

# Effectiveness of Rectangular Rapid Flashing Beacons (RRFBs) at Mid-Block Crosswalks

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# Motivation

## Pedestrian risks are higher in rural areas

US rural areas have:

- 8% of pedestrian travel (miles and trips)
- 19% of pedestrian deaths

## RRFB effectiveness in rural areas is unknown

- RRFBs have mostly been evaluated in urban areas
- Vehicles and pedestrians may behave differently in rural contexts
- Rural / urban transition zones are an area of particular concern



# Research questions

How do RRFBs affect driver and pedestrian behavior in Vermont communities?

Does RRFB effectiveness vary across rural and small community contexts?

## How do we measure RRFB effectiveness?

### Compliance

Driver yielding rate

Driver stopping position

Pedestrians crossing out of the crosswalk

### Risky behaviors

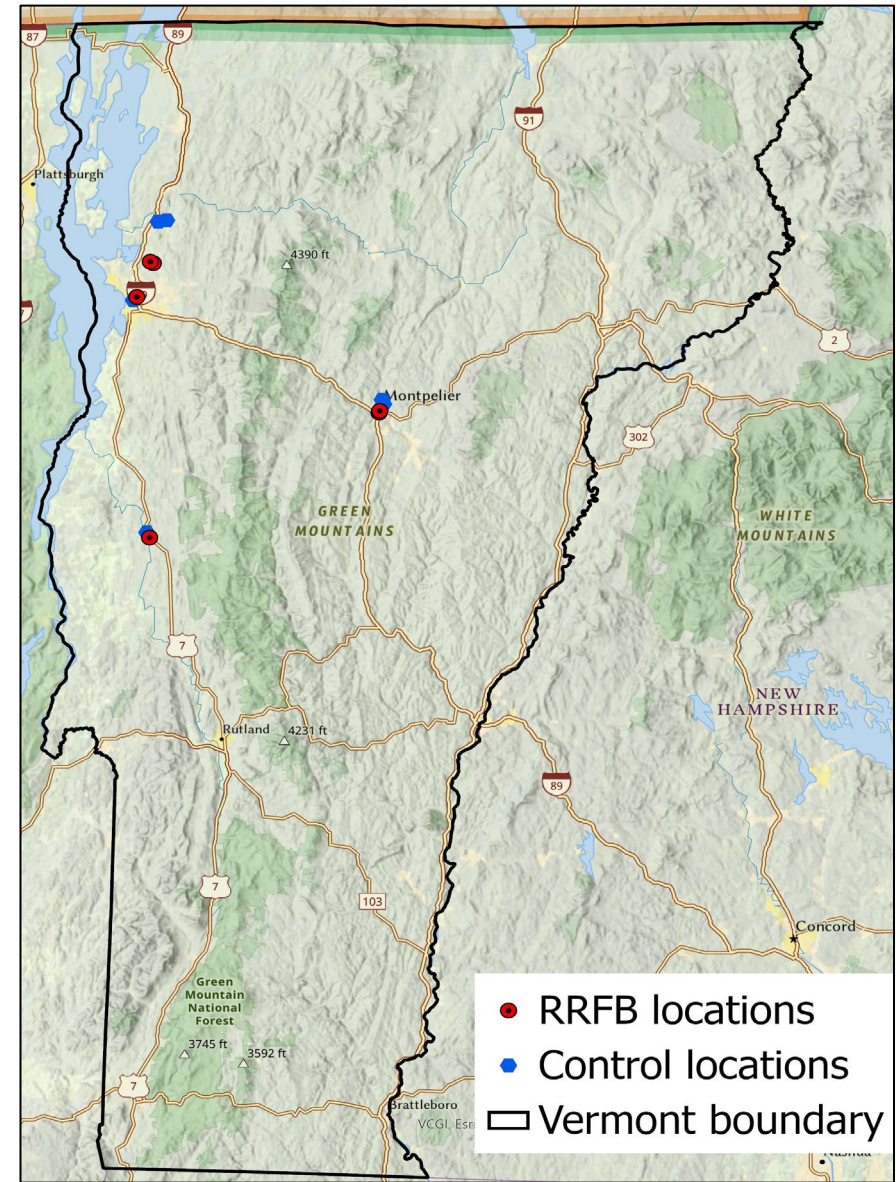
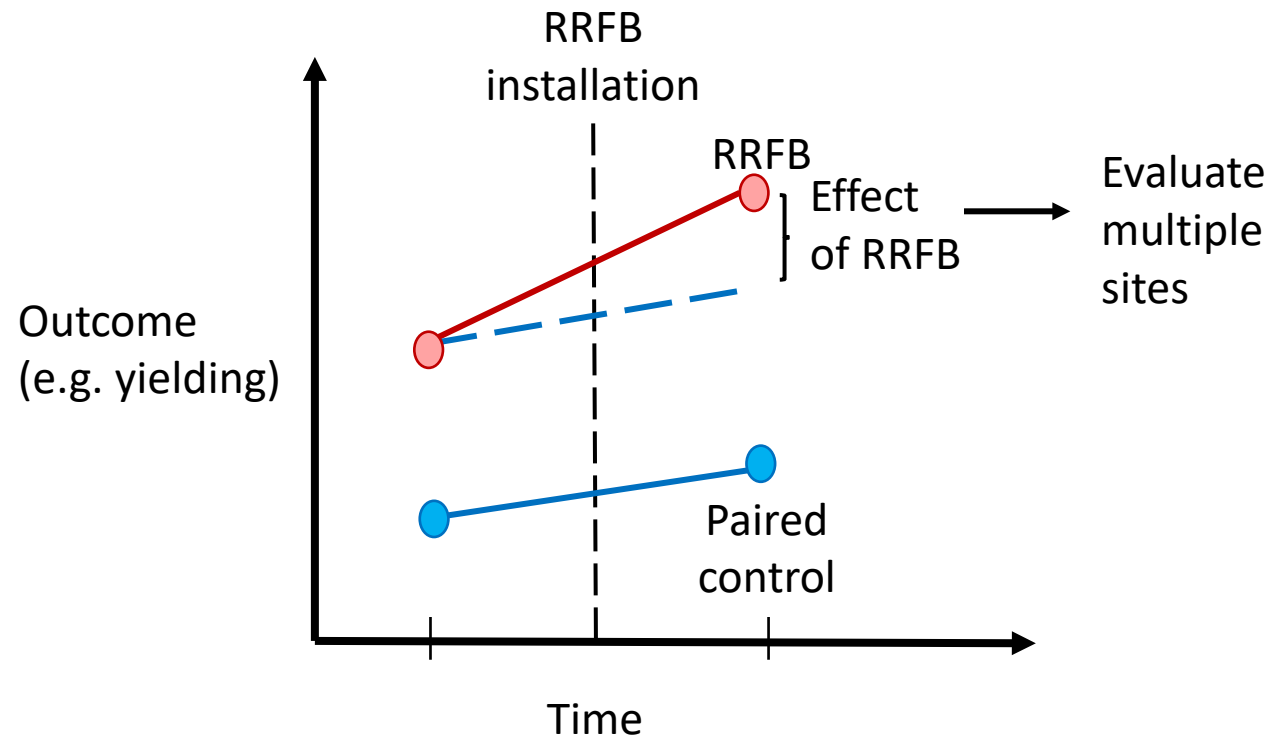
Pedestrians stepping into the roadway before drivers yield

Vehicles stopping suddenly



# Study Design

## Before/After with Paired Control



# Data Collection





# Preliminary results

## **Pedestrian compliance: improving**

Clear evidence of reduced out-of-crosswalk pedestrian crossings

## **Other outcomes: mixed results *so far***

Differences across locations

Analysis still underway

**Study will be completed by January 2023**

# Thank you

# Study location characteristics

Municipality	ID	Locations	Population density of surroundings pop/Miles <sup>2</sup>	Crossing distance (feet)	Speed limit (mph)	# lanes	School zone	Crosswalk markings	Nearby land use
Burlington	1	East Ave RRFB	9359	35	25	2	N	fresh	homes, hospital
		East Ave Pair	3591	30	25	2	N	faded	homes
Colchester	3	Main/Cobbleview RRFB	226	35	35	2	N	not visible	church, historical society and house meeting
		Main/Cobbleview Pair	538	38	35	2	N	not visible	vet hospital, homes, office
Colchester	4	Main/Village Scoop RRFB	226	31	35	2	Y	faded	ice cream shop, park, end of school zone
		Main/Village Scoop Pair	1180	39	25	2	Y	not visible	ice cream shop, tanning salon, school, dentist
Middlebury	2	Court/Creek RRFB	470	54	25	2	N	faded	commercial mall
		Court/Creek Pair	635	48	25	2	N	faded	church, square
Montpelier	5	VT-12/Derby RRFB	579	34	30	2	N	faded	church, motel, houses
		VT-12/Derby Pair	504	33	30	2	N	faded	homes, park
Montpelier	6	VT-12/Derby-Rt 2 RRFB	579	27	25	2	N	faded	homes
		VT-12/Derby-Rt 2 Pair	504	34	25	2	N	fresh	homes
Winooski	7	East Allen St./ Manseau St.	3692	40	25	4	N	not visible	homes, car shop, café
		East Allen St. / Dion St.	3692		25	4	N	not visible	homes, gas station
St. Johnsbury	8	Main/Rt. 5 RRFB	1289	76	40	5	N	--	GMP facility, rail trail
		Main/Rt. 5 Pair	1499	68	25	3	N	faded	motel, gas station
Milton	9	Elem School RRFB	580	22	25	2	Y	--	schools, playground, parking lot
		Elem School Pair	580	22	25	2	Y	fresh	schools, playground, parking lot



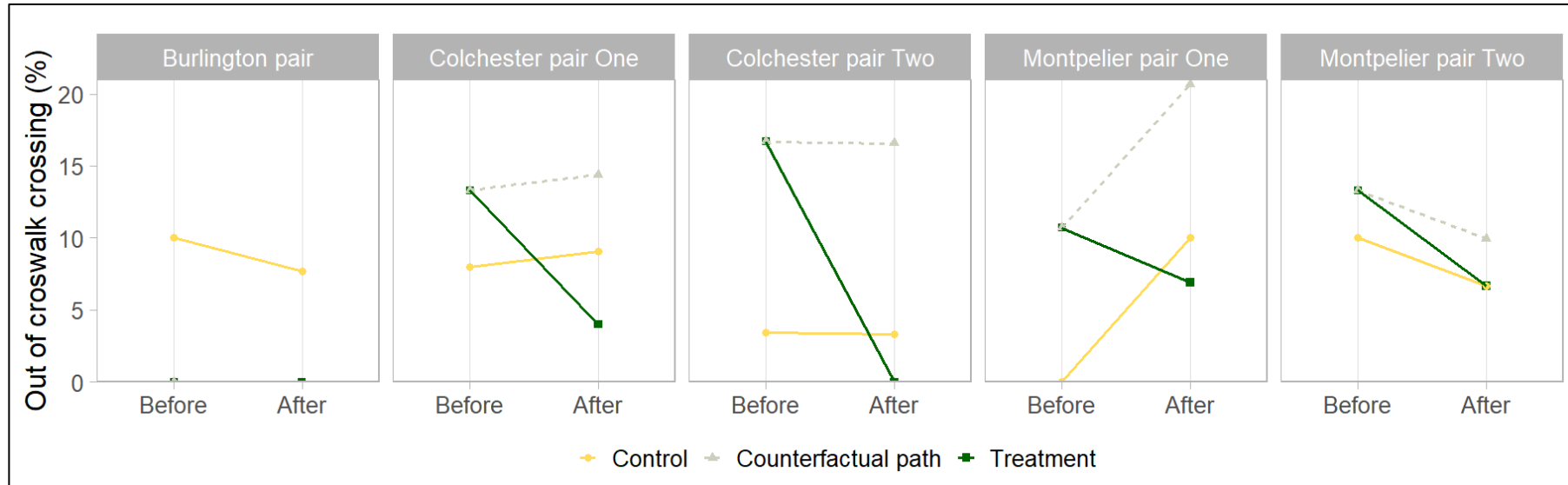
# Study location characteristics : zone type

Municipality	Locations	Posted speed change	Zone type
Burlington	East Ave RRFB	<b>25</b>	Central
	East Ave Pair	<b>25</b>	Central
Colchester	Main/Cobbleview RRFB	<b>35</b>	Transition
	Main/Cobbleview Pair	40 - <b>35</b>	Transition
Colchester	Main/Village Scoop RRFB	<b>35</b>	Central
	Main/Village Scoop Pair	<b>25</b>	Central
Middlebury	Court/Creek RRFB	50 - 40 - 35 - <b>25</b>	Transition
	Court/Creek Pair	50 - 40 - 35 - <b>25</b>	Transition
Montpelier	VT-12/Derby RRFB	50 - <b>25</b> -50	Transition
	VT-12/Derby Pair	<b>30</b> -25	Transition
Montpelier	VT-12/Derby-Rt 2 RRFB	50 - <b>25</b> -50	Transition
	VT-12/Derby-Rt 2 Pair	<b>30</b> -25	Transition
Winooski	East Allen St./ Manseau St.	30 - <b>25</b>	Central
	East Allen St. / Dion St.	<b>25</b>	Transition
St. Johnsbury	Main/Rt. 5 RRFB	50-40- <b>30</b>	Transition
	Main/Rt. 5 Pair	30- <b>25</b> -30	Transition
Milton	Elem School RRFB	<b>25</b>	Central
	Elem School Pair	<b>25</b>	Central

# Preliminary results

## Pedestrian compliance improvements

Rural RRFBs may improve compliance (out-of-crosswalk pedestrian crossings)



## Other compliance and risky behavior outcomes

Some results mixed but analysis still underway

Differences may stem from location-specific differences