Evacuations

Office of Disaster Management

City of Boulder & Boulder County

How to Build it!

1. Centralized authority to create standards of evacuation.
2. Conduct capability assessment.
3. Complete data analysis related to hazard, risk, demographics, metrics and modeling.
4. Bring together subject matter experts and facilitate process.
5. Conduct scenario-based planning and record SME actions and recommendations.
6. Operational decision assistance assessment & technology assessment.
7. Write operational plan, train & exercise cycle.
8. Adjust Community preparedness programs and content.
9. Future AAR and improvement planning commitment.

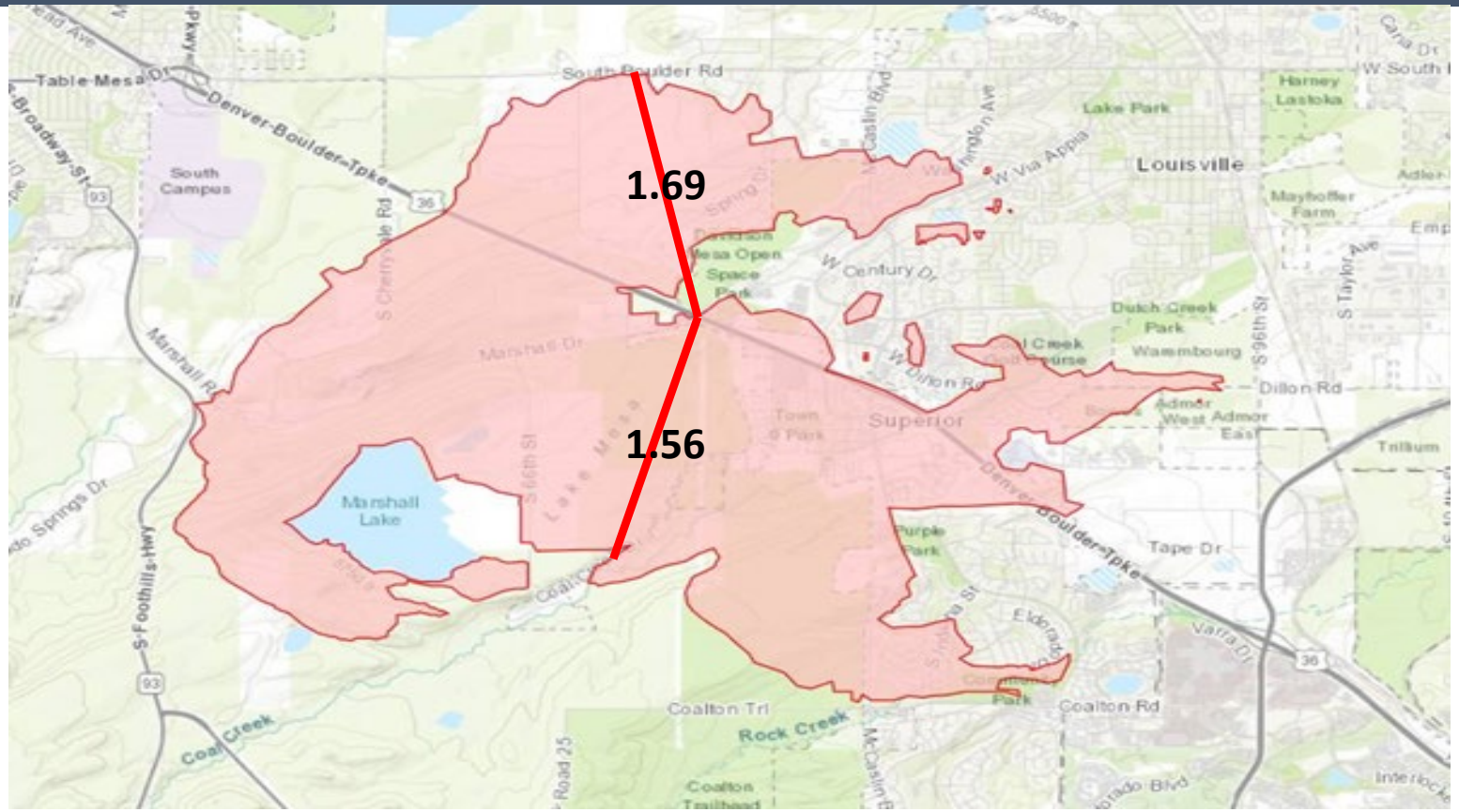
Factors

- Fuels
- Drought
- High winds (sustained 30 mph)
- Low humidity below 10-12%
- Fuel moisture levels
- Location of fire to urban environment

Factors

1. Level of preparedness- community, training, operational response, alert and warning systems, public messaging and resource surge capacity.
2. Area of evacuation
3. Density
4. Demographics
5. Time
6. Human behavior
7. Road system available
8. Traffic management
9. Route loss behavior
10. Available strategies – evacuation, defend in place or safe refuge

Impact Zones



Reduce the size or decrease the intensity.

Narrow the Impact Zone, Slow the Speed, Reduce the intensity

- Supports the fire suppression and control capability of the fire department.
- Time to evacuate the community.
- Route protection.
- Defend in place can be achieved.

To engage and control a developing conflagration requires....

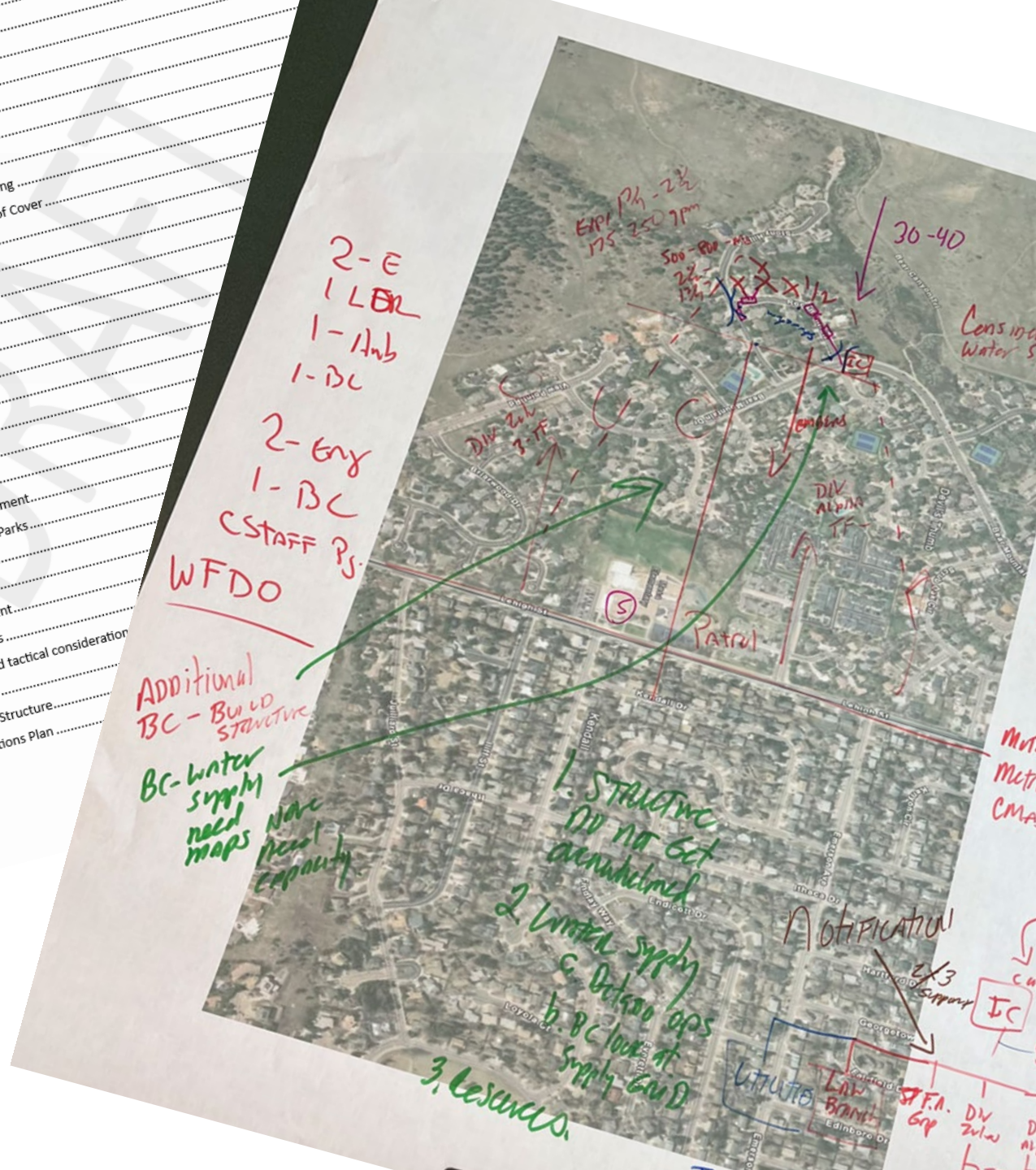
1. C2 structure does not become overwhelmed.
2. Water supply remains intact and can increase fire flow capacity.
3. The ability to quickly assemble resources to fill operational needs within 1 hour and over the next 3-4 hours.
4. Sound tactical decision making and tactical execution(task, purpose end-state).

Conflagration Operational Response Plan

2024

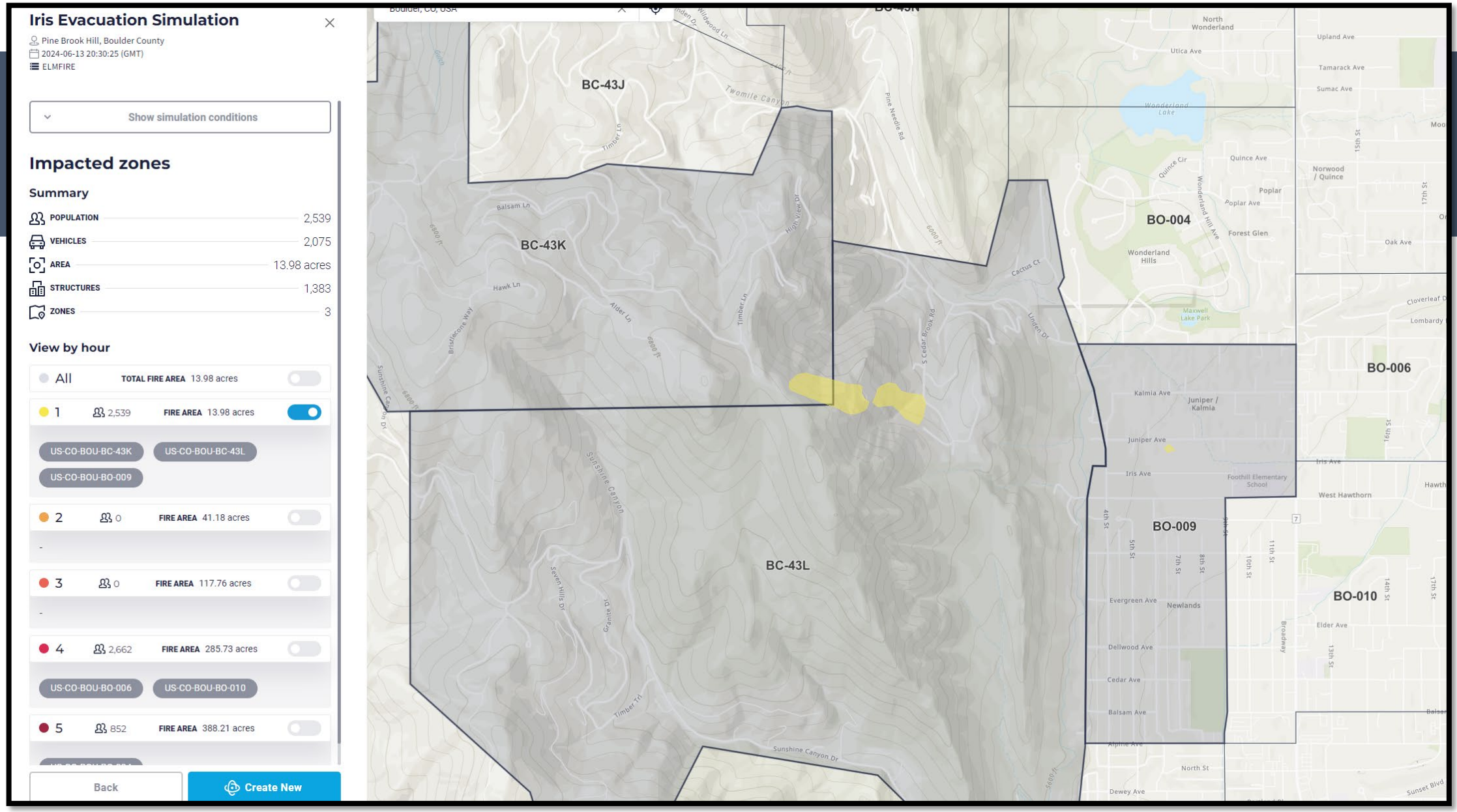
Chard, Mike
OFFICE OF DISASTER MANAGEMENT |

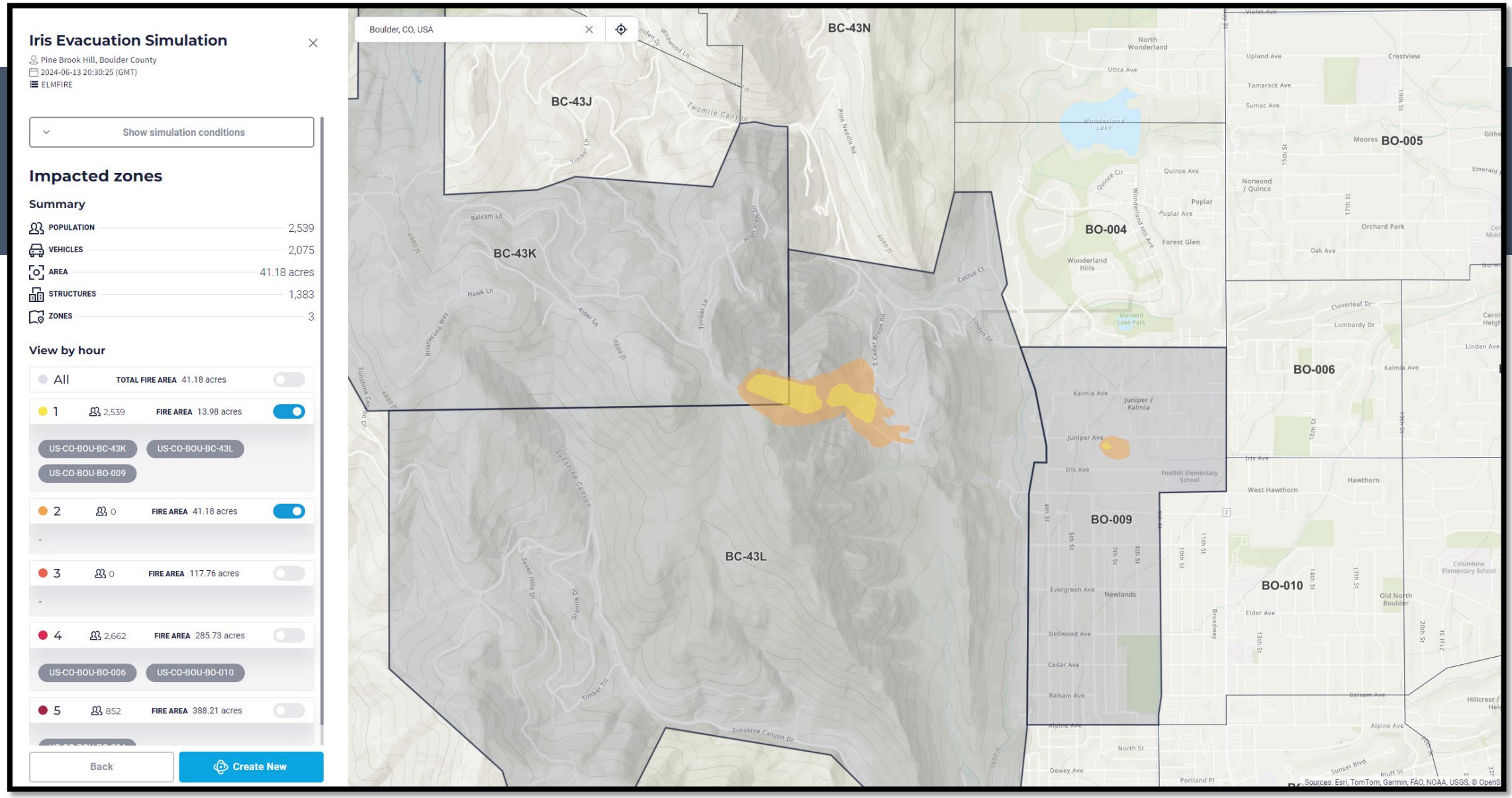
Introduction
Scope of Plan
Authorities
Plan Distribution & Maintenance
Leadership
Operational
Partners
Planning Assumptions
Weather conditions
Pre-incident communications and messaging
Indices Based Dispatching and Standard of Cover
Fire Behavior expected.
Fire Suppression Capacity
Municipal Water Supply Capacity
Alert and Warning / Evacuations
Final Planning Assumptions
Roles & Responsibilities
Fire Department
911 Center
Police Department
FRCO
Public Works Utilities Department
Open Space and Mountain Parks
EOC
Concepts of Operations
Conditions of Engagement
Fire Suppression Tactics
General command and tactical consideration
Mutual Aid Required
Incident Command Structure
Radio Communications Plan



Lake
Riverside
Quince Ave
Quail Cir
Quince Cir
Wonderland Hill Ave
Poplar
Broadway St
Poplar Ave
Promontory Ct
Spring Valley Rd
Oakwood Pl
Newport Ln
BO-004
Forest Glen
Wonderland Hills
Cactus Ct
Lakebriar Dr
Orange Ln
Moffit Ct
Wonderland Hill Ave
Silver Lake Ditch
Maxwell Lake Park
Linden Dr
Linden Ave
Linden Ave

Linden Ave
Linden Ave
Kalmia Ave
Kalmia Ave
Juniper / Kalmia
4th St
Broadway St
Juniper Ave
Juniper Ave
Two Mile Canyon Creek
Iris Ave
Foothill Elementary
Hawthorn Ave
6th St
4th St
5th St
BO-009
9th St
11th St
Broadway St
Forest Ave
Forest Ave
7th St
10th St
Evergreen Ave
Evergreen Ave
Newlands
6th St
4th St
9th St
Broadway
Broadway St
Silver Lake Ditch
Dellwood Ave
Dellwood Ave
7th St
10th St
11th St
Cedar Ave
Cedar Ave
North Boulder Park
Balsam Ave
Balsam Ave
Alpine Ave


Iris Evacuation Simulation
Pine Brook Hill, Boulder County
2024-06-13 20:30:25 (GMT)
ELMFIRE
Show simulation conditions
Impacted zones
Summary
POPULATION 2,539
VEHICLES 2,075
AREA 13.98 acres
STRUCTURES 1,383
ZONES 3
View by hour
All TOTAL FIRE AREA 13.98 acres
1 2,539 FIRE AREA 13.98 acres
US-CO-BOU-BC-43K
US-CO-BOU-BC-43L
US-CO-BOU-BO-009
2 0 FIRE AREA 41.18 acres
3 0 FIRE AREA 117.76 acres
4 2,662 FIRE AREA 285.73 acres
US-CO-BOU-BO-006
US-CO-BOU-BO-010
5 852 FIRE AREA 388.21 acres
Back
Create New
BC-43J
BC-43K
BC-43L
BO-004
BO-006
BO-009
BO-010
Twomile Canyon
Sunshine Canyon
Sunshine Canyon Dr
Wonderland Lake
Wonderland Hills
Maxwell Lake Park
Foothill Elementary School
Newlands
Juniper / Kalmia
Norwood / Quince
West Hawthorn
Forest Glen
Poplar
Balsam Ln
Hawk Ln
Timber Ln
Alder Ln
Cactus Ct
Linden Dr
Kalmia Ave
Juniper Ave
Iris Ave
Evergreen Ave
Dellwood Ave
Cedar Ave
Balsam Ave
North St
Dewey Ave
Elder Ave
Upland Ave
Tamarack Ave
Sumac Ave
Quince Ave
Poplar Ave
Oak Ave
Cloverleaf Dr
Lombardy
Sunset Blvd
Broadway
Pine Needle Rd
S Cedar Brook Rd
Seven Hills Dr
Granite Dr
Timber Trl
Utica Ave
North Wonderland
Wonderland Hill Ave
Quince Cir
Bristlecone Way
Sunshine Canyon Dr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US-CO-BOU-BO-010
5 852 FIRE AREA 388.21 acres
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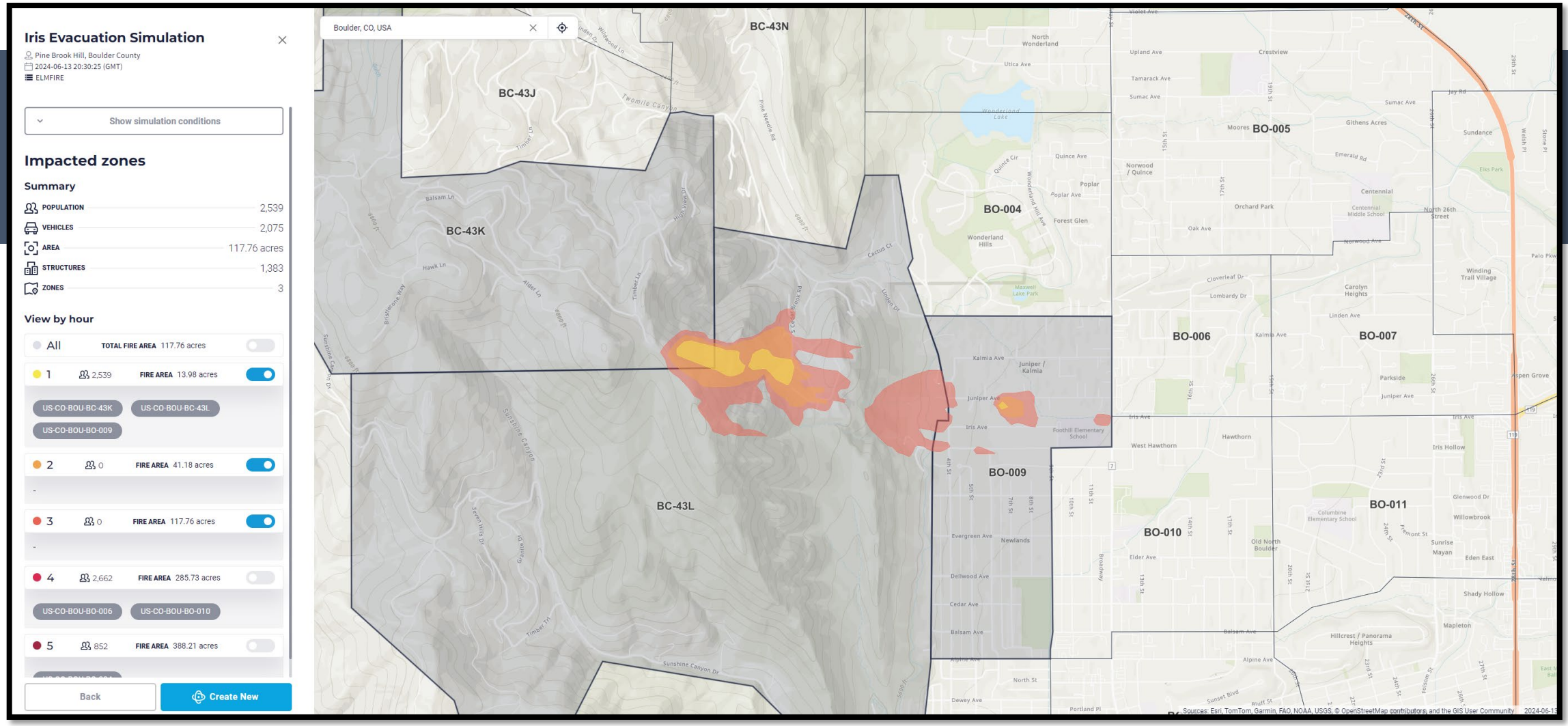
Create New
Boulder, CO, USA
BC-43N
BC-43J
BC-43K
BC-43L
BO-004
BO-005
BO-006
BO-009
BO-010
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenS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VEHICLES 2,075
AREA 117.76 acres
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ZONES 3
View by hour
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Boulder, CO, USA
BC-43N
BC-43J
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BC-43L
BO-004
BO-005
BO-006
BO-007
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BO-010
BO-011
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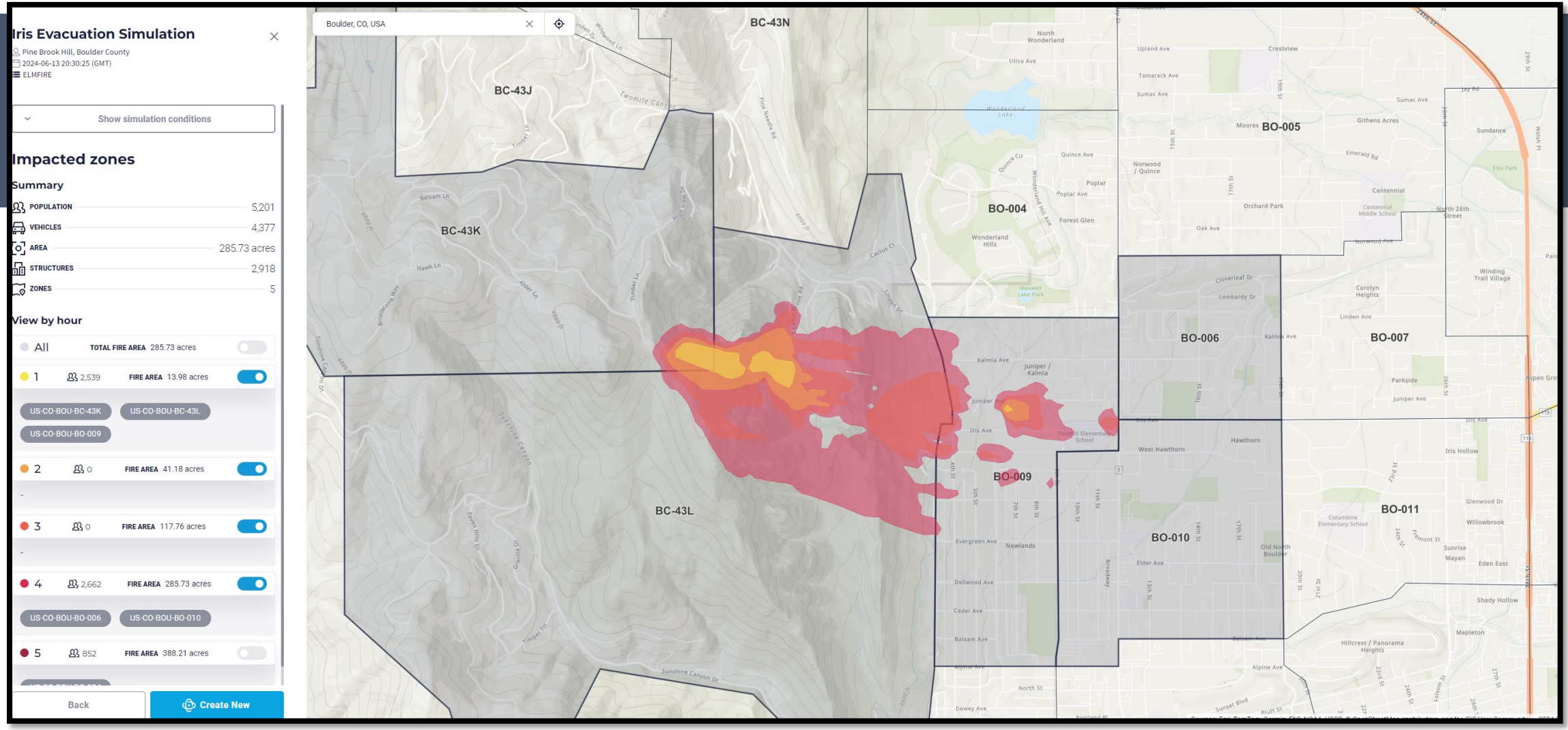
2024-06-13


Iris Evacuation Simulation
Pine Brook Hill, Boulder County
2024-06-13 20:30:25 (GMT)
ELMFIRE
Show simulation conditions
Impacted zones
Summary
POPULATION 5,201
VEHICLES 4,377
AREA 285.73 acres
STRUCTURES 2,918
ZONES 5
View by hour
All TOTAL FIRE AREA 285.73 acres
1 2,539 FIRE AREA 13.98 acres
US-CO-BOU-BC-43K
US-CO-BOU-BC-43L
US-CO-BOU-BO-009
2 0 FIRE AREA 41.18 acres
3 0 FIRE AREA 117.76 acres
4 2,662 FIRE AREA 285.73 acres
US-CO-BOU-BO-006
US-CO-BOU-BO-010
5 852 FIRE AREA 388.21 acres
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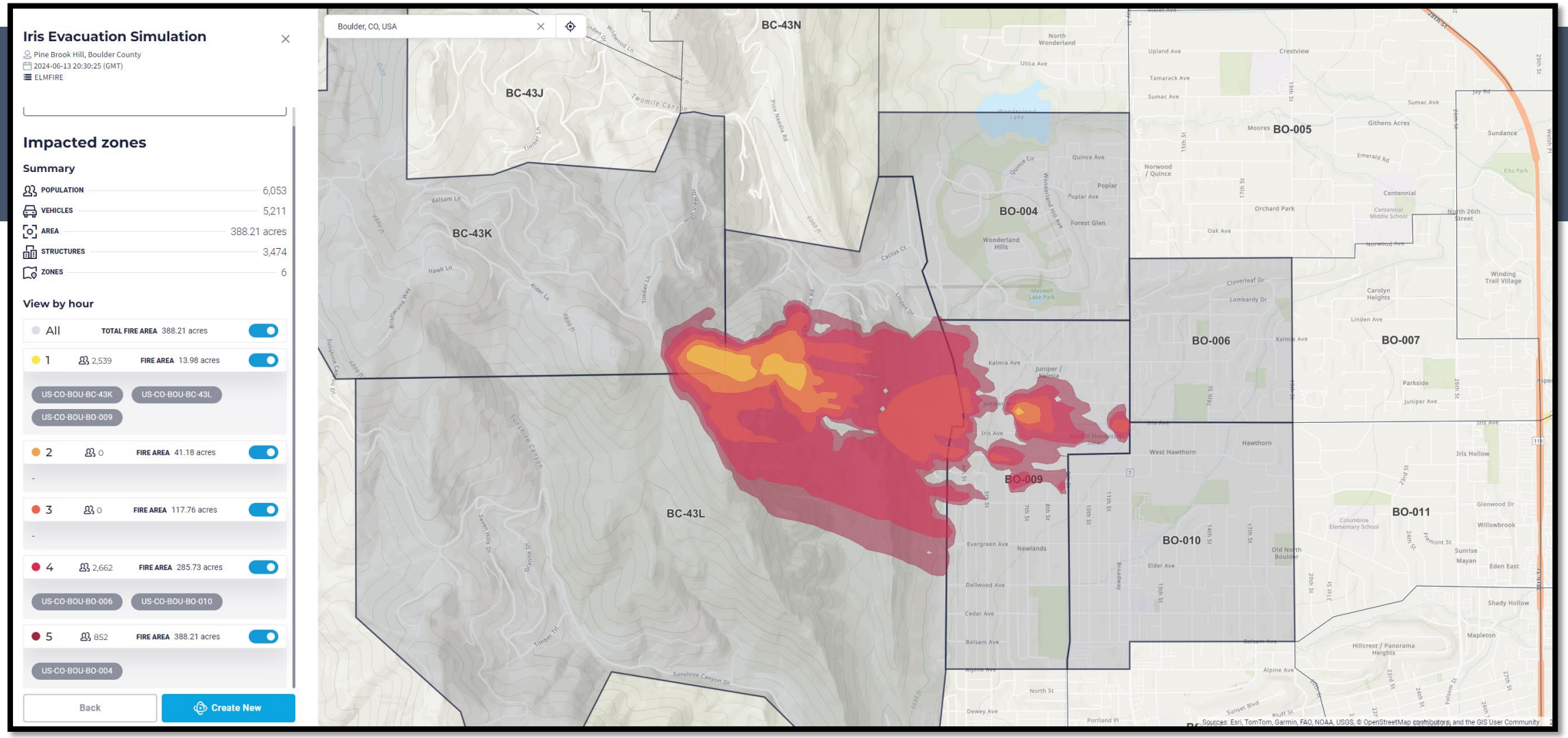
Create New
Boulder, CO, USA
BC-43N
BC-43J
BC-43K
BC-43L
BO-004
BO-005
BO-006
BO-007
BO-009
BO-010
BO-011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Pine Brook Hill, Boulder County
2024-06-13 20:30:25 (GMT)
ELMFIRE
Impacted zones
Summary
POPULATION 6,053
VEHICLES 5,211
AREA 388.21 acres
STRUCTURES 3,474
ZONES 6
View by hour
All TOTAL FIRE AREA 388.21 acres
1 2,539 FIRE AREA 13.98 acres
US-CO-BOU-BC-43K
US-CO-BOU-BC-43L
US-CO-BOU-BO-009
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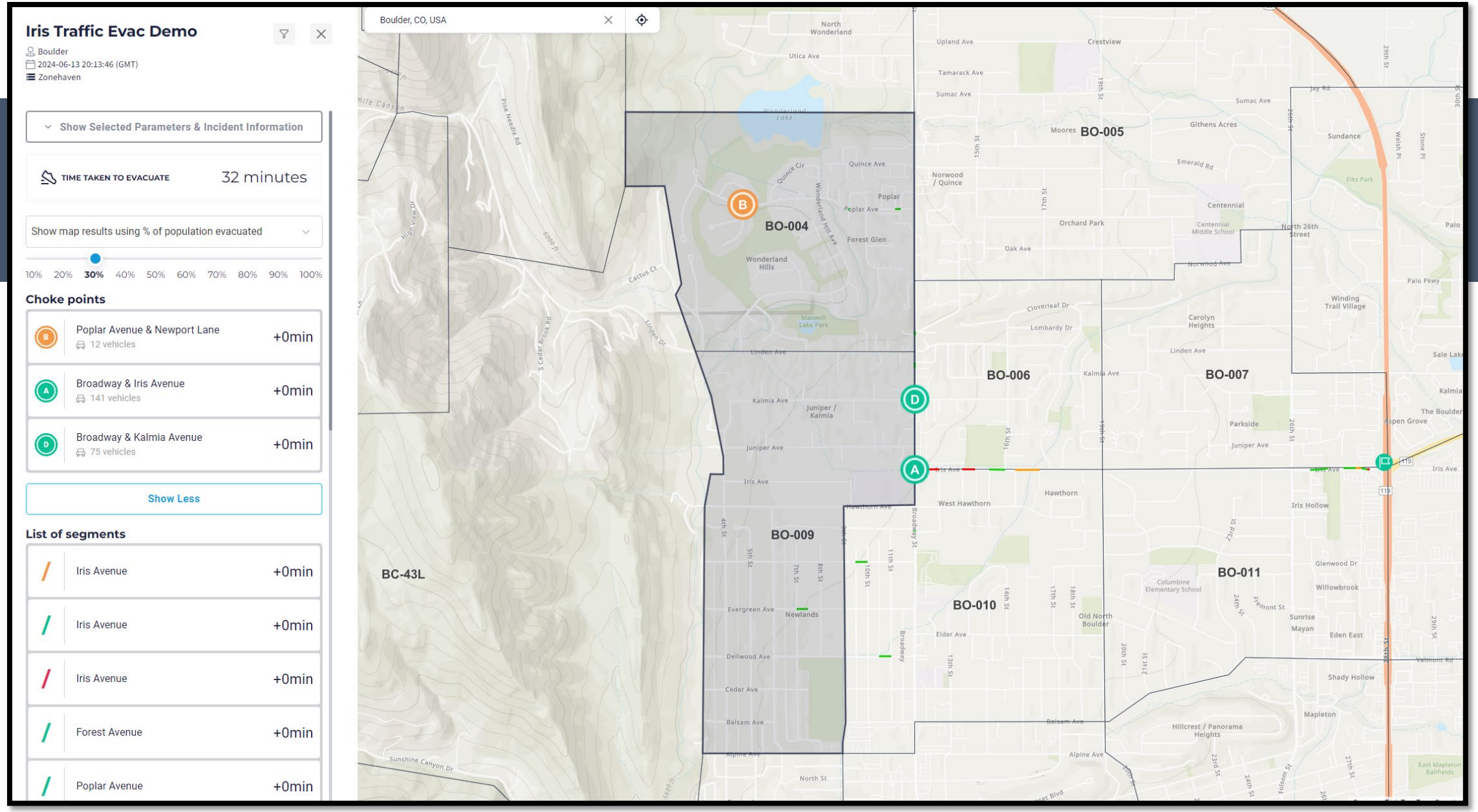
US-CO-BOU-BO-004
Back
Create New
Boulder, CO, USA
BC-43N
BC-43J
BC-43K
BC-43L
BO-004
BO-005
BO-006
BO-007
BO-009
BO-010
BO-011
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

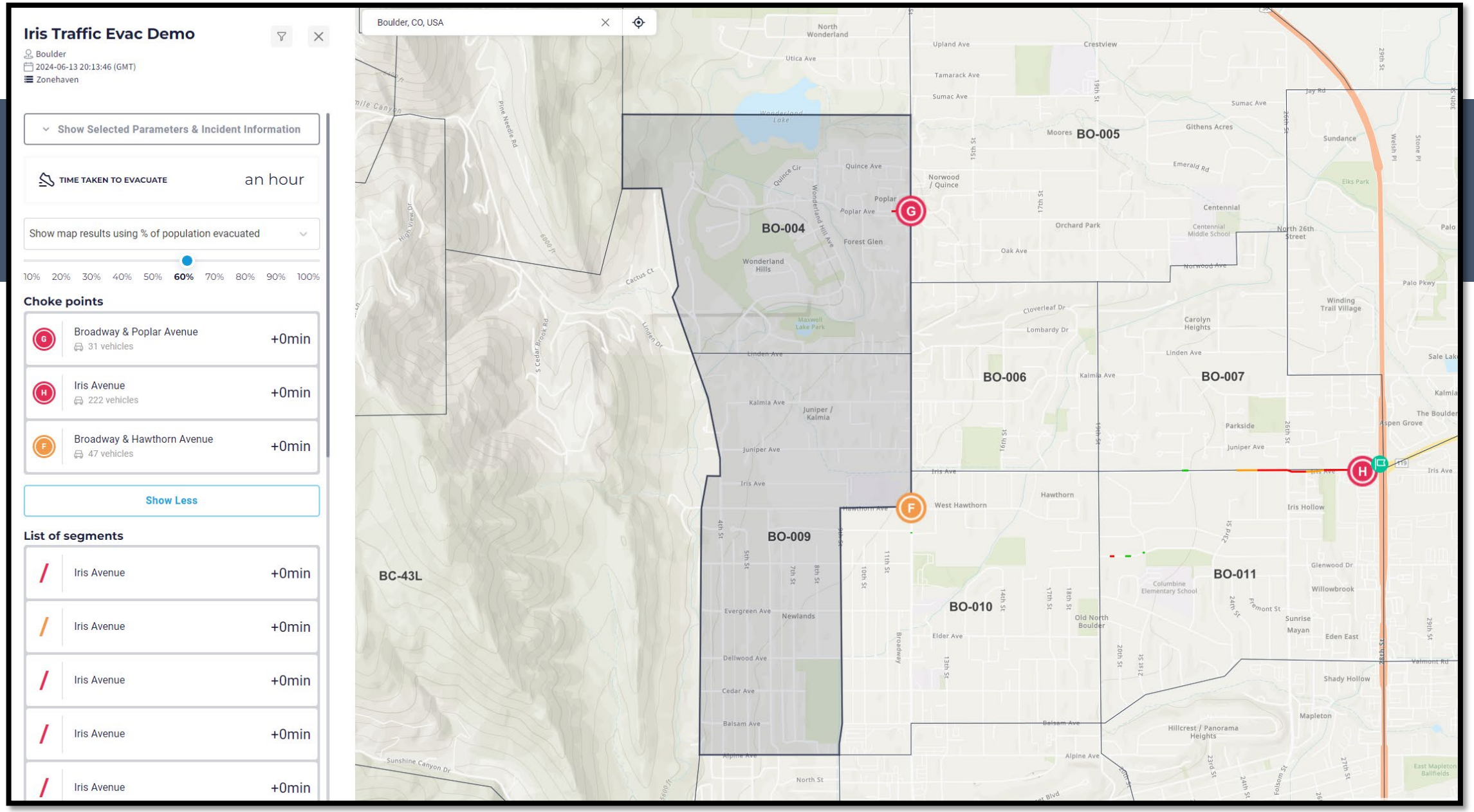
Required Safe Evacuation Time

$$RSET = T_{d(detection)} + T_{frs\ (first\ responder\ SA)} + T_{fri\ (first\ responder\ intervention)} + T_{ddeo\ (dispatch\ develops\ evac\ order)} + T_{cp\ (community\ processing)} + T_{evp\ (evac\ process)}$$

$$RSET = 15_{min/d} + 10_{min/frs/fri} + 10_{m/dnp} + 30_{min/cp} + 60_{min/evp} = 2\ hr,\ 5\ min$$

Temperature	55 degrees
Humidity	12% - 15%
Wind Speed	40 mph with 3-4 gusts per hour of 60 mph.
Direction	270.00 degrees


Iris Traffic Evac Demo
Boulder
2024-06-13 20:13:46 (GMT)
Zonehaven
Show Selected Parameters & Incident Information
TIME TAKEN TO EVACUATE
32 minutes
Show map results using % of population evacuated
10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Choke points
Poplar Avenue & Newport Lane
12 vehicles
+0min
Broadway & Iris Avenue
141 vehicles
+0min
Broadway & Kalmia Avenue
75 vehicles
+0min
Show Less
List of segments
Iris Avenue
+0min
Iris Avenue
+0min
Iris Avenue
+0min
Forest Avenue
+0min
Poplar Avenue
+0min
Boulder, CO, USA
BO-004
BO-005
BO-006
BO-007
BO-009
BO-010
BO-011
BC-43L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Boulder
2024-06-13 20:13:46 (GMT)
Zonehaven
Show Selected Parameters & Incident Information
TIME TAKEN TO EVACUATE
an hour
Show map results using % of population evacuated
10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Choke points
Broadway & Poplar Avenue
31 vehicles
+0min
Iris Avenue
222 vehicles
+0min
Broadway & Hawthorn Avenue
47 vehicles
+0min
Show Less
List of segments
Iris Avenue
+0min
Iris Avenue
+0min
Iris Avenue
+0min
Iris Avenue
+0min
Iris Avenue
+0min
Boulder, CO, USA
BO-004
BO-005
BO-006
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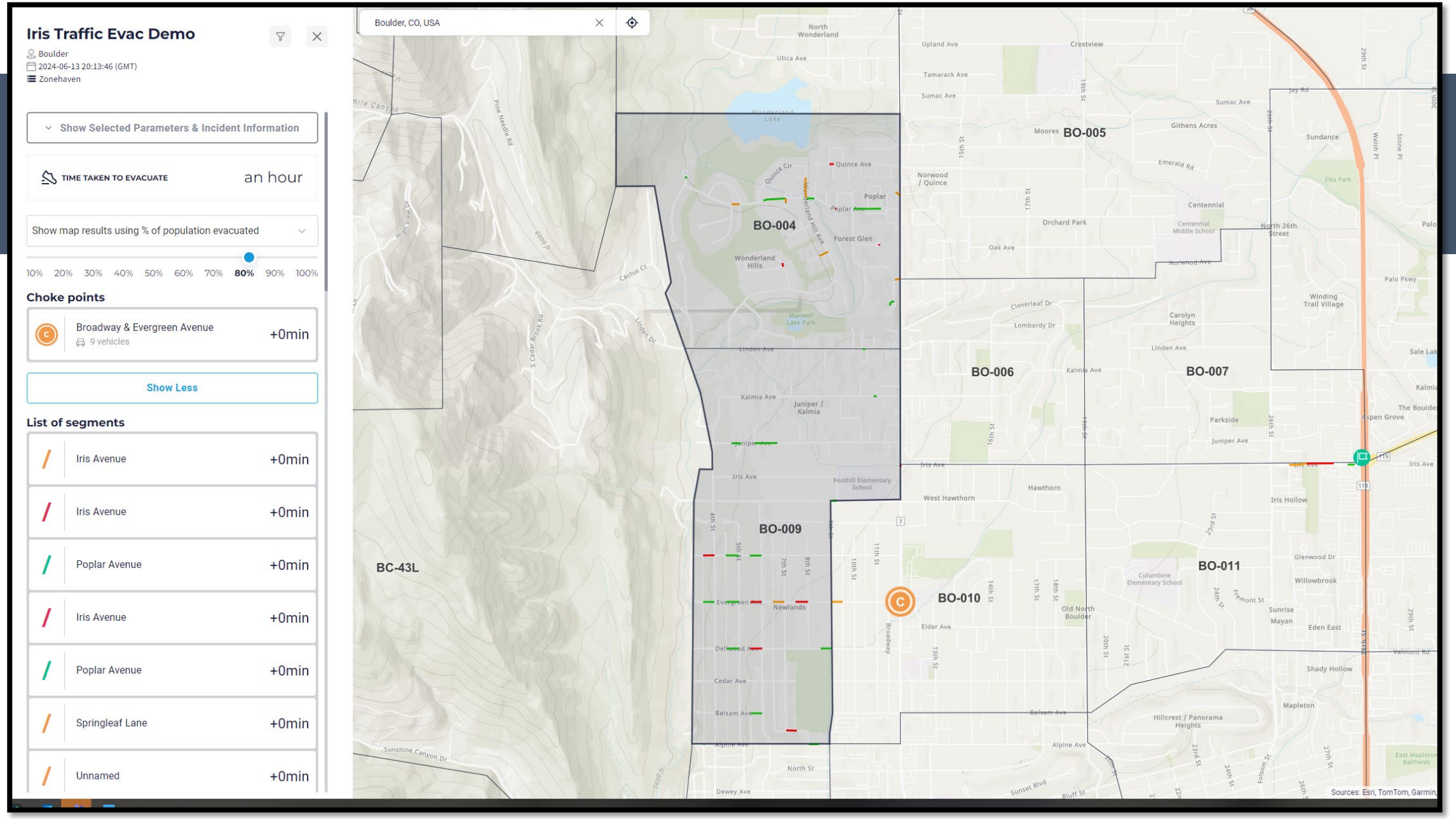
BO-010
BO-011
BC-43L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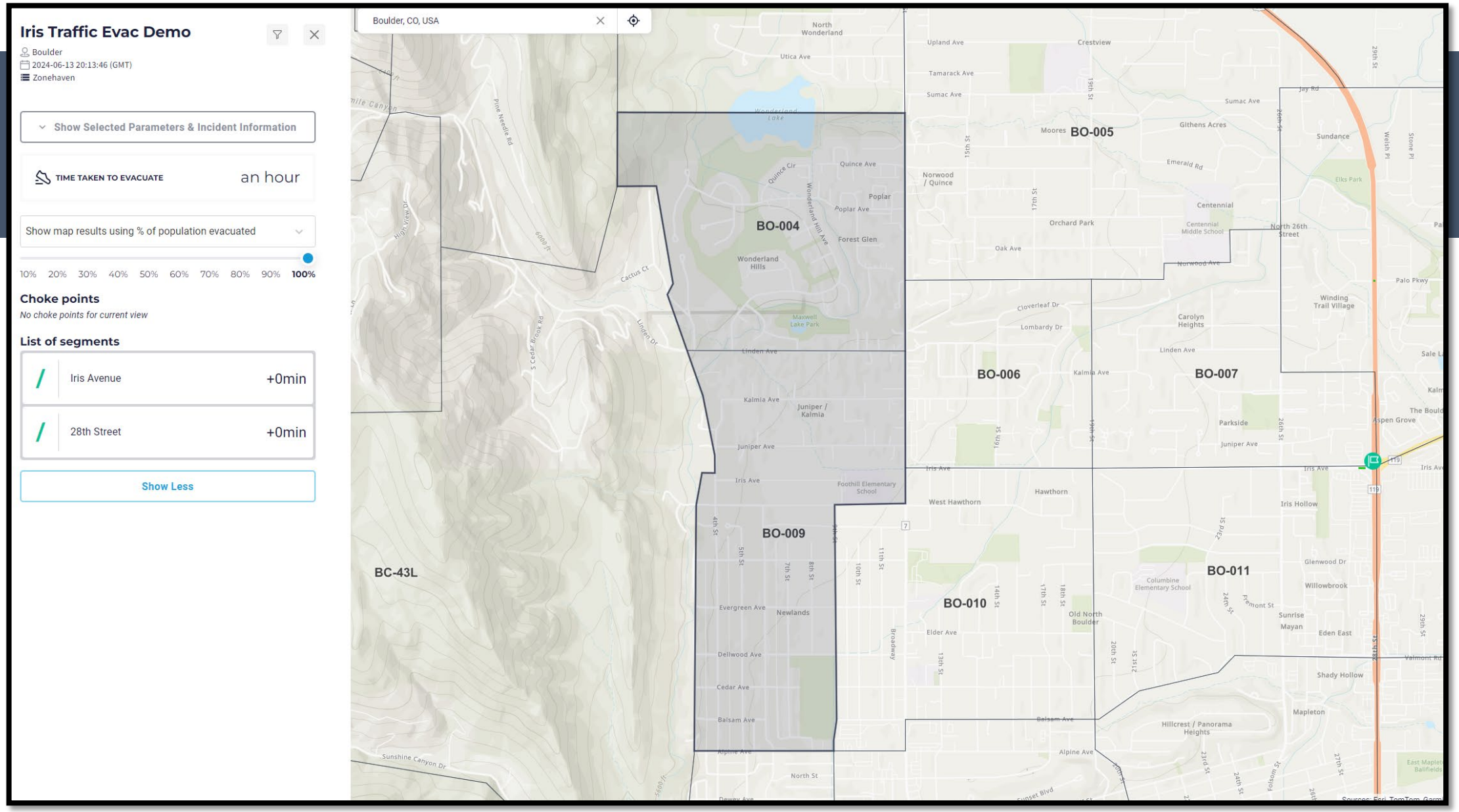
Boulder
2024-06-13 20:13:46 (GMT)
Zonehaven
Show Selected Parameters & Incident Information
TIME TAKEN TO EVACUATE
an hour
Show map results using % of population evacuated
10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Choke points
Broadway & Evergreen Avenue
9 vehicles
+0min
Show Less
List of segments
Iris Avenue +0min
Iris Avenue +0min
Poplar Avenue +0min
Iris Avenue +0min
Poplar Avenue +0min
Springleaf Lane +0min
Unnamed +0min
Boulder, CO, USA
BO-004
BO-005
BO-006
BO-007
BO-009
BO-010
BO-011
BC-43L
Sources: Esri, TomTom, Garmin,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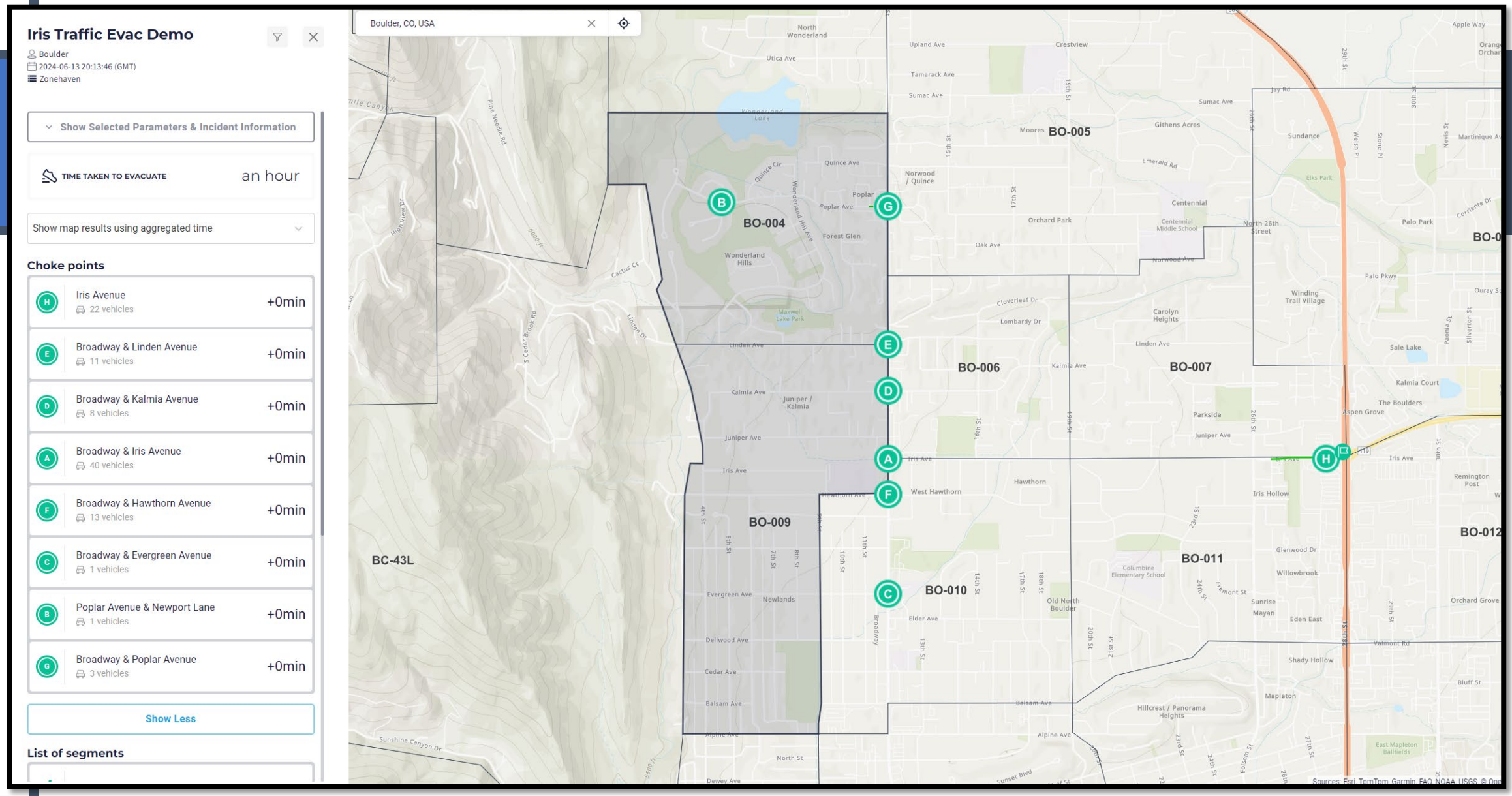
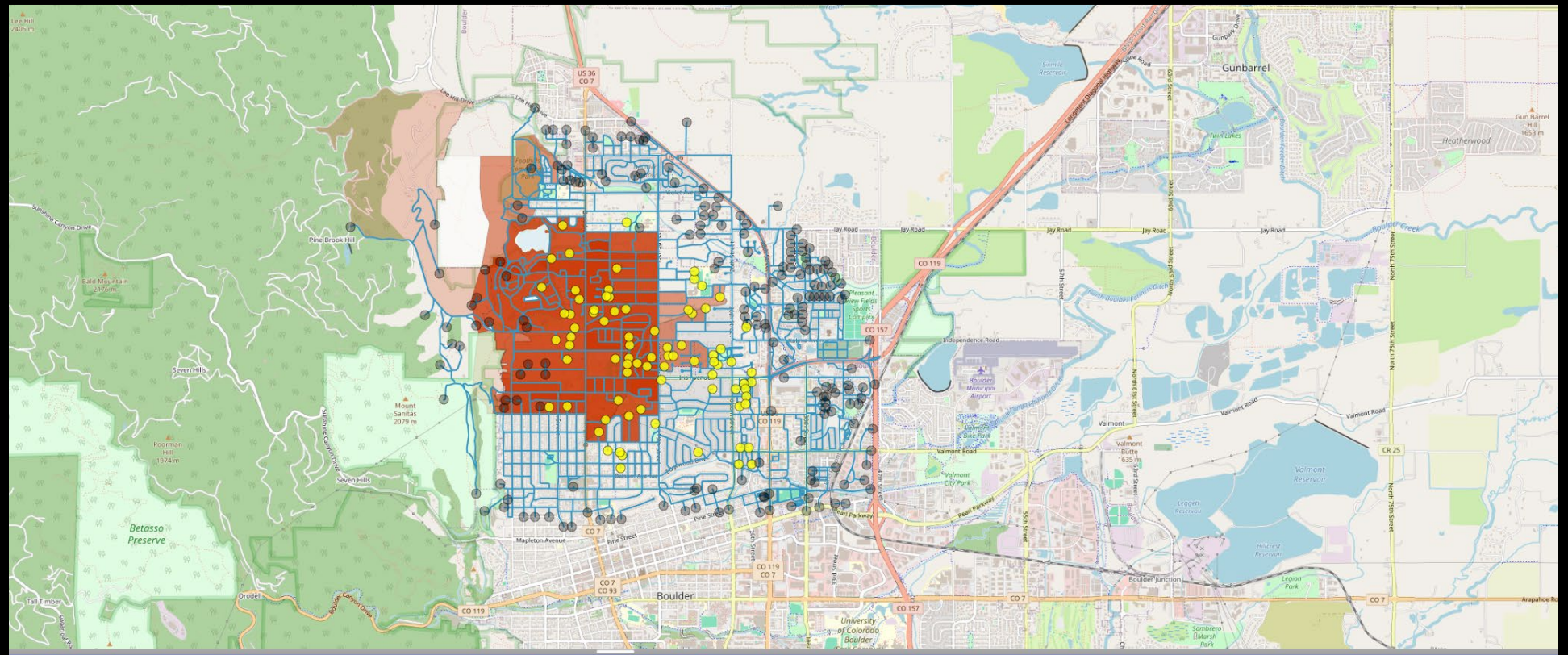
Boulder
2024-06-13 20:13:46 (GMT)
Zonehaven
Show Selected Parameters & Incident Information
TIME TAKEN TO EVACUATE
an hour
Show map results using % of population evacuated
10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Choke points
No choke points for current view
List of segments
Iris Avenue +0min
28th Street +0min
Show Less
Boulder, CO, USA
BO-004
BO-005
BO-006
BO-007
BO-009
BO-010
BO-011
BC-43L


Iris Traffic Evac Demo
Boulder
2024-06-13 20:13:46 (GMT)
Zonehaven
Show Selected Parameters & Incident Information
TIME TAKEN TO EVACUATE
an hour
Show map results using aggregated time
Choke points
Iris Avenue
22 vehicles
+0min
Broadway & Linden Avenue
11 vehicles
+0min
Broadway & Kalmia Avenue
8 vehicles
+0min
Broadway & Iris Avenue
40 vehicles
+0min
Broadway & Hawthorn Avenue
13 vehicles
+0min
Broadway & Evergreen Avenue
1 vehicles
+0min
Poplar Avenue & Newport Lane
1 vehicles
+0min
Broadway & Poplar Avenue
3 vehicles
+0min
Show Less
List of segments
Boulder, CO, USA
BO-004
BO-005
BO-006
BO-007
BO-009
BO-010
BO-011
BO-012
BC-43L
B
G
E
D
A
F
C
H



Level of Detail

- ○ Regional Evacuation
- ◉ Local Evacuation

	Started	Finished	Evacuation Time
	Jun 27, 2024 9:04:12 PM	Jun 27, 2024 9:06:07 PM	1:10

Emergency Alert Request Job Aid

1) Action requested:

☐ Evacuation
☐ Shelter in Place
☐ Climb to Higher Ground
☐ All Clear
☐ Missing Endangered Person

2) Severity level:

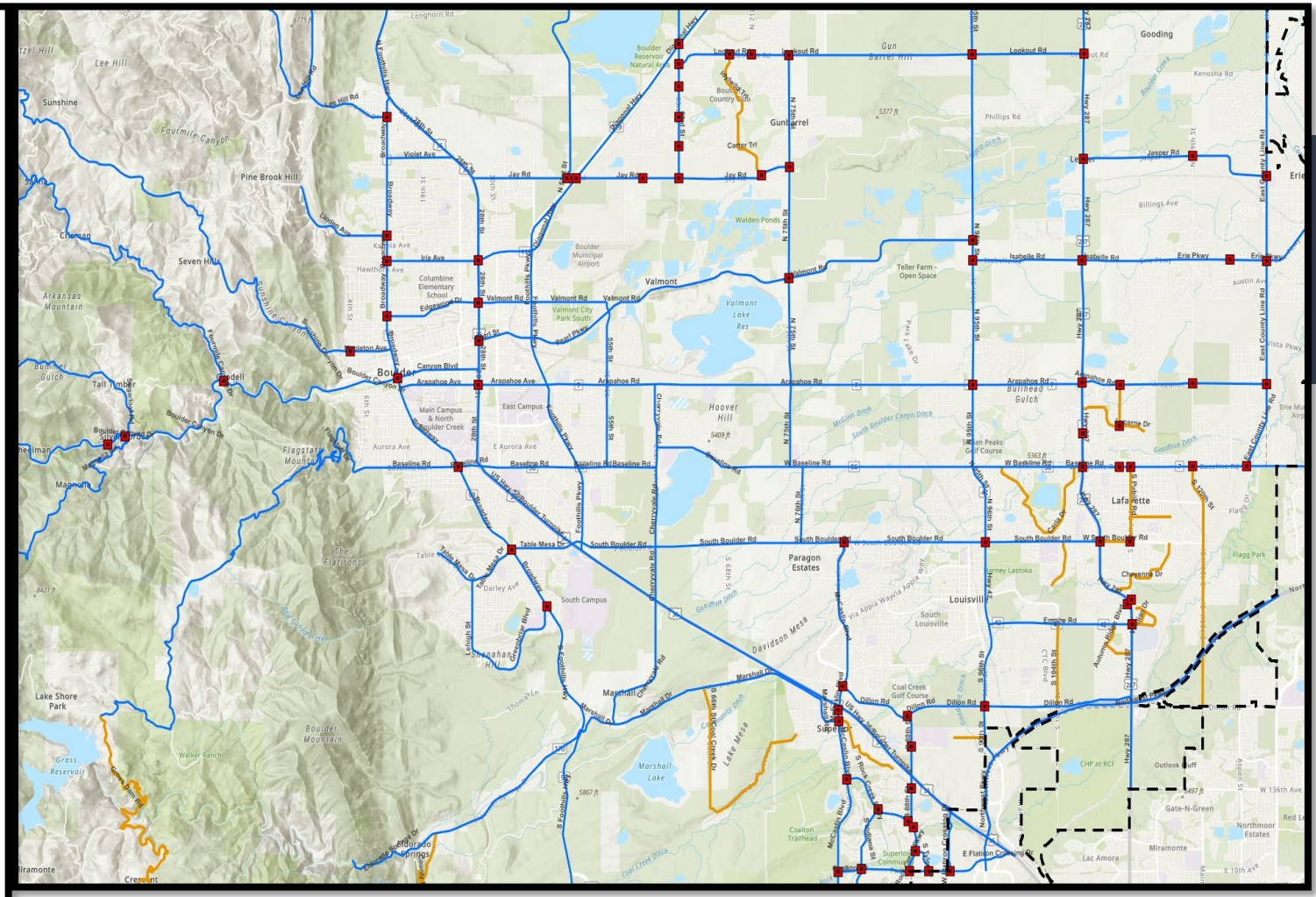
☐ Advisory
☐ Warning
☐ Order (Includes WEA and EAS)

3) Determine the area for sending the message:

☐ List specific alert area(s) using All-Hazard polygon(s)
☐ List specific alert area(s) using Flood polygon(s)
☐ Draw a radius using a specific distance from an address or intersection.
☐ Draw a shape on a paper map or mobile device and email it to dispatch BCSOCommunications@BoulderCounty.org
☐ Verbally relay the defined area by phone or radio. Use streets as boundaries

Considerations for Supervisors

☐ Incident Command has Law and Fire representatives for alerting decision-making needs	☐ Safe route in for first responders
☐ Stop railroads	☐ Use of IPAWS (WEA/EAS) for shelter in place orders during incidents that people may be hiding
☐ Traffic control at primary intersections	☐ Access & functional needs
☐ Schools	☐ Long-term care facilities
☐ Hospitals	☐ Large animal evac needs
☐ Water Treatment Plants	☐ Gas, electric and phone Infrastructure



Incident Command Actions for Law Enforcement to Implement Evacuation Orders

Category	Yes	No	Resolution and Time
Unified Command with Police and Fire Dept in place. • assess hazard info related to location, speed of growth, & impacts • initiate an ICS 201 form or tactical worksheet.			
Is command capable to manage surge resources and a Swarm environment?			
Determine evacuation zones place the evacuation order(s) with the 911 center. • Evacuation Order: Everbridge, WEA, EAS, Sirens.			
Do you have sufficient resources to complete door to door evacuations? • A reliable metric is that one officer can contact and complete a notification process every 3-5 minutes. This equates to 12-20 resident contacts per hour.			
Do you have sufficient resources to manage traffic objectives, traffic control points (choke points) and roadblocks?			
Have ingress routes been secured to allow for emergency vehicles and transportation resources to access hazard or evacuation sites?			
Genasys Evac checked to locate critical evacuation facilities associated with the evacuation zones being placed into an evacuation order status (schools, hospitals long term care centers, senior housing sites, daycare centers). • Consider Access & Functional Needs populations. • Develop tactical plan to address critical evac facilities either evac or shelter in place if possible.			
Is the ICS structure correct and able to manage evacuations and traffic management.			
Are there evacuation problems causing route loss for the public evacuation routes (for example stalled vehicles, road construction or other obstacles)? • If so, fix and communicate to command and PIO to message.			
Has the Office of Disaster Management been called out to activate the EOC (request through dispatch)?			
Other Issue:			

Incident Command Actions for Fire Department Evacuation Order Support

Category	Yes	No	Resolution and Time
Unified Command with Police and Fire Dept in place. • assess hazard info related to location, speed of growth, & impacts • initiate an ICS 201 form or tactical worksheet.			
Is command capable to manage surge resources and a Swarm environment?			
Determine evacuation zones place the evacuation order(s) with the 911 center. • Evacuation Order: Everbridge, WEA, EAS, Sirens.			
Develop immediate tactical plan to initiate fire suppression activities in areas where evacuation zones are occurring to reduce fire spread, change direction, and control spot fires.			
Do you have sufficient resources to complete the fire attack lines of effort to support evacuations? • Reducing smoke production for visibility • Reduce ember storms. • Slow fire growth. • Protect evacuation routes. • Increase the time available to evacuate areas.			
Do you have sufficient resources to manage traffic objectives, traffic control points and roadblocks?			
Are ingress routes secure to allow for emergency vehicles and transportation resources to access hazard or evacuation sites? Have these routes been communicated to the Law Branch for traffic management group for traffic control points and roadblocks to be implemented?			
Genasys Evac checked to locate critical evacuation facilities associated with the evacuation zones being placed into an evacuation order status (schools, hospitals long term care centers, senior housing sites, daycare centers). • Consider Access & Functional Needs populations. • Develop tactical plan to address protecting critical evac facilities either evac or shelter in place if possible.			
Has the Office of Disaster Management been called out to activate the EOC (request through dispatch)?			
Other Issue:			

Next Steps

- We are not going to legislate ourselves out of this problem!
- Expertise
- Personnel
- Funding
- Technology
- Develop standards for evacuation in rural areas, foothills (WUI) and dense urban conflagration risk areas.
- Conduct assessment state-wide to determine best structure to address the problem.

Preparedness Handouts