



DRCOG Crash Data

Presented by:

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Background

- DRCOG has processed regional crash data dating back to vintage 2004
- The dataset processing workflow was mostly geocoding off-system records and aggregating with CDOT geocoded records
- The datasets were difficult to work with due to record character length limitations and inconsistent schemas



Update Schedule



2018

New processing
workflow



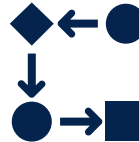
2004 - 2015

2016 - 2017

2018

2018

Converted existing
data to a new schema



2020

Updated workflow



Value Add



STANDARDIZED

Consistent field types and location fields



INTERSECTIONS

Concatenated address intersection field



GEOCODED

Geocoded off-system records for a complete spatial dataset



LOCATION

More precise locations using attribution



QC

Quality check of high priority records



DOCUMENTATION

Data dictionaries



Data Schema

Name	Type	Name	Type	Name	Type	Name	Type
geomid	integer not null	at_ot_na	charvar	hs1	charvar	saeq_sys1 (X3)	charvar
year	integer	act1 (X3)	charvar	drv_hcf1 (X3)	charvar	saeq_hlmt1 (x3)	charvar
month	integer	dir1 (X3)	charvar	ped_act1 (X3)	charvar	airb_dply1 (x3)	charvar
day	integer	vm1 (X3)	charvar	age1 (X3)	integer	airb_type1 (x3)	charvar
hour	charvar	killed	integer	sex1 (X3)	integer	drv_eject1 (x3)	charvar
serial	charvar	injured	integer	dob1 (X3)	integer	drv_alcoh1 (x3)	charvar
system	charvar	vehicles	integer	state1 (X3)	charvar	drv_drugs1 (x3)	charvar
city_st	charvar	rrxing	boolean	di1 (X3)	charvar	v1_impact (x3)	charvar
city_name	charvar	const	boolean	belt1 (X3)	charvar	alcohol_1 (x3)	boolean
county_nm	charvar	bridge	boolean	publicemp	boolean	drugs_1 (x3)	boolean
state	charvar	intch	boolean	private	boolean	corrected	date
location	charvar	contour	charvar	comcode_1 (X3)	charvar	cdot_load	date
drcog_loc	charvar	surface	charvar	violcode_1 (X3)	charvar	ears_load	date
cdot_flag	charvar	condition	charvar	hazmat_1 (X3)	boolean	accident_d	date
modified	boolean	lighting	charvar	wan_type	charvar	agency_nam	charvar
road	boolean	weather	charvar	reportform	charvar	citycntyrd	boolean
city	charvar	vt1 (X3)	charvar	limit1 (X3)	integer	interstate	boolean
county	charvar	injlevel_0	integer	drv_act1 (X3)	charvar	state_hwy	boolean
loc_01	charvar	injlevel_1	integer	v1_defect (X3)	charvar	hwy_num	boolean
loc_02	charvar	injlevel_2	integer	dui1 (X3)	boolean	mp	charvar
link	charvar	injlevel_3	integer	position1 (X3)	charvar	longitude	double
acctype	charvar	injlevel_4	integer	comp_rstr1 (X3)	charvar	latitude	double
mhe	charvar	speed1 (X3)	integer	comp_endr1 (X3)	charvar	geom	geometry



Processing Workflow

PREP SCHEMA

Insert data
Populate city & county
Create geometries



COMBINE

Combine on-system
and off-system
geocoded records



FLAG

Flag high priority
Delete outside
Final QC



STEP
01

STEP
02

STEP
03

STEP
04

STEP
05

STEP
06



GEOCODE

Geocode off-system
Rematch
QC



LINK FIELD

Move points on link
field
Snap points to
nearest road



FINISH

Recalculate fields
Export table



Improving Spatial Location by the Link Field

SELECT SUBSET

Link field has an offset value (link <=> 'AT')

DRCOG geocoded records (cdot_flag IS NULL)

CALCULATE MOVE

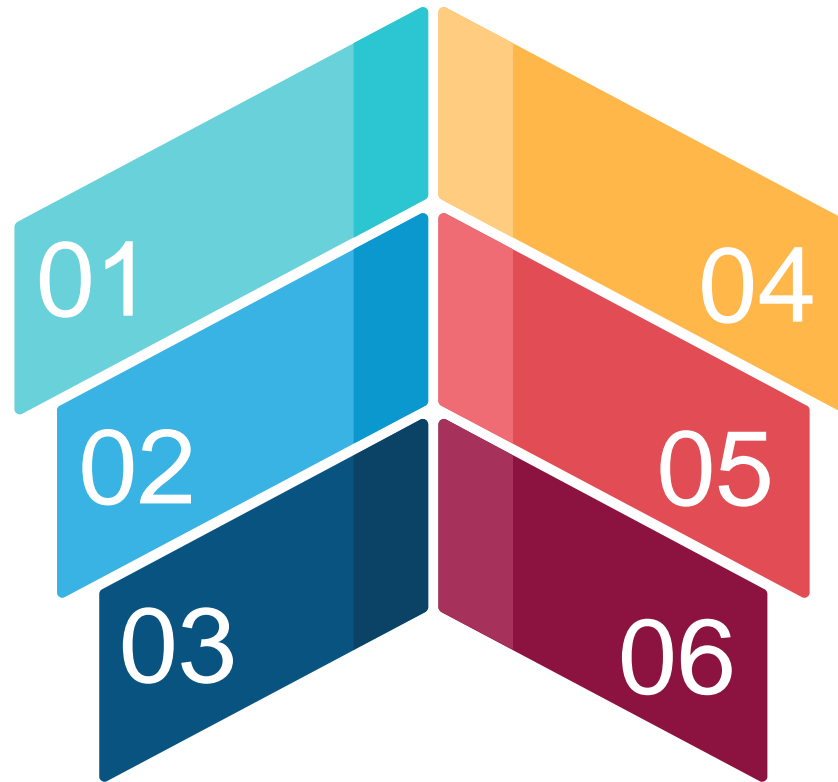
Distance

Direction

ST_PROJECT

Direction in (N, E, S, W)

Distance < 5280 feet



FIND ROADS

Within 50 feet of crash data point

SELECT ROAD

Shortest distance away from point

SNAP

Snap to the selected road segment

15,839 records in 2018 (21%)





Calculating the Move

drcog_loc	link	link_copy	link_dist_ft	link_dir	link_radians
FOURMILE CANYON DRIVE 903 BLOCK & HIGHWAY 119	04910FN	4910FN	4910	N	0
MOUNTIN PINES ROAD & SUGARLOAF ROAD	00298FN	298FN	298	N	0
OLDE STAGE ROAD & LEE HILL DRIVE	04224FN	4224FN	4224	N	0
PIPIT ROAD EAST & PIKE ROAD	00450FN	450FN	450	N	0
ROCKY VIEW ROAD & CASTLE OAKS DRIVE	00500FE	500FE	500	E	90
PENA BOULEVARD INBOUND & TOWER ROAD NORTH	01500FE	1500FE	1500	E	90
PENA BOULEVARD 7600 BLOCK & WENATCHEE STREET	00200FE	200FE	200	E	90
104TH AVENUE WEST & HURON STREET NORTH	00150FE	150FE	150	E	90
104TH AVENUE WEST & HURON STREET	00334FE	334FE	334	E	90
104TH AVENUE WEST & HURON STREET NORTH	00158FE	158FE	158	E	90
BROADWAY 500 BLOCK NORTH & FIFTH AVENUE EAST	00015FS	15FS	15	S	180
BROADWAY 500 BLOCK NORTH & SIXTH AVENUE EAST	00160FS	160FS	160	S	180
FILLMORE STREET 100 BLOCK NORTH & SECOND AVENUE EAST	00080FS	80FS	80	S	180
FILLMORE STREET 500 BLOCK NORTH & SIXTH AVENUE EAST	00200FS	200FS	200	S	180
MARKET STREET 2200 EAST & PARK AVENUE WEST	00150FS	150FS	150	S	180
MILWAUKEE 3500 BLOCK NORTH & 36TH AVENUE EAST	00150FS	150FS	150	S	180
MILWAUKEE STREET 500 BLOCK NORTH & SIXTH AVENUE EAST	00150FS	150FS	150	S	180
MONACO STREET 100 BLOCK NORTH & FIRST AVENUE EAST	00050FS	50FS	50	S	180
SMOKY HILL ROAD EAST & AURORA PARKWAY SOUTH	00300FW	300FW	300	W	270
SMOKY HILL ROAD EAST & AURORA PARKWAY SOUTH	01000FW	1000FW	1000	W	270
SMOKY HILL ROAD EAST & TUFTS PLACE EAST	00188FW	188FW	188	W	270
SOUTHLANDS PARKWAY SOUTH & MAIN STREET SOUTH	00010FW	10FW	10	W	270
TELLURIDE WAY EAST & 3586 EAST TELLURIDE WAY	00300FW	300FW	300	W	270

`ST_Project(geom, link_dist_ft, link_radians)`

Results of geocode with Esri SMP

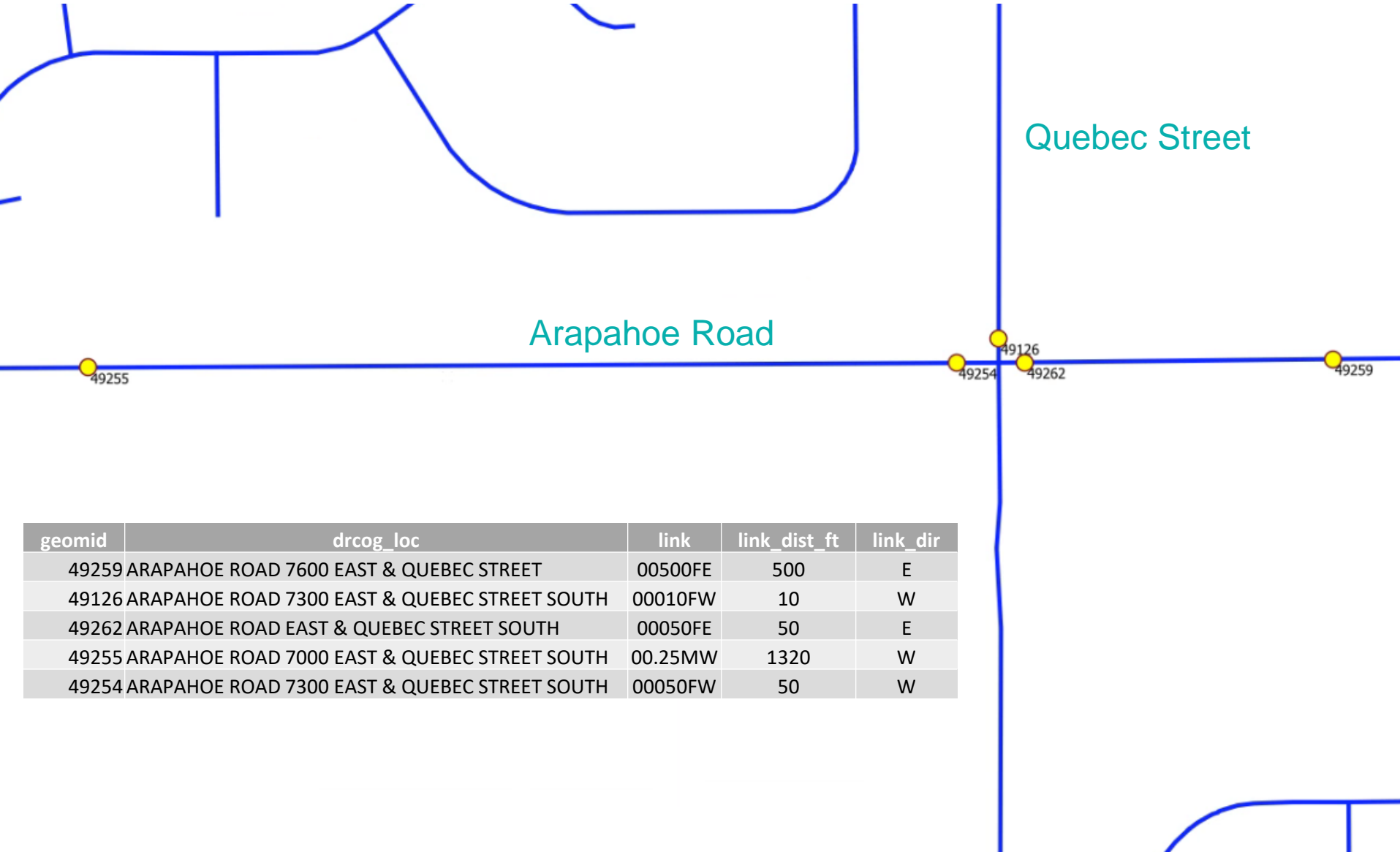


crash_2018_final :: Features Total: 15839, Filtered: 5, Selected: 5

	geomid	county_nm	state	location	drcog_loc	cdot_flag	modified	road	
1	49259	ARAPAHOE	CO	01	ARAPAHOE ROAD 7600 EAST & QUEBEC STREET		true	04	0193
2	49126	ARAPAHOE	CO	01	ARAPAHOE ROAD 7300 EAST & QUEBEC STREET SOUTH		true	04	0193
3	49262	ARAPAHOE	CO	01	ARAPAHOE ROAD EAST & QUEBEC STREET SOUTH		true	01	0193
4	49255	ARAPAHOE	CO	01	ARAPAHOE ROAD 7000 EAST & QUEBEC STREET SOUTH		true	04	0193
5	49254	ARAPAHOE	CO	01	ARAPAHOE ROAD 7300 EAST & QUEBEC STREET SOUTH		true	04	0193

Show Selected Features

Results of moving and snapping



geomid	drcog_loc	link	link_dist_ft	link_dir
49259	ARAPAHOE ROAD 7600 EAST & QUEBEC STREET	00500FE	500	E
49126	ARAPAHOE ROAD 7300 EAST & QUEBEC STREET SOUTH	00010FW	10	W
49262	ARAPAHOE ROAD EAST & QUEBEC STREET SOUTH	00050FE	50	E
49255	ARAPAHOE ROAD 7000 EAST & QUEBEC STREET SOUTH	00.25MW	1320	W
49254	ARAPAHOE ROAD 7300 EAST & QUEBEC STREET SOUTH	00050FW	50	W



Regional Data Catalog

- Crash data is available from 2004 on the RDC
- data.drcog.org
- Check out the supplemental information!

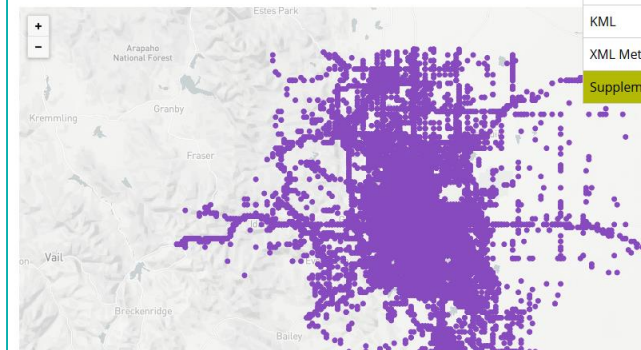
A	B	C	D
Field Name	Field Description	Description	Attribute
1	GEOMID	Object ID	Object ID
2	YEAR	Year of accident	Year of accident
3	MONTH	Month of accident	0-12
4	DAY	Day of accident	0-31
5	HOUR	Time of accident	0000 to 2359 (Military time)
6	SYSTEM	Interstate, state highway, city or county Rd, private property	1 Interstate 2 State Highway 3 Frontage Road 4 County Road 5 City Street 6 Private Property 7 Record to be Deleted 8 X
9	CITY_ST	Ramp designation or off system location 2	Ramp Code (if State Highway) Location 2 Abbreviation (if County Rd or City St)
10	CITY_NAME	City Name	City Name
11	COUNTY_NM	County Name	County Name
12	LOCATION	Description of the location of the crash with respect to the roadway	On-roadway 01 Ran off left side 02 Ran off right side 03 Ran off T Intersection 04 Divided Highway - on Other Roadway 05 On Private Property 06
13	MODIFIED	Was Record Altered?	If record has been manually coded At Intersection 01 Driveway Access Related 02 Intersection Related 03 Non-Intersection 04 Alley Related 05 Roundabout 06 Ramp 07 Parking Lot 08 TIF
14	ROAD	Description of the location of the crash on the roadway	City (if accident occurred within city limits) 0000 to 1395 County accident occurred in 01 to 64 Roadway that crash occurred on Reference point of accident in relation to LOC_01 Location 2/Reference location Distance in reference to location 2
15	CITY	City Code	0000 to 1395
16	COUNTY	County Code	01 to 64
17	LOC_01	Location 1/Roadway name on which crash occurred	Reference point of accident in relation to LOC_01
18	LOC_02	Location 2/Reference location	Reference point of accident in relation to LOC_01
19	LINK	Distance in reference to location 2	
20	DRCOG_LOC	DRCOG location aggregated from LOC_01 and LOC_02 and standardized	DRCOG location aggregated from LOC_01 and LOC_02 and standardized

CRASHES 2018

Data Vintage: January 2018
Data Modified: January 2020
Original Sources: DRCOG, CDOT
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GET DATA

- Shapefile
- GeoJSON
- WMS
- KML
- XML Metadata
- Supplemental Information



DR 2447 (02/01/00) COLORADO DEPARTMENT OF REVENUE
STATE OF COLORADO TRAFFIC ACCIDENT REPORT

MAIL TO: STATE OF COLORADO MOTOR VEHICLE TRAFFIC RECORDS DENVER, CO 80261-0016

AMENDED/SUPPL. UNDER \$1,000 COUNTER REPORT PRIVATE PROPERTY

Case # _____ DOR Code _____

Date of Accident _____ City _____ Agency _____ County _____

Number Killed _____ Number Injured _____ Location Route, Street, Road _____ Miles _____ Feet _____

Agency Code _____ Investigated _____ Total Vehicles _____ District Number _____ Public Property/Photos Taken _____ Railroad Crossing _____ Const. Zone _____ Highway _____ Bridge _____

Street Address _____ City _____ State _____ ZIP _____ Personal Phone _____

Driver License Number _____ CDL _____ State _____ Sex _____ DOB _____ Other License Number _____ CDL _____ State _____ Sex _____ DOB _____

Vehicle Identification Number _____ Vehicle Identification Number _____

Vehicle Owner Last Name _____ Same _____ First _____ MI _____

Address _____ City _____ State _____ ZIP _____

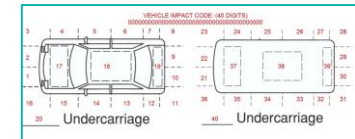
Towed Due to Damage _____ By _____ To _____

Towed Due to Damage _____ By _____ To _____

Trailer VIN# _____ Trailer VIN# _____

Undercarriage Undercarriage Undercarriage Undercarriage

1- Slight 2- Moderate 3- Severe





Suggested Future Improvements

- Revisit field types and make changes
- Improve address intersection cleaning
- Convert coded values to understandable text
- Improve on link field adjustments (fixing errors, adding multidirectional bearings, including CDOT records)
- Investigate other potential sources of crash data
- What else?!



Regional Vision Zero

- Uses the DRCOG crash data for statistics, analysis, and reporting
- Expected Spring/Summer 2020
- High Injury Network uses 2013-2017 crash data



Questions/Feedback/Brainstorm:

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THANK YOU!