

Impact of Out-of-County Transports Summit County, CO



SUMMIT COUNTY AMBULANCE & AREA FIRE SERVICES

**CONSULTANT PRESENTATION
EXPANDED INCIDENT LIST**

DECEMBER 2016

FITCH & ASSOCIATES, LLC



Project Objectives

2

- **Analyze the impact of out-of-county transports on the system's capacity to respond to all hazard FIRE incidents**
- **Analyze the impact of out-of-county transports on the system's capacity to respond to EMS incidents**
- **Date Range: June 1, 2015 through May 31, 2016**

Fire Agencies' Concerns

3

- **Out-of-county transports take units out of the local system for long durations.**
- **Do sufficient units remain in the local system to adequately respond to requests for FIRE & EMS emergency services?**

Terminology

4

TROUT = Out-of-County Transport
CRIT = Critical Incident

TROUT is the [CallTypeCode] used in the CAD to designate an out-of-county transport. CRIT is a moniker created for brevity and parallelism.

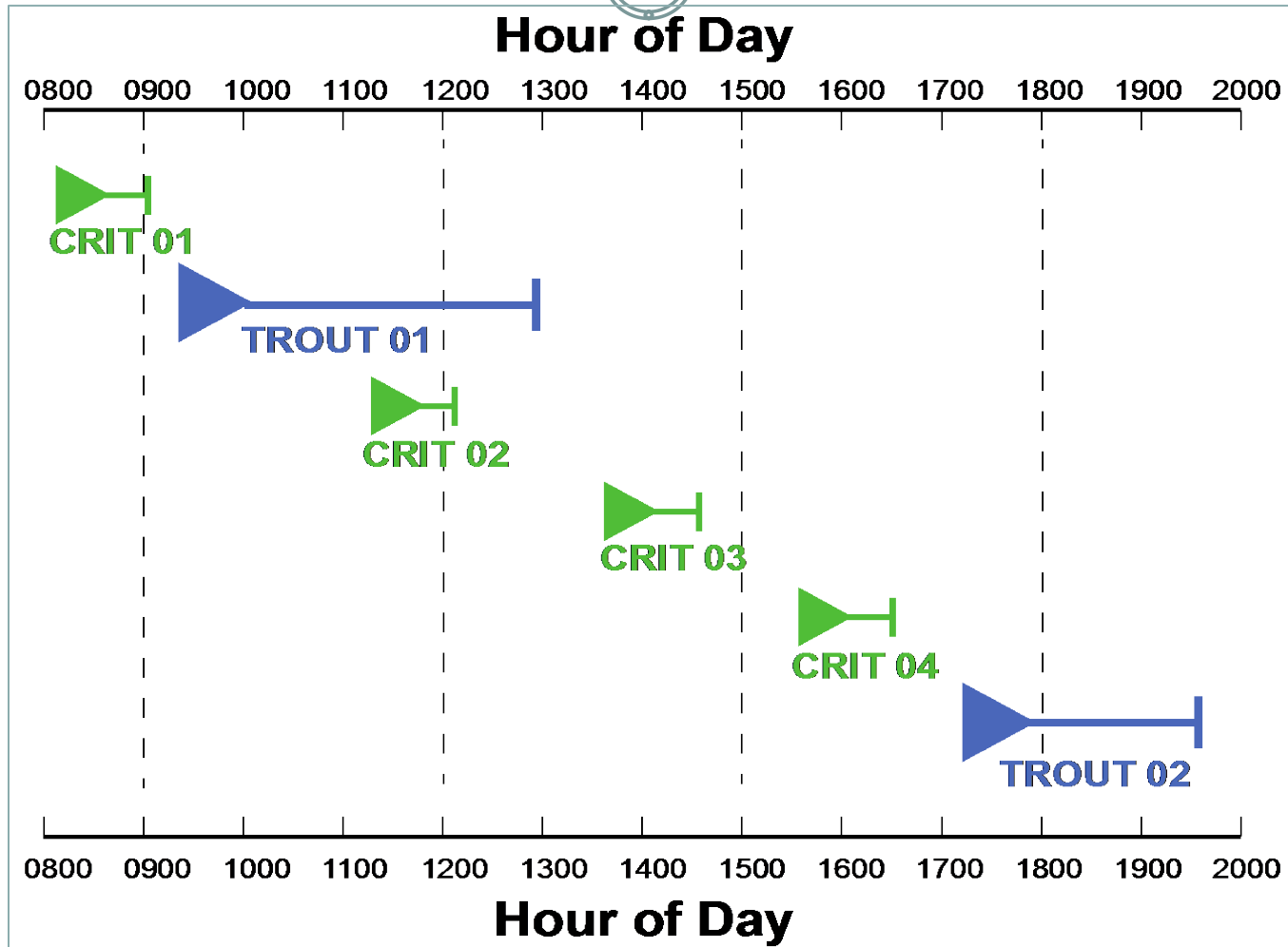
Critical Incidents (CRITs)

5

- **County listed the incident types to be included in these analyses. Referred herein as CRITs.**
 - List expanded November 11, 2016
 - Final Count: 4,136 CRITs with Vehicles Arrived AtScene
- **CRITs divided into two categories:**
 - Emergency Medical [CallTypeCodes]
 - Fire All Hazard [CallTypeCodes]

Preliminary Expectation of Overlaps

6



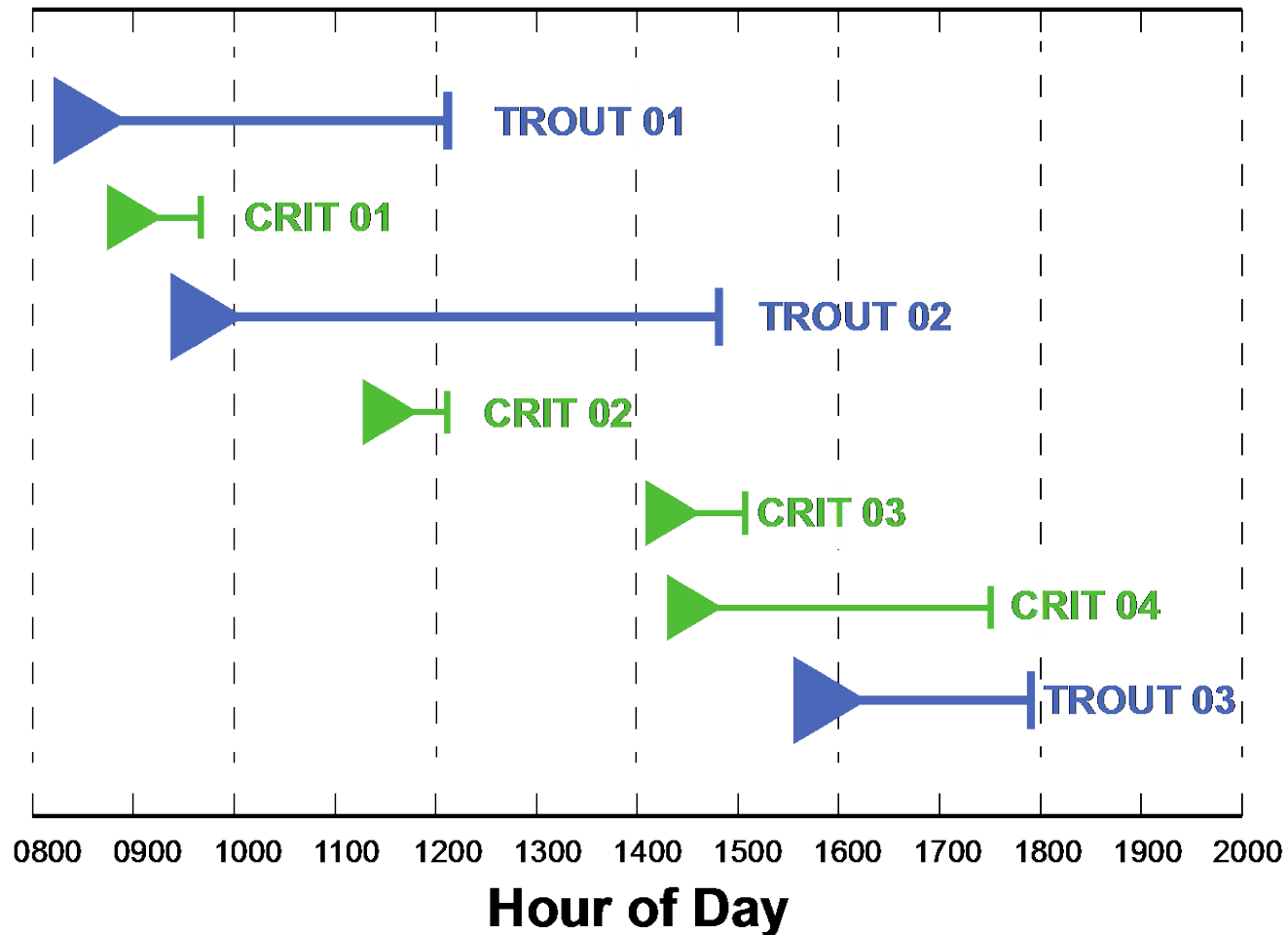
FITCH Analyses

7

- **Created Master Incident Table from CAD records**
 - Total of 6,050 incidents with Vehicle Arrived AtScene
- **Tested start time/duration of each TROUT for overlap with any subsequent CRITs and/or TROUTs**
- **Tallied overlaps by month-of-year, day-of-week, and hour-of-day**

(TROUT x TROUT) & (TROUT x CRIT) Overlaps

8



Out-of-County Transports (TROUTs)

9

- **775 TROUTs occurred from 6/1/15 to 5/31/16**
- **310 (40%) of all TROUTs occurred with one or more additional TROUTs simultaneously in-progress**
- **TROUT average duration: 4 hrs. 20 min. 47 sec.**
- **One or more TROUT(s) in-progress during 2,595 of hours from 6/1/15 to 5/31/16 (30% annual hours)**

Temporal Distributions

10

CRITs

- **Month of Year**
 - Most: Dec thru Jan
- **Day of Week**
 - Upswing on Friday
 - Maximum on Saturday
- **Hour of Day**
 - Spike @ 1300 hrs.; broad maximum at 1200 to 1600

TROUTs

- **Month of Year**
 - Most: Dec thru Jan + July
 - Minimum in May
- **Day of Week**
 - Spike on Monday
- **Hour of Day**
 - Broad max. 1300 to 1700
 - Minimum 0200 to 0400

Simultaneous (TROUT x TROUT) Overlaps

11

# TROUTs Simultaneously In-Progress	Count	Percent of Total
1	465	60.0%
2	216	27.9%
3	80	10.3%
4	11	1.4%
5	3	0.4%
Total	775	100.0%

- 60% of 775 Out-of-County Transports occurred as singular events
- 310 or 40% of Out-of-County Transports occurred when there were 2 or more simultaneous TROUTs

Interference with CRITs

12

- **Initiation of a critical incident is when vehicles are tasked with responding to the incident**
- **If TROUTs cause an “operational scarcity” of resources, dispatchers may be compelled to:**
 1. **Assign to a Unit already running an incident in-progress**
 2. **Assign to a Unit normally considered too remote**
- **Observable consequence is that response intervals for Vehicles Arrived AtScene will increase**

(CRIT x TROUT) Overlaps by Category

13

Category	All CRITs	CRITs <i>without</i> TROUTs	CRITs <i>with</i> TROUTs
Emergency Medical	2,807	1,716	1,091
Fire All Hazard	1,285	820	465
Other Categories	44	23	21
Total	4,136	2,559	1,577

Distribution of Overlaps: (CRIT x TROUT)

14

- **Month-of-Year**
 - Greatest number – Dec thru Mar; pronounced drop in May
- **Day-of-Week**
 - Greatest number on Fridays and Saturdays
- **Hour-of-Day**
 - Broad maximum 1300 to 1700 hours
 - Minimums between 0100 and 0800 hours

Interference Metric

15

- **Average response intervals for all Vehicles Arrived AtScene is used to determine the impact of TROUTs on CRITs**
- **All Vehicles Arrived AtScene is the metric that best describes assembly of an Effective Response Force, especially on FIRE all hazard incidents.**

Impact on System Response

16

- Identified any all hazards critical incidents that initiated when an out-of-county transport was in progress
- Logged and compared the response intervals for all Vehicles Arrived AtScene for —
 - CRITs *with* simultaneous TROUT(s) = 0
 - CRITs *with* simultaneous TROUT(s) = 1+

Do TROUTs Interfere With FIRE CRITs?

17

Average Response Intervals, All Units Arrived AtScene

Fire All Hazard CRITs	Average (sec) [mm:ss]	± Std Dev (sec) [mm:ss]
With TROUTs = 0	439 [07:19]	± 263 [04:23]
With TROUTs = 1+	415 [06:55]	± 247 [04:07]

- Casual interpretation of averages DOES NOT convey the correct picture.
- Noisy data — pronounced standard deviations.
- Need to use statistical methods to interpret correctly.

t-Test and p-Value Method for Comparison

18

- Primary method to determine interference is to compare response times in the two distributions (with and without) based on averages and standard deviations
- These are relatively small data sets, so random fluctuations or “noise” in the data will be pronounced
- t-Test is the standard statistical method for assessing how strong the signal is, the difference of the two means, versus how much “noise” is present in data
- p-Value is the probability that difference between the two data sets is due to *real systematic* differences rather than *random fluctuations* occurring within each data set

Do TROUTs Interfere With FIRE CRITs?

19

Average Response Intervals, All Units Arrived AtScene

FIRE CRITs	Average (sec) [mm:ss]	± Std Dev (sec) [mm:ss]	t-Value	p-Value
With TROUTs = 0	439 [07:19]	± 263 [04:23]	1.255	0.034
With TROUTs = 1+	415 [06:55]	± 247 [04:07]		

p-Value Indicates

There is a *96.6% probability* that TROUTs have **NO** effect on all hazards fire CRIT average response intervals for all Vehicles Arrived AtScene (ERF).

Do TROUTs Interfere with EM CRITs?

20

Average Response Intervals, All Vehicles Arrived AtScene

Emergency Medical CRITs	Average (sec) [mm:ss]	± Std Dev (sec) [mm:ss]	t-Value	p-Value
With TROUTs = 0	485 [08:05]	± 294 [04:54]	3.571	<0.001
With TROUTs = 2+	547 [09:07]	± 335 [05:35]		

p-Value Indicates

There is more than a *99.9% probability* that two or more simultaneous TROUTs have **NO** effect on emergency medical CRIT average response intervals. The conclusion is similar with TROUTs = 1.

Conclusion

21

The Summit County 911 System has a sufficiency of units to accommodate the conduct of out-of-county transports without compromising in-county response intervals on either critical fire all hazard or emergency medical incidents. This conclusion is based on data from June 1, 2015 to May 31, 2016 using the expanded incident list provided on November 11, 2016.

Questions/Contacts

22

Guillermo Fuentes, Partner

gfuentes@fitchassoc.com

Dr. Erwin Stedronsky, Senior Consultant

estedronsky@fitchassoc.com

Dianne Wright, Senior Consultant

dwright@fitchassoc.com