

Beyond Limits: City of Boulder's Context-Sensitive Approach to Speed Limit Setting

DRCOG Regional Vision Zero Meeting
October 14, 2025

Devin Joslin, PE, PTOE, City of Boulder



OUTLINE

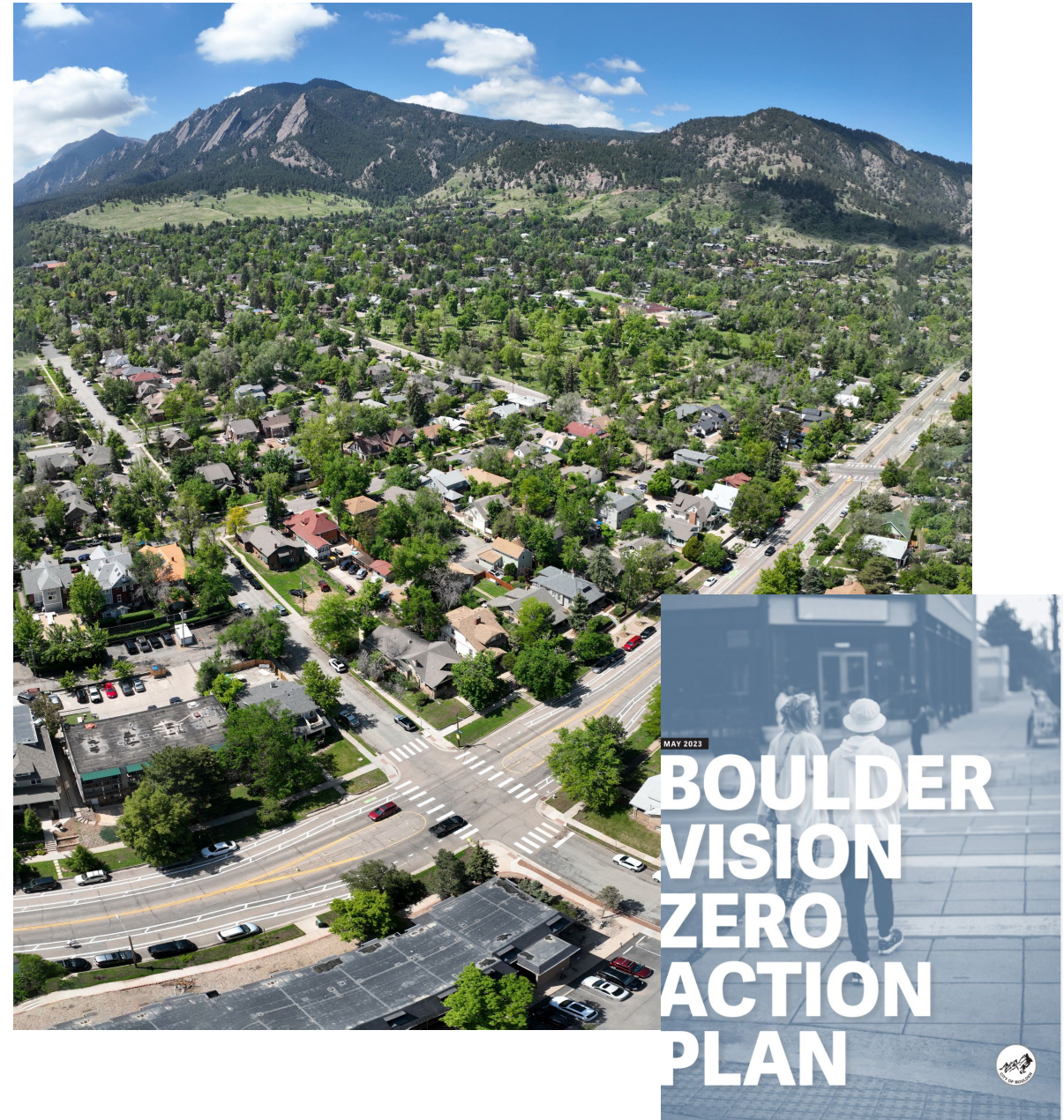
- I. Background & Purpose
- II. Methodology Development
- III. Methodology Application Examples
- IV. Results
- V. Project Successes

I. Background & Purpose



Background

- 20 is Plenty in 2020
- 1 out of 3 severe crashes involve speeding
- Inconsistent speed limits on collectors and arterials
- Context sensitive methodologies
- Funded by DRCOG CMPI grant
- Key stakeholders



Project Purpose



CONSISTENCY: Develop methodology for speed limits aligned with street character



DATA DRIVEN: Establish quantitative process using crash history, roadway geometry, user experience, and land-use data



SAFETY CENTRIC: Prioritize speed-related and vulnerable user crashes in methodology



BICYCLE AND PEDESTRIAN ACTIVITY FOCUSED: Incorporate bicycle and pedestrian activity levels to determine posted speed limit.



Safe
System
Approach



Safe
Speeds

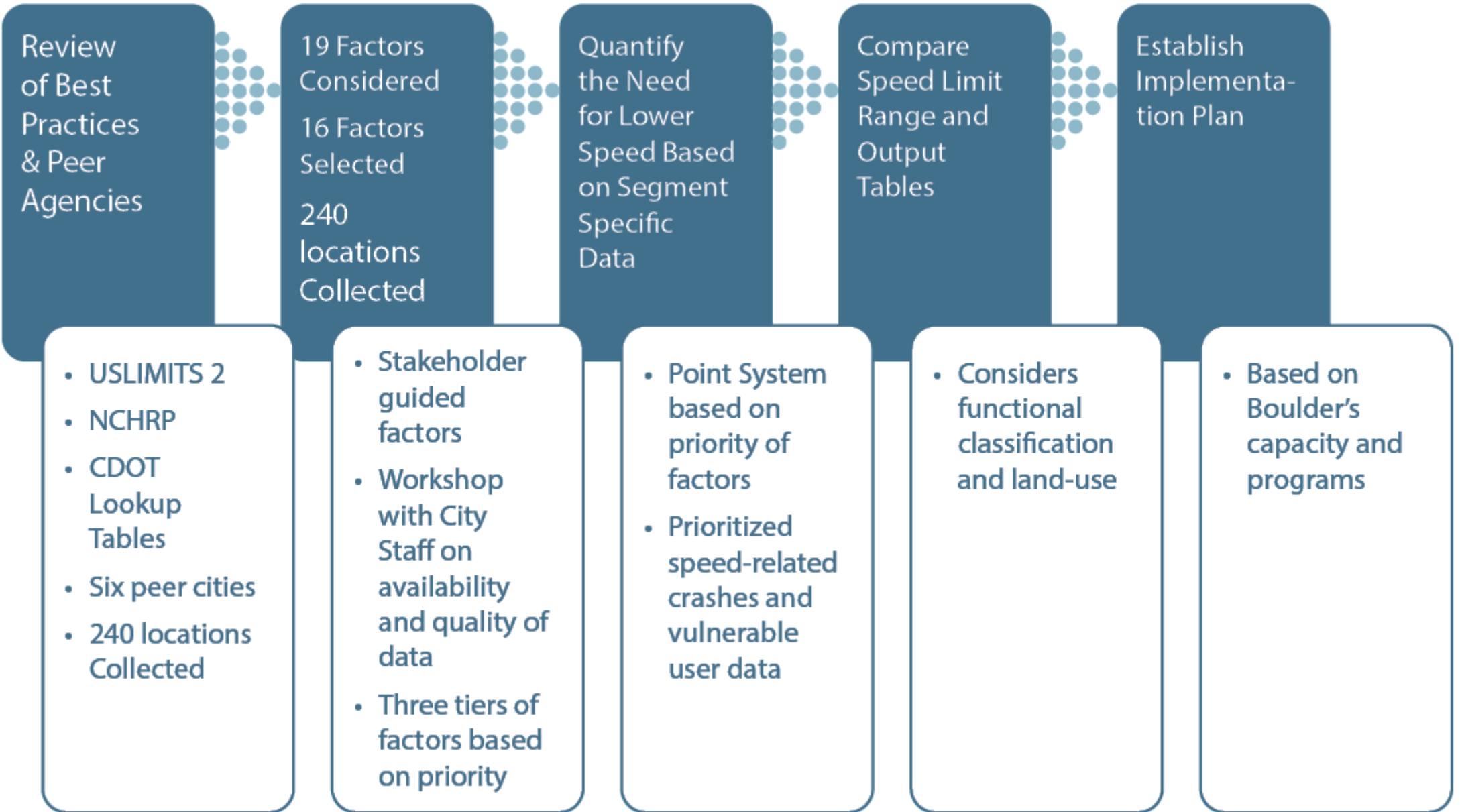


Roadway Design
Enforcement
Speed Limits
Education

II. Methodology Development



Methodology Development



What has been included



Streets within city limits



Streets owned by City of Boulder



Collector, minor arterial and principal arterial (no local streets)



Segmented by existing posted speed and functional classification



Average 0.5-mile segments

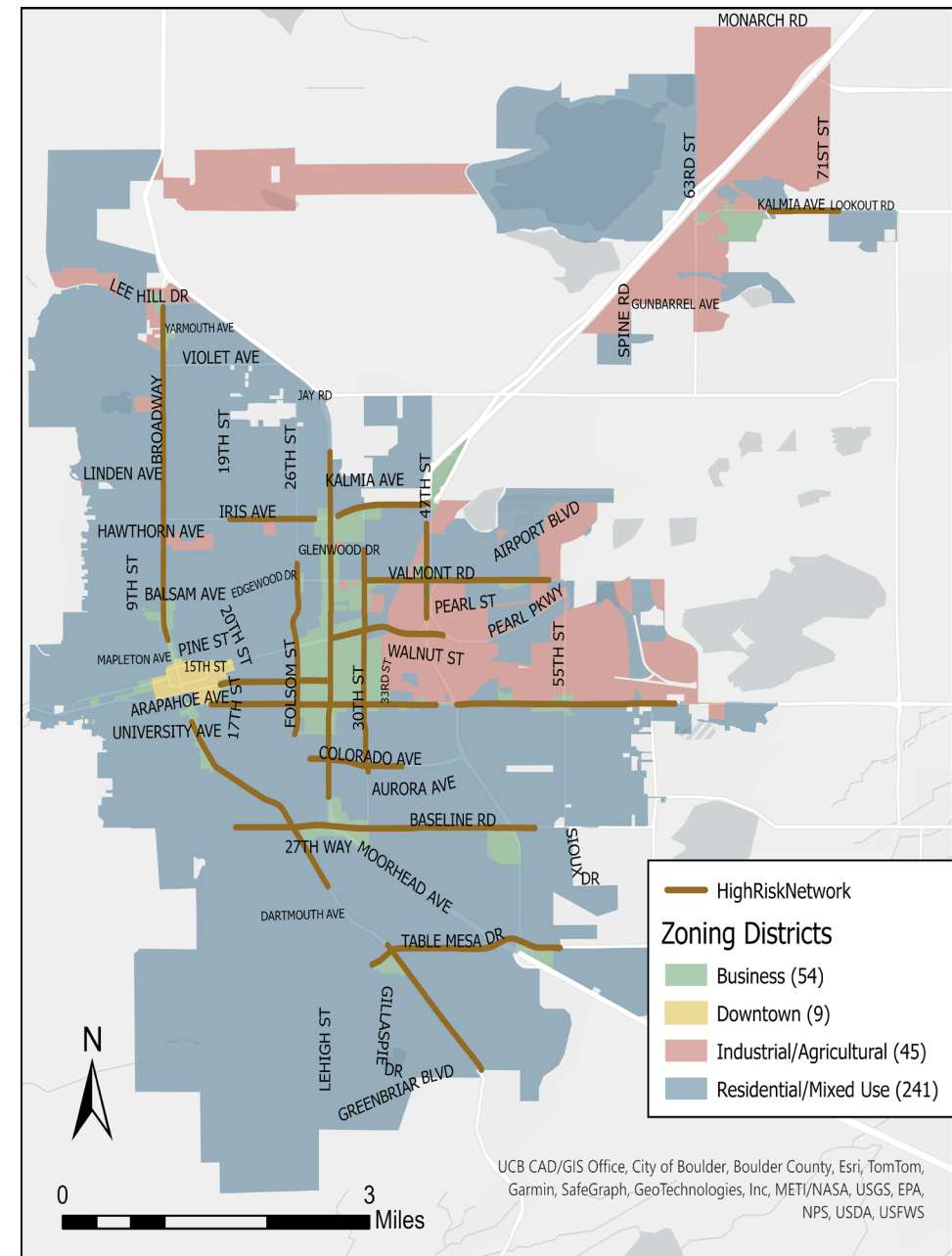


Attributes Considered – Land Use

- Residential/Mixed-Use/Public (includes CU Campuses)
- Downtown
- Business
- Industrial/Agricultural
- Other (e.g. County)

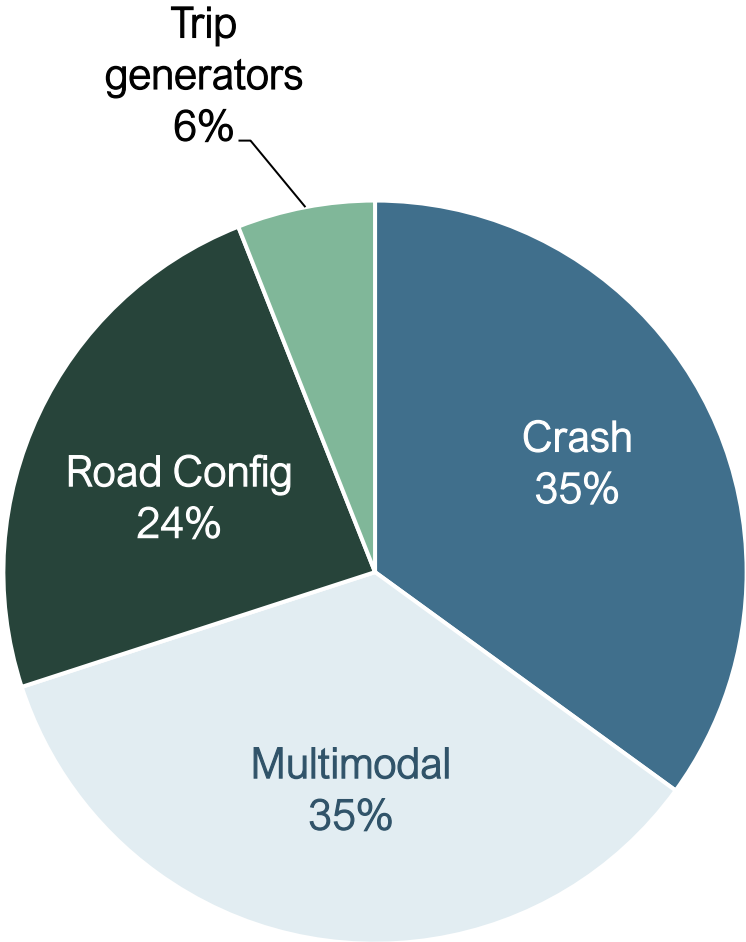
	Downtown	Residential/ Mixed Use/ Public	Business	Industrial/ Agricultural
Collector	0.1 miles	24.6 miles	0.6 miles	5.1 miles
Minor Arterial	1.7 miles	14.2 miles	1.5 miles	5.5 miles
Principal Arterial	0.4 miles	6.0 miles	1.6 miles	4.5 miles
TOTAL	1.84 miles	44.8 miles	3.7 miles	15.1 miles

Zoning in each segment is assigned by the most predominant corresponding land use category



Attributes Considered – Roadway Context

Factor	Category	Maximum points
Fatal crashes	Crash	15
Ped/Bike crashes		10
Speed crashes		10
Perpendicular multimodal crossings	Multimodal	5
Pedestrian facilities		5
Pedestrian activity		10
Bike facilities		5
Bike activity		10
Driveway access density	Road Config	5
On street parking		5
Unsignalized density		5
Signalized intersection density		5
Number of through lanes		4
Schools	Trip generators	2
Park		2
Assisted living facility		2
Total Points Possible		100



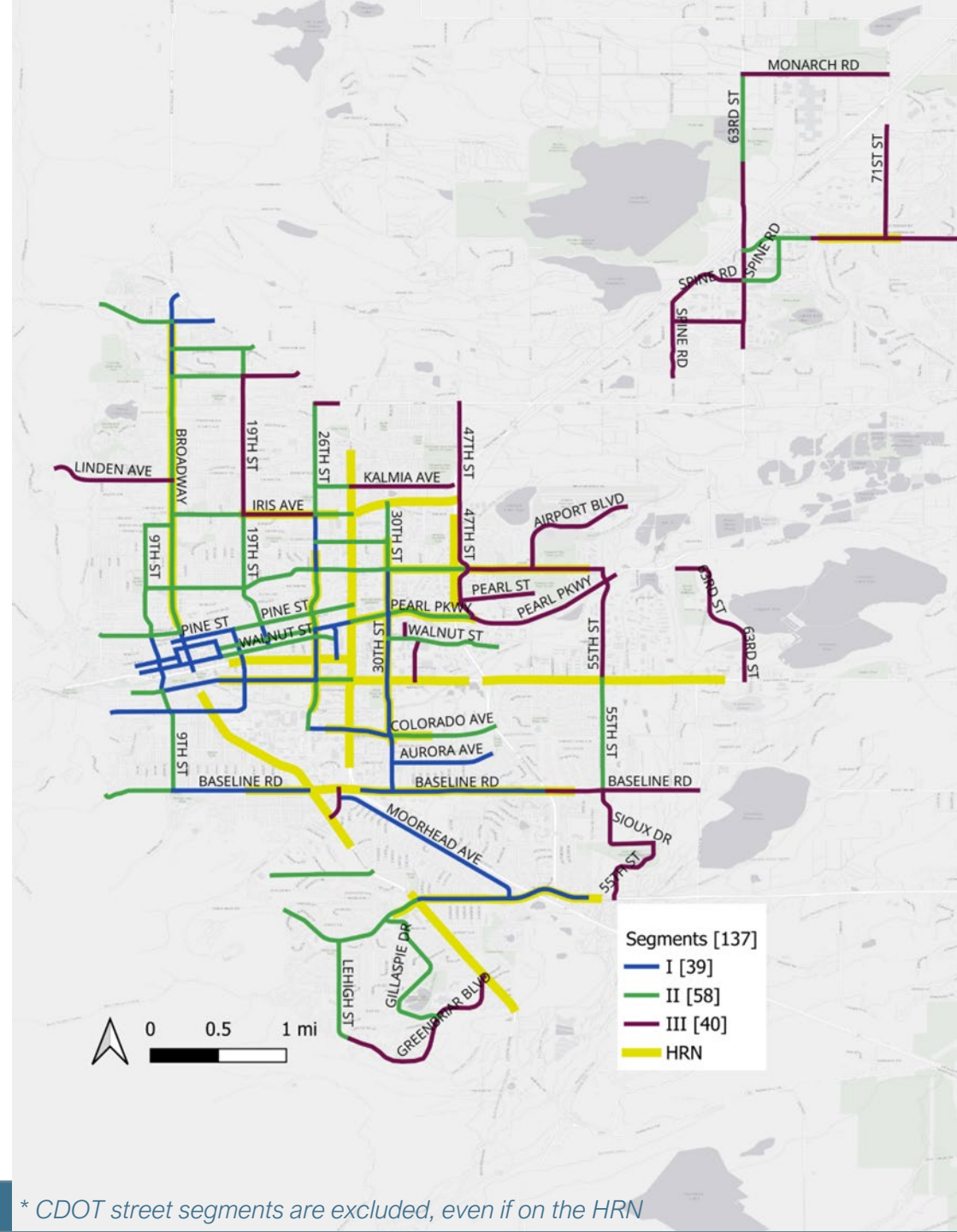
16 Boulder-Specific Factors & Thresholds

Need for Lower Speeds

Tier I (55 – 100 points) – Highest need for low speeds

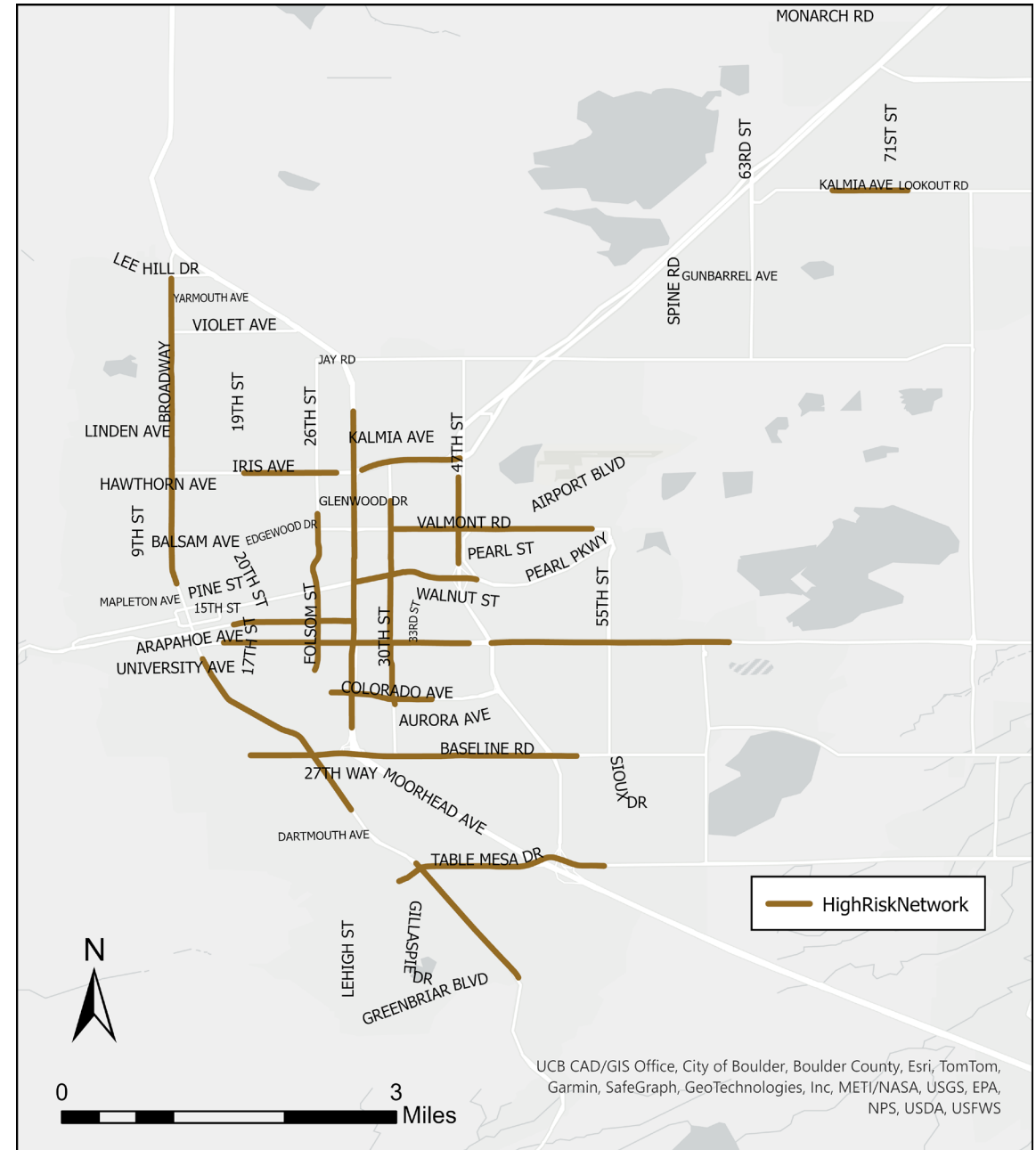
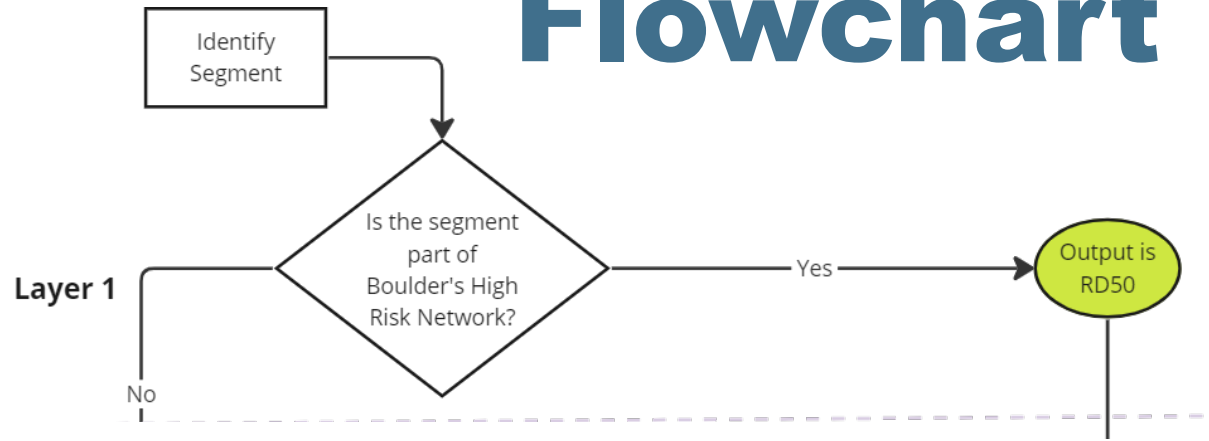
Tier II (34 – 54 points) – Medium need for low speeds

Tier III (0 – 33 points) – Lowest need for low speeds

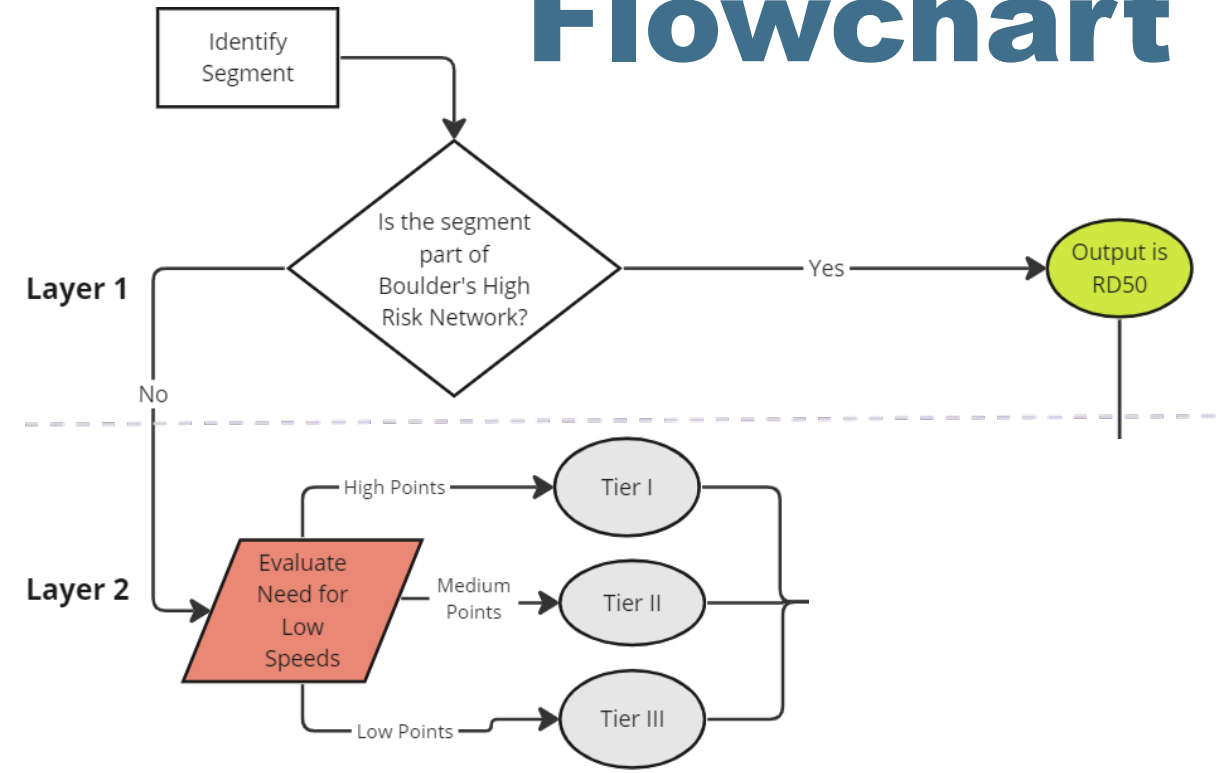


* CDOT street segments are excluded, even if on the HRN

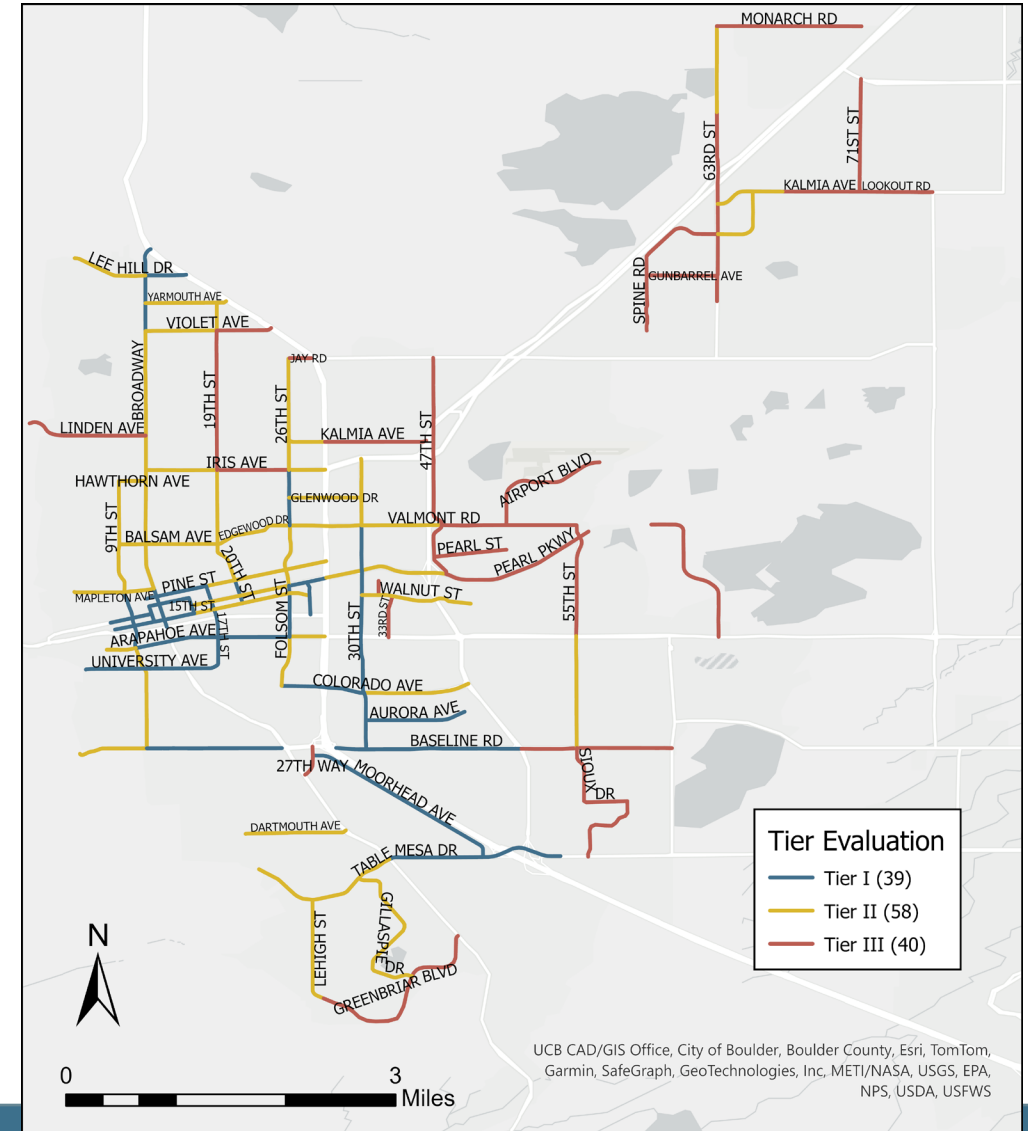
Flowchart



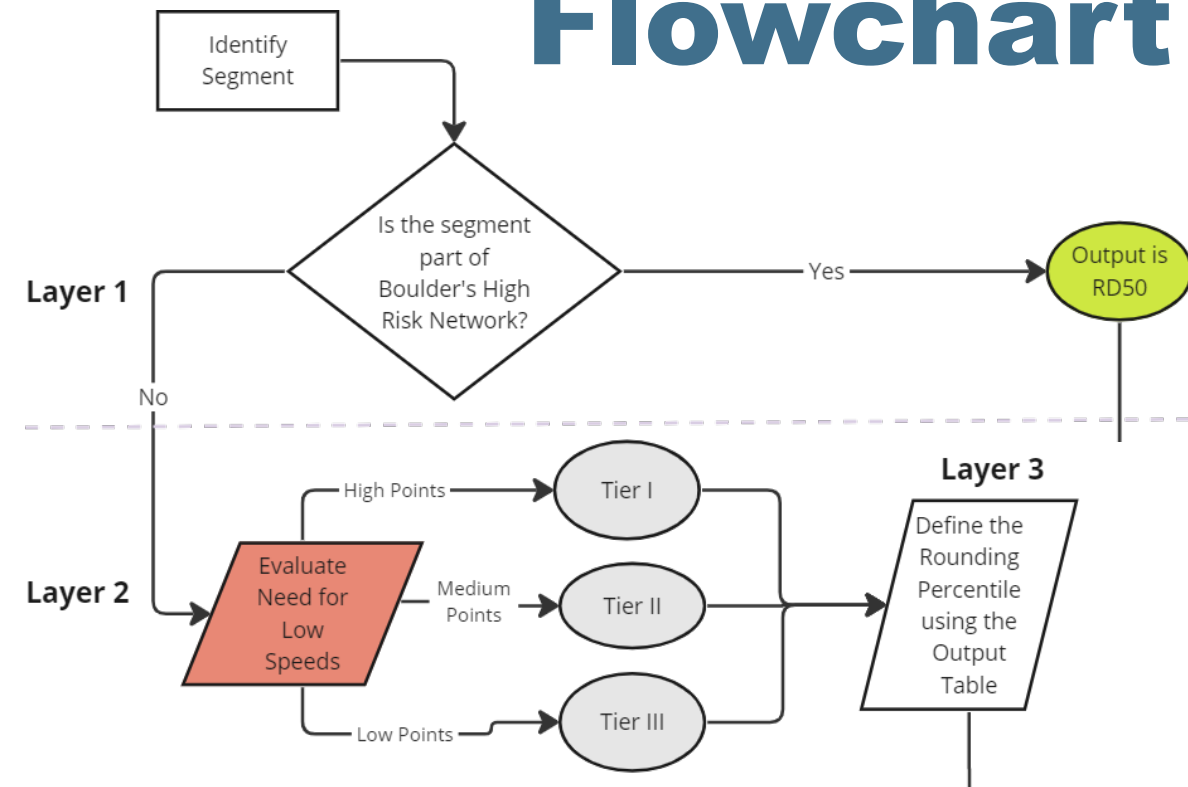
Flowchart



Tier I (55 – 100 points) – Highest need for low speeds
Tier II (34 – 54 points) – Medium need for low speeds
Tier III (0 – 33 points) – Lowest need for low speeds



Flowchart



Output Table defines a rounding percentile to inform a recommended speed limit

Speed Category:	Land Use								
	Residential/ Mixed Used			Business/ Downtown			Industrial/ Agricultural		
	Tier III	Tier II	Tier I	Tier III	Tier II	Tier I	Tier III	Tier II	Tier I
Collector	C50	RD50	RD50	C50	C50	RD50	RD85	RD85	C50
Minor Arterial	C50	C50	RD50	RD85	C50	C50	C85	RD85	RD85
Principal Arterial	RD85	C50	C50	C85	RD85	RD85	C85	C85	RD85

Tier I – Highest need for low speeds

Tier II – Medium need for low speeds

Tier III – Lowest need for low speeds

RD50 - rounded down 50th percentile

C50 - closest 50th percentile

RD85 - rounded down 85th percentile

C85 – closest 85th percentile

Output and Speed Limit Tables

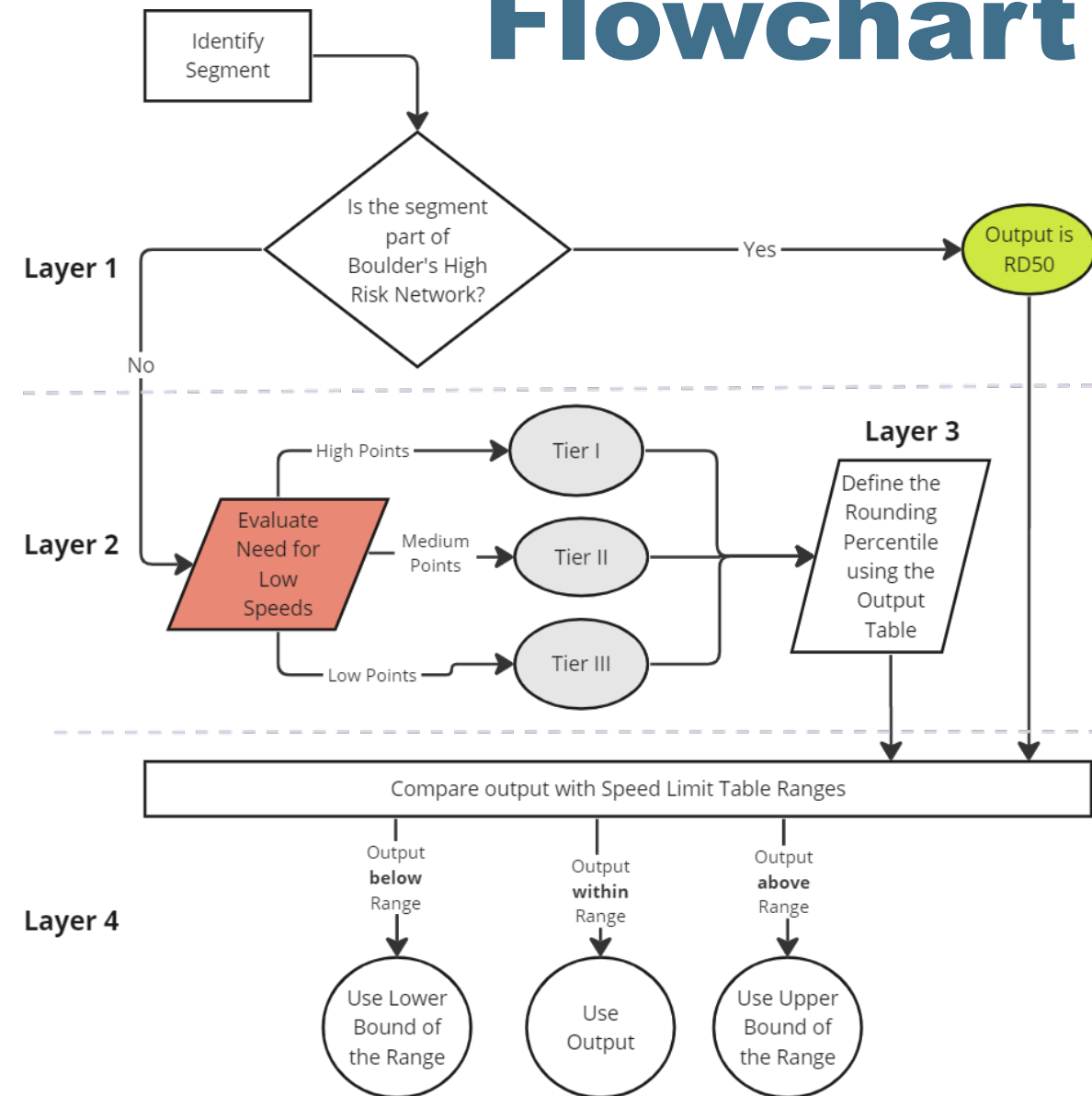
- **Output Table** defines a rounding percentile to inform a recommended speed limit

Speed Category:	Land Use								
	Residential/ Mixed Used			Business/ Downtown			Industrial/ Agricultural		
	Tier III	Tier II	Tier I	Tier III	Tier II	Tier I	Tier III	Tier II	Tier I
Collector	C50	RD50	RD50	C50	C50	RD50	RD85	RD85	C50
Minor Arterial	C50	C50	RD50	RD85	C50	C50	C85	RD85	RD85
Principal Arterial	RD85	C50	C50	C85	RD85	RD85	C85	C85	RD85

Tier I – Highest need for low speeds
 Tier II – Medium need for low speeds
 Tier III – Lowest need for low speeds

RD50 - rounded down 50th percentile
 C50 - closest 50th percentile
 RD85 - rounded down 85th percentile
 C85 – closest 85th percentile

Flowchart



Speed Limit Table defines a range with lower and upper bounds that sets the limits of recommended speed

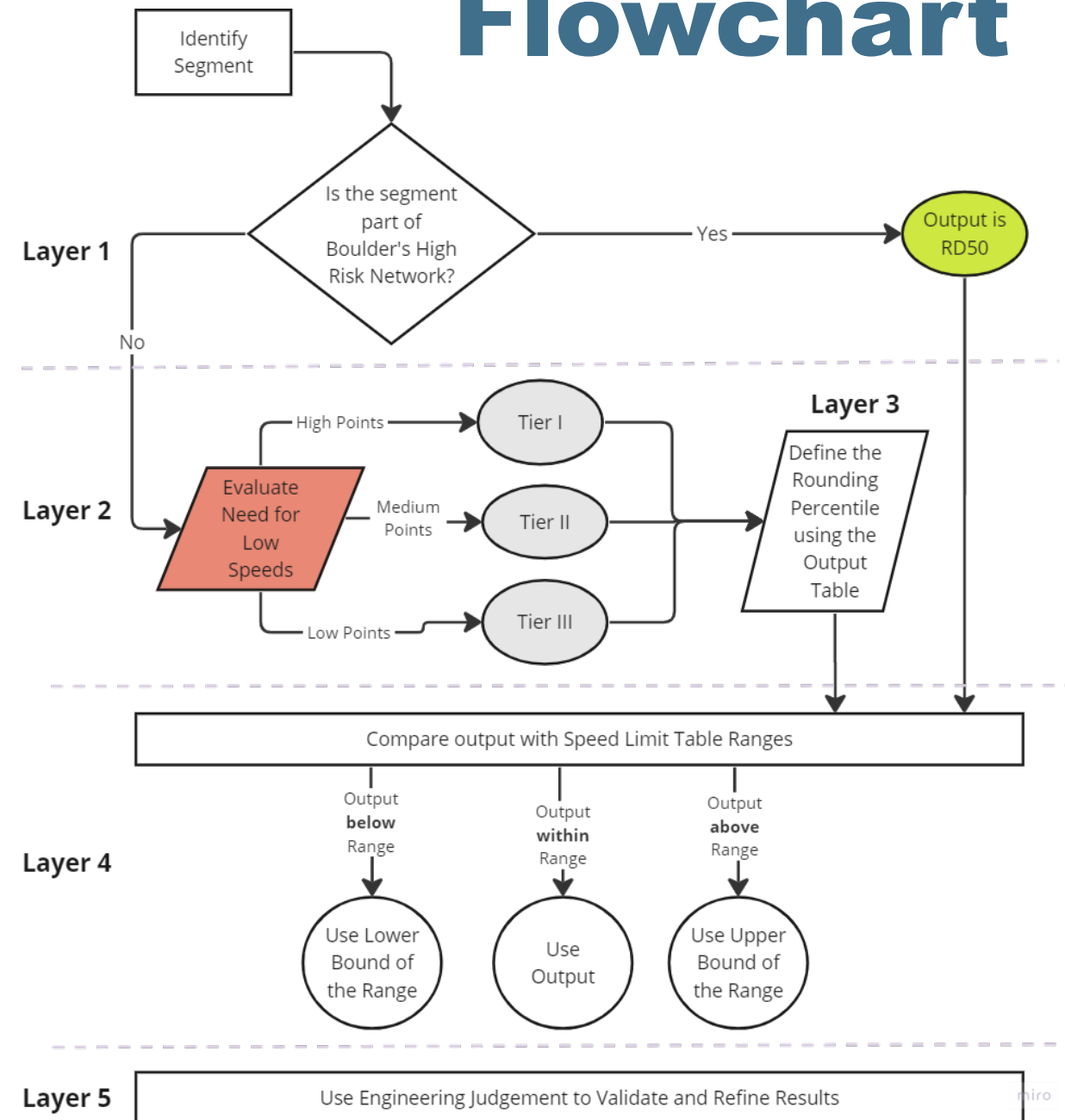
	Land Use		
	Downtown	Residential/ Mixed Use/ Business/ Public	Industrial/ Agricultural
Collector			
Speed Limit Range	20-25 mph	20-30 mph	25-35 mph
<i>Miles/% of streets evaluated</i>	[0.1 mi.; 0.2%]	[25.2; 38.1%]	[5.1 mi.; 7.7%]
Minor Arterial			
Speed Limit Range	20-25 mph	20-35 mph	30-40 mph
<i>Miles/% of streets evaluated</i>	[1.7 mi.; 2.6%]	[15.7 mi.; 23.8%]	[5.5 mi.; 8.3%]
Principal Arterial			
Speed Limit Range	20-25 mph	25-35 mph	30-45 mph
<i>Miles/% of streets evaluated</i>	[0.4 mi.; 0.6%]	[7.6 mi.; 11.5%]	[4.5 mi.; 6.8%]
Total Miles/% of streets evaluated	2.2 mi.; 3.4%	48.5 mi.; 73.4%	15.1 mi.; 22.8%

Output and Speed Limit Tables

- **Speed Limit Table** defines a range with lower and upper bounds that sets the limits of recommended speed

Land Use			
	Downtown	Residential/ Mixed Use/ Business/ Public	Industrial/ Agricultural
Collector			
Speed Limit Range	20-25 mph	20-30 mph	25-35 mph
<i>Miles/% of streets evaluated</i>	[0.1 mi.; 0.2%]	[25.2; 38.1%]	[5.1 mi.; 7.7%]
Minor Arterial			
Speed Limit Range	20-25 mph	20-35 mph	30-40 mph
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Total Miles/% of streets evaluated	2.2 mi.; 3.4%	48.5 mi.; 73.4%	15.1 mi.; 22.8%

Flowchart



Engineering evaluation ensures consistency in speed limits on corridors and by city boundaries.

III. Methodology Application Examples



Example 1

Residential/Mixed Use

Minor Arterial

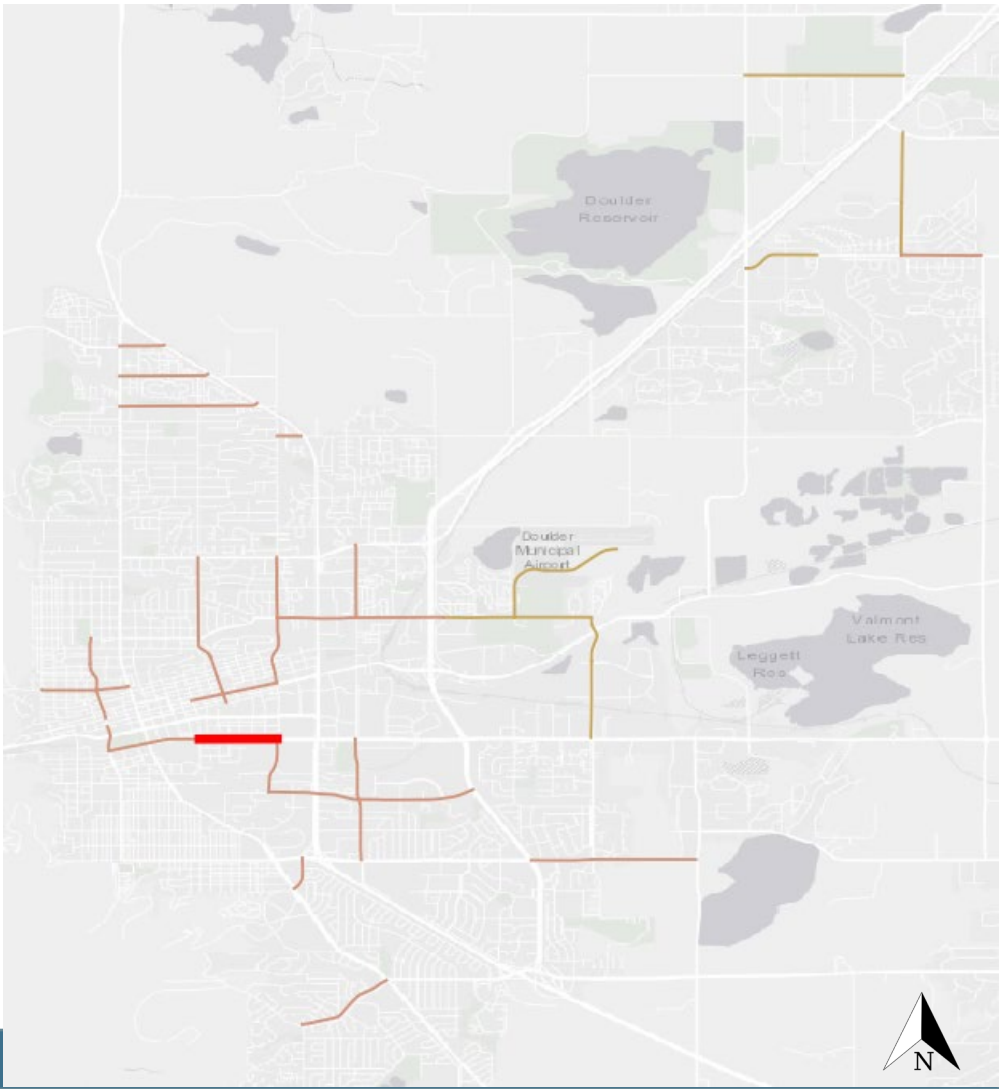
Example: Arapahoe Ave, 17th Street to Folsom St
Existing Speeds: 85th: 33 mph / 50th: 28 mph
Tier I

Speed
Limit
Ranges

Residential/ Mixed Use/ Business/ Public	EXISTING	PROPOSED
Collector (24.6 miles)	25-40	20-30
Minor Arterial (14.2 miles)	20-40	20-35
Principal Arterial (6.0 miles)	25-40	25-35



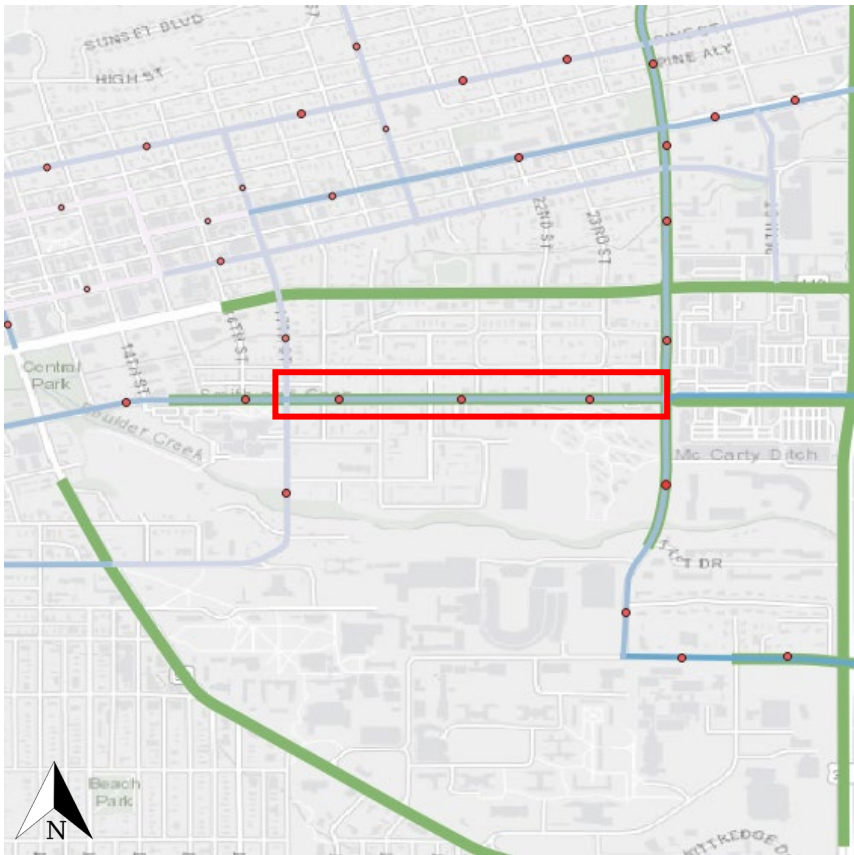
Arapahoe Ave @ 20th Looking east



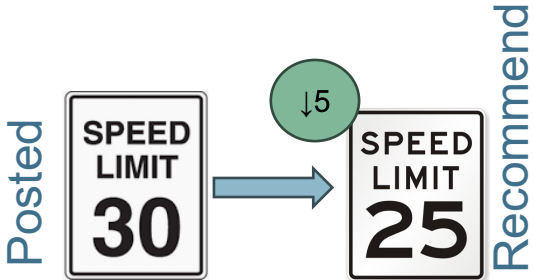
Example 1

High Risk Network

Arapahoe Ave, 17th Street to Folsom St



Existing Speed Limit: 30 mph
Collected 50th Percentile: 28, 29, 28
Average 50th Percentile: 28, RD=25
Range: 20-35 mph
Recommended Speed Limit: 25 mph



Speed Limit Table	Downtown	Residential/ Mixed Use/ Business/ Public	Industrial/ Agricultural
Collector	20-25	20-30	25-35
Minor Arterial		20-35	30-40
Principal Arterial		25-35	30-45

Example 2

Industrial Streets

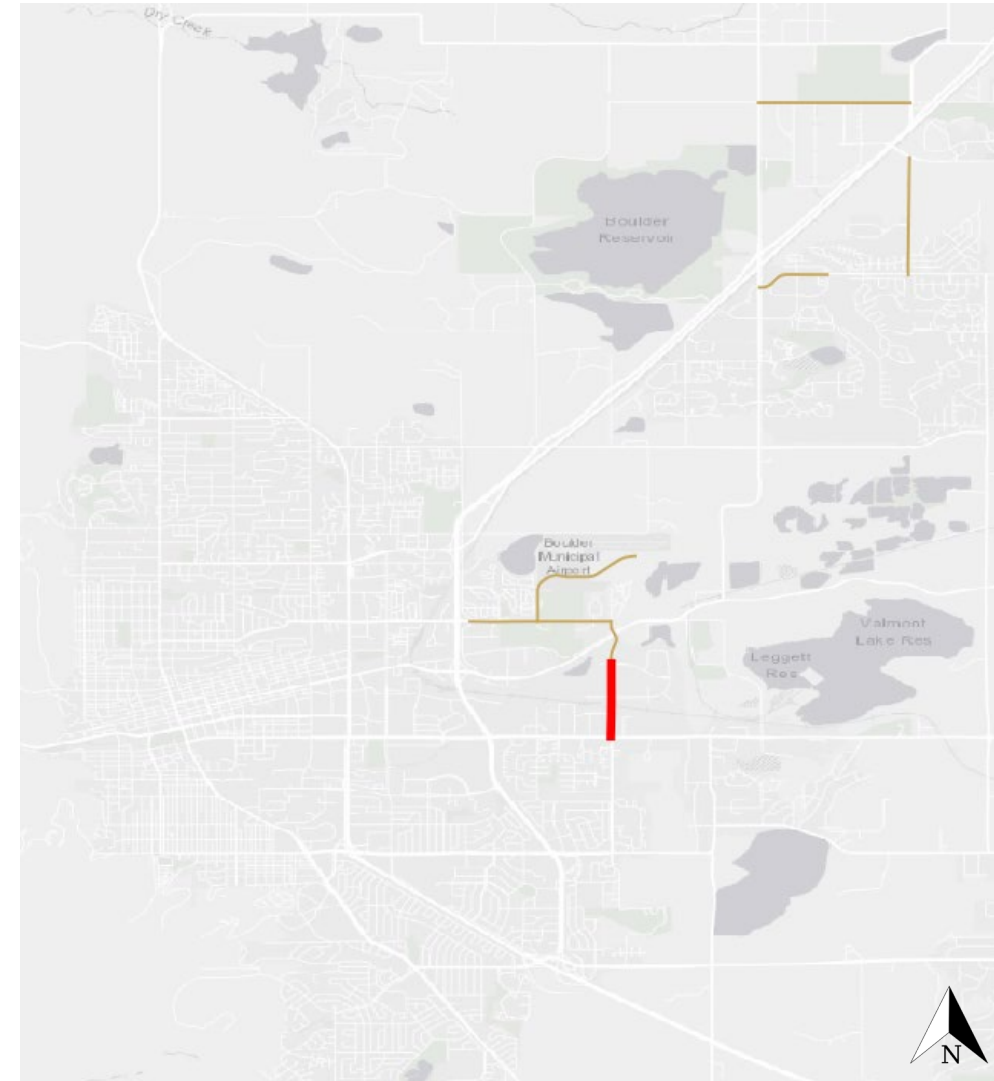
Minor Arterial

Example: 55th, from Flatiron Pkwy to Arapahoe Ave
Existing Speeds: 85th: 43 mph / 50th: 38 mph
Tier III



Speed
Limit
Table

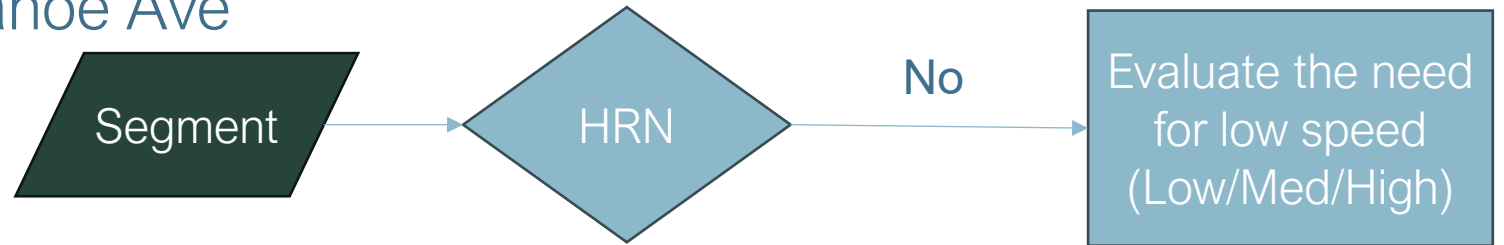
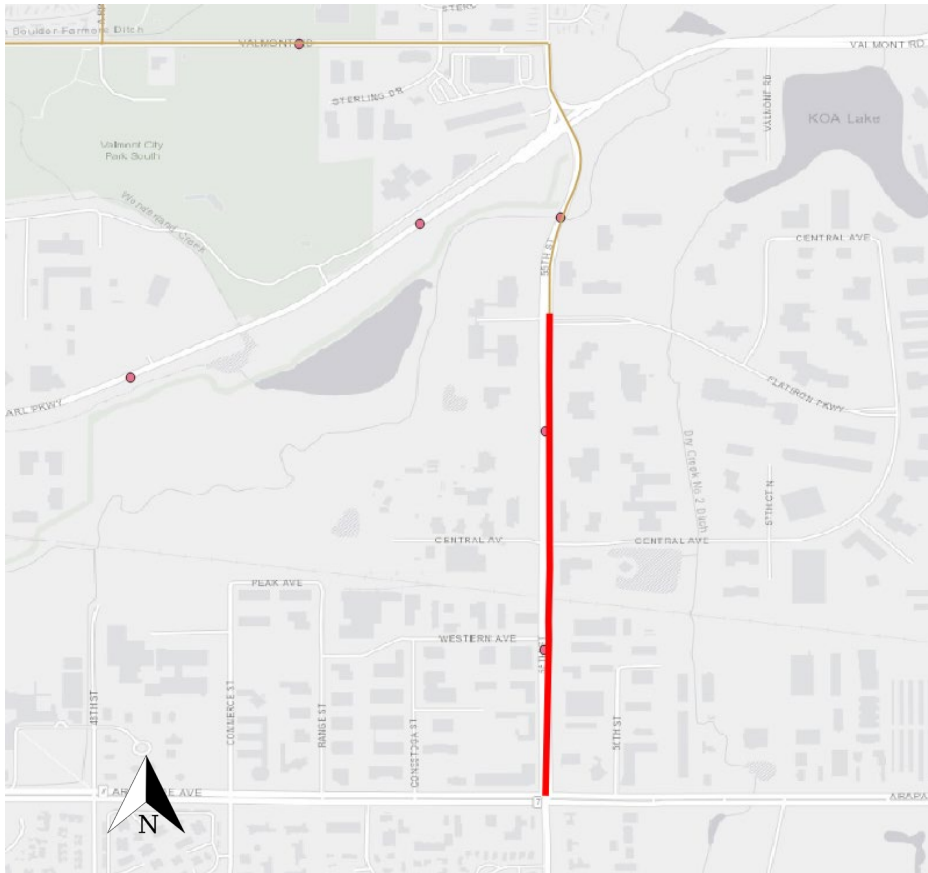
Industrial/ Agricultural Ranges	EXISTING	PROPOSED
Collector (5.1 miles)	25-35	25-35
Minor Arterial (5.5 miles)	30-40	30-40
Principal Arterial (4.5 miles)	35-45	30-45



Example 2

Industrial Minor Arterial

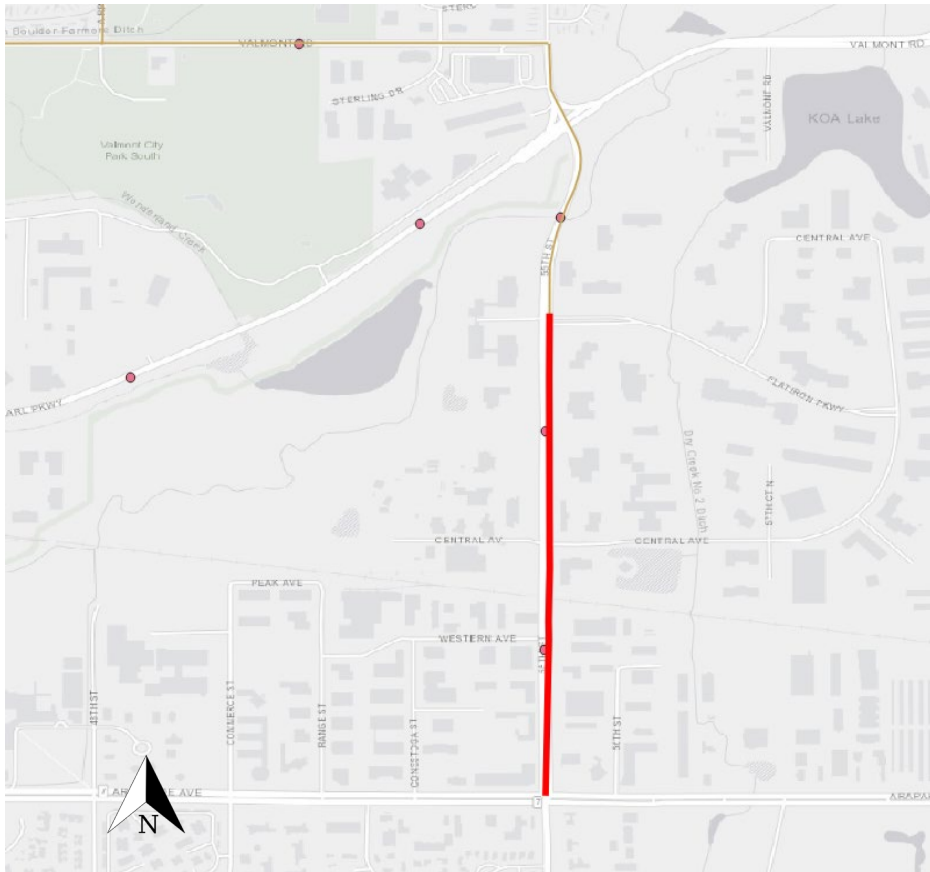
55th, Flatiron Pkwy to Arapahoe Ave



Example 2

Industrial Minor Arterial

55th, Flatiron Pkwy to Arapahoe Ave



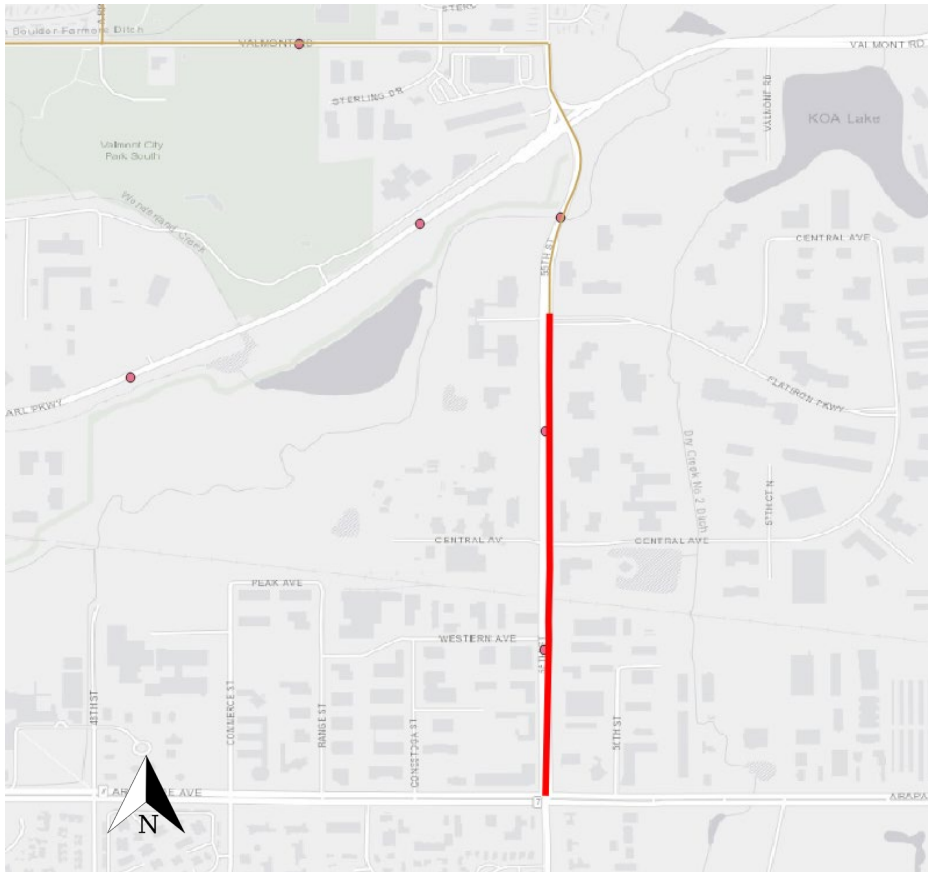
Factor	Segment Attribute
Fatal crashes	0
Ped/Bike crashes	8
Speed crashes	5
Perpendicular Multi-modal Crossings	4
Pedestrian facilities	Present
Pedestrian activity	Medium
Bike facilities	Present
Bike activity	Medium
Driveway Access Density	Low
On street parking	Not present
Unsignalized Density	Low
Signalized intersection density	High
Number of Through lanes	4
Schools	Not present
Park	Present
Community Senior Center	Not present

**TIER
III**

Example 2

Industrial Minor Arterial

55th, Flatiron Pkwy to Arapahoe Ave



Land Use:	Residential/ Mixed Used			Business/ Downtown			Industrial/ Agricultural		
	TIER III	TIER II	TIER I	TIER III	TIER II	TIER I	TIER III	TIER II	TIER I
Speed:									
Collector	C50	RD50	RD50	C50	C50	RD50	RD85	RD85	C50
Minor Arterial	C50	C50	RD50	RD85	C50	C50	C85	RD85	RD85
Principal Arterial	RD85	C50	C50	C85	RD85	RD85	C85	C85	RD85

Existing Speed Limit: 40 mph

Collected 85th Percentile: 42/45

Closest 85th Percentile: 45 mph

Range: 30-40

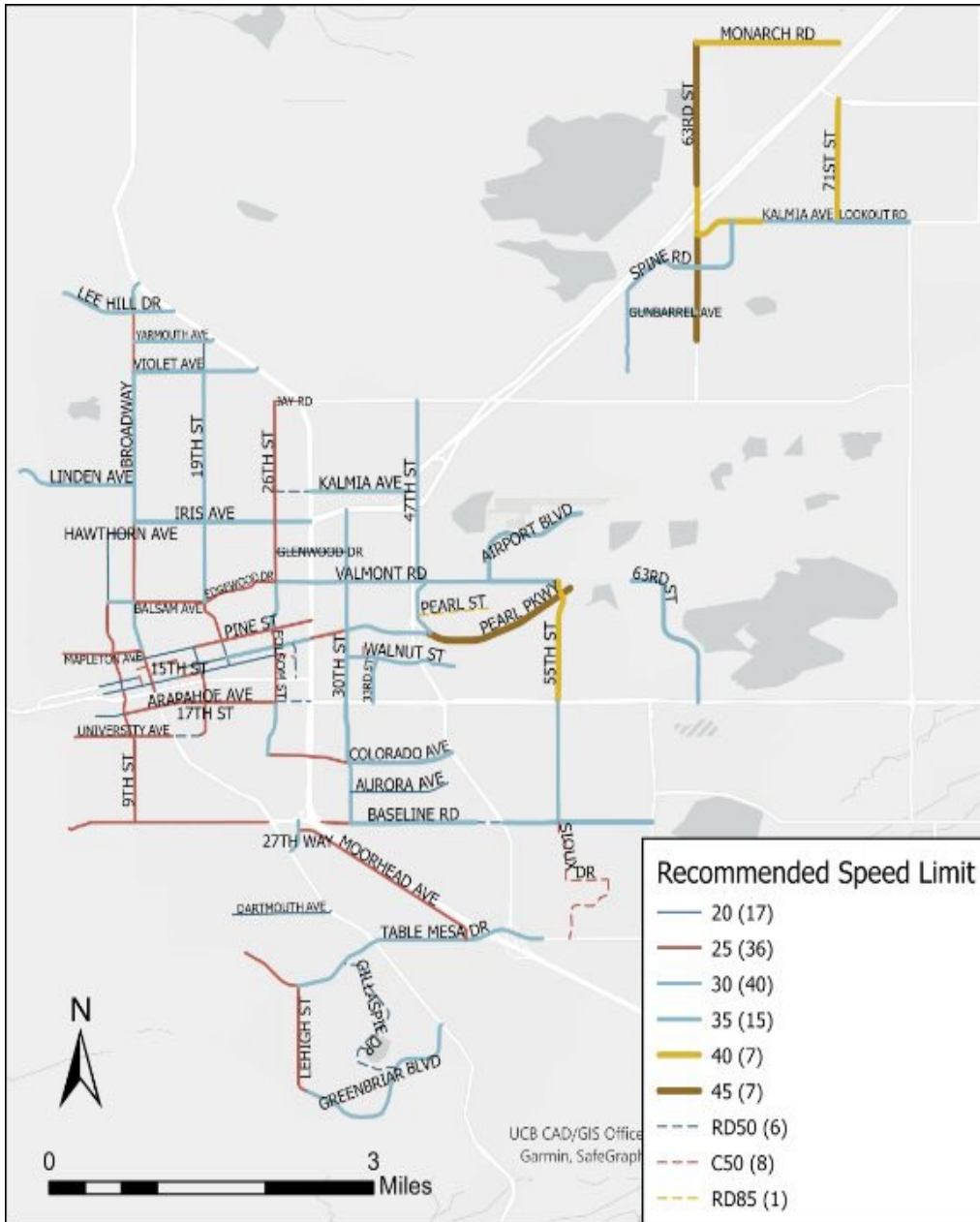
Recommended Speed Limit: 40 mph



Speed Limit Table	Downtown	Residential/ Mixed Use/ Business/ Public	Industrial/ Agricultural
Collector	20-25	20-30	25-35
Minor Arterial		20-35	30-40
Principal Arterial		25-35	30-45

IV. Results





Recommended Speeds

- Lower speeds near downtown; highest speeds in industrial/agricultural areas
- 73% of evaluated streets recommended for ≤ 30 mph
- 12% of evaluated streets recommended speed limit of ≥ 40 mph

	-10 mph	-5 mph	0 mph	+5 mph	+10 mph	Total
High Risk Network (HRN)	1.6	10.3	7.0	0.0	0	18.9
Not on HRN	1.5	8.8	24.6	6.6	0.8	42.4
Total	3.2	19.2	31.6	6.6	0.8	61.4

* CDOT street segments are excluded

** Engineering Judgement Layer Not Applied

Final Recommendations

58% of streets remain unchanged

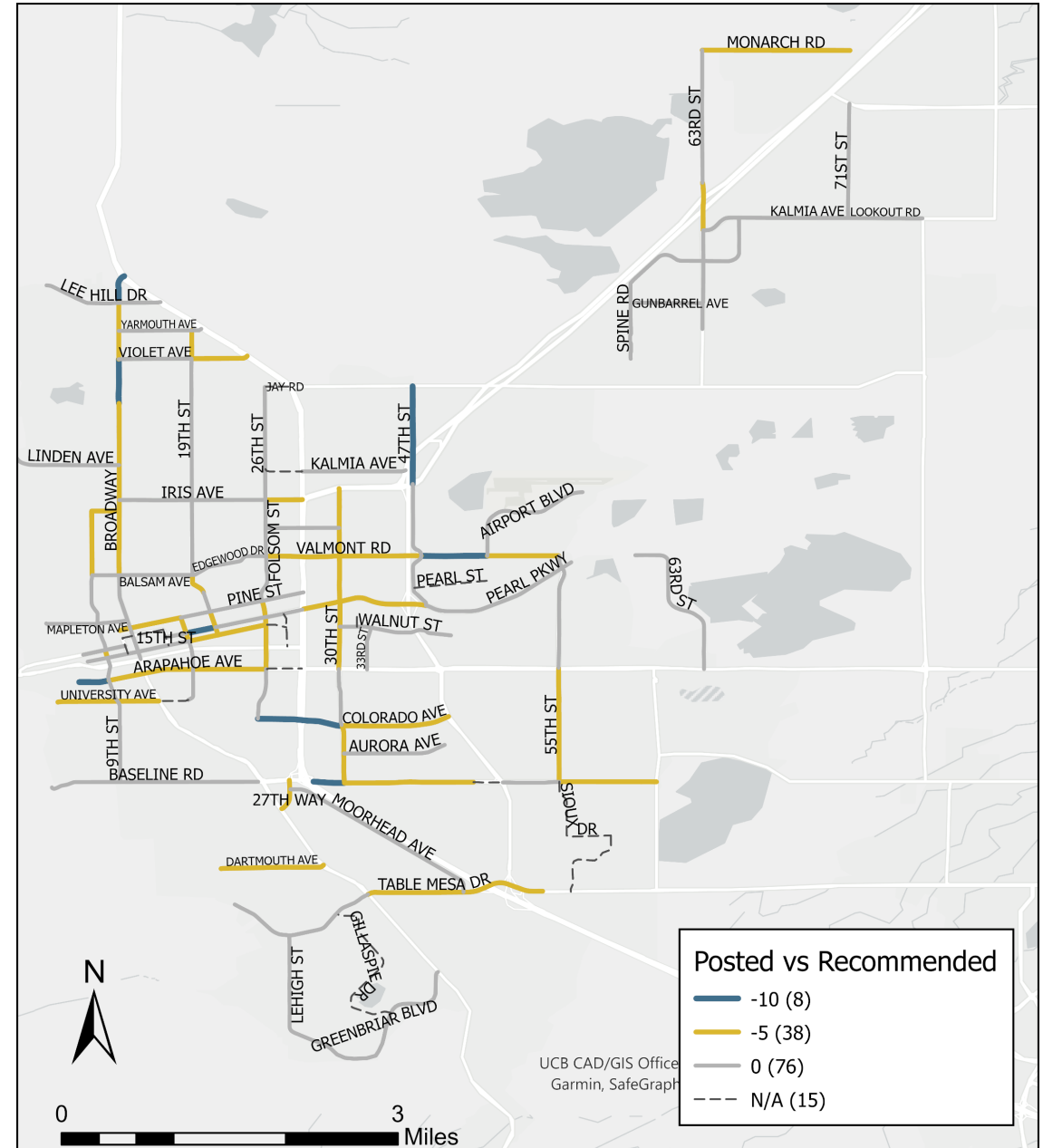
86% of the streets with changes are recommended to be reduced by 5 mph

0% of streets are recommended to be increased

- No HRN streets with recommended increases
- 61% of HRN streets are recommended to be reduced

* *CDOT street segments are excluded*

**** Engineering Judgement Layer Applied**

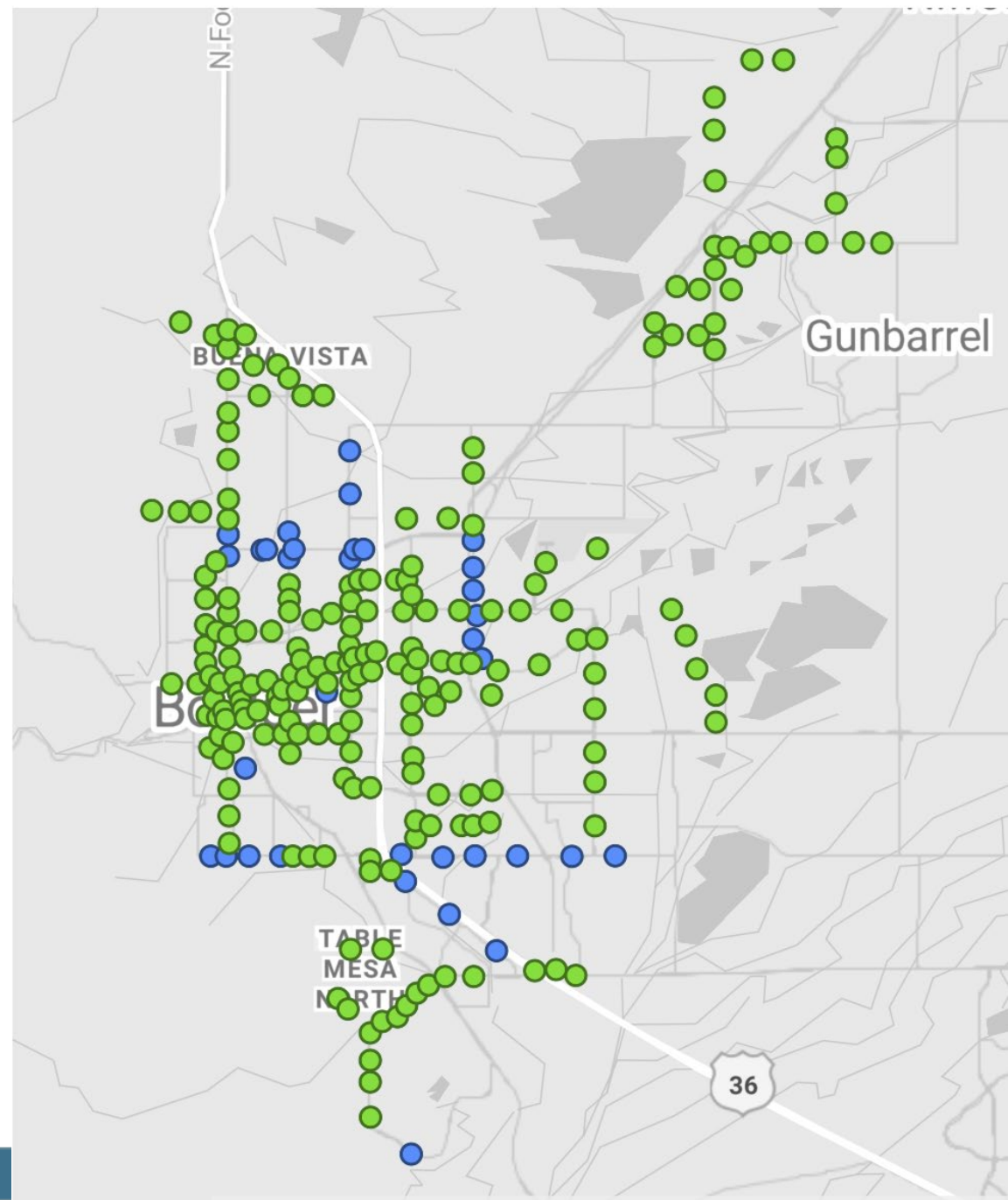


IV. Project Successes



Project Successes

- Funded through a Community Mobility Planning and Implementation (CMPI) grant from DRCOG
- Completed first ever systematic, citywide evaluation of speed limits
- Completed largest ever citywide data collection effort
- Developed innovative methodology that incorporates roadway context and industry best practices



Key Takeaways

- The methodology matches city goals for safer speeds and Vision Zero.
- 58% of the segments' recommendations matches the current speeds, validating the approach and showcasing what Boulder is already doing right
- Method suggests slower speeds where it counts, for safer streets where it matters most.

Questions

Devin Joslin, PE, PTOE
Principal Traffic Engineer
303-441-3289
joslind@bouldercolorado.gov

