WINOOSKI AVE TRANSPORTATION STUDY

BURLINGTON, VT PUBLIC WORKS

CHITTENDEN COUNTY RPC
Communities Planning Together

RSG
the science of insight

DESMAN

North Winooski Ave Parking Management Plan (PMP)

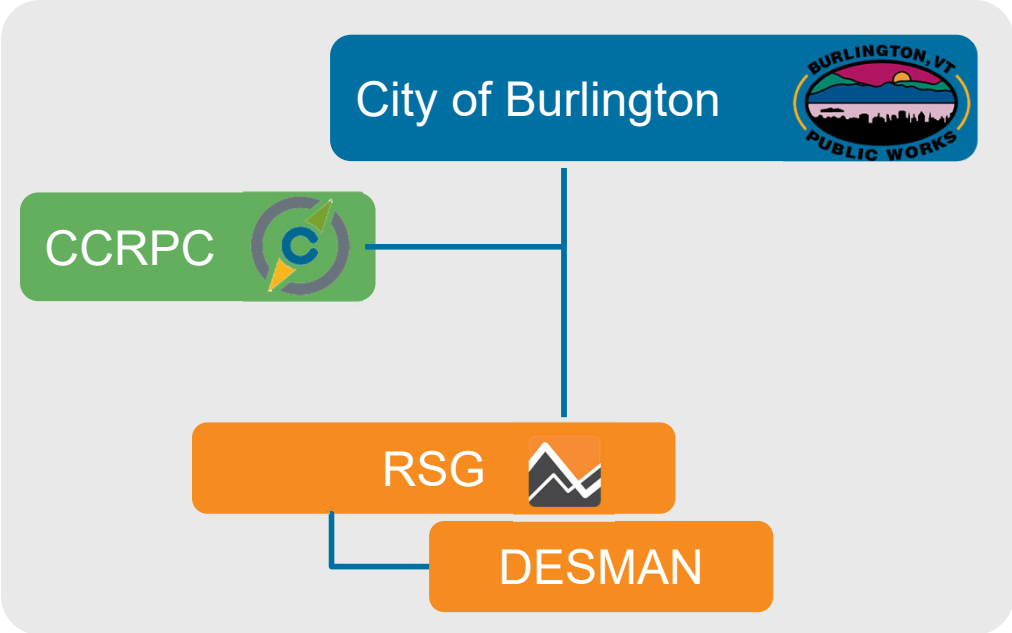
City Council-Stakeholder Committee Meeting #2 | Phase B

July 22, 2021

Committee Meeting #2: Agenda

1. Welcome, Introductions, Changes to the Agenda
2. Parking Management Plan: Purpose, Goals
3. Public Comment Period
4. Phase A: Status and Findings
5. Phase B: Introduction & Committee Discussion
   - Engagement and Survey
   - Analysis and Evaluation
   - Schedule
6. Public Comment Period
7. Committee Discussion and Action: Approve Phase B Scope of Work
8. Committee Action: Select 2 Members for Survey Review
9. Next Steps

Project Team Structure



City of Burlington

- Nicole Losch

CCRPC

- Bryan Davis
- Chris Dubin
- Sai Sarepalli

RSG/DESMAN

- Jonathan Slason
- Aaron Lee
- Justin Culp
- Andy Hill [DESMAN]

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City Council-Stakeholder Committee

Stakeholder Committee

Seven Members as directed by City Council:

City Council TEUC:

- Mark Barlow
- Jack Hanson
- Jane Stromberg

Community members:

- Charles Sizemore
- Kelly Duggan
- Kirsten Merriman Shapiro
- Maxwell Horovitz

Committee Role & Responsibilities

City Council direction:

- Approve the Scope of Work, methodology, and public engagement plan for the Parking Management Plan
  - Phase A Scope of Work and technical methodology
  - Today: Phase B Scope of Work, public engagement, and final methodology
- Review recommendations of the draft PMP
- Approve the final PMP
  - Ward 2/3 NPA presentation before final approval

Committee Structure

- Committee will function as a public body
- Committee members may not meet in person or via email to discuss the Parking Management Plan outside of established meetings
- Follow open meeting law requirements
  - DPW will advertise meetings
  - Meeting materials available online
- Meetings are open to the public and include time for public comments

Committee Procedures are available online

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Parking Management Plan: Purpose and Goals

Purpose and Goals
Interim Actions resulting from Corridor Study

As directed by City Council, the North Winooski Avenue Parking Management Plan (PMP) will **identify practical strategies for balancing parking supply and demand north of Pearl Street, with the goal of meeting essential parking needs while freeing up space for dedicated bike lanes.**

Achieving this goal by:

- Convening this Committee
- Model how actual demand compares to parking supply based on observed conditions (data on parking occupancy in the corridor and the overlapping demands of the various land uses)
- Management strategies to influence the demand for parking in the corridor
- Engage with the community to account for impacts and identification of the essential parking needs.

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Public Comment Period

To participate in public comment via Zoom:

- If signed in via Zoom, please use the "Raise Your Hand" feature to alert the project team that you wish to speak during public comment period. When it's your turn to speak, your name will be called and you will be unmuted. In the event of challenges with Zoom video, please use the call-in option.

- If you are calling in, please press *9 which will alert the project team that you wish to speak. Your phone # will be called out and you will be unmuted when it's your turn to speak.

- Comments in the YouTube livestream are not monitored – please participate through Zoom platform or phone, connection details: https://www.burlingtonvt.gov/dpw/WinAveImprovements

If you encounter any difficulties when attempting to speak during public forum, please email nlosch@burlingtonvt.gov.

Scope of Work

Phased approach:

PHASE A: technical work not directly impacted by COVID

- Understand the source of parking demand
- Committee approved the Phase A scope in March 2021

PHASE B: management strategies and public engagement

- Understand local travel behaviors
- Evaluate and analyze potential management strategies

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Phase A: Existing Conditions

Existing Parking Supply

- All parking spaces: 1,618
- On-street: 351 (223 along North Winooski, 128 on side streets)
- Off-street spaces: 1,253
- Restricted off-street (dedicated residential or non-shared commercial): 1,024
- Off-street shared with one more than one use: 229
- Average 1.3 spaces off-street per household unit

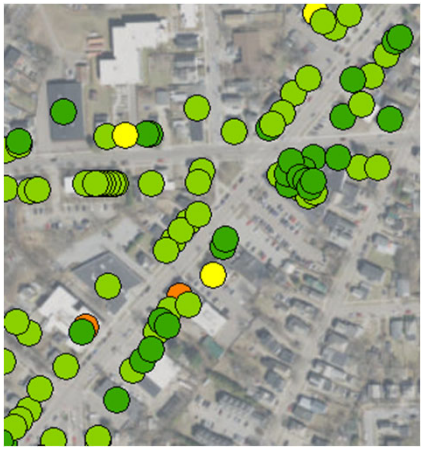
Source of data: RSG counts for Winooski Avenue and Google aerial photos for off-street spaces. City and CCRPC staff supported some additional field data collection.

Source: RSG using Google Earth background image

Turning that Data into a Model

Step 1: (ULI) Parking generation rates and sensitivity for how a collection of land uses may lower net parking supply needed to meet individual land use demands

Step 2: Converted all land uses into a land use type and an estimated square footage (ArcGIS shapefiles)



Step 3: Created a Python Script that created a utility function that assigned the estimated demand to various parking lots

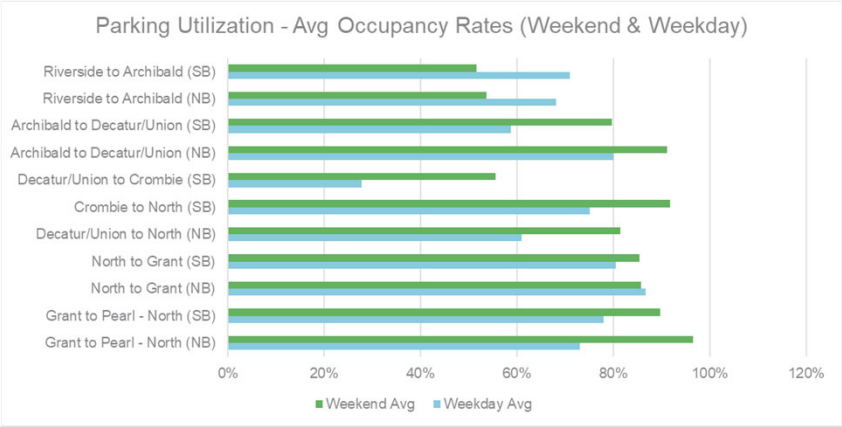
```python
# Add chooser columns summed over generator IDs
demand_df = demand_df.join(
    demand_df.groupby(gen_agg_cols)[
        [LOT_DIST_COL, lot_capacity_col, LOT_DEMAND_COL]
    ].sum(),
    on=gen_agg_cols,
    rsuffix="_sum",
)

# Define distance score as inverse of gen-to-lot distance relative to all lots
demand_df["distance_score"] = (
    1 - (demand_df[LOT_DIST_COL] / demand_df[f"{LOT_DIST_COL}_sum"])
) * distance_factor

demand_df.loc[
    demand_df[LOT_DIST_COL] == demand_df[f"{LOT_DIST_COL}_sum"],
    "distance_score",
] = distance_factor

# Weight lots by relative size
demand_df["capacity_score"] = (
    demand_df[lot_capacity_col] / demand_df[f"{lot_capacity_col}_sum"]
) * capacity_factor

# Weight lots by inverse of popularity
demand_df["lot_demand_score"] = 1 - (
    (demand_df[LOT_DEMAND_COL] / demand_df[f"{LOT_DEMAND_COL}_sum"])
    * scarcity_factor
)

# Weight lots by private access
demand_df["private_lot_score"] = demand_df[PRIVATE_LOT_COL] * private_lot_factor

demand_df[UTILITY_COL] = np.exp(
    demand_df[
        [
            "distance_score",
            "capacity_score",
            "lot_demand_score",
            "private_lot_score",
        ]
```

Step 4: Excel Pivot Tables are created to analyze lot by lot demand across weekday and weekend hours

Month	Sep				
Day	Weekend				
Category	On Street				
Sum of PctFull		Column Labels			
Row Labels	LOT_UID	8	13	18	Grand Total
Riverside Ave	3	7.5%	29.5%	25.5%	20.8%
Riverside Ave to Archibald Street	1	11.8%	24.5%	22.4%	19.5%
Riverside Ave to Archibald Street	7	15.3%	37.9%	35.7%	29.6%
Archibald	2	55.9%	100.0%	100.0%	85.3%
Archibald	4	22.3%	37.7%	34.0%	31.3%
Archibald Street to Union Street	5	21.3%	37.4%	33.5%	30.7%
Archibald Street to Union Street	6	31.3%	55.6%	49.7%	45.5%
Union Street To North Street	8	24.4%	52.0%	46.9%	41.1%
Union Street To North Street	9	37.7%	72.4%	61.5%	57.2%
Union Street To North Street	10	16.7%	32.5%	28.2%	25.8%
North	11	24.0%	58.5%	51.0%	44.5%
North	13	17.2%	44.5%	41.1%	34.3%
Union	12	23.5%	44.5%	37.9%	35.3%
North Street to Grant Street	14	21.7%	30.9%	34.9%	29.1%
North Street to Grant Street	15	24.5%	34.5%	39.2%	32.7%
Grant Street to Pearl Street	18	100.0%	100.0%	100.0%	100.0%
Grant Street to Pearl Street	19	100.0%	100.0%	100.0%	100.0%
Crombie	20	21.9%	39.3%	34.0%	31.7%
Decatur	21	20.7%	30.7%	25.8%	25.7%
Grant Street	16	57.0%	61.5%	78.1%	65.5%
Grand Total		28.5%	44.7%	42.9%	38.7%

Turning that Data into a Model

Step 5: Use observed parking rates to calibrate the parking rates in the model



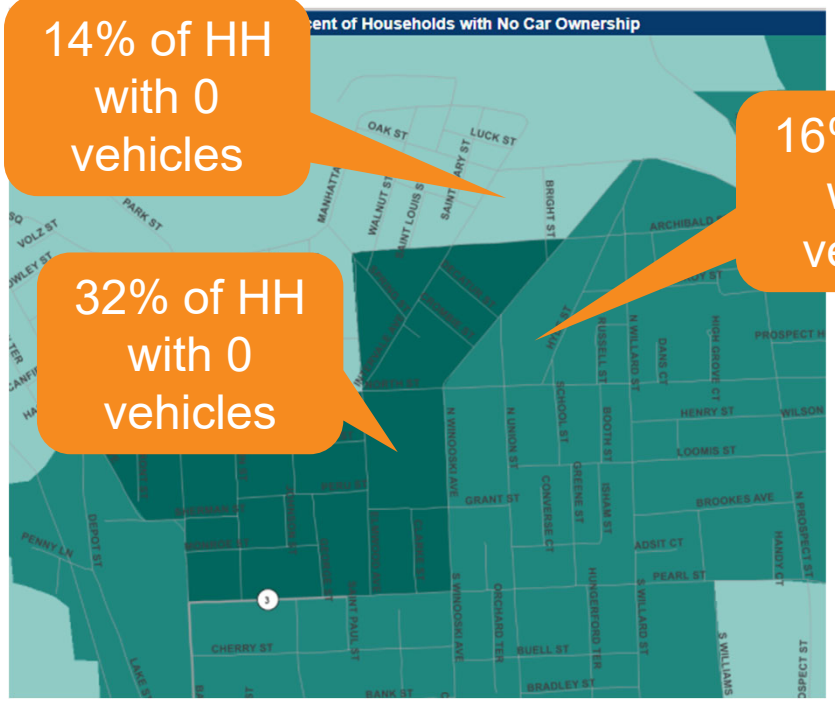
LUC	Land Use	User	Weekday	Weekend	Unit
8	Retail (400 to 600 ksf)	VisitorCustomer	1.035	1.08	ksf GLA
8	Retail (400 to 600 ksf)	Employee	0.225	0.225	ksf GLA
10	Retail (over 2,000 ksf)	VisitorCustomer	1.305	1.44	ksf GLA
10	Retail (over 2,000 ksf)	Employee	0.315	0.36	ksf GLA
11	Supermarket/Grocery	VisitorCustomer	1.8	1.8	ksf GLA
11	Supermarket/Grocery	Employee	0.3375	0.3375	ksf GLA
12	Pharmacy	VisitorCustomer	1.35	1.35	ksf GLA
12	Pharmacy	Employee	0.18	0.18	ksf GLA
13	Discount Stores/Superstores	VisitorCustomer	1.53	1.71	ksf GLA
13	Discount Stores/Superstores	Employee	0.3825	0.4275	ksf GLA
14	Home Improvement Stores/Garden	VisitorCustomer	1.395	1.5525	ksf GLA
14	Home Improvement Stores/Garden	Employee	0.36	0.405	ksf GLA
20	Fine/Casual Dining	VisitorCustomer	5.9625	6.8625	ksf GLA
20	Fine/Casual Dining	Employee	1.0125	1.125	ksf GLA
21	Family Restaurant	VisitorCustomer	6.8625	6.75	ksf GLA
21	Family Restaurant	Employee	0.9675	0.945	ksf GLA
22	Fast-Food Restaurant	VisitorCustomer	5.58	5.715	ksf GLA
22	Fast-Food Restaurant	Employee	0.9	0.9	ksf GLA
30	Nightclub	VisitorCustomer	6.8625	7.875	ksf GLA
30	Nightclub	Employee	0.5625	0.675	ksf GLA
31	Cineplex	VisitorCustomer	0.0675	0.108	seats
31	Cineplex	Employee	0.0045	0.0045	seats
32	Performing Arts Theater	VisitorCustomer	0.135	0.1485	seats
32	Performing Arts Theater	Employee	0.0315	0.0315	seats
33	Arena	VisitorCustomer	0.1215	0.135	seats
33	Arena	Employee	0.0135	0.0135	seats
34	unused	VisitorCustomer	0	0	seats
34	unused	Employee	0	0	seats
35	Pro Baseball Stadium	VisitorCustomer	0.1395	0.153	seats
35	Pro Baseball Stadium	Employee	0.0045	0.0045	seats

Step 6: Model run by changing the base parking inputs to align with observations including vehicle ownership.

Initial use of 0.75 per household parking per unit. Based on hundreds of observations in the City of Winooski with very similar household vehicle ownership rates.

Non-Residential at 45% of national suburban parking rates include employees, visitors, and all other business activities.

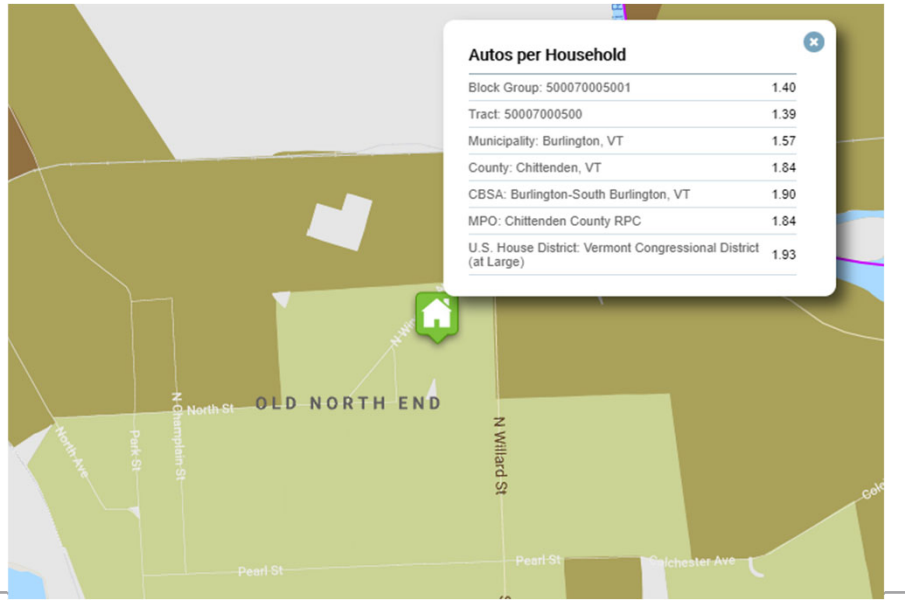
Using Vehicle Ownership Data to Inform the Model



Source: https://hepgis.fhwa.dot.gov/fhwagis/ViewMap.aspx?map=Demographic+Information|Percent+of+Households+with+No+Car+Ownership

% of Zero Vehicle Households influences average parking rates

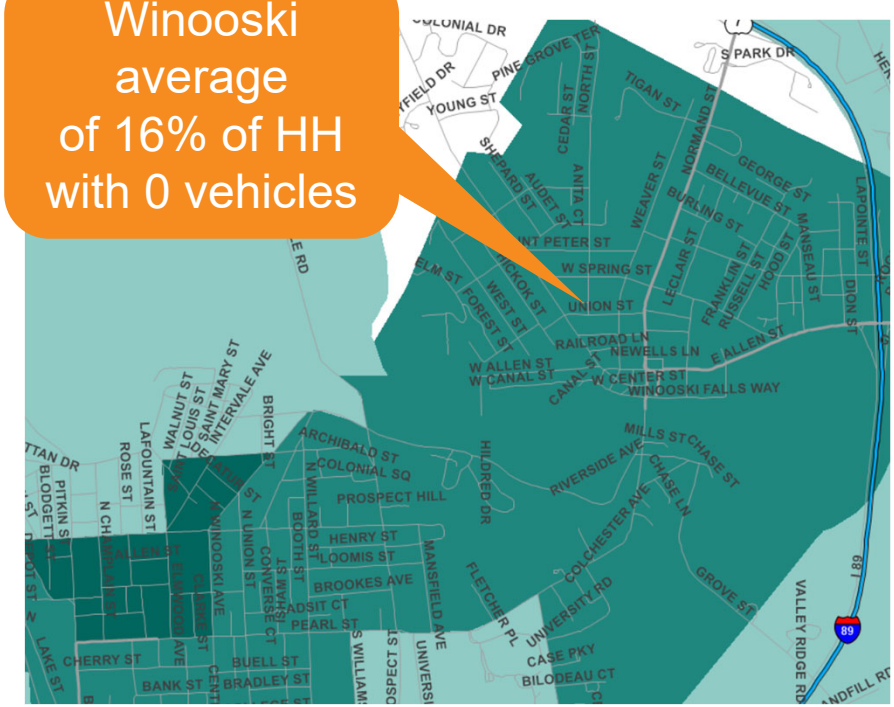
1.39 to 1.56 vehicles per household for those with vehicles for Census tracts in area



Source: https://htaindex.cnt.org/map/#

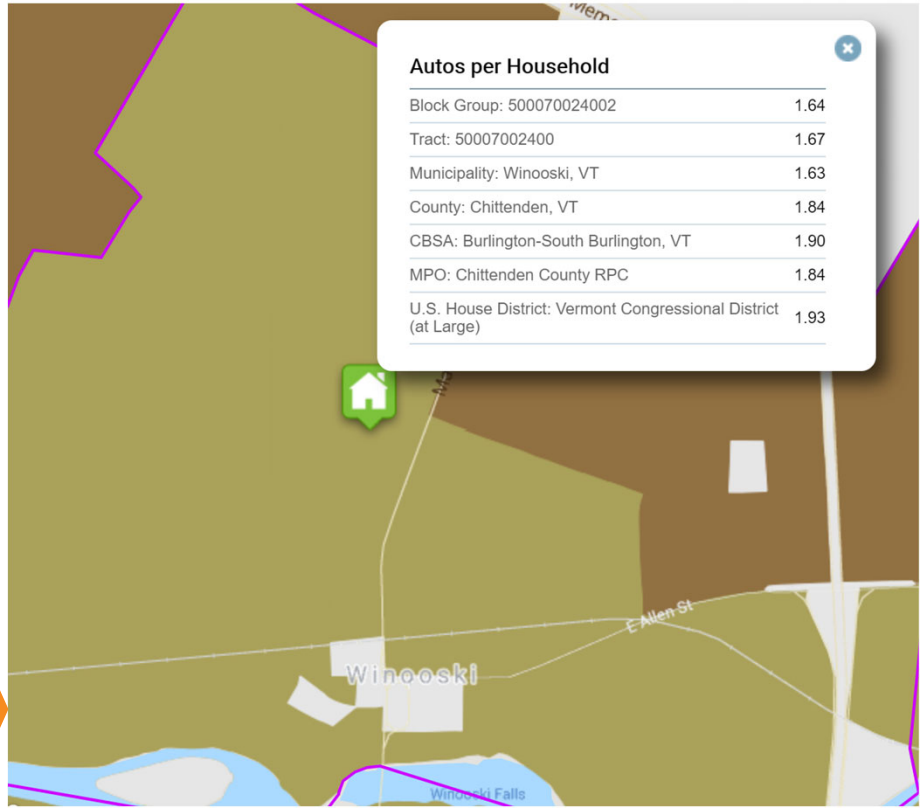
How does this compare to City of Winooski

Winooski average of 16% of HH with 0 vehicles



Source: https://hepgis.fhwa.dot.gov/fhwagis/ViewMap.aspx?map=Demographic+Information|Percent+of+Households+with+No+Car+Ownership

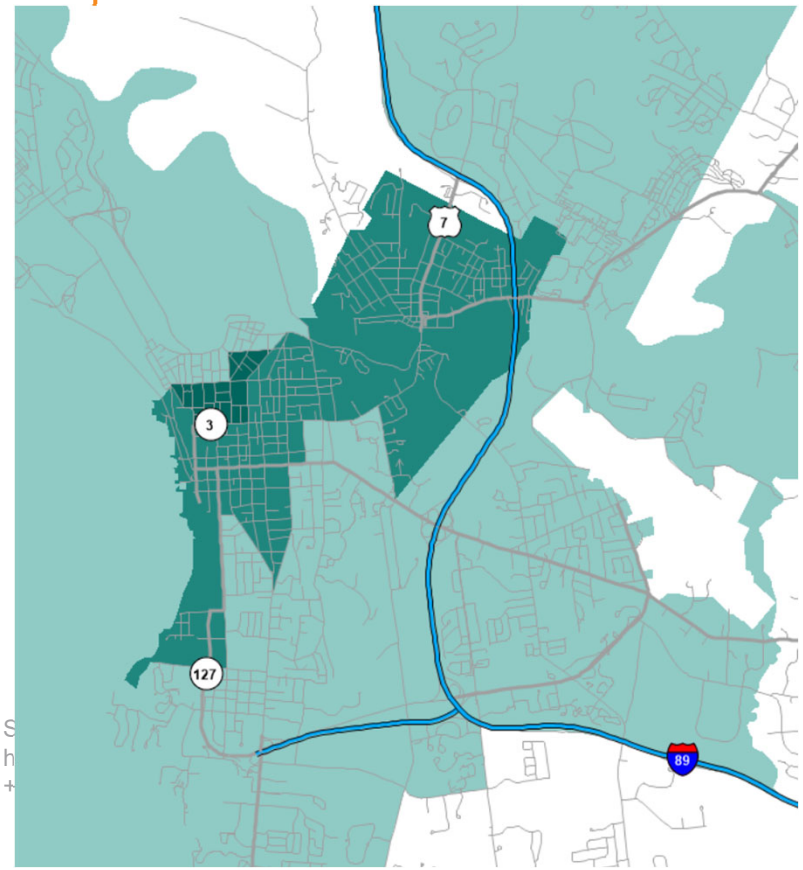
City of Winooski has slightly higher vehicle ownership rates than the study corridor



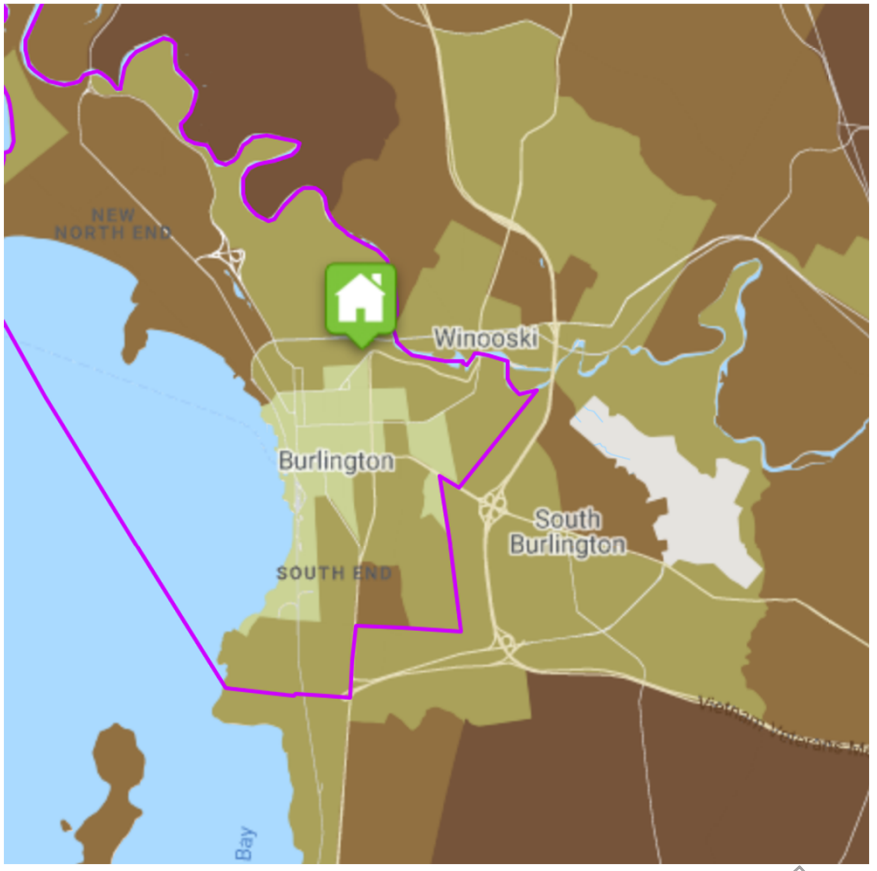
~1.6 vehicles per household for those with vehicles for Census tracts in area

Source: https://htaindex.cnt.org/map/#

Study Area Compared to Wider Area



Can see how the % of Zero Vehicle households is focused in this corridor



~1.6 average vehicles per household in Burlington and 1.84 vehicles per household in Chittenden County

Source: https://htaindex.cnt.org/map/#

Areas with Parking Pressure given Off-Street Lots

using only Households

	Housing Units [A]	Estimated Parking Demand (~.75spaces per HH) [B]	Estimated Off-Street Residential Spaces [C]	Off-Street Residential Spaces to Residential Demand [D]	Value of D relative to the Average [E]	Off-Street Spaces per HH Unit [F]
Winooski Avenue						
Grant Street to Pearl Street	95	71	63	0.88	52%	0.7
North Street to Grant Street	118	88	180	2.03	119%	1.5
Union Street to North Street	52	39	76	1.95	114%	1.5
Archibald Street to Union Street	68	51	111	2.18	127%	1.6
Riverside Ave to Archibald Street	41	31	37	1.20	70%	0.9
Archibald (west of Winooski Ave)	92	69	104	1.51	88%	1.1
Archibald (east of Winooski Ave)	4	3	4	1.33	78%	1.0
Decatur	38	28	63	2.21	129%	1.7
Crombie	24	18	37	2.06	120%	1.5
North Street (west of Winooski Ave)	48	36	54	1.50	88%	1.1
North Street (east of Winooski Ave)	24	18	30	1.67	97%	1.3
North Union Street (block btwn North and Winooski)	17	13	35	2.75	160%	2
Grant Street (west of Winooski Ave)	57	43	50	1.17	68%	0.8
Grant Street (east of Winooski Ave) (residential parking permit)	34	25	39	1.53	89%	1.1

Areas with Parking Pressure given Off-Street Lots
using Employees and Households

	Number of Employees [A]	Housing units [B]	Sum of Emp and HH units [C=A+B]	Off Street Parking spaces [D]	Ratio of Off Street Spaces per HH+Emp [E = D / C]
Winooski Avenue					
Grant Street to Pearl Street	25	95	120	105	88%
North Street to Grant Street	33	118	151	224	148%
Union Street to North Street	15	52	67	79	118%
Archibald Street to Union Street	131	68	199	239	120%
Riverside Ave to Archibald Street	40	41	81	138	170%
Community Health Center	140	0	140	76	54%
			0		
Archibald (west of Winooski Ave)	13	92	105	114	109%
Archibald (east of Winooski Ave)	0	4	4	4	100%
			0		
Decatur	1	38	39	64	164%
			0		
Crombie	5	24	29	37	128%
			0		
North Street (west of Winooski Ave)	12	48	60	57	95%
North Street (east of Winooski Ave)	0	24	24	30	125%
			0		
North Union Street (block btwn North and Winooski)	0	17	17	35	206%
			0		
Grant Street (west of Winooski Ave)	0	57	57	50	88%
Grant Street (east of Winooski Ave) (residential parking permit)	6	34	40	39	98%

Preliminary Model Parking Demand

Using Employees, Visitors, Residents, Guests

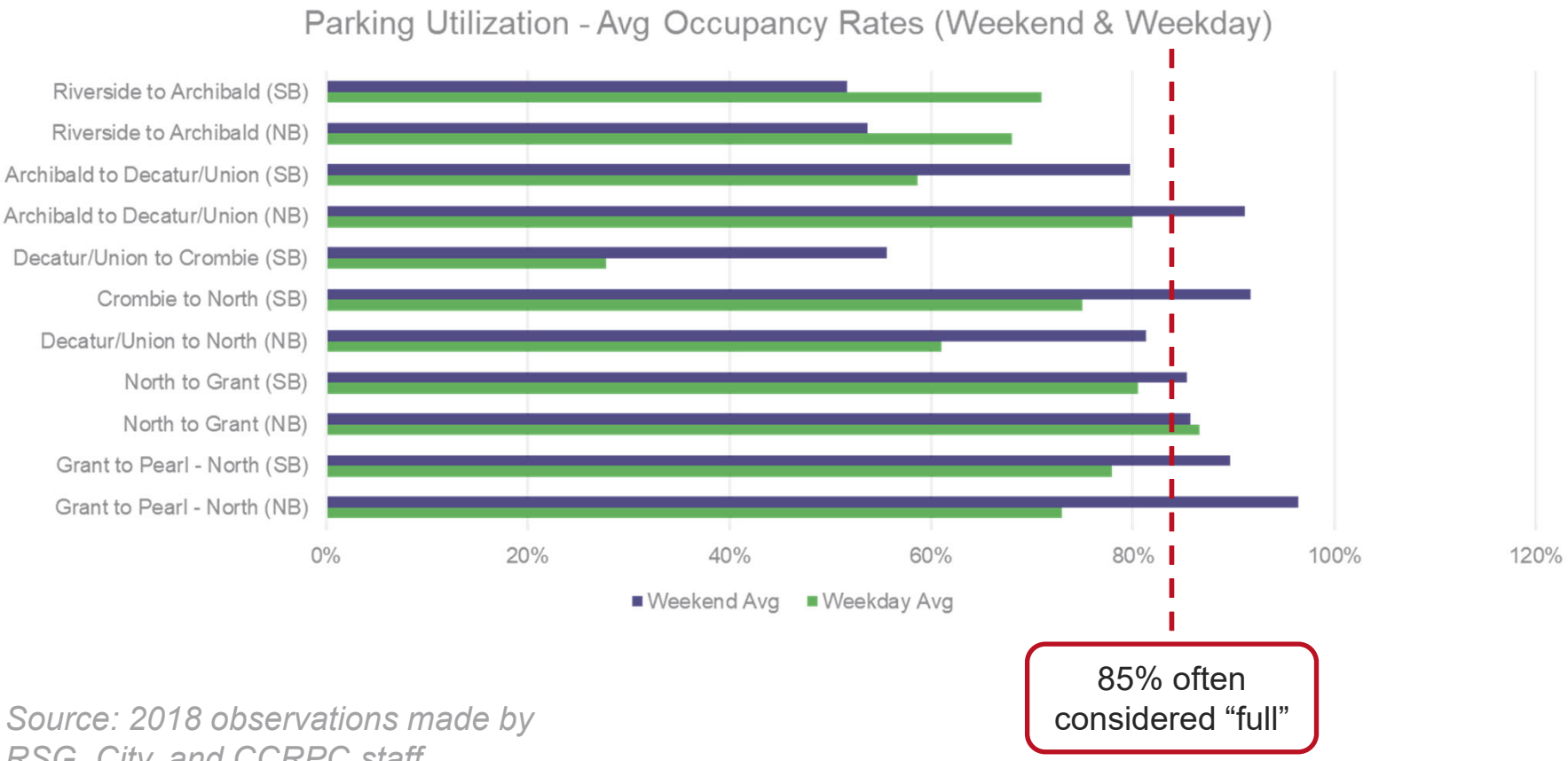
Commercial	Size (ksqft)	8am Parking Demand	8am Avg. Parking Rate per ksqft	2pm Parking Demand	2pm Avg. Parking Rate per ksqft	6pm Parking Demand	6pm Avg. Parking Rate per ksqft
Riverside Ave to Archibald Street	32	15	0.5	42	1.3	34	1.1
Archibald Street to Union Street	95	118	1.2	170	1.8	90	0.9
Union Street To North Street	6	8	1.3	25	4.2	21	3.5
North Street to Grant Street	14	16	1.1	33	2.4	22	1.6
Grant Street to Pearl Street	18	19	1	61	3.4	56	3.1
Riverside Ave	75	123	1.6	162	2.2	111	1.5
North	7	7	0.9	20	2.9	17	2.4
Crombie	2	2	1.2	3	1.5	1	0.5
Archibald	10	10	1	18	1.8	8	0.8
Sum	**259**	**318**		**534**		**360**	
Average			**1.1**		**2.4**		**1.7**

Residential	Size (household units)	8am Parking Demand	8am Avg. Parking Rate per ksqft	2pm Parking Demand	2pm Avg. Parking Rate per ksqft	6pm Parking Demand	6pm Avg. Parking Rate per ksqft
Riverside Ave to Archibald Street	42	26	0.6	22	0.5	29	0.7
Archibald Street to Union Street	73	43	0.6	36	0.5	47	0.6
Union Street To North Street	62	39	0.6	32	0.5	43	0.7
North Street to Grant Street	123	74	0.6	62	0.5	82	0.7
Grant Street to Pearl Street	122	77	0.6	63	0.5	84	0.7
Riverside Ave	18	10	0.6	8	0.4	11	0.6
North	71	43	0.6	35	0.5	47	0.7
Crombie	39	29	0.7	24	0.6	31	0.8
Archibald	100	58	0.6	48	0.5	64	0.6
Union	48	30	0.6	25	0.5	33	0.7
Decatur	46	31	0.7	26	0.6	34	0.7
Sum	**744**	**460**		**381**		**505**	
Average			**0.6**		**0.5**		**0.7**

On Street Parking Occupancy Data from Corridor Study

Weekday average on-Street observed occupancy = 69%

Parking Model average on-Street occupancy = 68%



Source: 2018 observations made by RSG, City, and CCRPC staff

Riverside to Archibald

On-Street is already managed by 1hr and 2 hr zones limiting residential and long-term employee parking.

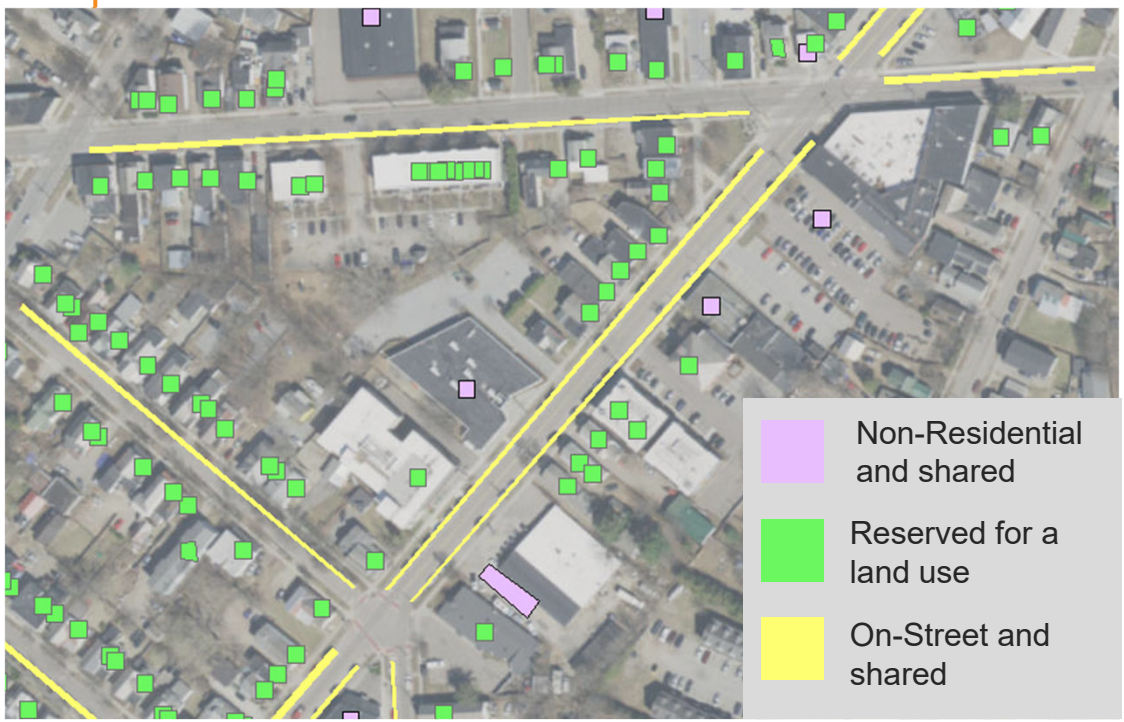
Heavily constrained off-street parking supply relative to HH's (.9 spaces per HH).

Health Center parking demand from clients and staff (~140 employees with 76 spaces on site).

Model and observations suggest >85% occupancy throughout weekday business hours.

40 jobs in businesses other than Health Center.

Archibald to Union/Decatur



Heavily residential Archibald (~1.1 spaces per HH) and Decatur (1.6 spaces per HH) are <50% occupied during mid-day weekdays. Parking occupancy decreases as spaces open up on Winooski and in commercial lots.

One of least constrained off-street parking supply relative of HH's (1.6 spaces per HH).

High employment (130 people) with ~128 spaces for non-residential uses.

Model and observations indicate 70-80% occupancy on-street during 2pm weekdays (peak time).

Overall model suggests that fewer than 50% of all parking spaces are occupied at 2pm.
[Some opportunities for sharing]

Residential off-street only 40% occupied Commercial off-street ~90% occupied

Union/Decatur to North Street

Model estimates North Street is ~60% occupied at 2pm.

Average weekday observations and model ~ 55% occupied on-street parking.

Above the corridor average (1.3) by having ~1.5 off-street spaces per HH.

15 jobs are in this segment.

Crombie has ~ 1.5 spaces per HH. Less than 50% occupancy ratios for mid-days. Increasing to 60-70% evenings.

North Street to Grant Street

Grant Street (west end) has 0.88 spaces per HH. (lower than 1.3 corridor average).

Most dense residential part of corridor with 118 household units at an average of 1.5 off-street spaces per unit provided.

Model suggests occupancy of ~40%. However, observations suggest closer to 80%. **This may indicate that free parking is inducing people to park here and walk into downtown.** This was identified by several local residents during the Corridor Study and protected bike lane demonstration.

The metered parking to the south may lead to a higher demand for this segment.

33 jobs in the segment.

Grant Street to Pearl Street

Model suggests occupancy of ~100%. Observations suggest closer to 80% on weekdays and 95-100% on weekends. Meter effect is not well captured by the model, which may lead to lower occupancy during the weekdays. The 80% occupancy is in-line with goals for metered spaces.

2nd most dense residential part of corridor with 95 household units at an average of .66 off-street spaces per unit provided.

Most constrained in the study area by having the fewest off-street spaces per HH unit and employment constraints.

Approximately 50% fewer spaces for the demand relative to other segments in the study area.

25 jobs in the segment.

Model Feedback

The Phase A segment-by-segment analysis will inform individualized management options to be developed and analyzed in Phase B.

Side Streets in Study Area	Number of On-Street Spaces in study area	Weekday Average Occupancy (% filled)			
		8am	1pm	6pm	Average
Riverside Ave	15	100.0%	100.0%	100.0%	100.0%
Archibald	25	73.3%	83.6%	73.4%	76.8%
North	25	28.0%	60.5%	50.0%	46.2%
Union	17	36.4%	59.3%	45.5%	47.1%
Crombie	16	30.1%	48.5%	39.8%	39.5%
Decatur	17	34.0%	46.0%	33.8%	38.0%
Grant Street	22	67.4%	73.9%	80.7%	74.0%
Totals & Average	**128**	**52.8%**	**67.4%**	**60.5%**	**60.2%**

How do these values compare to your observations?

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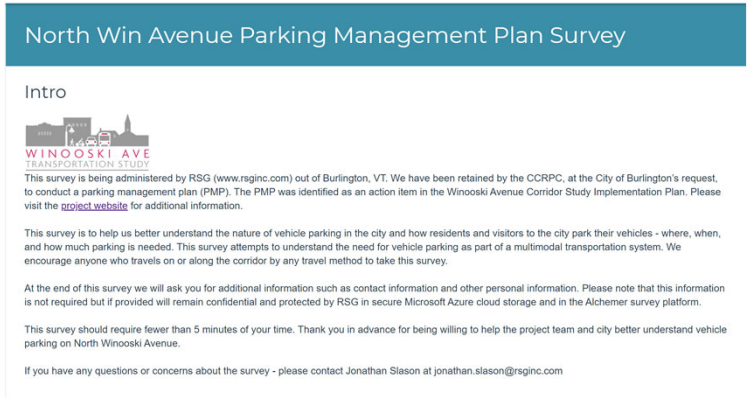
Phase B Scope of Work

Public Engagement

Goal: Understand travel behaviors, parking needs and experiences, and travel / parking preferences

Strategy: Web-based community survey (Project Team with Committee reps)

- **Direct survey distribution to North Winooski businesses and non-profits**
- **Mail postcards to all addresses and property owners in study area**
- **Postcards at businesses, lawn signs, citywide FPF, and social media to advertise survey for visitors**
- **Paper copies and translated versions / assistance will be available**



North Win Avenue Parking Management Plan Survey

Intro

WINOOSKI AVE TRANSPORTATION STUDY

This survey is being administered by RSG (www.rsginc.com) out of Burlington, VT. We have been retained by the CCRPC, at the City of Burlington's request, to conduct a parking management plan (PMP). The PMP was identified as an action item in the Winooski Avenue Corridor Study Implementation Plan. Please visit the project website for additional information.

This survey is to help us better understand the nature of vehicle parking in the city and how residents and visitors to the city park their vehicles - where, when, and how much parking is needed. This survey attempts to understand the need for vehicle parking as part of a multimodal transportation system. We encourage anyone who travels on or along the corridor by any travel method to take this survey.

At the end of this survey we will ask you for additional information such as contact information and other personal information. Please note that this information is not required but if provided will remain confidential and protected by RSG in secure Microsoft Azure cloud storage and in the Alchemer survey platform.

This survey should require fewer than 5 minutes of your time. Thank you in advance for being willing to help the project team and city better understand vehicle parking on North Winooski Avenue.

If you have any questions or concerns about the survey - please contact Jonathan Slason at jonathan.slason@rsginc.com

Analyze and Evaluate Options

Next Committee meeting: review evaluation criteria and metrics to refine parking management strategies

- **Develop evaluation criteria**
  - Review survey results. Evaluate results relative to census data
  - Distill feedback from Corridor Study
  - Review parking model trends and opportunities

- **Analyze Parking Management Strategies**
  - Apply evaluation criteria to review options

Schedule

Phase B	
Survey design	July 26th – August 6th
Field survey	August 9th – 27th
Committee Meeting: review survey, draft evaluation criteria and analysis, preliminary parking management plan	September 9th
Committee Meeting: review and approve draft parking management plan	September 23rd
NPA Meeting	Sept/Oct
City Council & Public Works Commission	Oct/Nov

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Committee Discussion

Action will follow Public Comment Period

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Public Comment Period

To participate in public comment via Zoom:

- If signed in via Zoom, please use the "Raise Your Hand" feature to alert the project team that you wish to speak during public comment period. When it's your turn to speak, your name will be called and you will be unmuted. In the event of challenges with Zoom video, please use the call-in option.

- If you are calling in, please press *9 which will alert the project team that you wish to speak. Your phone # will be called out and you will be unmuted when it's your turn to speak.

- Comments in the YouTube livestream are not monitored – please participate through Zoom platform or phone, connection details: https://www.burlingtonvt.gov/dpw/WinAveImprovements

If you encounter any difficulties when attempting to speak during public forum, please email nlosch@burlingtonvt.gov.

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Committee Actions:

Phase B Scope of Work + Survey Participation

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Next Steps

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Thank You!

PROJECT INFORMATION:

Burlington Public Works Website: https://www.burlingtonvt.gov/dpw/WinAveImprovements
CCRPC Website: Winooski Avenue Corridor Study

CONTACTS:

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Steering Committee

BURLINGTON, VT PUBLIC WORKS

CHITTENDEN COUNTY RPC
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DESMAN

Consultant Team