
# Pedaling Proactive Bicycle Use for Disaster Response

## Findings from the Federal Highway Administration *Disaster Relief Mobilization Study*

U.S. Department of Transportation
Federal Highway Administration

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### HOW CAN PEOPLE AND SUPPLIES MOVE BETWEEN PLACES WHEN A DISASTER DISRUPTS POWER, TRANSPORTATION, AND COMMUNICATIONS SYSTEMS?

## Bicycles!

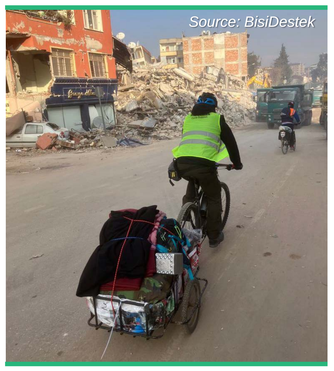
Bicycles are **multipurpose**, **flexible**, **adaptable, accessible**, and **affordable**. Bicyclists can ride on many surfaces, navigate around blockages, and travel longer distances than walking.


## HOW HAVE COMMUNITIES USED BICYCLES?

Bicycle use for disaster relief is uncommon and ad-hoc. Planning for bicycle use in disasters is even more rare.

### *Communities have used bicycles for:*

- Supply distribution
- Search and rescue
- Local evacuation
- Security patrolling and traffic control
- Information gathering and communications
- General transportation between places




### *Bicycle use is:*

\+ More likely when a person can't use a motor vehicle

\+ More common in densely developed and populated urban areas

\- Less feasible in rural communities, areas with mountainous terrain, or locations with cold climates and frequent snow and ice

\- Not suitable in conditions that risk the bicyclist's health, such as extreme heat or radiological/chemical events

## BEYOND RESPONSE OPERATIONS POST-DISASTER


**Bicycles are an essential mode of transportation** for many people post-disaster – especially when roads are blocked, public transportation is suspended, or vehicles are damaged.

Bicycles provide access to employment, housing, food, and healthcare.

For example, bicycle commuting in New York City increased *threefold* following Hurricane Sandy in 2012.

## CAN BICYCLES PLAY A VIABLE ROLE IN MY COMMUNITY?

It is up to individual communities to determine how bicycles can best serve their needs post-disaster. ***Consider:***

### *What type of hazard?*

✓ Magnitude and extent of disaster
✓ Condition of transportation system
✓ Overall response needs and who is involved

### *What type of task? What type of bicycle?*

✓ Conventional, electric, cargo, mountain, trailer-mounted, or other type
✓ Origins, destinations, and routes used by bicyclists

### *What are community characteristics?*

✓ Geography, topography, and development patterns
✓ Weather and climate
✓ Road functional class and connectivity, dedicated bicycle infrastructure, and connections to public transportation

### *Who uses and owns the bike?*

✓ User bicycle skill level
✓ Organizational affiliation and equipment sources and types

### *What disaster and bike orgs already exist?*

✓ Law enforcement, emergency medical services, and first responder organizations with established bicycle units
✓ Disaster Relief Trials (DRTs) and Community Emergency Response Teams (CERTs)
✓ Bicycle advocacy groups, riding clubs, retail shops, and bikeshares

### *How can bicycles be integrated into existing disaster response?*

✓ Formal processes of disaster planning, training, operations, and organizations
✓ Volunteer bicyclists could be disruptive and potentially dangerous if not properly trained and integrated

## DISASTER RELIEF TRIALS

**Disaster Relief Trials (DRTs)** are community-hosted cargo bike competitions simulating a supply run four days post-disaster.

DRTs prepare communities for disaster response and encourage the formal inclusion of bicycles in response planning and operations.


Participants ride fully-loaded bicycles and visit designated checkpoints with obstacles and tasks over 3+ hours. Participants must carry up to 110 pounds of supplies, including fragile items.

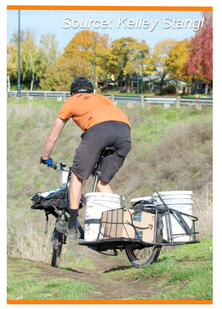
The Portland DRT has successfully integrated with other disaster relief programs. DRT participation counts towards volunteer hours for the Portland region's CERT. The Portland DRT also prompted the 2019–2021 update of Regional Emergency Transportation Routes, which includes bicycle routes.



## OPPORTUNITIES FOR COMMUNITIES

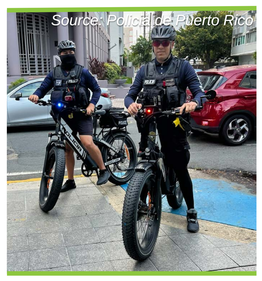
There are many opportunities to integrate bicycles into disaster response. Not every opportunity will be right for each community.

### *Integrate bicycles into existing plans and operations.*




- **Plan for scenarios in which to use bicycles.** Answer how, when, where, why, by whom, and with what equipment.
- **Build partnerships** with groups related or adjacent to disaster response who may benefit from bicycle use.
- **Develop and deploy training modules** about bicycle use in disasters for both law enforcement/ first responders and community volunteer organizations (such as CERTs).

### *Determine and build out the bicycle network.*




- **Perform a vulnerability assessment** of bicycle-related infrastructure to determine which sections are the most *critical* and *vulnerable*. Identify areas where bicycle activity is suitable and important to support disaster response.
- **Designate and maintain bicycle emergency evacuation routes**, which are prioritized for clearance following a disaster.
- **Invest in bicycle infrastructure** to contribute to the diversity and redundancy of the transportation network.
- **Leverage Complete Streets policies, bicycle and pedestrian plans, and other active transportation efforts** ongoing in your community, region, and state.

### *Build bicycle response capacity.*

- **Develop relationships with local bicycle groups**, including shops, bikeshare companies, advocacy groups, and riding clubs. They have access to bicycle fleets, repair and maintenance services and equipment, and volunteer lists.


- **Maintain a fleet or registry of bicycles**, trailers, helmets, and maintenance equipment for use in disaster response.
- **Establish Disaster Relief Trials** or similar programs in your community.
- **Ensure volunteer bicyclists receive proper training and equipment** – safety comes first.

*The Disaster Relief Mobilization Study is funded and managed by the Federal Highway Administration (FHWA) and is required by the Bipartisan Infrastructure Law (Public Law 117-58) Section 11505. One component of the study explored how bicycles have been used in disaster preparedness and response through a literature review and targeted outreach. This poster was developed for the 2023 Natural Hazards Workshop. Additional details on this study will be available pending FHWA's transmittal to Congress in response to the Bipartisan Infrastructure Law §11505.*

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