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# PUBLIC SAFETY

Concerns, Best Practices, and Recommendations

Presented by  
Westside Watch and The Maverick Observer

November 22, 2021



# Agenda



- ❖ Clearance Evacuation Times (Tim Hoiles)
- ❖ Fire / Hazard Best Practices & Challenges (RC Smith)
- ❖ FLEET vs. Zonehaven (John McLain)
- ❖ Public Safety Requirements in Developments (Jim Shirley)
- ❖ The Solution (Bill Wysong)
- ❖ Question / Answer



# Clearance Evacuation Times



## ❖ **Modeling:**

- Prior to the 2021 Emergency Plan, evacuation modeling included:
  - As a critical part of emergency preparedness
  - 2017 WUI Appendix A dedicated a Section to evacuation modeling
  - Listed clearance evacuation times as the first critical metrics

## ❖ **Evacuation Maps:**

- Before 2021 evacuation maps were accessible, ex. 2010 PPACG Study
  - Ex. District 6 highlighted two egress major issues
- After 2021 evacuation maps filed in CSPD Criminal Records Division and inaccessible to public, except through challenging CORA process

## ❖ **Advanced Planning:**

- Critical to successful outcomes
- Prioritizes equipment, resources, and manpower
- Promotes public awareness, education, and safety



# Clearance Evacuation Times (cont)



## ❖ Recommendations:

- Publish emergency evacuation maps on regional / city website, example: City of Ashland, OR Evacuation Plan
- Highlight routes used for ingress/egress and emergency vehicles
- Enhance Pikes Peak Prepared app with real-time evacuation data & more information





# Fire / Hazard Best Practices



## ❖ Custom Studies:

- Custom evacuation modeling studies every 5-10 years by reputable firms
- Example: KLD Engineering – evacuation modeling firm

## ❖ Other Best Practices:

- Manitou Springs – Providing evacuation plans/maps every two years, starting on November 12 with maps
- Santa Fe’s “Tie a Red Ribbon Around a Tree” program

"From the time it hit the top of Queen's Canyon, we estimated we would have about 4 hours to evacuate, the way the winds picked that up and pushed that down, we had on the order of 45 to 50 minutes."

- Fire Marshal Brett Lacey, FEMA, *Strategies Tested & Lessons Learned*



# Fire / Hazard Challenges



## ❖ **Equipment and Staffing Standards:**

- City adopted response time standards in the late 1990s
  - Response Standard – one truck, 6 min time frame
  - Effective Force – two trucks, 12 min time frame

## ❖ **Parkside Development:**

- Urban conflagration - density matters, specifically in WUIs

## ❖ **2012 Waldo Canyon / 2013 Black Forest Fires:**

- Lost 4 lives
- Lost 875 homes
- \$1 Billion insured property loss, more for uninsured property loss

## ❖ **1950 Carson / 2018 Camp Fire (Paradise) Fires:**

- Camp Fire traveled 80 football fields (4.5 miles) in 60 seconds

“And wildfire is part of nature. It's gonna come. We had it bump into Mountain Shadows. We're gonna have it come down into Broadmoor Bluffs. It's a matter of when not if.”

- Fire Marshal Brett Lacey City Podcast-62 Wildfire Warning 7/7/2021



# Fire / Hazard Challenges



**80 Football Fields/Minute**



**Inside Camp Fire Paradise  
Fire Evacuation**



# Benefits of Modeling



## ❖ The Organization

- Reduces chaos by having a plan – focuses the tactical team on the task
- The fewer firefighters knocking on doors to evacuate, the more homes and lives will be saved ·
- Improves employee (firefighter) satisfaction knowing fewer homes and lives will be lost ·
- First Place is not always good (linear regression projects a very bad outcome)
  - In 2012 the Waldo fire was the worst fire in Colorado history – 347 homes and 2 lives
  - In 2013 the Black Forest was the worst fire in Colorado history – 528 homes and 2 lives
  - In 20xx the next fire will be the worst fire in Colorado history – 900 homes and 6 lives (Is this the goal?)

## ❖ The Customer

- Customer satisfaction
- Confident the evacuation will be successful
- Less chance of property loss
- Higher probability of surviving





# Tools: Expert Systems vs. AI



## ❖ Expert System: FLEET

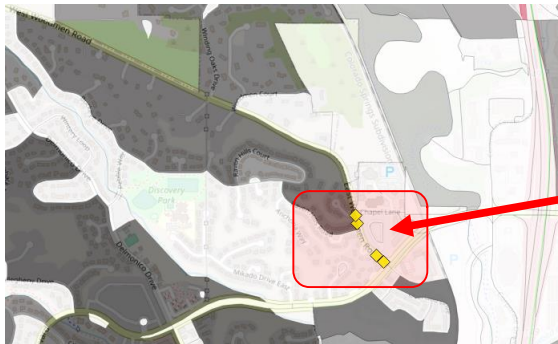
- Experts define functionality and parameters to create the application
- Data source are mostly static but can be modified for forecasting and anomalies (tourism)
- **Algorithms are deterministic**
- Results are calculated in advance of an event
- THE OUTCOME HAS A VERY HIGH RATE OF PREDICTABILITY

## ❖ AI: Zonehaven

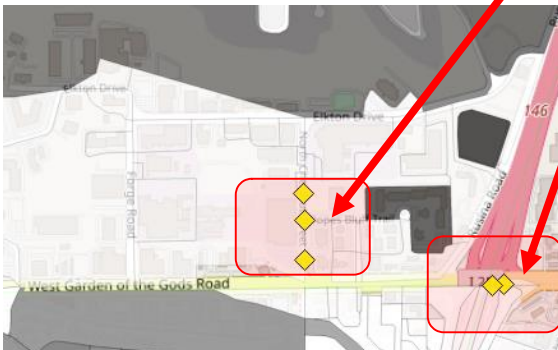
- Experts define functionality and parameters to create the application
- Data sources are real-time and can not guarantee a high level of accuracy
- **Algorithms are weighted (aka guess)**
- Results are calculated during the event
- THE OUTCOME IS MUCH MORE LIKELY TO YIELD UNEXPECTED RESULTS
- Moneyball Analytics - Past behavior in AI model didn't predict fire would jump the fire break & a canyon. Caldor Fire, Dixie Fire.

# FLEET: District 1

CET 8:10



Woodmen & Rockrimmon



GOG Rd. at Chestnut & I-25

4:00 Major delays  
10 to 15 minutes

Name	▼ Delay
W GARDEN OF THE GODS RD / Unnamed	15.0
W GARDEN OF THE GODS RD / RUSINA RD	14.0
Unnamed / E GARDEN OF THE GODS RD	10.0
Unnamed	12.0
RUSINA RD / Unnamed	13.0
RUSINA RD	13.0
N NEVADA AVE	10.0
E WOODMEN RD / Unnamed	10.0
E WOODMEN RD / GAYLE LYN LN	10.0
E WOODMEN RD / CHAPEL LN	10.0
E WOODMEN RD / BUCKHORN CIR	12.0
E WOODMEN RD	11.0
CHELSEA VILLAGE HTS / CHESHAM CIR / CHESHAM VILLAGE PT	10.0

4:20 tourists are still at the  
Flying W Ranch





# FLEET: District 1



## Current Traffic in Gridlock Conditions





# FLEET: Broadmoor sub-region



3:10 – 36 intersections – 10 to 16 minute delays  
8:20 CET



Normal background traffic

11/01/2021

Name	Delay		Delay
W MOTOR WAY / E MOTOR WAY	16.0	E CHEYENNE RD / ROANOKE ST	12.0
E MOTOR WAY / Unnamed	16.0	ROANOKE ST / OLD BROADMOOR RD	12.0
Unnamed / E MOTOR WAY	16.0	FENMOOR PL / W CHEYENNE BLVD	12.0
Unnamed / W MOTOR WAY	16.0	S NEVADA AVE / E BROOKSIDE ST	11.0
W MOTOR WAY / Unnamed	16.0	E BROOKSIDE ST / S NEVADA AVE	11.0
MT WASHINGTON AVE / Unnamed	16.0	OLD BROADMOOR RD W / OLD BROADMOOR RD E ...	11.0
W CHEYENNE BLVD / CERRITO PT	16.0	OLD BROADMOOR RD E / MT WASHINGTON AVE	11.0
W BROOKSIDE ST / CRESTONE AVE	14.0	S 8TH ST	11.0
S TEJON ST / E NAVAJO ST	14.0	W CHEYENNE BLVD / S 8TH ST	11.0
Unnamed / S NEVADA AVE	14.0	W CHEYENNE BLVD / MESITA CT	11.0
W CHEYENNE BLVD / CRESTA RD	14.0	MOTOR CITY DR / MOTOR WORLD PKWY	10.0
S NEVADA AVE / CO-115	13.0	Unnamed / S NEVADA AVE	10.0
E ST ELMO AVE / S NEVADA AVE	13.0	Unnamed	10.0
S NEVADA AVE / CO-115 / Unnamed	13.0	W CIMARRON ST / Unnamed	10.0
BEAVER AVE / BEAVER CT / W CHEYENNE BLVD	13.0	W CIMARRON ST / Unnamed	10.0
ARCTURUS DR / Unnamed	13.0	E RAMONA AVE	10.0
WOODBURN ST / W CHEYENNE RD	12.0	MT WASHINGTON AVE / SOMMERLYN RD	10.0
		ARCTURUS DR / Unnamed	10.0
		SKYWAY BLVD / MERCURY DR	10.0

Source: Westside Watch/TMO





# FLEET: Broadmoor sub-region

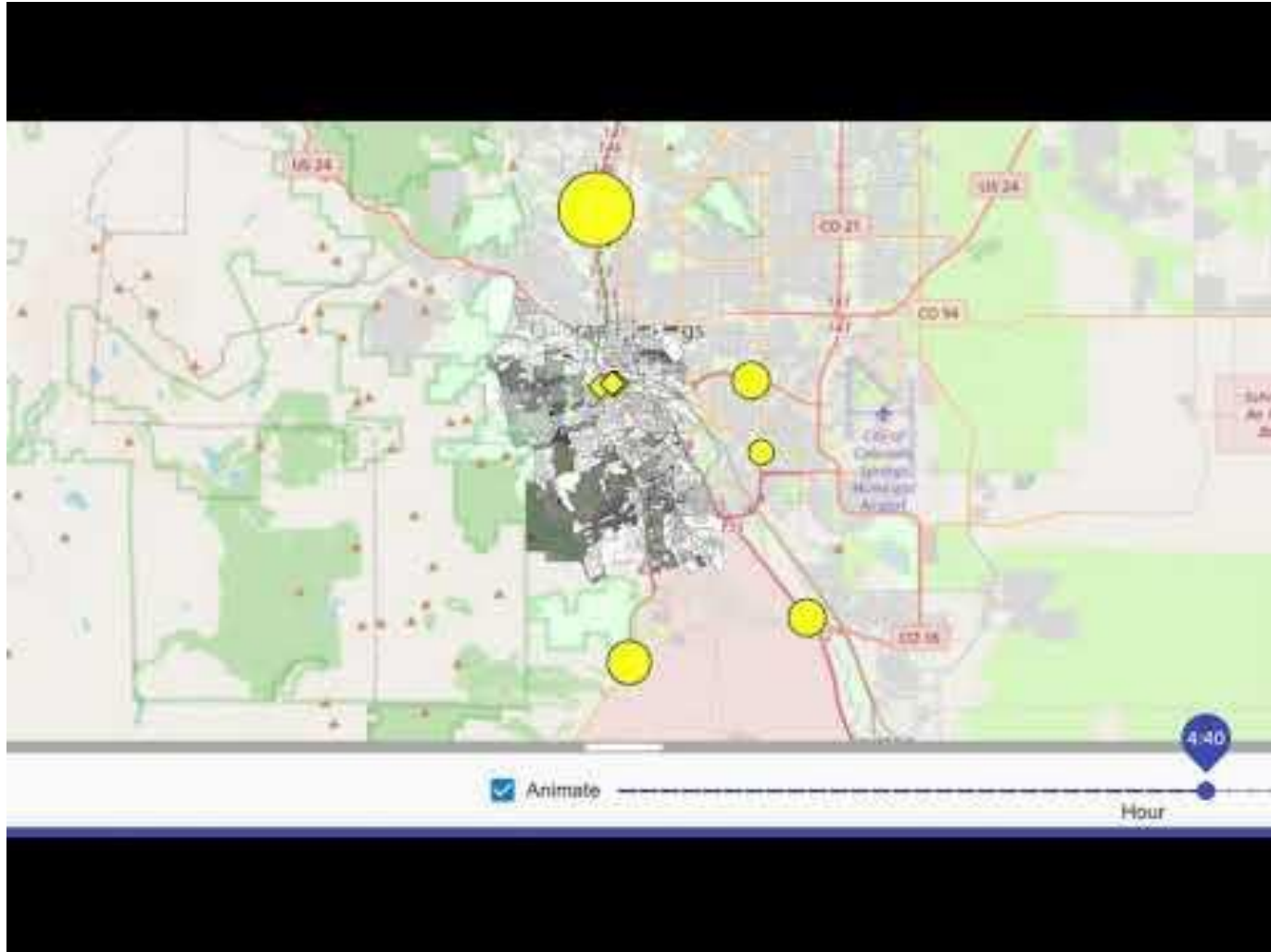


## Major Choke Point - "Beanabout"





# Simulation Video





# Public Safety Requirements in Developments



## ❖ **Developments are currently required to provide:**

- Geological Hazards Report, Drainage Report, Traffic Impact Analysis
- Architectural plans that meet Regional Building and Fire Codes
- Parking spaces, landscape and accessibility

## ❖ **Concerns about infill and proposed developments / rezoning:**

- Traffic impact analysis - **"If necessary"**
  - 100 vehicle / 150 dwelling units
  - TIS - conducted by "Professional Engineer"
    - Measurement, background traffic, traffic sources / control
- Ingress / Egress:
  - Minimum number of evacuation routes
  - Contraflow identification for public awareness
- Clearance Evacuation Times:
  - Impact on sub-district and district CETs
- Traffic Studies:
  - Need to gear towards public safety and emergency preparedness



# Why We Need Public Safety Requirements



## ❖ Liabilities:

- Charges for loss of life and property destruction
  - Ex. 84 counts of manslaughter against PG&E for loss of life in Paradise, CA fire
  - Ex. Paradise fire bankrupted PG&E

## ❖ Trends in the Courts:

- Squaw Valley Ski Resort – stopped development due to incorrect CETs submitted by developer and supported by fire chief
- Wyoming – stopped development because of CET concerns
- San Diego Otay Ranch - stopped development due to wildfire concerns

## ❖ Our Next Fire:

- Broadmoor fire models indicate the potential for greater loss of property and life than Waldo Canyon and Black Forest combined





# The Solution: Tools & Public Education

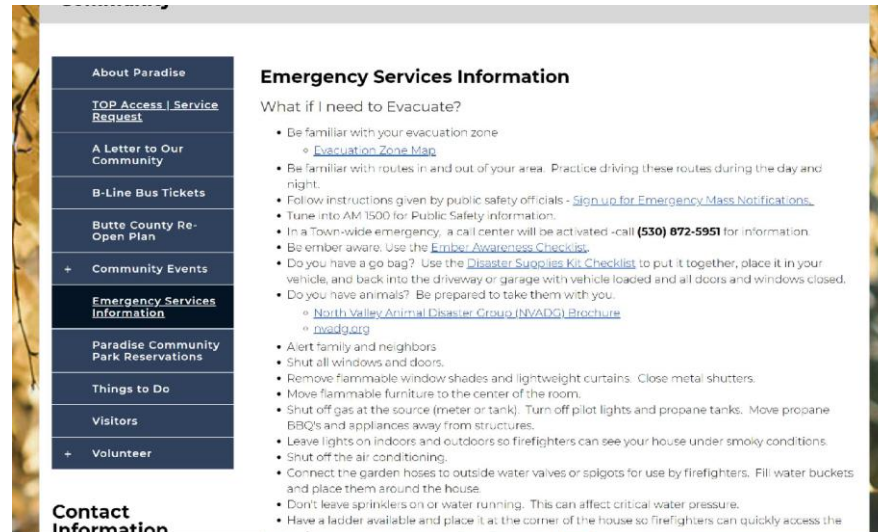
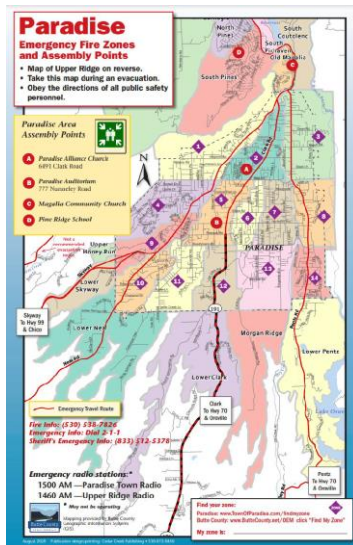


## ❖ Modeling Tools:

- Implement evacuation modeling software for CETs and traffic flow to meet target evacuation times, ex. FLEET software

## ❖ Public Education / Information:

- Build a city/regional website for public evacuation maps and CETs, accessed by address. Ex. Paradise, CA, Manitou Springs, CO





# The Solution: CET- Public & Life Safety Ordinance



- ❖ **CET Ordinance** - Public & Life Safety which codifies the requirement to report CETs and provide emergency evacuation **maps** for hazards from all cardinal directions & codifies the requirement to identify current CETs, mitigate any issues and conduct CETs studies for all development.

"A CET-Public & Life Safety Ordinance is a good idea. Evacuation maps and advanced preparedness is important to positive outcomes in these chaotic events. People should be aware of how to get out and how long it takes."

- Dan Dallas, Type 1 Incident Commander for Pike Gulch and Cameron Peak Fires, Rio Grande Forest Supervisor, USFS

- ❖ **Moratorium** - A moratorium needs to be implemented on all building in the WUI until the ordinance is passed with a reasonable CET's with proper evacuation maps that will allow the public to evacuate safely.



# The Solution: CET- Public & Life Safety Ordinance



## ❖ Ingress / Egress:

- Mandate analysis of ingress / egress of an area, sub-district, and district
- Set standards for the analysis criteria: i.e. egress portals, evacuation routes, evacuation lanes available.

## ❖ Clearance Evacuation Times:

- Requires a target evacuation time of 1 hour to be met (per the historical target time from the 2017 WUI Appendix A document).
- Approve and execute CET Ordinance for future developments and rezoning actions

## ❖ Areas of analysis:

- CET studies must include both the local site as well the impact of the development on the district, neither of which can exceed the targeted CET.

"If you know the area the streets aren't huge. Woodmen Rd. is the main artery going out of there and the traffic was backed up and the fire was advancing on the line of cars."

-Sgt. Dale Fox CSPD - *In our own backyard: Reflection on the Waldo Canyon Fire* - PPLD



# Points of Contact



## ❖ Industry Experts:

- Tom Cova, [cova@geog.utah.edu](mailto:cova@geog.utah.edu)
- R. Michael Robinson, [RMRobins@odu.edu](mailto:RMRobins@odu.edu)
- Brian Wolshon, [brianw@lsu.edu](mailto:brianw@lsu.edu)

## ❖ Westside Watch / TMO Community Members:

- Bill Wysong, [bill.fortresshomeinspection@gmail.com](mailto:bill.fortresshomeinspection@gmail.com)
- John McLain, [jvmclainjr@gmail.com](mailto:jvmclainjr@gmail.com)
- Jim Shirley, [jimshirley1781@gmail.com](mailto:jimshirley1781@gmail.com)
- RC Smith, [rsmithjr2015@gmail.com](mailto:rsmithjr2015@gmail.com)
- Dana Duggan, [danaannduggan@gmail.com](mailto:danaannduggan@gmail.com)
- Tim Hoiles, [tim@hoiles.com](mailto:tim@hoiles.com)



# Q & A