  • Enable analysis of impacted areas within 3D context