



the science of insight

APPENDIX

STATEWIDE PARK-AND-RIDE FACILITIES PLAN

DECEMBER 2015



55 Railroad Row
White River Junction, VT 05001
802.295.4999
www.rsginc.com

PREPARED FOR:
VERMONT AGENCY OF TRANSPORTATION

SUBMITTED BY:
RSG



STATEWIDE PARK-AND-RIDE FACILITIES PLAN
TECHNICAL MEMORANDUM #1

EXISTING CONDITIONS REPORT





STATEWIDE PARK-AND-RIDE FACILITIES PLAN

PREPARED FOR:
VERMONT AGENCY OF TRANSPORTATION

CONTENTS

1.0	EXECUTIVE SUMMARY	1-1
2.0	INTRODUCTION.....	1-1
2.1	Study Purpose	1-1
	Agency Vision.....	1-1
	Study Objectives.....	1-1
2.2	Methodology	1-2
3.0	SUMMARY OF PREVIOUS STUDIES	1-2
3.1	Statewide Studies.....	1-2
	Findings.....	1-2
3.2	ADA Compliance Review	1-3
3.3	Regional Needs Assessments	1-4
	Summaries of Each RPC's Needs Assessment	1-5
4.0	PARK AND RIDE INVENTORY	1-7
4.1	Existing Infrastructure.....	1-7
	Locations	1-7
	Amenities.....	1-7
4.2	Supply and Demand	1-9
	Capacity.....	1-9
	Transit Demand	1-9
	Automobile Demand	1-10
	Utilization.....	1-11



4.3 Gap Analysis	1-12
5.0 VTRANS PARK AND RIDE OPERATIONS.....	1-12
5.1 Historical Development of Park and Rides.....	1-12
5.2 Staffing and Workflow.....	1-13
Maintenance and Operations	1-13
Project Development.....	1-14
5.3 Costs and Funding	1-15
Initial Capital Costs	1-15
Maintenance and Operating (MO) Costs	1-16
Funding Mechanisms.....	1-16
FIGURE 1: STATE-OWNED AND MUNICIPAL PARK AND RIDE LOCATIONS	1-7
FIGURE 2: PARK AND RIDE CAPACITY	1-9
FIGURE 3: PARK AND RIDE UTILIZATION RATES	1-11
TABLE 1: SURFACE TYPE AND CONDITION FROM ADA STUDY	1-4
TABLE 2: P&R AMENITIES.....	1-7
TABLE 3: P&R WITH A BUS SHELTER BUT NO TRANSIT ACCESS	1-8
TABLE 4: P&R LOTS OVER 85% UTILIZATION.....	1-11
TABLE 5: CAPITAL COSTS OF STATE OWNED PARK AND RIDES CONSTRUCTED AFTER 2000.....	1-15
TABLE 6: CAPITAL COSTS OF STATE OWNED PARK AND RIDES RECONSTRUCTED AFTER 2009.....	1-15
TABLE 7: CAPITAL COSTS OF ADDING SPACES TO STATE OWNED PARK AND RIDES	1-16

1.0 EXECUTIVE SUMMARY

RSG has compiled and summarized existing conditions data related to the Vermont park and ride (P&R) facilities. Previous studies of the entire state and specific regions reveal that the need for P&R continues to grow and that prioritization is necessary to expand the system in a thoughtful and cost-effective manner.

The State maintains a listing of both state-owned and municipality-owned P&R. Most state-owned P&R are located along an Interstate. Amenities, such as bus shelters and lighting, are present to varying degrees. They can make P&R more comfortable but can also complicate maintenance.

We have examined utilization and demand and mapped where there may be gaps in the system. By using different types of demand, such as transit stops, population density, AADT, and regional commuter routes, we have tried to account for how demand varies between different regions of the state.

We also examined VTTrans operations in relation to P&R. The program developed out of popular demand and remains popular today. Operations are spread across the Agency, and this lack of a formal structure may add inefficiencies to the system.

Finally, P&R costs are highly variable between projects, and it is therefore difficult to determine a unit cost per space. Similarly, it is difficult to determine maintenance costs per space due variations in weather, differences between P&R layouts, and highways and P&R drawing on the same maintenance funds. The federal CMAQ program has funded all the state-owned P&R capital costs. VTTrans also provides state funds to assist municipalities in developing and expanding their own P&R lots.

2.0 INTRODUCTION

2.1 | STUDY PURPOSE

AGENCY VISION

The Vermont Agency of Transportation's (VTTrans) vision for the state transportation network is "a safe, reliable, and multimodal transportation system that promotes Vermont's quality of life and economic wellbeing."¹ Park and rides (P&R) promote multimodal transportation, increase the energy efficiency of the road network, and reduce the number of vehicles present on State highways.

STUDY OBJECTIVES

VTTrans asked RSG to develop a Statewide Park and Ride Facility Plan with the following goals:

1. Document and summarize the characteristics, condition and utilization of

¹ <http://vtrans.vermont.gov/about-us/mission-vision> accessed 11/24/2014

- existing facilities
2. Identify current asset management concerns
 3. Identify and evaluate future funding needs for capital, maintenance, and operations
 4. Investigate alternative funding scenarios to maintain existing facilities and for additional facilities
 5. Prioritize where to make both current facility investments and strategic future investments
 6. Recommendations in the Park and Ride Facility Plan should support the Agency of Transportation's mission statement

This portion of the Study focuses on documenting the existing conditions under study goal 1.

2.2 | METHODOLOGY

To assess existing conditions related to P&R, we have examined numerous documents and data sources. VTTrans-sponsored studies of the State's P&R system and Needs Assessments conducted by the Regional Planning Commissions are summarized in Section 3. Section 4 inventories the existing P&R infrastructure, and Section 5 examines P&R operations within the Agency. We collected data from the State P&R database, numerous studies and facility inventories, interviews with VTTrans staff, and publicly available geographic data.

RSG also reviewed peer agency P&R programs for this study. That review is included in Technical Memorandum #2.

3.0 SUMMARY OF PREVIOUS STUDIES

3.1 | STATEWIDE STUDIES

In the last 25 years, VTTrans sponsored two significant studies that examined Vermont's P&R facilities: the 1991 Evaluation of Statewide Park and Ride Facilities by TAMS Consultants, Inc.; and the 2004 Park-and-Ride study by VTTrans. The 1991 study inventoried all 24 P&Rs owned by the State of Vermont at that time and investigated short and long-term steps for improving the P&R program in the future. It also used license plate studies and user surveys to profile P&R users. The 2004 study inventoried a subset of the P&Rs owned by the State and prioritized new P&R locations in consultation with the Regional Planning Commissions and public transit providers. The study did not suggest ways to improve the P&R program in the future.

FINDINGS

Both P&R studies found that P&Rs are popular with the traveling public and demand continues to grow. Short-term recommendations in the 1991 study included:

- Marketing Improvements: Distribution of P&R map and incorporating P&R into the Vermont State Map
- Physical Improvements: Signage and maintenance

The 1991 study also recommended evaluating existing and new sites based on the following criteria:

- Accessibility – A site should be within 0.25 miles of a major commuter corridor, defined as connecting major employment centers and having an average daily traffic of over 4,000 vehicles
- Visibility – The site should be able to be seen from the road.
- Security – The site should be secure both by being visible and by providing safety amenities such as lighting. Being proximate to a populated area such as a shopping center is also helpful.
- Utilization – The lot should be well utilized. A target rate was not given in the report.
- Development Costs – New lots should be sited so as to minimize development costs.
- Commuter Capture – New lots should be sited to maximize their potential for commuter capture.

We also note that the 2013 VTrans Electric Vehicle Fueling Infrastructure Plan by DuBois and King and the Vermont Energy Investment Corporation (VEIC) recommended installing charging stations at certain P&R facilities.

3.2 | ADA COMPLIANCE REVIEW

Between September 2013 and January 2014, VTrans staff inventoried state-owned P&Rs for three types of information: general information (surface condition, parking capacity and utilization, amenities, etc.), ADA accessibility, and transit stop ADA accessibility (where applicable). They also evaluated municipally-owned P&Rs for general information. As of the date of this report, VTrans continues to compile the data, but the lack of a dedicated staff person has slowed the project. We summarize the preliminary results below and in the attached maps:

- **P&Rs included in the assessment:** (Map 1) Most of the P&Rs on the state website are included in this assessment. Information was not available for the following lots at this time:
 - Corinth
 - Orange
 - Putney
 - Richmond
 - St. Johnsbury

- Weathersfield (VT 131)
 - Weathersfield (VT 106)
 - West Rutland
 - Williamstown
- **Short-term recommendation costs:** (Map 2) The ADA Compliance Review assessed costs for 24 P&Rs. Two of these (Hartland and Springfield) were expected to be rebuilt, so no improvements were recommended there². Total improvement costs at each of the remaining 22 lots ranged from \$14 to \$3,740. Recommended improvements typically involved signage and pavement markings.
 - **Surface type:** 83% of lots studied (state and municipal) were paved, 12% were gravel, and 6% were a combination of the two.
 - **Surface condition:** (Map 3) Surface conditions were rated between “Excellent” and “Poor” with the majority of lots (68%) rated “Good”. Table 1 shows the surface type and condition of State and municipal lots.

TABLE 1: SURFACE TYPE AND CONDITION FROM ADA STUDY

		State N = 30	Municipal N = 49
Surface Type	Paved	63%	80%
	Both	13%	0%
	Gravel	3%	14%
	Unknown	20%	6%
Surface Condition	Excellent	13%	18%
	Good	37%	71%
	Fair	20%	4%
	Poor	7%	0%
	Unknown	23%	6%

- **Availability of ADA walkways:** ADA compliant walkways were present in 14% of the lots in the study (state and municipal).

Only two lots (Waterbury and Clarendon) were found to be in complete compliance with ADA requirements.

3.3 | REGIONAL NEEDS ASSESSMENTS

As part of the Fiscal Year 2012 Transportation Planning Initiative, VTTrans requested that the Regional Planning Commissions assess regional P&R needs. The assessments were to be based on a P&R Plan or Study, and coordination with regional public transit providers was expected. These P&R assessments varied by region. Some planning commissions, such as the CCRPC, developed a comprehensive report examining the needs in the region and what

² Projects are programmed at other locations (Berlin, St. Johnsbury, Thetford, Williamstown and Manchester) as well, but there were not noted in the short-term recommendations.

the future priorities should be. Others, such as the NVDA, simply created a list of desirable improvements and future sites. The following sections summarize the needs of each region.

SUMMARIES OF EACH RPC'S NEEDS ASSESSMENT

Addison County Regional Planning Commission: In 2013, the ACRPC TAC prioritized four P&R priorities within their jurisdiction. The first included a lot at the US7 and Vermont Route 17 (VT17) intersection in New Haven, to accommodate a combined average annual daily traffic (AADT) of 14,500 around the site. Secondly, the RPC identified a P&R location at the Champlain Bridge – also along VT 17 – which has an AADT of 3,200. A site along US7, with an AADT of 10,000, in Middlebury was the third priority, while the VT116 corridor between Lincoln Road to VT17, with an AADT of 4,000, in Bristol provided the fourth priority.³

Bennington County Regional Commission: In 2012, the BCRC identified one P&R priority for the region at the existing state lot in Manchester. Improvements requested at the site include the addition of permeable paving, lighting improvements, a shelter with a bench, and signage. Since 2012, the RPC identified two potential P&R locations in Arlington and Pownal, but the requests for these lots are not yet formalized.⁴

Central Vermont Regional Planning Commission: The CVRPC included an assessment of their P&R needs in their 2008 regional plan. The plan identified a variety of expansion potentials and other improvements at existing lots. Additionally, the plan identified ten potential lots to serve rural commuter lines, three potential lots to serve urban shuttle service, and one to serve interstate transit service.⁵

Chittenden County Regional Planning Commission: CCRPC produced a P&R Intercept Facility Plan in 2011 that included a system inventory to identify P&R needs. The report notes service gaps in demand along the North Corridor, as well as a need for more convenient P&R lot locations. CCRPC identified and ranked 22 new P&R facilities based on AADT, level of transit service, bicycle/pedestrian locations, highway access, activity center proximity, specific site identification, land acquisition status, and confirmed public-private partnerships. The top five site locations included three facilities in Williston, one in Shelburne, and one in Milton. Most of the top prioritized P&Rs showed high levels of transit service, strong bicycle/pedestrian access, and close proximity to an activity center, site identification, and land acquisition.

Lamoille County Planning Commission: LCPC published the results of their regional P&R needs analysis in 2012 detailing the need for various improvements at existing facilities, recognizing the opportunity to increase lot usage at some existing P&Rs, and identifying potential site locations for new P&Rs in the region. LCPC described the need for increased shelters, bike racks, signage, and public outreach for the existing P&R facilities to both improve the experience for current P&R users and also to bolster lot utilization. The need analysis identified four potential sites for new P&Rs, of which two are existing informal lots.

³ <http://acrpc.org/programs-services/transportation/parknride/>

⁴ Letter to State of Vermont Jan 22, 2013 to Wayne Davis from Mark Anders

⁵ CVRPC Regional Transportation Plan

The potential sites identified exhibit the opportunity to attract riders given their accessibility, visibility, and safety characteristics.

Northeastern Vermont Development Association: NVDA published a list of their existing P&R system, along with identified opportunities for lot improvements and new construction. The region currently has a number of informal or private lots that are not included within the official P&R system but still help to serve demand. Improvements include an upgrade at the facility in St. Johnsbury along US2 and ten proposed new lots.

Northwest Regional Planning Commission: The NRPC inventoried their seven park-and-ride lots (three state-owned and four municipality-owned) in 2015. They also solicited feedback from their Transportation Advisory Committee and their local transit agency (GMTA). The recommendations included improved signage, better visibility from the street, lighting, curbing, and striping. New or improved bicycle racks are a high priority item due to large bicycle tourism demand in the region. They also note that many of these lots are at or near capacity. NRPC also specified locations for six new lots. Two of these new lots would help relieve existing lots that are at capacity; the other four lots would serve new locations.

Rutland Regional Planning Commission: RRPC reviewed the region's existing P&R sites to identify areas where the construction of P&R lots would be helpful to meet demand. This study located 15 areas along major roads for new P&R facilities, as well as identified five areas where a P&R is already present but additional capacity could be provided to better serve the need at those locations. The following towns are the top priorities for P&R development in coming years: Clarendon, Ira, Killington, Pittsford, Poultney, Proctor, Sudbury and Tinmouth. RRPC noted that they will encourage increases in regional transportation options, as well as growth of informal P&Rs in the region.

Southern Windsor County Regional Planning Commission: SWRPC updates their regional P&R needs assessment in 2012 that prioritized the improvement of existing lots over the development of new lots throughout their region. Proposed improvements at the Hartland, Springfield, Weathersfield and Ludlow lots included expansions, pavement upgrades, provision of amenities, transit service improvements, inclusion of bicycle parking, and trail connection enhancement. Following these improvement recommendations, SWRPC prioritized four P&R lots for construction in Weathersfield, Proctorsville, North Springfield, and Gassetts to meet growing demand.

Two Rivers-Ottawaquechee Regional Commission: TRORC's 2013 Regional Transportation Plan assessed existing P&R facilities and identified four potential new facilities in the region. The assessment of existing P&R lots noted areas where lighting, shelters, and bike racks were not provided. The proposed facilities for construction included a location in Hartford at the I-91 and I-89 interchange, a location in Royalton at I-89 Exit 3, a location in Bridgewater/Woodstock along US4 and a location in Stockbridge at the VT107/VT100 interchange.

Windham Regional Commission: WRC produced a list of P&R site recommendations in 2012 including the existing four municipal P&R lots in the region and seven proposed lots. The proposed Putney P&R at I-91 Exit 4 was confirmed for construction in FY13-14. The

other six proposed facilities remain in development stages. One of these proposed lots will replace current commercial lot utilization for P&R purposes near the site. Another three of the proposed lots function as informal P&R lots to meet regional demand.

4.0 PARK AND RIDE INVENTORY

4.1 | EXISTING INFRASTRUCTURE

LOCATIONS

VTrans maintains a listing of state-owned and municipal-owned P&R lots on its website. In July, 2014, the State provided a copy of this database to RSG for this report. Data from that database is reported here. It is based on the 79 P&R included in that database. As shown in Figure 1, the State owns 30 P&R and maintains a listing for 49 additional municipally-owned lots. Most of the state-owned lots are located in the I-89, I-91, and US 7 corridors.

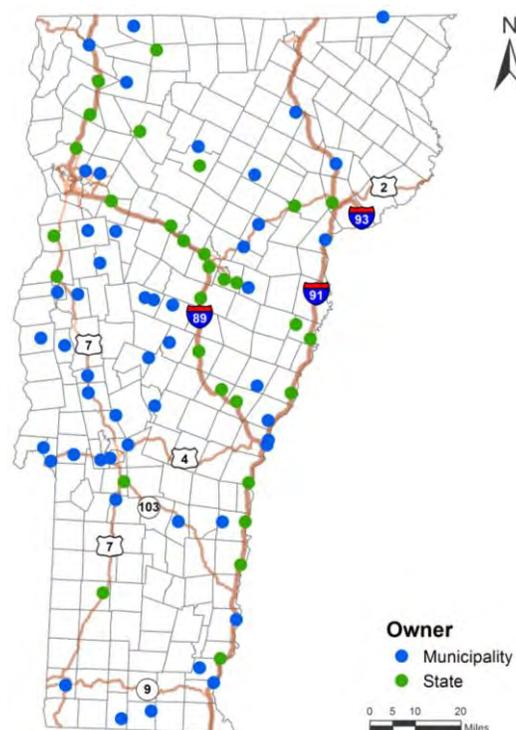
AMENITIES

P&R lot amenities, such as bus shelters, lighting, and sidewalks, improve comfort, safety, energy efficiency, and multi-modal connectivity. Some amenities are more common than others. Table 2 summarizes the presence of these amenities.

TABLE 2: P&R AMENITIES

		State N = 30	Municipal N = 49
Lighting	Yes	83%	65%
	No	17%	35%
Shelter	Yes	47%	18%
	No	53%	82%
Transit Access	Yes	80%	49%
	No	20%	51%
Bicycle Rack	Yes	57%	37%
	No	43%	63%
Sidewalk Access	Yes	17%	27%
	No	63%	65%
	Unknown	20%	8%

FIGURE 1: STATE-OWNED AND MUNICIPAL PARK AND RIDE LOCATIONS



There are currently no formal policies or rules of thumb about when to install amenities; designers usually specify them when appropriate, e.g. bus shelters where there is transit access. Sometimes towns will request a particular amenity even if it has not been specified.

Lighting contributes to the security of P&R lots and is found at the majority of the 79 lots. Almost half the State lots have shelters, and the majority are served by transit. Eight P&R (five State-owned and three Municipality-owned) have shelters but do not have transit service as shown in Table 3.

TABLE 3: P&R WITH A BUS SHELTER BUT NO TRANSIT ACCESS

State-Owned	Municipality-Owned
Barre Town (east)	Brattleboro
Charlotte	Castleton
Enosburg	Westminster
Putney	
St. Albans	

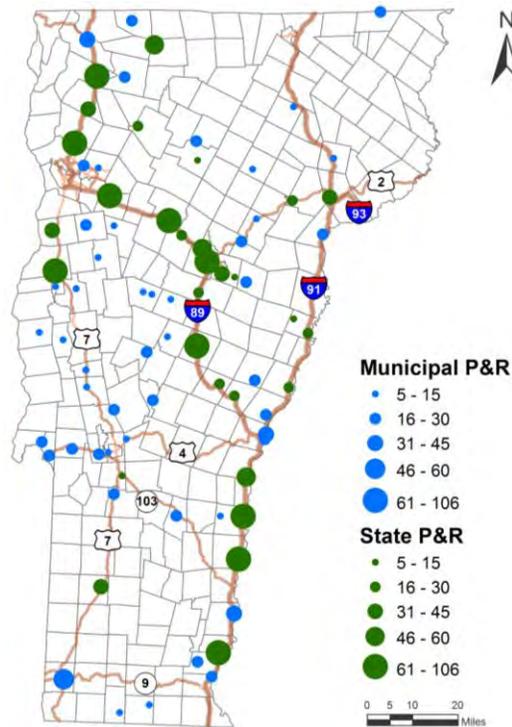
Currently, electric vehicle charging stations are only present at the Hartland and Putney lots, although there are plans to install Level 1 stations (basic outlets) at lots with light poles as part of new construction or expansion. This means that the Agency does not plan to retrofit lots for charging stations unless construction is already planned there. Level 2 charging stations will be considered on an individual basis depending on the characteristics and location of the P&R.

Forty-four percent (44%) of the 79 lots contain bicycle racks, and all of the lots examined for ADA compliance have bicycle access from the proximate road network. Only 23% of lots are known to have access to a sidewalk, in large part because P&R are typically not located near pedestrian facilities.

According to VTTrans officials, amenities provide benefits to P&R users, but they can also complicate maintenance activities. For example, shoveling sidewalks or repairing shelters and charging stations does not fall under established highway maintenance procedures; thus, being prepared for these and similar tasks may require additional VTTrans maintenance funds and staff. Currently, all maintenance funding, for roadways as well as P&R, comes from the same general fund line item.

There are multiple examples of issues that can arise due to “non-typical” P&R maintenance needs. In 2014 trash began to accumulate in the bus shelter at the Montpelier P&R, and it was unclear whether VTTrans or the transit agency was responsible for trash cleanup and removal. Typically, District staff do not regularly inspect P&R facilities nor do they typically remove trash. Similarly, the Districts do not have the staff or the equipment required to efficiently remove snow from sidewalks that are not flush with the pavement.

FIGURE 2: PARK AND RIDE CAPACITY



4.2 | SUPPLY AND DEMAND

CAPACITY

P&R capacity is shown in Figure 2. State-owned P&R lots range from 5 spaces (Corinth) to 106 spaces (Colchester), with an average of 47 spaces per lot. Municipal lots range from 5 spaces (Huntington) to 60 spaces (Bennington) with an average of 19 spaces per lot. Larger lots are typically owned by the State and found along the Interstates.

TRANSIT DEMAND

Vermont is served by the following 10 public transit providers:

- Advance Transit
- Addison County Transit Resources (ACTR)
- Chittenden County Transportation Authority (CCTA)
- The Current, a.k.a. Connecticut River Transit (CTR)
- The Moover, a.k.a. Deerfield Valley Transit Association (DVTA)

- Green Mountain Community Network, Inc. (GMCN)
- Green Mountain Transit Agency (GMTA)
- The Bus, a.k.a. Marble Valley Regional Transit District
- Rural Community Transportation (RTC)
- Stagecoach Transportation Services, Inc.

In addition, six commercial bus services operate in or near Vermont, including:

- Vermont Translines
- Greyhound
- Megabus
- Yankee Trails
- Dartmouth Coach
- Concord Coach Lines

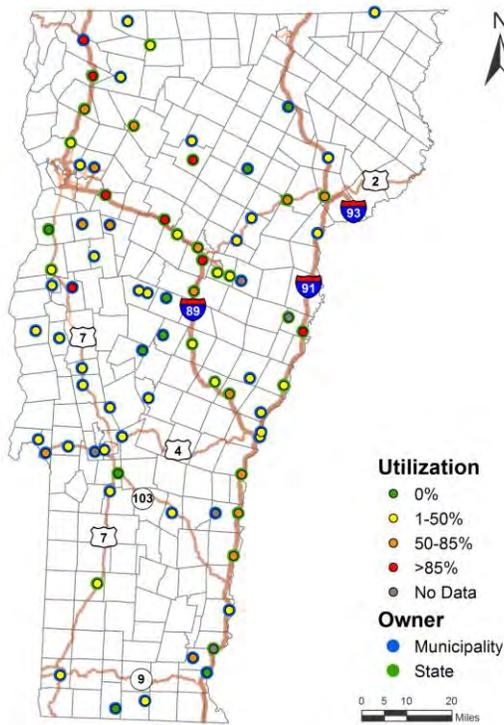
Map 4 (attached) shows the bus stops for which data is available and the P&R system. Data for Greyhound is not available and the other commercial services have few if any stops in Vermont. Transit stops and P&R locations overlap in many places, so these P&R can serve the transit stops there as well as carpoolers. In other places, bus stops are not present at P&R locations, and these lots are intended to serve carpoolers only.

AUTOMOBILE DEMAND

In addition to serving transit, carpoolers often use P&R lots as a meeting point. In light of this consideration, we have examined various factors that promote carpool demand in the attached maps. P&R locations overlay the following data:

- **Population Density** (Map 5) based on the 2010 Census

FIGURE 3: PARK AND RIDE UTILIZATION RATES



- **Employment Hot Spots** (Map 6) based on 911 address locations, the heat map shows the number of employment within two miles
- **Average Annual Daily Traffic (AADT)** (Map 7) based on VTtrans data
- **Major Commuter Corridors** (Map 8) as determined by the Regional Planning Commissions

The goal of this analysis is to determine the location of high P&R demand. This analysis is complicated by regional factors, so a large AADT in one region may be considered a small AADT in another region. Focusing on transit stops would skew the analysis away from places not served by transit. The commuter corridors determination is qualitative data that brings local knowledge to this analysis. Examining all of these factors provides a well-rounded picture of automobile demand.

UTILIZATION

As shown in Figure 3, P&R lots in Vermont experience varying utilization rates, with some lots at or over capacity and others having significant unused spaces. Count data are based on counts conducted by the regional planning commissions between 2012 and 2014 as well as counts from the ADA Compliance Study. The maximum count of these sources was used to calculate the utilization rate. Note that eight of the 79 lots (see Table 4) are over 85% utilization.

When expanding an overcapacity lot, VTtrans will sometimes first expand with a gravel lot. If the temporary gravel lot is utilized, they will then pave it and make it permanent. This method allows them to gauge the demand for an expanded lot. To date, every lot that has been tested with gravel has been permanently expanded.

TABLE 4: P&R LOTS OVER 75% UTILIZATION

Location	Utilization	Capacity	Owner
Georgia	76%	42	State
Huntington	80%	5	Municipal
Fair Haven	83%	30	Municipal
Swanton Village	88%	42	Municipal
St. Albans	94%	84	State

Waterbury	94%	69	State
Berlin	100%	81	State
Morrisville	100%	6	State
New Haven	100%	9	Municipal
Bradford	114%	65	State
Richmond	142%*	21	State

* Based on capacity and usage data collected before Richmond expansion. The Richmond lot is known to currently be over capacity.

4.3 | GAP ANALYSIS

Most population centers are served by a P&R either within the population center or nearby. The major exception is Newport in the Northeast Kingdom. Similarly, most employment hot spots have a park and ride in or nearby them. P&R are mostly found on the higher volume roads, with State P&R largely located on highways with greater than 10,000 vehicles per day. Municipal P&R serve roads with varying volumes and tend to be smaller than State P&R.

While most residents in most of the state have access to a nearby P&R lot, many are limited by lots that are at or over capacity. Building on the success of the P&R network will require expanding these lots and watching for other lots that are nearing capacity.

5.0 VTRANS PARK AND RIDE OPERATIONS

5.1 | HISTORICAL DEVELOPMENT OF PARK AND RIDES

The State's current P&R system has grown from a single trial lot to 30 State-owned P&R. VTrans observed that people were parking in set locations along State roads, so they decided to formalize the Park and Ride system. The first P&R facility was constructed in Richmond in 1991, and VTrans found that this lot was popular with the commuters. Since then, VTrans has continued to build P&R as funding allows and when there exists demand and a suitable site. The program has remained popular with the public and has strong support across VTrans.

VTrans has generally relied on several sources of information when deciding where to locate P&Rs. These include VTrans District Staff observations, input from the public, RPC plans and analyses, and availability of land. For example, District staff may observe groups of cars parked regularly at a certain roadside location, and will recommend that VTrans consider siting a P&R at that location. In addition, members of the public may engage the VTrans P&R contact person suggesting a new or expanded lot. Finally, RPCs and municipalities may also suggest locations, or they can apply for State funding to build their own. When deciding where to locate new lots, a geographic database of constraints such as ROW, floodplains, and zoning would be helpful.

5.2 | STAFFING AND WORKFLOW

There is no official P&R program within VTrans such as exists for Public Transit or Traffic Research. Instead, staff and bureaus share a variety of P&R responsibilities. One staff member in the Municipal Assistance Bureau (MAB) is the principal P&R contact person and performs the bulk of the day-to-day work. Other staff in other offices coordinate with public transit and track P&R projects. The Asset Management and Performance Bureau is currently investigating how to prioritize VTrans projects, including P&R.

MAINTENANCE AND OPERATIONS

The Maintenance Operations Bureau (MOB) is responsible for maintaining the state-owned lots. MOB staff have recently been involved in the design of new lots to advise on maintenance best practices and ensure that future P&R will not present maintenance challenges. MOB has developed the following best practices:

- Use short growing grass to reduce the frequency of mowing
- Install sidewalks flush with pavement to ease plowing
- District supervisors use pickup trucks equipped with plows to plow lots so they can maneuver around parked vehicles and tight spaces

The same staff that maintain State-owned highways maintain State-owned P&R; crews are responsible for P&R that reside in their District. Some P&R maintenance tasks, such as fixing pavement and potholes, line striping, and signage are similar to typical road maintenance tasks. Others require different equipment and a different focus.

For plowing and salting, VTrans maintenance crews are currently outfitted primarily to maintain highway facilities, so their equipment can be ill suited for maintenance of P&R lots. For example, VTrans staff have described their snowplows as “big and bigger;” they are designed to clear at least 14 feet of road width, or more if the plow has wings. It is difficult to back up with these plows, so operating within a parking lot usually requires a second person. These plows are unable to navigate small spaces or between parked vehicles in P&R lots. Currently, District managers have pickup trucks outfitted with standard sized snowplows to plow the lots. This arrangement requires managers to be at P&R during the aftermath of a snowstorm rather than on the roads. The Middlesex supervisor has three lots to plow, so that is a significant amount of time that he is not out supervising highway plowing. Similarly, salting cannot be accomplished with standard highway equipment.

Clearing sidewalks can also pose a problem. Sidewalks flush with pavement can be plowed with along with the pavement, provided no parked vehicles are in the way. Sidewalks that the plow cannot reach, due to curbing or a parked vehicle, requires additional equipment or requires district staff to shovel by hand. MOB currently does not have adequate staff to clear the highways and shovel sidewalks after a large storm.

Maintenance staff also do not have a performance standard for snow removal on sidewalks or parking aisles. The Americans With Disabilities Act requires that sidewalks and handicap

accessible spaces be accessible, but there is not a formal standard regarding how soon one must plow after a snow storm or how much snow may accumulate before snow removal is required.

Landscaping requirements for highways and P&R are also different. Highways are typically mowed once or twice each year and may simply be bush hogged. P&R are maintained to look like a lawn, which requires lawn care equipment and up to weekly mowing. Other examples of tasks that differ between P&R and highways include litter pickup, bus shelter repair, light bulbs replacement, and vandalism removal.

To save money, VTrans uses inmate labor when possible, but the fixed locations of correctional facilities and the uncertain availability of inmate labor means this option is not always feasible. MOB will hire contractors to perform some maintenance tasks when District staff or inmate labor is not available; contractor labor is significantly more expensive than District or inmate labor.

Further, maintaining landscaping and amenities such as flowerbeds and bus shelters are duties associated with P&Rs but not highways. These atypical tasks either require special trips and non-standard equipment or they require VTrans to hire outside contractors. The former can be difficult to accommodate and time-consuming while the latter can be expensive. Because the Districts must prioritize competing needs to optimize their use of limited resources, the requirements of highway maintenance will often supersede “non-essential” P&R maintenance tasks such as landscape maintenance.

PROJECT DEVELOPMENT

Because VTrans has historically spread P&R responsibilities across units and staff rather than assigning a dedicated program manager, the operations may not be as efficient as it could be under a more centralized arrangement. Over time, the operations have become more complex. Agency staff estimate that the time devoted to P&R-related issues totals about two full-time equivalent employees, not including maintenance of existing lots or project design.

Every P&R project is required to go through the normal VTrans project process including Scoping, Design, Right-of-Way, and Construction. In Chittenden County, the CCRPC has helped with scoping when staff are available, but typically VTrans staff have led the scoping process. P&Rs must also meet the zoning and public hearing requirements for their respective municipalities during the design review process, and some towns have more onerous processes than others. In some cases, town requirements for layout or landscaping have presented a challenge for VTrans maintenance staff.

5.3 | COSTS AND FUNDING

INITIAL CAPITAL COSTS

The capital cost of a new P&R lot depends significantly on the location of the lot. VTrans tries to site lots in locations that are convenient for the construction process as well as for the eventual users of the lot, but each site does have its own challenges. For example, the Chittenden County Park-and-Ride & Intercept Facility Plan (2011), found that state-owned P&R lots cost between \$9,000 and \$15,000 per space to build with an average of \$11,500 per space⁶. Municipal lots had an average cost of \$4,000 per space⁷. Neither of these cost figures, however, include the cost of purchasing the land, which is also variable. In some cases, the State or municipality may own the land. The average land cost was about \$2,000 per space, but in one case (Waterbury) land acquisition was projected to cost over \$3,000 per space.

Since 2000, VTrans has built three new P&R, descriptions of which are in Table 5. The average cost is about \$10,000 per space; however, given the wide range of costs and the low number of projects, this cost figure should be considered as an order of magnitude estimate.

TABLE 5: CAPITAL COSTS OF STATE OWNED PARK AND RIDES CONSTRUCTED AFTER 2000

Location	Year Completed	Spaces	Cost (C+CE)	Cost (C*)	Cost (CE**)	Cost per Space
Enosburg	2014	59	\$380,721	\$318,624	\$62,097	\$6,453
Ferrisburgh-Vergennes	2009	77	\$1,141,304	\$993,793	\$147,411	\$14,822
Colchester	2003	106	\$922,330	\$795,167	\$180,925	\$8,701

* C = Construction Cost

** CE = Construction Engineering Cost

VTrans also reconstructed three P&R since 2010, descriptions of which are in Table 6. The average cost for these projects was about \$6,200 per space.

TABLE 6: CAPITAL COSTS OF STATE OWNED PARK AND RIDES RECONSTRUCTED AFTER 2009

Location	Year Completed	Spaces	Cost (C+CE)	Cost (C*)	Cost (CE**)	Cost per Space
Waterbury	2012	69	\$327,070	\$277,254	\$49,816	\$4,740.15
Weathersfield	2010	63	\$382,924	\$297,323	\$85,601	\$6,078.16
Hartland	2014	55	\$429,336	\$330,738	\$98,598	\$7,806.09

* C = Construction Cost

** CE = Construction Engineering Cost

Parking spaces were also added to the Richmond and St. Albans lots at a cost of about \$20,000 per space and \$13,000 per space, respectively (see Table 7). A retaining wall and bus accommodations increased the per space costs of the Richmond project.

⁶ 2010 VTrans Capital Program.

⁷ Based on actual and estimated costs of P&R projects.

TABLE 7: CAPITAL COSTS OF ADDING SPACES TO STATE OWNED PARK AND RIDES

Location	Year Completed	New Spaces	Cost (C+CE)	Cost (C*)	Cost (CE**)	Cost per Space
Richmond	2014	53	\$1,073,867	\$865,637	\$208,230	\$20,262
St. Albans	2007	24	\$306,093	\$276,294	\$29,799	\$12,754

* C = Construction Cost

** CE = Construction Engineering Cost

For planning purposes, it can be assumed that a new lot will cost between \$5,000 and \$15,000 per space, not including the cost of land acquisition. This range can be narrowed once a specific site and draft layout are developed for a proposed lot. It appears that adding spaces to an existing lot may be more expensive per space than new construction, but there is not enough data to draw reliable conclusions at this time. The added expenses of the Richmond project are an example of how total costs can fluctuate widely by project.

MAINTENANCE AND OPERATING (MO) COSTS

According to VTrans Maintenance and Operations Bureau (MOB) officials, maintaining a P&R lot costs an estimated \$25,000 to \$50,000 per year, although the exact amount is not currently tracked. The actual amount will vary greatly depending on the characteristics of a particular location and proximity to District garages. This cost figure assumes all work will be performed by VTrans staff or inmates and does not include hiring contractors. Some VTrans officials have suggested that maintenance costs and operating costs be tracked separately. This method of accounting would make it easier to understand funding needs and may make some line items eligible for funds that cannot be used on the combination of maintenance and operations.

There are a number of complications associated with determining maintenance costs. It can be difficult to discern a definitive demarcation between “typical” highway maintenance and P&R lot maintenance. Weather related costs such as plowing and salting vary from year to year. The cost and availability of contractors and inmate labor is variable. Further, because each P&R site is configured differently, maintenance costs that are driven by physical layout characteristics can vary greatly. This means that a unit cost of maintenance per space cannot be applied across the board.

FUNDING MECHANISMS

VTrans has historically used federal Congestion Mitigation and Air Quality Improvement (CMAQ) program funds to pay for the development of state-owned P&R lots. VTrans spends \$2-\$3 million annually for design, ROW acquisition, and construction of P&R lots. To date, the CMAQ funding has been adequate for P&R needs, and projects have not been delayed due to lack of funding.

MO costs are currently funded from the State Transportation Fund under the same line items as highway maintenance and operations. VTrans has tried to use CMAQ funds for operations expenses in the past and that was not acceptable to FHWA. There has been

consideration of moving P&R MO funding to a different bureau such as MAB or tracking P&R costs separately within MOB. The advantage of keeping funds within MOB is that fund can be transferred more easily between highway and P&R expenses if need be.

VTrans also maintains a grant program for P&R development to which municipalities can apply. The VTrans budget allocates about \$250,000 annually from the State Transportation Fund to finance this program, and this funding is available at the discretion of the Legislature. The program helps municipalities develop their own P&R lots. Among the benefits of this program is facilitating development of P&R lots that help remove congestion from state highways while not adding to VTrans' maintenance burden.



STATEWIDE PARK-AND-RIDE FACILITIES PLAN
TECHNICAL MEMORANDUM #2

FUTURE SCENARIO ASSESSMENT



STATEWIDE PARK-AND-RIDE FACILITIES PLAN

PREPARED FOR:
VERMONT AGENCY OF TRANSPORTATION



CONTENTS

1.0	INTRODUCTION.....	2-1
2.0	PEER AGENCY REVIEW.....	2-2
2.1	Methodology	2-2
2.2	Maine	2-3
	Program Profile.....	2-3
	Program Financing.....	2-4
	Project Prioritization.....	2-4
2.3	Michigan	2-5
	Program Profile.....	2-5
	Program Financing.....	2-6
	Project Prioritization.....	2-7
2.4	Minnesota	2-8
	Program Profile.....	2-8
	Program Financing.....	2-9
	Project Prioritization.....	2-9
2.5	New Mexico	2-11
	Program Profile.....	2-11
	Program Financing.....	2-12
	Project Prioritization.....	2-13
2.6	Featured Best Practices	2-13
3.0	FUTURE FACILITY NEEDS.....	2-16
3.1	Future Statewide Needs	2-16
	Design features and Improvements.....	2-Error! Bookmark not defined.
	Current and Future Capacity Needs.....	2-22
3.2	Current and Future Capacity Requirements	2-26
	Increasing Capacity	2-27
3.3	Cost of Increased Capacity	2-32
	Maintain Existing Lots Scenario	2-32



Simplified Analysis	2-32
Year-By-Year Analysis	2-33
3.4 Ongoing Monitoring	2-34
4.0 PARK & RIDE FINANCING STRATEGIES	2-35
4.1 Review of Historic Park-and-Ride Funding	2-35
4.2 Financing Sources, Best Practices, & Innovation	2-36
Federal	2-37
State	2-41
Local	2-42
4.3 Future Federal and State Funding	2-45
5.0 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS	2-47

LIST OF FIGURES

FIGURE 1: PARK-AND-RIDE PLANNING METHODOLOGY	2-10
FIGURE 2: OVER-UTILIZED PARK-AND-RIDE LOTS	2-24
FIGURE 3: AREAS OF VERMONT NOT SERVED BY A PARK-AND-RIDE LOT.....	2-25
FIGURE 4: OVERCAPACITY PARK-AND-RIDE LOCATIONS AND THE ROAD NETWORKS THEY SERVE	2-28
FIGURE 5: LOCATIONS IDENTIFIED IN THE REGIONAL NEEDS ASSESSMENTS AND LOCATED WITHIN 10 MILES OF AN OVER-CAPACITY PARK-AND-RIDE.....	2-29
FIGURE 7: RPC NEEDS ASSESSMENTS AND NEW PARK-AND-RIDE LOCATIONS	2-30
FIGURE 8: CURRENT VTRANS PRIMARY PARK-AND-RIDE FUNDING SOURCES	2-36
FIGURE 9: POTENTIAL FEDERAL FUNDING SOURCES.....	2-40
FIGURE 10: POTENTIAL STATE FUNDING SOURCES	2-42
FIGURE 11: POTENTIAL LOCAL FUNDING SOURCES	2-45

LIST OF TABLES

TABLE 1: 2012 SUMMARY OF MAINE DOT PARK-AND-RIDE FACILITIES	2-3
TABLE 2: 2014 SUMMARY OF MDOT PARK-AND-RIDE FACILITIES.....	2-5
TABLE 3: SUMMARY OF MNDOT PARK-AND-RIDE FACILITIES,.....	2-8
TABLE 4: SUMMARY OF NMDOT PARK-AND-RIDE FACILITIES.....	2-11
TABLE 5: SUMMARY OF PARK-AND-RIDE PRACTICES BY DOT	2-13
TABLE 6: PARK-AND-RIDE WITHOUT LIGHTING.....	2-18
TABLE 7: CAPACITY AND UTILIZATION OF STATE PARK-AND-RIDE LOTS WITHOUT LIGHTING.....	2-18
TABLE 8: PARK-AND-RIDE LOTS WITH TRANSIT ACCESS AND NO SHELTER.....	2-19
TABLE 9: PARK-AND-RIDE WITH SHELTER AND NO TRANSIT ACCESS	2-19
TABLE 10: CAPACITY AND UTILIZATION OF STATE PARK-AND-RIDE WITH TRANSIT ACCESS AND NO SHELTER.....	2-20
TABLE 11: PARK-AND-RIDE WITH GRAVEL SURFACES (*CONSTRUCTION PLANNED AT THIS LOCATION)	2-21
TABLE 12: UTILIZATION VERSUS TRANSIT ACCESS	2-24
TABLE 13: ADDITIONAL SPACES AT OVER-CAPACITY LOTS	2-26
TABLE 14: PARK-AND-RIDE LOT SIZES.....	2-31
TABLE 15: DRAFT PRIORITIZATION SCHEME	2-32

TABLE 16: ANNUAL AND CUMULATIVE COSTS (CAPITAL AND MAINTENANCE) OVER THREE SCENARIOS 2-33
TABLE 17: FEDERAL, STATE, AND LOCAL FINANCING SOURCES 2-37
TABLE 18: PARK-AND-RIDE PROGRAM GROWTH SCENARIO COSTS 2-46



1.0 INTRODUCTION

This report documents three efforts to guide future investment scenarios in the Vermont Agency of Transportation (VTTrans) Park-and-Ride program.

First, this report provides a scan of Statewide park-and-ride facility plans from four other states and summarizes key information and findings from this assessment. In particular, this review identifies innovative approaches to operating, financing, and prioritizing park-and-ride facilities and expansions.

Second, the report identifies funding strategies currently employed by VTTrans to support capital investment and maintenance for the statewide park-and-ride program. This section then identifies potential resources for future funding strategies based on a review of federal, state, and local financing opportunities available. This includes an assessment of four potential future park-and-ride facility scenarios that match facility needs with the funding scenarios, including identification of maintenance and operational costs, including:

- Maintain existing (i.e. no new capacity)
- Focus on expanding existing facilities
- Focus on constructing new facilities
- Blended approach (focus on highest ranking new and expanded facilities)

In conclusion, the report identifies future facility needs including the improvement of existing lots, expansion of existing lots, and development of new lots. The park-and-ride ranking system evaluates specific, objective criteria for park-and-ride lot construction and expansion, ensuring decisions are made taking both costs and benefits into account.¹

¹ It is important to note that all referenced facility count of other quantitative data is in reference to July 2014 counts.

2.0 PEER AGENCY REVIEW

This section summarizes the review of statewide park-and-ride facility plans in Maine, Michigan, Minnesota, and New Mexico. The report details key information and findings from this assessment, particularly innovative approaches to prioritizing and financing park-and-ride facility expansions, as they relate to Vermont and its statewide park-and-ride program. The report will cover the following topics:

- **Methodology**, featuring a summary of the methodology used to identify the specific states for review and the research conducted for each state.
- **Statewide Park-and-Ride Programs**: including a park-and-ride program profile, as well as project prioritization practices and program financing strategies employed in
 - **Maine,**
 - **Michigan,**
 - **Minnesota,** and
 - **New Mexico.**
- **Featured Best Practices**, highlighting the most feasibly applicable strategies to the Vermont park-and-ride program to help in enhancing both the park-and-ride facilities and services in the state.

2.1 | METHODOLOGY

Agencies for consideration in the peer review were selected through the review of existing literature of park-and-ride best practices throughout the US. Only agencies with statewide programs were considered as these practices would best correspond with VTTrans' intentions for their statewide program.

The two major resources references were (1) the National Cooperative Highway Research Program Report 359 (NCHRP 359), which included a review of "Models to Support State-Owned Park and Ride Lots and Intermodal Facilities," and (2) the Virginia Department of Transportation's "Statewide Park and Ride Program Best Practices Guide." Using these reports and other materials, state programs were assessed based on their unique practices with regard to park-and-ride facility development and management.

The shortlist developed using these materials included a variety of states including West Virginia, Alabama, New Hampshire, Minnesota, Michigan, Massachusetts, New Mexico, Maine, and Delaware. From these states, the following four were selected based on their population concentrations and/or climate and geographic similarities: Maine, Michigan, Minnesota, and New Mexico.

2.2 | MAINE

PROGRAM PROFILE

The Maine Department of Transportation (Maine DOT) has a robust park-and-ride program that offers free parking at designated facilities across the State. Maine DOT in partnership with the Maine Turnpike Authority initiated the program in 1988, which has grown to include over 2,400 parking spaces across 41 lots.²

Facilities

Table 1 summarizes the basic statistics associated with the Maine DOT Park-and-Ride Program.

TABLE 1: 2012 SUMMARY OF MAINE DOT PARK-AND-RIDE FACILITIES³

Park-and-Ride Program Characteristics	
Number of Parking Spaces	2,400
State-Owned Lots	29
Maine Turnpike Authority-Owned Lots	12
Private Interest-Owned Lots	9
Total Lots	41
Average Lot Occupancy	51%

Fixed-bus route service is present at over 35 percent of the park-and-ride lots, while over 20 percent of the park-and-ride lots are located on lots that also serve retail or commercial services. About five percent of lots provide specific parking facilities for bicycles.

Operations and Maintenance

Maine DOT conducts biannual assessments of the designated park-and-ride lots to identify needs for maintenance or facility development, as well as to maintain a record of lot characteristics. Maine DOT supports a website that identified park-and-ride facilities on an interactive map of the State. This map is available to the public to promote awareness and usage of the lots. The database maintained by Maine DOT includes the following characteristics for each park-and-ride facility: location, town, owner (public or private), capacity, handicap spots, services, bike racks (yes or no), lighting (yes or no), phone (yes or no), and shelter/bench (yes or no).⁴

Various Maine DOT staff members are involved in the management of the park-and-ride lots including personnel from the Planning, Legal, and Finance Divisions. The representative from Planning deals primarily with policy development. The representative from the Legal Division handles the shared-use leases involved with the commercial lot sites, while the staff

² http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_359.pdf 7.

³ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_359.pdf 7.

⁴ <http://www.exploremaine.org/commuters/parknride/>

member from the Finance Division manages Federal grants applied to the Park-and-Ride Program.

Maine DOT, Maine Turnpike Authority, and private lot owners hold quarterly meetings to review the program and identify areas for improvement to encourage park-and-ride lot usage. Shared-use lot participants from the private sector generally include municipalities, venues of worship, and businesses. In addition to working with other park-and-ride management entities, Maine DOT meets with local jurisdictions and regional planning agencies to gather information about local park-and-ride usage and needs.⁵

PROGRAM FINANCING

The Maine DOT identified funding as a setback to the park-and-ride program. Specifically, the State's facilities lack shelters and signage, which are helpful mechanisms in encouraging lot usage. Additionally, the resources to provide outreach and education to both commuters and employers are limited.

Funds from the Congestion Mitigation and Air Quality (CMAQ) Improvement Program are also critical to the development and maintenance of Maine park-and-ride lots, given biannual grants of about \$1.2 million. Maine DOT must provide a 20 percent match to CMAQ funds, which is obtained via state highway funds, state bonds, or regional agency financial support.⁶

To develop new or expand existing park-and-ride lots, Maine DOT seeks to identify projects within State-owned right-of-way on which commuter facilities would be beneficial to the overall transportation system. Maine DOT less often acquires new land for park-and-ride facilities due to the often-high costs associated with land acquisition.

The program's current success has been due in large part to the realization of partnerships between Maine DOT and private businesses throughout the State. Maine DOT collaborates with members of the private sector to identify and develop new park-and-ride facilities. This can occur through the traffic permit process through which Maine DOT arranges an agreement with a developer to allow park-and-ride spaces in a development in return for impact fee exemption. Collaboration with the private sector may also occur through general negotiation between Maine DOT and private businesses or landowners where private entities grant public use park-and-ride spaces in return for other improvements or compensation from Maine DOT.⁷

PROJECT PRIORITIZATION

When interviewed for the NCHRP 359 report, the manager of the Maine DOT Park-and-Ride Program identified the following six goals for the program:

- Increase the number of park-and-ride users;
- Decrease vehicle miles traveled Statewide;

⁵ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_359.pdf 7.

⁶ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_359.pdf 8.

⁷ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_359.pdf 7.

- Reduce air pollution;
- Offer viable alternatives to single occupancy vehicle travel;
- Develop private-public partnerships; and
- Encourage efficient land use patterns.⁸

Maine DOT typically selects and develops its park-and-ride facilities based on their ability to address these goals and encourage usage of the designated park-and-ride facilities.

Furthermore, Maine DOT uses the following four categories to prioritize projects: (1) project cost given funds available, (2) site proximity to major roadways, (3) anticipated usage, and (4) connectivity to other modes, such as fixed-bus routes.

Regional planning agencies may also suggest park-and-ride projects through their regional plans. If Maine DOT approves of the projects and has the necessary funding available, the projects are included in the Statewide Transportation Improvement Plan (STIP).⁹

2.3 | MICHIGAN

PROGRAM PROFILE

The Michigan DOT (MDOT) Carpooling Lot Program started with an 11-lot pilot program in 1974 in an attempt to make carpooling accessible and safe for commuters. The program offers both free and overnight parking. There are currently 238 carpool parking lots in Michigan, consisting of about 9,800 parking spaces. MDOT administers the State’s park-and-ride program with the assistance of a ridesharing service. MDOT works with employers and other private entities through public-private partnerships to support the park-and-ride program.

Facilities

Table 2 summarizes the basic statistics associated with the Maine DOT Park-and-Ride Program.

TABLE 2: 2014 SUMMARY OF MDOT PARK-AND-RIDE FACILITIES¹⁰

Park-and-Ride Program Characteristics	
Number of Parking Spaces	9,800
Total Lots	238
Average Occupancy	36%

Most lots in the program support local and regional carpooling, while about 10 percent of lots feed transit routes. Transit-serving lots are primarily located in suburban Ann Arbor, Flint, and Detroit.

⁸ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_359.pdf 7.

⁹ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_359.pdf 8.

¹⁰ http://www.michigan.gov/mdot/0,4616,7-151-9615_11228_11234-22209--,00.html

Operations and Maintenance

Personnel in asset management and project planning in MDOT's Transportation Planning Division manage the statewide park-and-ride program. The Roads and Travel Division includes personnel associated with the ridesharing program. These divisions must coordinate to ensure adequate placement of park-and-ride lots in consideration of local transit service and rideshare opportunities.¹¹

Local Rideshare Offices (LROs) which provide carpool and vanpool matching services support the program, covering a significant portion of the State, including the northern peninsula.

In addition, MDOT works with VPSI, a vanpooling business, which organizes commuter matching for vanpools that use the MDOT lots extensively.¹²

MDOT conducts annual surveys of its park-and-ride facilities by having service and maintenance personnel assess each lot as they perform other routine work in the region. The assessments include obtaining a count of vehicles, recording the condition of the pavement, and noting signage and lighting characteristics at the lot. MDOT staff report the counts and conditions in a State-maintained asset management database.

The asset management database informs the State's interactive website: "MiDrive," which includes a map of each of the park-and-ride lots in the MDOT system and lot descriptions for potential users. Details for each park-and-ride facility included on the website are: location by county, primary route (closest major road), local route (closest minor road), capacity, surface type (paved or gravel), entrance sign (yes or no), lighting (yes, no, or near), and directions to the site. This information is helpful in allowing users know what to anticipate with regard to their parking experience and may increase overall comfort with use of the facilities.¹³

PROGRAM FINANCING

Like most states, Michigan has a five-year program for capital projects. Park-and-ride lot projects are included in this rolling fund, as MDOT places a special template aside each year to fund park-and-ride capital projects. Investment for park-and-ride lots comes primarily from surface transportation funding. In recent years, MDOT funding has been lower than average, with \$1.2 million set aside per year for the park-and-ride program, which is allotted per regional office. Each office submits a list of prioritized projects of lists for their region, which MDOT further prioritizes at the state-level.

Because MDOT generally does not have the funding needed to purchase new property, the agency seeks to build new lots on existing right-of-way. Various fringe cities and towns throughout the State cannot afford to buy new lots and have no remaining right-of-way, but

¹¹ http://www.virginiadot.org/travel/resources/parkAndRide/Final_PR_Best_Practices_021113.pdf 13.

¹² Annelin Interview. October 6, 2014.

¹³ <http://mdotnetpublic.state.mi.us/drive/>

continue to exhibit demand for additional carpooling facilities. A lack of both funding and State-owned right-of-way, thus, was the impetus for public private partnerships.¹⁴

MDOT collaborated with Meijer supercenter stores in these areas to create additional outlets for carpoolers. For example, one Meijer stores allocated 50 spaces in their for park-and-ride use, which MDOT marked as potential park-and-ride spaces. In return, MDOT added signs for Meijer stores on adjacent highways directing drivers to the lots. Thirteen Meijer stores throughout the State allow spaces for members of the public to park their vehicle to join a carpool, vanpool, or public transit vehicle.¹⁵ In these partnerships, businesses appreciate the publicity and the drawing of potential customers to their parking lots. MDOT estimated that they saved at least \$200,000 in right-of-way alone per lot given the partnership opportunities.

Given the success of the partnership with Meijer's, MDOT extended the public-private park-and-ride concept to more rural parts of the State. While these areas are not populated enough to house a Meijer store, larger regional gas stations have taken advantage of the public-private partnership with MDOT.

MDOT also leases property from churches and other businesses that do not have high traffic during the week. These leases have been less successful than the public-private partnerships.¹⁶

PROJECT PRIORITIZATION

MDOT had two major goals in the development of the park-and-ride program: (1) demonstrate commitment to “the conservation of limited energy resources” and (2) “provide safe and convenient parking facilities for Michigan's carpoolers.”¹⁷

MDOT's current priority is to use the limited park-and-ride program money available to improve and maintain the existing lots, as well as seek out partnerships when there is need for a new facility. Park-and-ride lot condition has become part of the agency's asset management dashboard. The database maintains a log of the size, usage, pavement, lighting, and signage conditions, which renders MDOT aware of conditions at each site and thus enables the agency to be more accountable for preventing disrepair.

To prioritize lot maintenance projects, a MDOT staff member reviews park-and-ride maintenance recommendations provided by District alongside the database of existing conditions to create the Statewide list of recommended projects. MDOT recognizes that the practice of tracking assets of the park-and-ride program significantly improved the condition of the program Statewide.

When MDOT set aside money specifically for park-and-ride facilities in the five-year plan, local and regional agencies became more involved in park-and-ride planning and were motivated to create five-year plans that suggested projects. The overall condition of the lots went from 60 to 90 percent in state-of-good repair since the funding pool was established.

¹⁴ Annelin Interview. October 6, 2014.

¹⁵ http://www.michigan.gov/mdot/0,4616,7-151-9615_11228_11234-202122--,00.html

¹⁶ Annelin Interview. October 6, 2014.

¹⁷ http://www.michigan.gov/mdot/0,4616,7-151-9615_11228_11234-22206--,00.html

Most new lots introduced to the system rely on local MDOT offices as they have a better understanding of the commuting patterns in the region and they are aware of excess property.

2.4 | MINNESOTA

PROGRAM PROFILE

Minnesota DOT’s (MnDOT) Park-and-Ride Program involves significant collaboration with MPOs, regional development councils (RDCs), and local governments to create and maintain park-and-ride lots throughout the State. The Park-and-Ride Program includes over 82 lots and a commuter-matching program throughout Greater Minnesota.

Facilities

Table 3 summarizes the basic statistics associated with the MnDOT Park-and-Ride Program.

TABLE 3: SUMMARY OF MNDOT PARK-AND-RIDE FACILITIES^{18,19}

Park-and-Ride Program Characteristics	
Number of State-Owned Lot Parking Spaces	2,900
Total State-Owned Lots	80+
Average Occupancy at State-Owned Lots	N/A
Number of Locally-Operated (Twin Cities) Parking Spaces	28,900
Total Locally-Operated Lots (Twin Cities)	111
Average Occupancy at Locally-Operated Lots (Twin Cities)	62%

MnDOT’s Park-and-Ride Program provides coverage outside the Minneapolis/St. Paul region. Local transit agencies mainly service the metropolitan area.

MnDOT uses specific language to differentiate between parking facilities with and without access to transit. Parking facilities that include transit facilities are termed “Park-and-Rides,” while parking facilities intended for carpooling are termed “Park-and-Pool.”²⁰

Operations and Maintenance

Nine transit providers serve the Minneapolis/St. Paul (Twin Cities) metropolitan area, including Metro Transit, Minnesota Valley Transit Authority (MVTA), SouthWest Transit, Maple Grove Transit, Northstar Corridor Development Authority (NCDA), Plymouth Transit, Prior Lake Transit, Shakopee Area Transit, and the City of Ramsey Transit. MnDOT’s parking facilities include 28 Park-and-Pool facilities located in the Twin Cities area, which have an average utilization rate of 31 percent.²¹

¹⁸ <http://www.dot.state.mn.us/transit/riders/park.html#3>

¹⁹ <http://www.metrocouncil.org/getattachment/78e2f2b4-4cfe-4926-a4dc-178b016b09fd/.aspx> 5.

²⁰ <http://www.metrocouncil.org/getattachment/78e2f2b4-4cfe-4926-a4dc-178b016b09fd/.aspx> 5.

²¹ <http://www.metrocouncil.org/getattachment/78e2f2b4-4cfe-4926-a4dc-178b016b09fd/.aspx> 7.

Metro Transit works in conjunction with MnDOT in annual surveys of the Park-and-Ride and Park-and-Pool facilities in the Minneapolis/St. Paul Region. These surveys include vehicle counts and license plate details, which provide home-origin information. The information obtained through these survey efforts allows MnDOT and transit providers to better understand the factors affecting usage of the Park-and-Ride and Park-and-Pool lots. For example, the 2010 Park-and-Ride Survey Report linked rising fuel prices and declining employment to increasing lot usage.²²

PROGRAM FINANCING

The Minnesota STIP indicates the application of FTA Urbanized Area Formula Grants 5307 and CMAQ funding for park-and-ride projects. Transit-related parking lot projects also typically utilize motor vehicle sales tax and local funding sources.²³

PROJECT PRIORITIZATION

MnDOT locates park-and-ride facilities along “trunk highway corridors” to ensure accessibility to commuters. MnDOT collaborates with other State entities, regional planning agencies, RDCs, tribal governments, municipalities, and other local entities to identify areas for possible park-and-ride facilities, as well as transit route design and rideshare assistance. Individual districts are responsible for the development of Park-and-Ride and Park-and-Pool locations.

The process of Park-and-Ride or Park-and-Pool planning and prioritization vary by location throughout the State. District Three, for example, suggests the following “facility siting guidelines.”

- Identify Purpose and Need (assess demand for additional parking facilities and evaluate demographic and land use trends);
- Select location along a corridor that connects to a major regional activity center;
- Prioritize sites where that State owns public right-of-way;
- Locate facility conveniently for both motorized and non-motorized access; and
- Target facilities to address local area factors including land use, environment, and economic impacts.

District 3 allows many of its local jurisdictions to play the primary role in site selection because they have greater local knowledge about the four factors listed above.²⁴

Metro Transit provides a metropolitan approach to facility planning. The agency devised a three-phase planning methodology for the development of new park-and-ride facilities. Each phase includes several criteria for review and consideration by staff and local officials. The first phase involves the identification of project need and the ability of the project to integrate into its surrounding transportation system features. The second phase is a market area analysis. In this phase, Metro Transit assesses both existing conditions and estimated

²² <http://www.metrocouncil.org/getattachment/78c2f2b4-4cfe-4926-a4dc-178b016b09fd/.aspx>

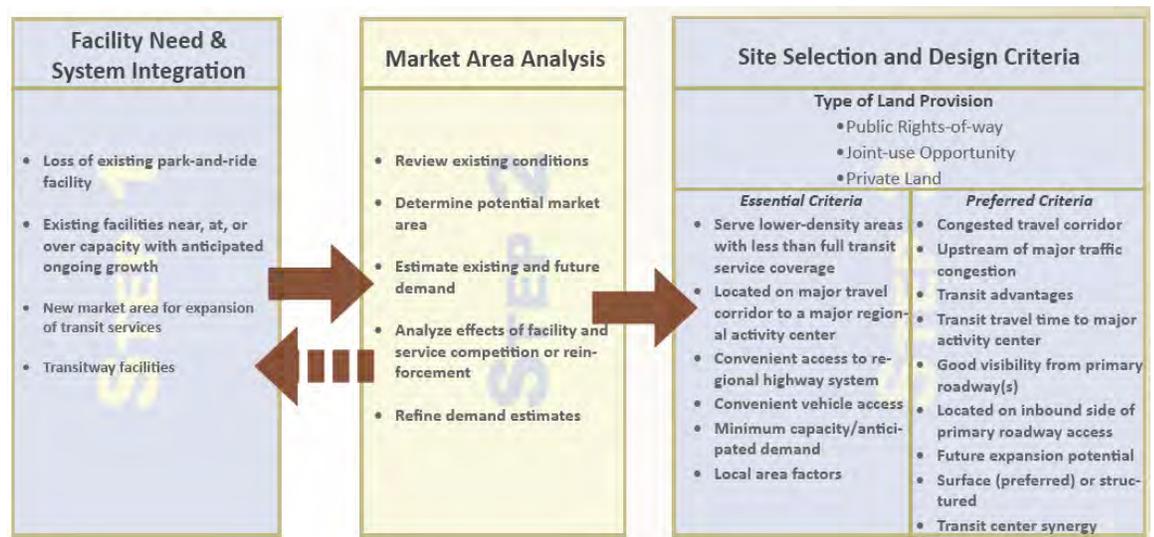
²³ <http://www.dot.state.mn.us/planning/program/pdf/STIP/2015-2018%20STIP%20FINAL.pdf> 67, 130.

²⁴ <http://www.dot.state.mn.us/d3/commuter/pgs/parknride.pdf>

future conditions, which involves the estimation of demand. Finally, site selection and design involves the identification of land provision and subsequent architecture of the site selected.

Figure 1 illustrates this process and the associated performance criteria associate with each phase.²⁵

FIGURE 1: PARK-AND-RIDE PLANNING METHODOLOGY²⁶



With regard to minimum capacity and anticipated demand for site selection and design criteria, MnDOT noted, “facilities should be sized to accommodate a minimum of three exclusive, peak-period, express bus trips. This translates to a need for at least 150 spaces, though specific sizes may depend on site factors and corridor service design. A small facility should not be located near a large facility, as increased service at the large facility will likely outcompete the smaller facility for nearby users.”²⁷

In phase two, Metro Transit employs a detailed demand estimation process to aid in the market analysis of park-and-ride facility-related projects in the Metropolitan area of the State. Metro Transit uses demand estimates to (1) identify lots for capacity increases and (2) identify areas that need new facilities.

A significant amount of data and resources are available around the metropolitan/regional-level, so the process is more complex and quantitative than that of a MnDOT District. The demand methodology employs a four-step process that includes:

- 1) Estimating 2008 Population by TAZ
 - a. Applies local population estimates.
- 2) Determining Downtown Commuters

²⁵ <http://www.metrocouncil.org/getattachment/449ce8a0-f6d1-4871-a517-7f87162aba08/.aspx>

²⁶ <http://www.metrocouncil.org/getattachment/449ce8a0-f6d1-4871-a517-7f87162aba08/.aspx> 77.

²⁷ <http://www.metrocouncil.org/METC/files/44/449ce8a0-f6d1-4871-a517-7f87162aba08.pdf> 84.

- a. Uses LEHD data to determine the share of the population commuting to downtown.
 - b. Calibrates LEHD commuter data to local employment forecast
 - c. Calibrates TAZ-level downtown workers to downtown employment totals.
- 3) Measuring and Applying Transit Park-and-Ride Mode Share
- a. Uses P&R origin survey data to determine users at the TAZ-level.
- 4) Distinguishing St. Paul and Minneapolis Park-and-Ride Demand
- a. Allocates trips to the two different downtowns using the number of bus trips to each downtown area by corridor to each TAZ.²⁸

Metro Transit also acknowledges that demand is reflective of the transit service provided, and that drivers will drive farther to access better transit service.²⁹ This demand estimation method works for Metro Transit because of their access to data; however, it is not a feasible methodology for application throughout the State.

In addition to seeking recommendations from regional and local entities, MnDOT also holds meetings with local stakeholders and members of the public to identify areas for park-and-ride facilities. For example, MnDOT conducted stakeholder interviews in the development of the 2010 Greater Minnesota Transit Plan. These interviews and meetings helped to illustrate needs for transit infrastructure including park-and-ride facilities from a regional viewpoint.³⁰

2.5 | NEW MEXICO

PROGRAM PROFILE

The New Mexico Department of Transportation’s (NMDOT) initiated its park-and-ride system in 2003. The system includes a variety of State and locally-owned parking lots. There are 24 lots in the system. Parking is free, but use of transit and shuttle services are fee-based. Lots may include lightning, shelters, benches, safety features, and other design features.³¹

Facilities

Table 4 summarizes the basic statistics associated with the NMDOT Park-and-Ride Program.

TABLE 4: SUMMARY OF NMDOT PARK-AND-RIDE FACILITIES³²

Park-and-Ride Program Characteristics	
Number of Parking Spaces	1,200
State-Owned Lots	10
Local Government-Owned Lots	10
Tribal-Owned Lots	1
Privately-Owned Lots	3

²⁸ <http://www.metrocouncil.org/getattachment/8ec4b148-8aa7-4a9b-8677-8cb229b36f3d/.aspx> 10-14.

²⁹ <http://www.metrocouncil.org/getattachment/8ec4b148-8aa7-4a9b-8677-8cb229b36f3d/.aspx> 22.

³⁰ http://www.dot.state.mn.us/transit/reports/transitplan/pdf/Gr_MN_Transit_Plan_03122010.pdf 2-3.

³¹ <http://dot.state.nm.us/content/dam/nmdot/ParkNRide/ParkandRideHistoryandFacts2013.pdf>

³² http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_359.pdf 8.

Total Lots	24
Average Lot Occupancy	40-50%

The NMDOT park-and-ride program is host to primarily traditional transit-oriented park-and-ride facilities. NMDOT allows carpoolers and vanpoolers to use lot facilities, only if capacity allows. There are eight bus routes and two shuttles that serve the lots in the State system. Shuttles provide a connection to New Mexico Rail Runner Express commuter trains, which provide access along the Belen-Albuquerque-Santa Fe corridor and to major employment centers.³³

Operations and Maintenance

The NMDOT Transit and Rail Division administers the Park and Ride Bus Service Program, using the equivalent of one full-time and one part-time staff member. While ten of the lots are State-owned, NMDOT works with local governments, tribal governments, and private businesses to lease land for park-and-ride operation. Each of these organizations assist NMDOT in the development, operations, and maintenance of the Park-and-Ride Program.³⁴

NMDOT also provides bus and weekday shuttle service. Shuttle service is free to riders who purchase related monthly transit/parking passes. Otherwise, shuttle service is \$1.00. When parking facilities are underutilized, the NMDOT Transit and Rail Division incentivizes the lot to the public by offering free bus services to and from that lot for one week to stimulate ridership.³⁵

PROGRAM FINANCING

NMDOT reports that funding is currently limited for the statewide park-and-ride program. NMDOT contributes about \$5.7 million per year to support transit that serves the park-and-ride lots. Section 5311(f), Rural Intercity Bus Funds, contribute an additional \$300,000 to these transit facilities. The NMDOT Transit and Rail Division manages all federal transit grants awarded in the State, as the agency is the FTA-designated recipient of these funds. The Albuquerque metropolitan area is the exception to this protocol. Other sources include advertising revenue, passenger fares, and contributions from the County of El Paso, Texas.

NMDOT management noted difficulty in acquiring property for additional lots, which could assist in augmenting the system’s current capacity. NMDOT currently pays \$750 per month to utilize the three private lots in the system. The agency does not utilize public private partnerships for these lots.³⁶

³³ http://dot.state.nm.us/en/Park_and_Ride.html

³⁴ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_359.pdf 8.

³⁵ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_359.pdf 9.

³⁶ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_359.pdf 9.

PROJECT PRIORITIZATION

NMDOT management identified lot occupancy, utilization, security, and safety as paramount elements in the success of the program.³⁷ On the other hand, NMDOT reports the reduction of annual trips, vehicle miles traveled, and carbon dioxide emissions per year as a result of the park-and-ride program, illustrating the program’s commitment to both supporting the environment and alleviating congestion on local roads.³⁸

A representative from NMDOT notes that there is currently no prioritization process in place to improve lots because there are only 24 lots in the system. The agency tracks stops and lots based on their ability to meet or not meet ADA requirements.³⁹

2.6 | FEATURED BEST PRACTICES

Maine, Michigan, Minnesota, and New Mexico exhibited various best practices with regard to the development of park-and-ride facilities. These agencies illustrated a variety of operational, financial, and planning practices, for both transit park-and-ride programs and ridesharing programs. Table 5 summarizes the findings in the peer review.

TABLE 5: SUMMARY OF PARK-AND-RIDE PRACTICES BY DOT

DOT	Facilities	O&M	Financing	Prioritization
Maine	<ul style="list-style-type: none"> ◆ 41 Lots ◆ 2,400 Spaces 	<ul style="list-style-type: none"> ◆ Coordination with Local Jurisdictions ◆ Quarterly Meetings with Stakeholders ◆ Shared-use lots ◆ Biannual surveys ◆ Interactive Online Map/Database 	<ul style="list-style-type: none"> ◆ CMAQ Funds ◆ Public-Private Partnerships ◆ Local Funding Sources ◆ State Funding Set Asides 	<ul style="list-style-type: none"> ◆ Four Criteria ◆ Regional/Local Recommendations
Michigan	<ul style="list-style-type: none"> ◆ 238 Lots ◆ 9,750 Spaces 	<ul style="list-style-type: none"> ◆ Coordination with LROs and Rideshare Companies ◆ Annual surveys ◆ Interactive Online Map/Database 	<ul style="list-style-type: none"> ◆ Public-Private Partnerships ◆ Local Funding Sources ◆ 5307 Formula ◆ State Funding Set Asides 	<ul style="list-style-type: none"> ◆ Use of Database ◆ Regional/Local Recommendations
Minnesota	<ul style="list-style-type: none"> ◆ 80+ Lots ◆ 2,850 Spaces ◆ 111 Lots ◆ 28,900 Spaces 	<ul style="list-style-type: none"> ◆ Annual surveys in Metro Area ◆ Support from Transit Agencies 	<ul style="list-style-type: none"> ◆ CMAQ Funds ◆ Local Funding Sources ◆ 5307 Formula ◆ Other State Transportation Revenue ◆ State Funding Set Asides 	<ul style="list-style-type: none"> ◆ Facility Siting Guidelines (District) ◆ Technical Methodology (Metro) ◆ Regional/Local Recommendations

³⁷ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_359.pdf 9.

³⁸ <http://dot.state.nm.us/content/dam/nmdot/ParkNRide/ParkandRideHistoryandFacts2013.pdf>

³⁹ Email nmparkandride@state.nm.us October 7, 2014.

New Mexico	◆ 24 Lots	◆ Support from Transit Agencies	◆ 5311(f) Funds	◆ No Prioritization Process
	◆ 1,200 Spaces		◆ Local Funding Sources	◆ Assess Impacts of Program Overtime
			◆ State Funding Set Asides	

Maine DOT exhibits strong interagency coordination at the State, regional, and local level. The agency works to include local stakeholders in the planning process given their inherent ground-level knowledge critical in recommending and funding projects that will meet local and regional needs. The agency shows signs of success through its shared lot program, and the biannual review of the program’s facilities is useful in system maintenance. Maine DOT’s interactive park-and-ride map feature provides a good example of how information from lot inventories can be used to educate the public on local facilities and their characteristics.

Michigan DOT’s program is more heavily focused on ridesharing, as many of the facilities throughout the State are utilized to support carpooling and vanpooling. Michigan DOT has made numerous resources available to the public so the public can get involved in ridesharing easily. One of Michigan’s strongest program components is its asset management database used to inform both the “MiDrive” website and aid in the prioritization of projects. MDOT’s data collection effort is relatively cheap given the lot counts and asset grading are conducted alongside routine services. This practice helps to prevent lots from falling into disrepair and also provide a base of knowledge of disrepair status. This pool of knowledge is very helpful in funding allocation given the extent of the park-and-ride program throughout the State. Another successful aspect of Michigan’s system is their strength in public-private partnerships. MDOT’s relationship with Meijer stores aided in the development of a significant number of lots throughout the State and saved the agency large sums of money in construction costs. Given the success of such mutually beneficial relationships with businesses, MDOT expanded the program to include other businesses in areas without Meijer stores, further illustrating how these programs are critical to the Statewide program.

Minnesota DOT has a unique program, as the state-owned lots are primarily concentrated throughout Greater Minnesota and focused mainly on carpooling and vanpooling. MnDOT, however, has a hand in the Twin Cities metropolitan area, hosting Park-and-Pool facilities, while local and regional transit agencies manage the park-and-ride facilities that feed transit service. Minnesota’s Statewide program illustrated how districts can prioritize projects based on regional facility siting guidelines, while Metro Transit provided a much more complex methodology that could be employed in areas where sufficient data and modeling capabilities are available. Regardless of scale, Metro Transit’s methodology illustrates various criteria for the consideration of park-and-ride project development and location.

New Mexico DOT's park-and-ride program is heavily focused on connecting the public to transit. The system has been creative in drawing ridership through flexible and cheap shuttle services to larger regional transit. Additionally, the State demonstrates good use of FTA 5311(f), Rural Intercity Bus Funds, to create park and rides that support the State's rural intercity bus program. Though New Mexico does not have an instituted project prioritization process, they report performance measures to show how the park-and-ride system has affected overall vehicle miles traveled and air quality, which ultimately serves to generate support and interest in the program by both governmental and transit agencies, as well as the general public.

Each of these agency's practices provide highly valuable insight into operating, financing and prioritization park-and-ride projects throughout the country, underscoring collaboration with localities, regional planning organizations, and private businesses or organizations to help support the park-and-ride system and encourage ridership statewide.

3.0 FUTURE FACILITY NEEDS

VTrans maintains a listing of state-owned and municipal-owned P&R lots on its website. In July 2014, the State provided a copy of this database to RSG for this report. Data from that database is reported here.

This section addresses the future needs of the Statewide Park and Ride program. The first subsection examines current deficiencies and future needs. It also lays out a course for addressing these future needs. The second and third sections focus on existing lot improvements and capacity improvements respectively. The fourth section focuses on funding these improvements, and the final section focuses on monitoring and data management to continue assessing future facility needs.

3.1 | FUTURE STATEWIDE NEEDS

The future needs are focused in two areas – design features and capacity. Design features encourage the public to choose to use park-and-ride lots and make the park-and-ride experience more comfortable. The discussion of capacity focuses on the demand and availability for park-and-ride spaces throughout the State.

DESIGN FEATURES

Design features at park-and-ride facilities, such as bus shelters, lighting, and bicycle racks, provide benefits to park-and-ride users. VTrans staff requested that RSG investigate best practices surrounding park-and-ride design features. RSG found some standard practices from other agencies and studies related to park-and-ride design features, but a set of national best practices have not been established.

The Transit Cooperative Research Program Report 95: *Traveler Response to Transportation System Changes*, Chapter 3 “Park and Ride/Pool,” (2004) includes a brief summary of previous studies regarding park-and-ride design features. These studies found that the most important factors in a potential user’s choice to use a park-and-ride lot or not were parking availability and perceived safety. Some design features, such as adequate lighting, safe crossings, and cameras, can increase perceptions of safety. However, increasing these design features in a lot already perceived safe will not increase the likelihood that someone chooses to use the lot.

Providing other design features, such as bus shelters or retail shopping, did not increase the likelihood of a person choosing to use a park-and-ride lot. Bus shelters were found to be somewhat desired but not as important as safety, highway conditions, and direct bus service. These findings are based on studies conducted in the 1990s, so recent changes, such as the prevalence of cellphones and car share programs, were not accounted for.

VTrans should develop standards regarding when to include different design features at new park-and-ride, when to add them at existing park-and-ride lots, when to remove them, how to monitor their use, and how to schedule inspections and maintenance. The sections below

summarize the presence of design features at VTrans and Municipal lots and provide guidance on how to develop standards. Existing standards from other agencies are also presented where applicable. The following design features are considered:

- Lighting
- Electric Vehicle Charging Stations
- Bus Shelters and Transit Service
- Pavement Markings
- Surface Type and Surface Condition
- Bicycle Design features
- Pedestrian Design features
- Landscaping

Additionally, this section considers what improvements are necessary to meet ADA requirements.

Lighting

Lighting increases the safety at park-and-ride facilities as well as the perception of safety. It can also make using the lot more pleasant and easier to navigate. Lighting should be installed at all State park-and-ride lots, and lighting guidelines should follow the 2004 AASHTO *Park-and-Ride Guide*. Other factors to consider include:

- The size of a lot or the number of spaces,
- The lot's proximity to well populated areas,
- The distance to power,
- The lot's visibility from proximate major roads,
- The ease of navigating the lot without lighting,
- Levels of crime in the area, and
- Local input.

Table 6 shows the 22 lots that do not contain lighting - 5 State lots and 17 Municipal lots. Of the five state-owned lots, only Corinth has fewer than 20 spaces.

TABLE 6: PARK-AND-RIDE WITHOUT LIGHTING

State-Owned	Municipality-Owned	
Cambridge*	Bridport	Strafford
Corinth	Castleton	Wallingford
Manchester	Chittenden	Waltham
Royalton	Dummerston	Warren (Roxbury Mtn Rd)
Sharon	Essex (Landfill Lane)	Weathersfield
	Hartford (Wilder)	West Rutland
	Marshfield	Westminster
	Rutland Town	Whitingham
	Starksboro	

*Construction planned at this location

Electric Vehicle Charging Equipment (EVCE)

At the time of this report, only the Hartland and Putney lots contain EVCE. Currently, VTTrans plans to install Level 1 stations any time lighting is being installed at a lot, and Level 2 stations will be considered depending on cost, location, and surrounding infrastructure. The 2013 *VTTrans Electric Vehicle Fueling Infrastructure Plan* identified and ranked State-owned sites as EVCE candidates, and many of these locations were park-and-ride lots.

Lighting and Electric Vehicle Charging Improvements

The state should consider adding lighting to the four lots that are unlit with at least 20 spaces. As shown in Table 7, all of these lots are underutilized and lighting may improve their usage. If the distance to a power source is prohibitive, the Agency should consider solar-powered lighting. In such cases, it may not be feasible to provide electric vehicle charging equipment due to battery constraints and solar power availability.

TABLE 7: CAPACITY AND UTILIZATION OF STATE PARK-AND-RIDE LOTS WITHOUT LIGHTING

State-Owned Lot	Capacity	Utilization
Cambridge*	20	60%
Corinth	5	20%
Manchester	35	6%
Royalton	21	38%
Sharon	23	61%

*Construction planned at this location

Bus Shelters and Transit Service

Although shelters may not be a deciding factor in whether or not people use park-and-ride lots, they do make lots more comfortable. On the other hand, they require maintenance and cleaning, without which they can become unattractive and detract from the park-and-ride experience. VTrans, therefore, should include shelters where transit use justifies them.

Twelve State-owned lots and 16 municipality-owned lots have transit service but no shelter (Table 8). There are also two State-owned and one municipality-owned lots with shelters but no transit access (Table 9).

TABLE 8: PARK-AND-RIDE LOTS WITH TRANSIT ACCESS AND NO SHELTER

State-Owned		Municipality-Owned	
Barre Town (South)	Middlesex	Bennington	Mendon
Bradford*	Morrisville	Brandon	New Haven
Cambridge	Sharon	Essex (Town Green)	Rutland Town
Clarendon	Springfield*	Fair Haven	Starksboro
Georgia	St. Johnsbury*	Hancock	Swanton Village
	Thetford	Hartford(Wrj)	Wallingford
		Leicester	West Rutland
		Marshfield	Whitingham

*Construction planned at this location

TABLE 9: PARK-AND-RIDE WITH SHELTER AND NO TRANSIT ACCESS

State-Owned	Municipality-Owned
Charlotte	Westminster

No standard exists regarding when to include a shelter at a park-and-ride facility, so the State should establish guidelines. For example, MetroTransit, serving Minneapolis and St. Paul, MN, will consider a shelter if boardings are greater than 25 per day in the suburbs or greater than 40 per day in Minneapolis or St. Paul⁴⁰. TriMet, serving Portland, OR, considers shelters at stops with at least 50 daily boardings or 35 boardings at stops with infrequent service⁴¹. Both agencies also consider the frequency of boardings by people with limited mobility. WMATA, serving the Washington DC Metro Area, also recommends a shelter at stops serving at least 50 boardings per day⁴².

⁴⁰ <http://www.metrotransit.org/shelter-guidelines>

⁴¹ <http://trimet.org/pdfs/publications/bus-stop-guidelines.pdf>

⁴² <https://www.wmata.com/pdfs/planning/WMATA%20Guidelines-Design%20and%20Placement%20of%20Transit%20Stops.pdf>

These guidelines apply to standard bus stops in large urban areas, so they are not directly applicable to rural park-and-ride lots in Vermont. The State, in conjunction with the regional transit agencies, will need to decide when a shelter is worth installing. Factors should include:

- The number of boardings at a stop,
- Who uses the stop, with attention to passengers with limited mobility,
- The cost of installing and maintaining a shelter,
- Potential problems with the shelter, e.g. trash accumulation, vagrancy, graffiti, and
- Local input.

The State should also consider guidelines for decommissioning shelters at locations that do not provide transit access.

Bus Shelters and Transit Service Improvements

Since transit service improves park-and-ride usage, the Agency should continue to work with regional transit providers to maximize the number lots with transit access. Table 10 shows lots with transit access and no shelter. After working with VPTA to develop guidelines for shelter installation and maintenance, VTTrans should prioritize additional shelters at larger lots, such as Springfield. Shelters will increase the comfort of riders, but the literature indicates they may not increase ridership.

TABLE 10: CAPACITY AND UTILIZATION OF STATE PARK-AND-RIDE WITH TRANSIT ACCESS AND NO SHELTER

State-Owned Lot	Capacity	Utilization
Barre Town (South)	34	32%
Bradford*	21	114%
Cambridge*	20	60%
Clarendon	8	0%
Georgia	42	76%
Middlesex	28	43%
Morrisville**	6	100%
Sharon	23	61%
Springfield*	80	63%
St. Johnsbury*	40	60%
Thetford	23	39%

*Construction planned at this location

**As the Morrisville lot is shared with airport parking, differentiating between airport and park-and-ride users is challenging and may lead to inaccurate occupancy information.

Surface Type, Surface Condition, and Pavement Markings

All paved lots (State and municipal) have painted lines to designate parking spaces. Twelve lots (five State-owned and seven municipality-owned) are gravel lots with no paint markings (see Table 11). Some of these lots contain few spaces, such as Huntington and Corinth with five spaces, and a gravel lot may be appropriate for these sites. A larger lot, such as Springfield with 80 spaces, may be more efficient if it was paved and painted. Formal spot designation can maximize the capacity of a lot by directing motorists to park optimally and can be easier to plow. It may also make the lot a more desirable place to park due to less dust and a more orderly feel.

Surface condition was observed in the State’s 2013 ADA study, and the majority of State and municipal lots were found to have “good” or “excellent” surface conditions. Few were rated as “poor”. The State is maintaining pavement conditions at park-and-ride lots. It should continue to monitor lots for pavement problems and repair them as necessary.

TABLE 11: PARK-AND-RIDE WITH GRAVEL SURFACES (*CONSTRUCTION PLANNED AT THIS LOCATION)

State-Owned		Municipality-Owned	
Corinth	St. Johnsbury*	Brandon	Norwich
Manchester	Thetford	Chittenden	Roxbury
Springfield		Huntington	Warren(Roxbury Mtn Rd)
		Marshfield	

*Construction planned at this location

The Agency should develop a guideline on when to pave lots based on:

- Lot size
- Utilization
- Ease of paving
- Maintenance costs, including plowing

Bicycle Design features

Although all lots can be accessed by bicycle, 43% of State lots do not contain bicycle racks. Bicycle parking is a higher priority at the 9 state lots and 14 municipal-owned lots that contain transit access. Transit allows a bicyclist to extend her or his range, so providing bicycle parking will encourage bicycling upstream of the park-and-ride facility. Bicycle lockers should be considered at park-and-ride lots in close proximity to higher density population centers and higher frequency public transit service where greater bicycle demand can be anticipated.

Pedestrian Design features

Pedestrian have been accommodated in some lots with walkways and connections to sidewalks, but they have not been the focus. Only 17% of State-owned lots and 26% of municipal-owned lots are connected to a sidewalk network. Park-and-ride lots are usually located in somewhat remote areas where major roads intersect, so they are often not near pedestrian facilities. Given the distances to a density of land uses, trying to connect the majority of park-and-ride facilities with pedestrian facilities may not be the best use of resources.

That said, once a driver exits his or her vehicle, he or she becomes a pedestrian. People should be able to safely navigate park-and-ride lots whether on foot or behind the wheel, and this safety concern may require installing walkways at park-and-ride lots. Walkways should be designed in coordination with VTtrans Maintenance and Operations Bureau (MOB) staff to ensure they do not unnecessarily increase maintenance costs.

Landscaping

Landscaping, including lawns, trees, and other plantings, increases the aesthetic appeal of park-and-ride lots and increases the perception of safety. VTtrans has an unwritten rule of only using plantings that are lower than knee-high or taller than head-high so that landscaping does not obstruct views of the road or nearby scenery. Although landscaping can make the park-and-ride experience more pleasant for users, it is frequently a lower priority item for District Staff. Safety issues, such as plowing, sweeping, or filling in potholes take precedence. Consequently, MOB favors low maintenance landscaping whenever possible.

ADA Requirements

Park-and-ride facilities are public areas, and therefore VTtrans must make reasonable accommodations to make them navigable for people with mobility difficulties. Only two of the lots surveyed in the 2013 ADA study were found to be in complete compliance with ADA. Meeting ADA standards may mean design considerations such as installing walkways at maximum grades and minimum widths and ensuring that sidewalk ramps can be navigated in a wheelchair. It may also require maintenance considerations such as plowing travel lanes and walkways more frequently and being more aware of ice buildup, potholes, and frost heaves. ADA does not have specific maintenance guidelines for park-and-ride facilities beyond the “reasonable accommodations” requirement. VTtrans should develop a maintenance and operations standard for what constitutes a reasonable accommodation so that MOB staff know what is expected and can plan and budget accordingly.

CURRENT AND FUTURE CAPACITY NEEDS

The literature in this field focuses on specific siting of park-and-ride/park-and-pool locations. Planning for regional needs is not well documented. Most of the available literature includes specific optimization algorithms or logit choice models for evaluating

demand at specific locations. Since this project is not focused on identifying specific sites for park-and-ride locations, we have reviewed the literature for themes that can inform this analysis.

There does not appear to be an industry standard target capacity for park-and-ride facilities, but one study stated that users will begin to avoid lots if utilization rates are above 70% or 80%⁴³. For this reason, we have used 75% as the threshold park-and-ride utilization for this study. A lot whose utilization is over 75% is considered over-capacity.

Park-and-ride locations in Vermont are meeting points for carpools and vanpools. Some of them have bus stops located within the site or nearby. To justify the time cost of interrupting a commute with a stop at a park-and-ride facility, either to meet another commuter or to wait for and board a bus, personal savings in time or money must be realized. For some, this can mean avoiding parking costs or the hassle of parking at their employment location, for others this can mean avoiding the cost of fuel used on their commute, and for others this can mean gaining productive time by being a passenger. As such, park-and-ride lots tend to serve longer commutes than other modes. In support of that, the literature indicates park-and-ride lots are ideally situated 10 miles from the primary activity center⁴⁴. The literature also suggests at least 50% of riders live within 5 miles of a park and ride and about 85-90% are within 10 miles⁴⁵.

Other studies suggest park-and-ride facilities should be within a visible distance of major travel corridors⁴⁶. Increased visibility improves lots' safety and encourages drivers to use the lot. Utilization describes the relationship between the demand and the capacity of the lot. Reviewing the existing park-and-ride locations and their utilization, overcapacity lots tend to be along or upstream from the Interstate, and under capacity lots tend to be far from the Interstate. The only overcapacity lots far from an Interstate are Fair Haven (30 spaces) and New Haven (9 spaces). Figure 2 shows park-and-ride utilization rates with the 12 overcapacity lots circled and labeled.

Once someone gets on an interstate, they are unlikely to get off to carpool or board transit. Thus, capturing potential parkers before they get on the interstate is important to maximize ridership. Ideally, park-and-ride locations are placed at the Interstate exits where commuters get on the highway. Park-and-ride locations near the Interstate may not have adequate space to build the needed capacity or nearby intersections may not be able to accommodate additional traffic. In such cases, VTtrans will need to find alternative locations for additional park-and-ride capacity.

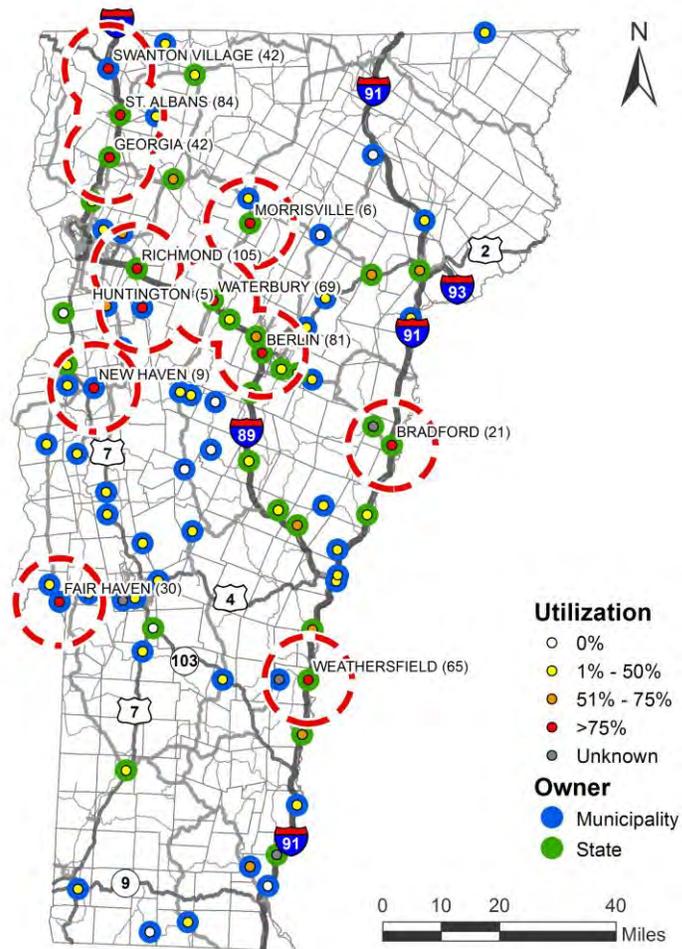
⁴³ Community Transit Long Range Transit Plan – Appendix V. 2010

⁴⁴ Holguín-Veras, Jose, et. al. 2012. “New York City Park and Ride Study.” Rensselaer University Research Center.

⁴⁵ *Ibid.*

⁴⁶ American Association of State Highway and Transportation Officials. 2004. *Guide for Park-and-Ride Facilities.*

FIGURE 2: OVER-UTILIZED PARK-AND-RIDE LOTS



In examining the conditions of the existing facilities, a strong theme emerges that the most successful park-and-ride facilities from a utilization perspective have transit service, i.e. are within 0.25 miles of a transit stop. Twelve existing facilities are overcapacity and 11 of those have transit service. Of the remaining 10 that have occupancy rates above 50%, all but one have transit service.

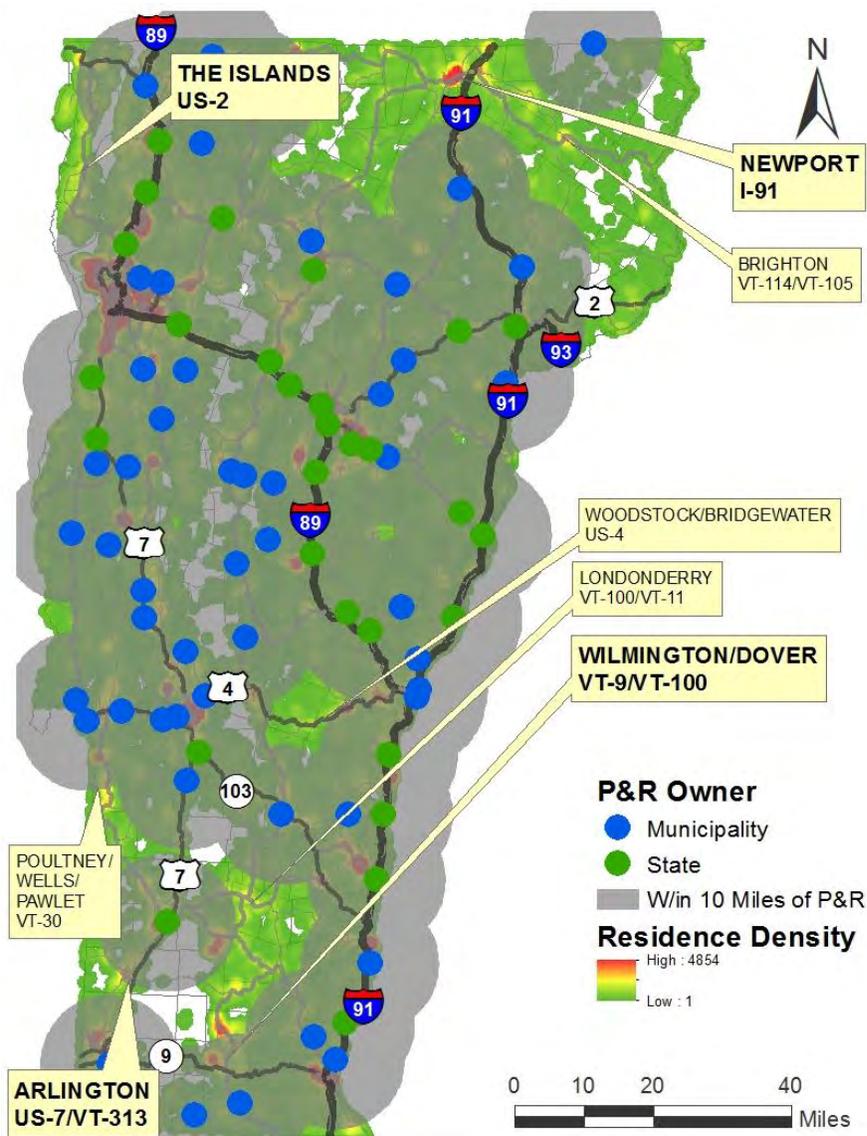
TABLE 12: UTILIZATION VERSUS TRANSIT ACCESS

Utilization Rate	Total in Category	Number with Transit***	Percent with Transit
0%	9	4	44%
1-50%	44	22	50%
50-75%	10	9	90%
>75%	12	11	92%

***Transit stop within 0.25 miles of park-and-ride

In addition to examining lots that are over capacity, some parts of the State are not currently served by a park-and-ride lot. Figure 3 shows residential density in Vermont with locations within 10 miles of a park and ride grayed-out. Most residences in the state are within the 10-mile threshold of a park-and-ride facility, but a few residential hotspots are more than 10 miles from the nearest park-and-ride facility. The most populated areas lacking park-and-ride facilities are Newport (I-91), the Islands (US-2), the intersection of VT-9/VT-100, and Arlington (US-7/VT-313).

FIGURE 3: AREAS OF UNMET NEED



3.2 | CURRENT AND FUTURE CAPACITY REQUIREMENTS

Park-and-ride lots currently cover most of the state, so current park-and-ride usage largely approximates demand. Therefore, this study focuses on the capacity needs at existing overcapacity park-and-ride lots and areas that are not currently served.

As show in Figure 2, 12 lots are considered over-capacity. VTTrans should increase capacity in these areas to meet current and future demand. VTTrans officials agreed that it was prudent to increase capacity so that these lots would be 50-60% full under the current use conditions. Table 13 shows the additional spaces required at the 12 lots that are currently over-capacity to bring them down to 50% utilization levels.

TABLE 13: ADDITIONAL SPACES AT OVER-CAPACITY LOTS

Lot	Owner	Current Utilization	Additional Spaces
Richmond	State	94%	140
Berlin	State	100%	81
St. Albans	State	94%	74
Weathersfield	State	102%	67
Waterbury	State	94%	61
Swanton Village	Municipal	88%	32
Bradford*	State	114%	27
Georgia	State	76%	22
Fair Haven	Municipal	83%	20
New Haven	Municipal	100%	9
Morrisville**	State	100%	6
Huntington	Municipal	80%	3
Total			542

*Construction planned at this location

**As the Morrisville lot is shared with airport parking, differentiating between airport and park-and-ride users is challenging and may lead to inaccurate occupancy information.

INCREASING CAPACITY

Determining Additional Capacity at Existing Lots

Overcapacity park-and-ride lots are presumably well located and familiar to the people who use them. Most already have transit. For these reasons, expanding the existing lots where possible is recommended before building new lots. This strategy may also reduce maintenance costs since maintenance costs are driven by the number of lots more than the number of spaces in individual lots. Although construction data is limited, there is an indication that expanding an existing lot may be slightly more expensive than creating a new lot (\$15,000 per space and \$12,000 per space respectively). A review of the state of park-and-ride funding indicates VTrans has more reliable access to capital funds.

There may be locations, such as Richmond, where expanding the existing lots is not feasible. In these places, the State should look for new park-and-ride locations within the catchment area of the over-capacity lot. Ideally, this new lot should be located near the intersection of major roads, within five miles of major residential areas, have transit access, and be visible from major roads. Figure 4 shows the over-capacity park-and-ride locations and roads within 10 miles of those park-and-ride locations in blue. Park-and-ride facilities will be most effective if they are between a higher-density residential area and a major road.

Most of the overcapacity lots are located along the I-89 corridor between Swanton and Berlin. Both Montpelier and Burlington are major commute destinations, and I-89 is the largest highway connecting these cities to surrounding areas. Four other lots are found to be over capacity: Weathersfield, Fair Haven, Bradford, and New Haven.

FIGURE 4: OVERCAPACITY PARK-AND-RIDE LOCATIONS AND THE ROAD NETWORKS THEY SERVE

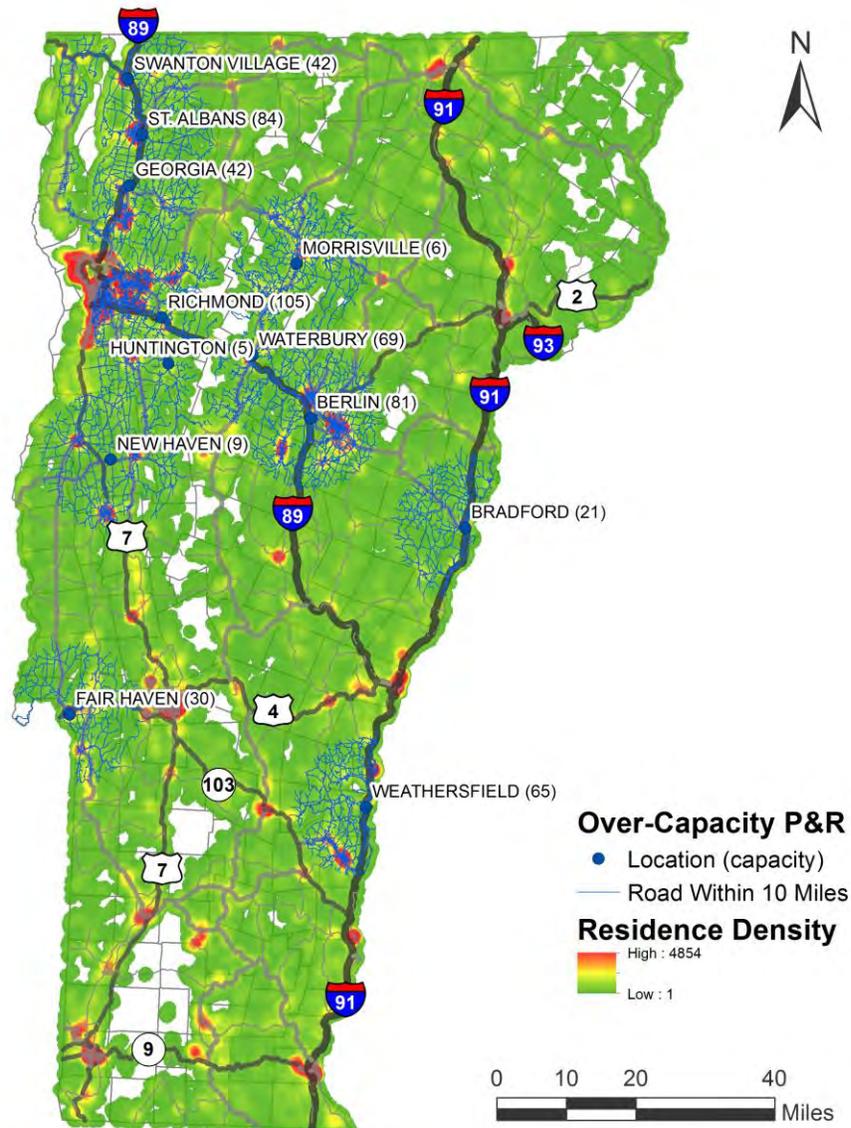
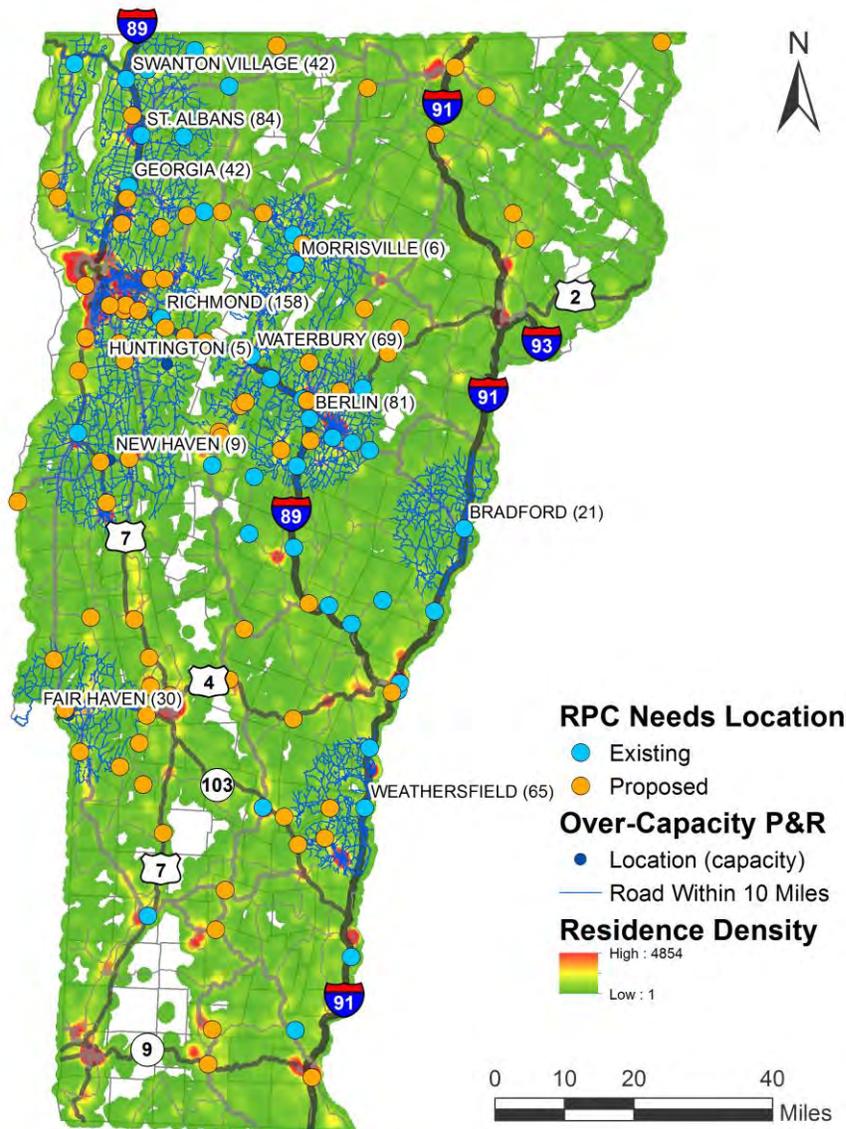


Figure 5 shows park-and-ride locations identified in the 2012 regional needs documents with light blue circles indicating improvements at an existing park-and-ride lot and orange circles indicating a location for a new lot. Some of the improvements requested at existing lots include expanding the number of spaces while other places only include design features improvements. Most of the lots this study has identified as overcapacity are also identified by their respective RCP as needing improvements. Orange circles within 10 miles of an overcapacity park-and-ride lot are likely promising locations for a new lot if an existing lot cannot be expanded.

FIGURE 5: LOCATIONS IDENTIFIED IN THE REGIONAL NEEDS ASSESSMENTS AND LOCATED WITHIN 10 MILES OF AN OVER-CAPACITY PARK-AND-RIDE



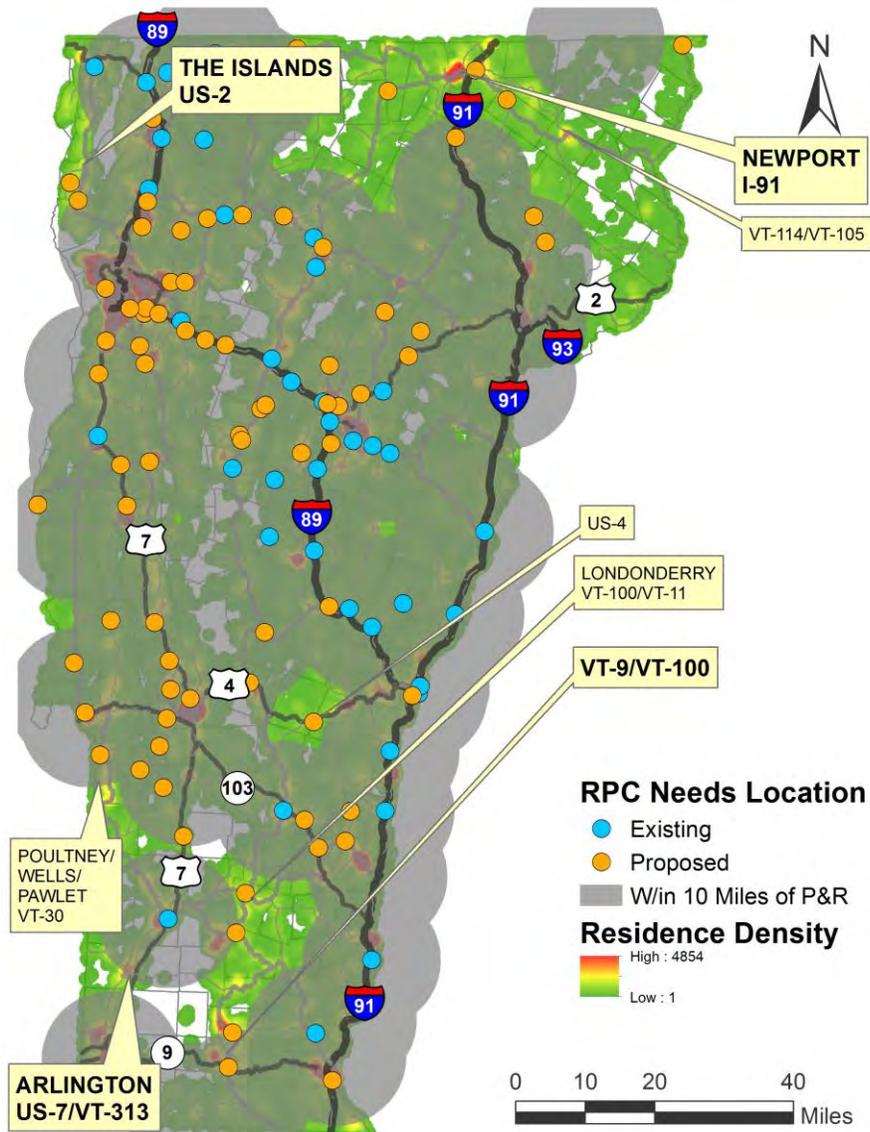
Locating and Sizing New Lots in Underserved Areas

Most park-and-ride users will live within 10 miles of the lot, and the lot will be along their existing commute route. There are places in Vermont that have a relatively high residential density and are more than 10 miles to the nearest park-and-ride facility. As shown in Figure 3 several high residential density areas in the State are more than 10 miles to a park-and-ride. Locations in bold are located along major roads; these should have high priority and could be either municipally-owned or State-owned facilities. Other locations would be best served by a municipally-owned park-and-ride facility.

Figure 6 compares these suggested new park-and-ride locations with locations identified in the Regional Planning Commissions’ (RPC) Needs Assessments. With the exception of

Arlington, all of the new locations suggested by this study were also suggested by the RPCs. Arlington falls under the purview of the Bennington County Regional Commission, and they only mentioned one location, the existing lot in Manchester, in their assessment.

FIGURE 6: RPC NEEDS ASSESSMENTS AND NEW PARK-AND-RIDE LOCATIONS



Estimating the appropriate size for each of these new lots without a detailed analysis of each location is difficult. To approximate the likely lot size, we have divided lots into three sizes as described in Table 14. Based on the lot sizes of existing park-and-rides, it is assumed that Newport will be medium lot (~40 spaces), and the other three locations will be small lots (~30 spaces).

TABLE 14: PARK-AND-RIDE LOT SIZES

Lot Size	Spaces
Small	10-39
Medium	40-79
Large	80+

These locations are general recommendations about areas of unmet need and do not include recommendations for specific site locations. The Agency will need to perform additional analysis to determine the best site for the park-and-ride lots within these areas. Staff should consider the criteria in Table 15 as well as comments from RPC and local officials.

Prioritizing Future Lot Locations

We recommend the following criteria to evaluate future lot locations:

- Identified area of need as identified by the RPCs and/or this Plan
- Residential density
- Maximum utilization
- Proximity to Interstate
- Transit presence and frequency of service
- Location along commuter route
- Site feasibility (availability of land and constructability)
- Potential to reduce vehicle miles traveled (VMT)

Projects are prioritized by assigning points to each of these categories in a way that upholds policy decisions. We recommend point allocation as shown in Table 15, but the Agency will ultimately need to decide how best to distribute points to maintain its priorities. For underserved areas, the location should receive 5 points in the utilization category. VTrans may decide to remove the utilization category and consider only lots that are over 75% capacity or in underserved areas. The project with the largest number of points should be the highest priority.

TABLE 15: DRAFT METHODOLOGY PRIORITIZING CAPACITY INVESTMENTS

Pt	P&R Plan Identified Need	Max Utilization (existing lots)	Max Residential Density (w/in 1 mi)	Interstate Proximity	Transit Proximity	Commute Route Location	Site Feasibility	Reduces VMT
0	No	0-50%	<200	None	None	Far	Multiple barriers	Low potential
1		50-75%	200-400	>0.5mi	>0.5 mi	upstream		
2				0.5 mi	Within 0.5 mi	Central spot	State or muni owned, physical/environmental constraints	Medium potential
3			>400	0.25 mi	Within 0.25 mi			
4					Visible from Interstate	Within 0.25 mi/ 15 min service	At major roadway junction	State/Muni owned, no physical/environmental constraints
5	Yes	>75%			On existing route			

3.3 | COST OF INCREASED CAPACITY

The cost of increased capacity can be looked at in a number of ways. We present a simplified analysis for general budgeting purposes followed by a more complex, year-by-year analysis to investigate different strategies.

MAINTAIN EXISTING LOTS SCENARIO

Assuming maintenance costs of \$37,500 per lot per year – the average of VTtrans’ high and low estimates – current maintenance costs are approximately \$1.1 million annually. However, VTtrans officials have noted that actual maintenance costs are likely higher and that this figure does not include low-priority tasks such as landscaping. If the Agency elected not to build more lots and just maintain the existing ones, it would cost over \$1 million per year.

SIMPLIFIED ANALYSIS

It is projected that 672 new spaces (542 at existing lots and 130 at new lots) are required to meet current demand and plan for the future. At \$15,000 per space to expand existing lots and \$12,000 per space to build new lots, it will cost about \$10 million dollars to build those spaces. The annual maintenance costs of any new State lots will also need to be considered as well as improvements not associated with additional capacity such as adding lighting.

YEAR-BY-YEAR ANALYSIS

This analysis investigates annual costs over the next 6 years (2015-2020) under different scenarios. RSG developed a spreadsheet tool to estimate capital costs and maintenance costs depending on the number of spaces being constructed, the type of space (expansion or new lot), and the level of design features associated with construction.

We compare annual costs under the following three scenarios:

- All expansion: all of the additional spaces from Table 13 are created as an expansion of an existing lot. New lots are built for the bold locations in Figure 3.
- All new lots: the additional spaces are created as new lots. Note that the three small-space additions (New Haven, Morrisville, and Huntington) are assumed to be expansions.
- Blended approach: the additional spaces are created as a combination of expansions of existing lots and construction of new lots.

This analysis assumes 1-4 lots are built per year, and the number of spaces in a new or expanded lot is based on the needs shown in Table 13 and the bold locations in Figure 3. All scenarios also assume that two lots per year will be improved with no increase in spaces.

TABLE 16: ANNUAL AND CUMULATIVE COSTS (CAPITAL AND MAINTENANCE) OVER THREE SCENARIOS

Year	All Expansion		All New Lots		Blended Approach	
	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative
2015	\$3,116,000	\$3,116,000	\$2,808,500	\$2,808,500	\$3,061,000	\$3,061,000
2016	\$3,731,000	\$6,847,000	\$3,598,500	\$6,407,000	\$3,771,000	\$6,832,000
2017	\$2,326,000	\$9,173,000	\$2,527,727	\$8,934,727	\$2,350,806	\$9,182,806
2018	\$3,676,375	\$12,849,375	\$3,597,595	\$12,532,322	\$3,423,133	\$12,605,939
2019	\$2,980,801	\$15,830,176	\$2,979,972	\$15,512,294	\$2,971,864	\$15,577,804
2020	\$2,380,237	\$18,210,413	\$2,560,548	\$18,072,842	\$2,495,292	\$18,073,096

Table 16 shows the annual and cumulative costs (inclusive of capital and maintenance) over the three scenarios. The cumulative cost of each scenarios is essentially the same in 2020 – about \$18 million. The All Expansion scenario is found to be the most expensive while the New Lots scenario is found to be the least expensive. While these estimates are based on the best available data, some of the assumed costs are highly site dependent. Some lots will be easily expanded for less than the \$15,000 per space while others will cost more. Similarly, some locations for new lots may be more or less expensive depending on site geometry, access, and land ownership. Lastly, maintenance costs also vary by location, so total spent on maintenance each year could be higher or lower than what we estimated. The variation in

2020 cumulative costs between the three scenarios is likely within the margin of error of the tool.

This estimate does not include new spots being developed through public private partnerships or permit requirements. That strategy may enable VTtrans to reduce capital costs and avoid maintenance costs.

3.4 | ONGOING MONITORING

The estimates provided here are based on the best available data, but that data has not been collected in a standardized manner. Utilization is calculated based on the maximum count at each lot. In some cases count data has been collected one time while others locations have been counted four times. Weather or seasonal events may also be influencing the counts. Different count data could lead to the conclusion that more or less than the 542 additional spaces are needed.

To ensure it has reliable, actionable data, VTtrans should develop a systematic count program, especially at lots that are over-capacity or close to over-capacity. The count program should be consistent across lots and from year to year. The counts should note:

- Weekday
- Time of day
- Weather
- Number of vehicles parked
- Number of vehicles parked in handicap spaces (if applicable)
- Number of bicycles parked
- Presence of trash and/or vandalism

An inventory of the condition of the lot should also be conducted and it is recommended that an Agency staff person be responsible to improve consistency of data collected . Issues to note should include:

- Lighting availability
- Burnt out lightbulbs (if applicable)
- Shelter availability (if applicable)
- Shelter condition (if applicable)
- Pavement/Surface condition
- Noticeable problems (pot holes, etc.)
- Walkway conditions (if applicable)

Currently, the regional planning commissions conduct counts, but they are not standardized. The Agency should develop a count template and distribute the template to the counters. It should also consider enlisting District staff to perform counts and inventory deficiencies. By utilizing simplified checklist, the District staff will be able to quickly record the needed information, and the operations staff will be able to quickly enter it into a database. A more

efficient option would be to have the District staff enter count data directly to the count database with a smart phone or tablet, but that method will require more setup.

A second benefit to standardizing the count reporting process is it will make monitoring usage easier on Agency staff. VTrans should decide how it wants to monitor usage and then implement procedures so count data is fed into the monitoring program as seamlessly as possible.

Monitoring the ongoing expenses associated with park-and-ride facilities, both maintenance and facilities improvements, will provide the Agency with a better understanding of annual costs of facilities once they are installed. As the Agency tracks the cost of maintaining different park-and-ride lots, it should watch for design features or design considerations that significantly add or reduce maintenance costs. For example, some towns require specific lighting fixtures or landscaping, so these costs cannot be avoided. Knowing the ongoing costs of these design features will help the Agency plan for the future costs of lots in these towns.

4.0 PARK & RIDE FINANCING STRATEGIES

This section details VTrans' historic and current park-and-ride funding mechanisms for both capital and maintenance and operations (MO) costs followed by a review of best practices and financing innovations exemplified by agencies around the country. Based on knowledge of both VTrans' financing strategies and those employed by its peers, Section 4.3 | provides four potential future financing scenarios for consideration in park-and-ride facility planning.

4.1 | REVIEW OF HISTORIC PARK-AND-RIDE FUNDING

VTrans has historically used federal Congestion Mitigation and Air Quality Improvement (CMAQ) program and Surface Transportation Funds (STP) funds to pay for the development of state-owned park-and-ride lots. VTrans spends \$2-\$3 million annually for design, right-of-way acquisition, and construction of park-and-ride lots. To date, the CMAQ funding has been adequate for park-and-ride construction needs; however, growing demand for commuter parking service and increased design features at new park-and-rides is beginning to stress the MOB and District budgets.

VTrans currently funds MO costs through the State Transportation Fund under the same line items as highway maintenance and operations. VTrans has tried to use CMAQ funds for operations expenses in the past, but FHWA did not accept this practice. VTrans considered moving park-and-ride MO funding to a different bureau such as the Municipal Assistance Bureau (MAB) or tracking park-and-ride costs separately within the Maintenance & Operations Bureau (MOB). The advantage of keeping funds within MOB is that VTrans can transfer funds easily between highway and park-and-ride expenses, if necessary.

VTrans has occasionally leveraged FTA (Federal Transit Administration) 5307, 5311, and 5339 funds for park-and-ride expenses, but these sources are usually for other areas such as the transit program.

VTrans also maintains an annual grant program for municipal park-and-ride development to which municipalities can apply. The VTrans budget allocates about \$250,000 annually from the State Transportation Fund to finance this program. This funding is available at the discretion of the Legislature, and the program is administered by VTrans. The program helps municipalities develop their own park-and-ride lots. Among the benefits of this program is facilitating development of park-and-ride lots that help remove congestion from state highways while not adding to VTrans’ maintenance burden. Figure 7 summarizes the existing funding mechanisms employed by VTrans for park-and-ride facilities and maintenance.

FIGURE 7: CURRENT VTRANS PRIMARY PARK-AND-RIDE FUNDING SOURCES

FEDERAL	STATE	LOCAL
<p>CMAQ used for capital costs at \$2-3 million annually</p> <p>Funding has not been limiting factor to date</p>	<p>Maintenance paid through general fund at \$25-50K per P&R annually</p> <p>\$250,000 in STF funds given to municipalities annually under discretion of the legislature</p>	<p>Municipalities pay MO costs of locally owned/constructed P&Rs</p>

4.2 | FINANCING SOURCES, BEST PRACTICES, & INNOVATION

Table 17 provides a summary of various sources available at federal, state, and local levels of potential park-and-ride financing. Federal sources for park-and-ride development and MO vary from discrete funds allocation (i.e., state allocation of Congestion Mitigation and Air Quality Improvement (CMAQ) Program funds) to application-based funding (i.e., Transportation Investment Generating Economic Recovery (TIGER) grants). State allocation is more predictable, given typical set-asides from State Highway Funds, while local contributions can vary significantly depending on the level of involvement of regional municipalities and businesses.

TABLE 17: FEDERAL, STATE, AND LOCAL FINANCING SOURCES

Federal	State	Local
CMAQ Grants	State Highway Funds	Contributions from Municipalities (Funds or Services)
Section 5307 Urbanized Area Formula Grants	Utilize Existing, State-Owned Right-of-Way	Operator Revenues (Passenger Fare)
Section 5339 Bus & Bus Facilities		Development Fees/Impact Fee Exemption
Section 5311 Formula Grants for Rural Area		Condition of Approval for New Development
MAP-21 Flexible Funding Programs		Public-Private Partnerships
TIGER Discretionary Grants		

The following list provides descriptions and best practice or innovative examples, where available, for each of these potential park-and-ride financing sources.

FEDERAL

CMAQ Funds

- Description:** “Funds may be used for transportation projects likely to contribute to the attainment or maintenance of a national ambient air quality standard, with a high level of effectiveness in reducing air pollution, and be included in the Metropolitan Planning Organization's (MPO's) current transportation plan and transportation improvement program (TIP) or the current state transportation improvement program (STIP) in areas without an MPO... A State without a nonattainment or maintenance area may use its CMAQ funds for any CMAQ- or STP-eligible project.”⁴⁷
- Example(s):** Funds from the CMAQ Program are critical to the development and maintenance of park-and-ride lots for DOTs in Delaware, Minnesota, Maine, New Hampshire, and West Virginia. Each of these agencies provides the required 20 percent match to CMAQ funds, through a variety of sources including state transportation funds, state bonds, or regional agency financial support.⁴⁸
- Use in Vermont:** VTtrans currently dedicates CMAQ funds to park-and-ride capital costs.
- Obligations/Limitations:** FHWA has not allowed CMAQ funds for operations and maintenance practices in Vermont.

⁴⁷ <http://www.fhwa.dot.gov/map21/factsheets/cmaq.cfm>

⁴⁸ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_359.pdf 8.

FTA Section 5307 Urbanized Area Formula Grants

- **Description:** “This program provides grants to Urbanized Areas¹ (UZA) for public transportation capital, planning, job access and reverse commute projects, as well as operating expenses in certain circumstances. These funds constitute a core investment in the enhancement and revitalization of public transportation systems in the nation’s urbanized areas, which depend on public transportation to improve mobility and reduce congestion... Federal share is 80% for capital assistance,... 50% for operating assistance,... [and] 80% for Americans with Disabilities Act (ADA) non-fixed-route paratransit service, using up to 10% of a recipient’s apportionment.”⁴⁹
- **Example(s):** Various states, for example Minnesota and Michigan DOTs, have applied FTA Urbanized Area Formula Grants 5307 for park-and-ride projects.⁵⁰
- **Use in Vermont:** In 2014, Vermont received \$2,426,378 for UZAs 50,000-199,999 in population (Burlington).⁵¹ CCTA receives the funds directly, and the CCRPC and VTrans approves of their use.
- **Obligations/Limitations:** VTrans cannot allocate these funds. It may be possible to allocate them for MO if CCTA thought that was the best use for them.

FTA Section 5339 Bus & Bus Facilities

- **Description:** “Provides capital funding to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities... Federal share is 80% with a required 20% local match.”⁵²
- **Example(s):** “Each year, \$65.5 million will be allocated with each State receiving \$1.25 million and each territory (including DC and Puerto Rico) receiving \$500,000. The remaining funding will be distributed by formula based on population, vehicle revenue miles and passenger miles.”⁵³
- **Use in Vermont:** In 2014, Vermont received \$161,288 for UZAs 50,000-199,999 in population (Burlington) and \$1.25 million in Statewide Allocation, accounting for \$1,411,288 total.⁵⁴ VTrans currently does not utilize these funds for Park & Ride facilities but could allocate a portion for those facilities that support transit users. These funds would only be eligible to maintain the spaces that were specifically prioritized for transit riders.
- **Obligations/Limitations:** 5339 funds typically account for capital costs.

⁴⁹ http://www.fta.dot.gov/documents/MAP-21_Fact_Sheet_-_Urbanized_Area_Formula_Grants.pdf

⁵⁰ <http://www.dot.state.mn.us/planning/program/stip.html> 67, 130.

⁵¹ http://www.fta.dot.gov/documents/Table_3_FY_2014_Section_5307_v2.pdf

⁵² http://www.fta.dot.gov/documents/MAP-21_Fact_Sheet_-_Bus_and_Bus_Facilities.pdf

⁵³ http://www.michigan.gov/mdot/0,4616,7-151-11056_13849-322737--,00.html

⁵⁴ http://www.fta.dot.gov/documents/Table_12_FY_2014_Section_5339.pdf

FTA Section 5311 Formula Grants for Rural Area

- **Description:** “This program provides capital, planning, and operating assistance to states to support public transportation in rural areas with populations less than 50,000, where many residents often rely on public transit to reach their destinations... Federal share is 80% for capital projects,... 50% for operating assistance,... [and] 80% for Americans with Disabilities Act (ADA) non-fixed-route paratransit service, using up to 10% of a recipient’s apportionment.” USDOT allocates these funds based on formulas and population data from the most recent Census.⁵⁵
- **Example(s):** At the New Mexico DOT, Section 5311(f) Rural Intercity Bus Funds contribute an additional \$300,000 to the State park-and-ride program facilities. The New Mexico DOT Transit and Rail Division manages all federal transit grants awarded in the State, as the agency is the FTA-designated recipient of these funds.⁵⁶
- **Use in Vermont:** In 2014, Vermont received \$3,465,912 in 5311 and 5340 apportionment.⁵⁷ VTTrans rarely uses this source to fund park-and-ride facilities. (Note: FHWA reports 5311 allocations with 5340 Growing States/High Density Formula funds with 5311.) 5311 and 5307 allocations are heavily increased by flexing funds from FHWA for capital and maintenance.
- **Obligations/Limitations:** 5311 funds are limited to rural areas of the state and 5307 are limited to urban areas.

MAP-21 Flexible Funding Programs

- **Description:** “National Highway Performance Program (NHPP) funds may only be used for the construction of a public transportation project that supports progress toward the achievement of national performance goals for improving infrastructure condition, safety, mobility, or freight movement on the National Highway System (NHS) and which is eligible for assistance under chapter 53 of title 49, if: the project is in the same corridor as, and in proximity to, a fully access-controlled NHS route; the construction is more cost-effective (as determined by a benefit-cost analysis) than a NHS improvement; and the project will reduce delays or produce travel time savings on the NHS as well as improve regional traffic flow... NHPP funds can be transferred (or “flexed”) over from the States to transit agencies and local governments for transit projects... For States that have implemented an asset management plan within the established timeframe, the Federal Share is generally 80 percent, subject to the upward sliding scale adjustment for States containing public lands.”⁵⁸

⁵⁵ http://www.fta.dot.gov/documents/MAP-21_Fact_Sheet_-_Formula_Grants_for_Rural_Areas.pdf

⁵⁶ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_359.pdf (10)

⁵⁷ http://www.fta.dot.gov/documents/Table_9_FY_2014_Section_5311.pdf

⁵⁸ [http://www.fta.dot.gov/documents/MAP-21_Fact_Sheet_-_Flexible_Funding_Programs_-_National_Highway_Performance_Program_\(NHPP\).pdf](http://www.fta.dot.gov/documents/MAP-21_Fact_Sheet_-_Flexible_Funding_Programs_-_National_Highway_Performance_Program_(NHPP).pdf)

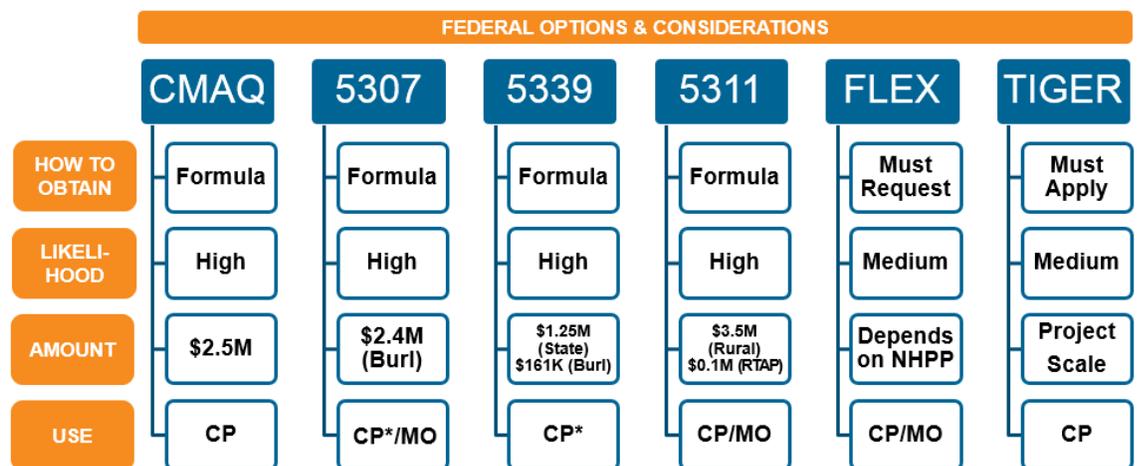
- **Use in Vermont:** VTTrans prepared a Transportation Asset Management Implementation Plan in October 2014,⁵⁹ rendering this source applicable to funding.
- **Obligations/Limitations:** This funding source requires VTTrans to work with the FTA to reallocate funding from the NHPP to public transportation projects that fall under the 5307 or 5311 programs. These projects must be on or serve an NHS route, which would include Vermont’s Interstates: 89/91/93, US 2/4/7/15 and portions of 103/100/11, as well as VT-9. Current park-and-ride lots are located on these facilities primarily.

TIGER Discretionary Grants

- **Description:** TIGER discretionary grants “fund capital investments in surface transportation infrastructure and are awarded on a competitive basis to projects that will have a significant impact on the nation, a region, or metropolitan area.”⁶⁰
- **Use in Vermont:** VTTrans does not have a history of TIGER funding for park-and-ride facilities. It currently applies for TIGER funding for rail, and it only submits one application so that it does not compete with itself.
- **Obligations/Limitations:** TIGER grants entail a significant amount of effort put forth through a competitive application process. TIGER grant applications must exceed \$10 million in urban areas (i.e., Burlington), but it is possible for agencies to request less in rural areas (i.e., the remainder of the state).

Figure 8 summarizes potential federal funding options for VTTrans consideration.

FIGURE 8: POTENTIAL FEDERAL FUNDING SOURCES



⁵⁹ <http://www.fhwa.dot.gov/asset/gap/vtgap.pdf>

⁶⁰ <http://www.dot.gov/tiger>

STATE

State Transportation Funds

- **Description:** State transportation funds come from a variety of sources including vehicle sales tax, fuel sales tax, registration fees, and other state revenue. Allocation toward park-and-ride facilities stems from the legislature or VTrans.
- **Example(s):** Many states allocate a portion of their statewide transportation funding to park-and-ride development. For example, Michigan DOT places a special portion aside each year to fund park-and-ride capital projects, which comes primarily from the state's transportation fund.⁶¹
- **Use in Vermont:** Vermont receives about \$250,000 annually from the State's transportation fund to distribute to municipalities for construction and maintenance of park-and-ride facilities. The state also pulls from the general fund to support MO costs at an average range of \$25,000 to \$50,000 per lot.
- **Obligations/Limitations:** Apportionments typically come from the state legislature, which denotes any obligations and limitations.

Use of State Right-of-Way

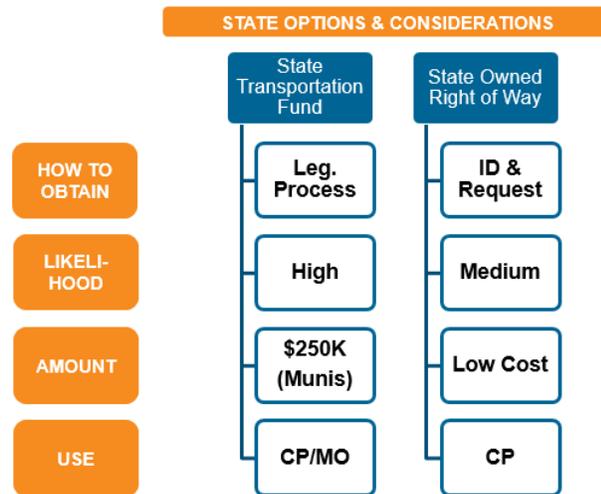
- **Description:** The use of state-owned property to develop or expand park-and-ride facilities.
- **Example(s):** To cost-effectively develop new or expand existing park-and-ride lots, Maine DOT seeks to identify projects within State-owned right-of-way on which commuter facilities would be beneficial to the overall transportation system.⁶² Because Michigan DOT generally does not have the funding needed to purchase new property, the agency seeks to build new lots on existing right-of-way.
- **Use in Vermont:** VTrans should review state-owned right-of-way in regions of over-capacity and adjacent to lots over-capacity to identify potential areas for park-and-ride development.
- **Obligations/Limitations:** State-owned land is often limited in areas of immediate need for program expansion.

Figure 9 summarizes potential state funding options for VTrans consideration.

⁶¹ Annelin Interview. October 6, 2014.

⁶² http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_359.pdf (7)

FIGURE 9: POTENTIAL STATE FUNDING SOURCES



LOCAL

Contributions from Municipalities (Funds or Services)

- **Description:** Coupling with municipalities to pay capital or MO costs.
- **Example(s):** The El Dorado County Transit Authority collaborates with the local municipalities and El Dorado County to combine their annual park-and-ride facility surface treatment with local annual road surface treatments to consolidate maintenance costs.⁶³
- **Use in Vermont:** VTtrans could work with municipalities to combine maintenance on local roads and near-by state-owned park-and-ride lots to minimize costs. VTtrans could compensate these agencies with small fees or other agreements.
- **Obligations/Limitations:** Requires negotiations and compromises with municipalities.

Transit Operator Revenues (Passenger Fare/ Parking/ Advertisement Revenues)

- **Description:** Application of revenue associated with passenger fares, parking costs, or advertising to pay for MO costs.
- **Example(s):** The City of Coralville in Iowa recently began construction of a new intermodal facility including 270 commuter park-and-ride spaces in its initial phase and an additional 212 spaces in its second phase. The City of Coralville used various FTA grants to fund the construction of this intermodal project, while the City intends to use revenue generated from the park-and-ride facility to fund the operation and maintenance costs associated with the site.⁶⁴ Likewise, New Mexico

⁶³ http://www.edctc.org/C/TRANSIT/PnR_master_plan/6finance_strat.pdf (31)

⁶⁴ <http://www.coralville.org/168/Intermodal-Facility>

DOT park-and-ride funding sources include advertising revenue, passenger fares, and contributions from the County of El Paso, Texas.⁶⁵

- **Use in Vermont:** VTTrans should investigate the possibility of collaborating with local transit agencies to use a small portion of revenue – particularly along routes with access to park-and-ride facilities – to maintain these facilities.
- **Obligations/Limitations:** Requires negotiations and compromises with local transit agencies. The State cannot charge for use of facilities built with FHWA dollars, so existing State park-and-ride lots are ineligible for parking fees. Additionally, low parking costs in urbanized areas in Vermont may limit potential revenue sources.

Development Fees/Impact Fee Exemption

- **Description:** Legal contracts to exchange development fees in return for transportation alternatives on-site.
- **Example(s):** Using the traffic permit process, Maine DOT arranges an agreement with a developer to allow park-and-ride spaces in a development in return for impact fee exemption.⁶⁶
- **Use in Vermont:** VTTrans should assess the feasibility of integrating development fee or impact fee exemptions in areas of new development to encourage the development of private park-and-ride lots in areas with the potential for transit usage. This exemption should be part of the State’s larger effort to incentivize new developments to include TDM and other trip reduction strategies.
- **Obligations/Limitations:** Requires negotiations and compromises with developers and potentially local jurisdictions. The legal processing and fees associated with this funding alternative limit the appeal of working with developers.

Condition of Approval for New Development

- **Description:** Requiring a developer to dedicate park-and-ride spaces in a new development in order for the development approval.
- **Example(s):** Through their park-and-ride program, the San Luis Obispo Council of Governments encourages the County, local jurisdictions, and the Air Pollution Control District to require park-and-ride lot spaces as a “Condition of Approval” for new development at appropriate locations.⁶⁷
- **Use in Vermont:** VTTrans should assess the feasibility of implementing conditions of approval for development in areas with the potential for transit usage.

⁶⁵ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_359.pdf (10)

⁶⁶ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_359.pdf (7)

⁶⁷ https://library.slocog.org/PDFS/MAXIMIZING_SYSTEM_EFFICIENCY/PARK_AND_RIDE/PNR-LOT-DEVELOPMENT-STUDY-2013.PDF (42)

- **Obligations/Limitations:** Requires negotiations and compromises with developers and potentially local jurisdictions. The legal processing and fees associated with this funding alternative limit the appeal of working with developers.

Public-Private Partnerships

- **Description:** Mutualistic partnerships between public and private agencies where both parties benefit and save costs associated with a program or project.
- **Example(s):**
 - Private entities grant public use park-and-ride spaces in return for other improvements or compensation from Maine DOT.⁶⁸
 - Michigan DOT collaborated with Meijer supercenter stores in these areas to create additional outlets for carpoolers. For example, a Meijer stores allocated 50 spaces in their lot, which Michigan DOT marked as available spaces for park-and-ride. In return, Michigan DOT added signs for Meijer stores on adjacent highways directing drivers to the lots. Thirteen Meijer stores throughout the state allow spaces for members of the public to park their vehicle to join a carpool, vanpool, or public transit vehicle.⁶⁹ Michigan DOT estimated that they saved at least \$200,000 per lot given the partnership opportunities.⁷⁰
 - Michigan DOT extended the public-private park-and-ride concept to rural parts of the State where businesses, like larger regional gas stations, have taken advantage of the public-private partnership with Michigan DOT.⁷¹
 - Michigan DOT leases property from churches and other businesses that do not have high traffic during the week.⁷²
 - The Regional Transportation Commission of Southern Nevada has a variety of free park-and-ride lots available to carpoolers and transit riders that are the result of the Commission's partnership with local retailers. The retail lots provided a set allocation of parking spots for park-and-ride usage in return for the business opportunity associated with parking lot usage.⁷³
 - The El Dorado County Transit Authority took advantage of the local fairgrounds when not in-use, as a park-and-ride lot.⁷⁴
 - The Hillsborough Area Regional Transit Authority, located in Florida's Tampa Bay region, takes advantage of underutilized parking lots through

⁶⁸ http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_359.pdf 7.

⁶⁹ http://www.michigan.gov/mdot/0,4616,7-151-9615_11228_11234-202122--,00.html

⁷⁰ Annelin Interview. October 6, 2014.

⁷¹ Annelin Interview. October 6, 2014.

⁷² Annelin Interview. October 6, 2014.

⁷³ <http://www.rtcnv.com/transit/routes-maps-schedules/transit-center-and-park-ride/park-ride-locations/>

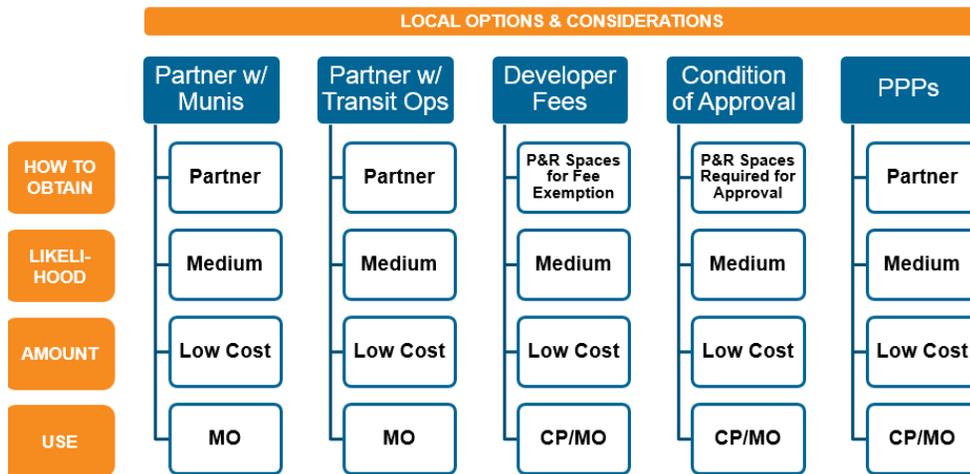
⁷⁴ http://www.edctc.org/C/TRANSIT/PnR_master_plan/6finance_strat.pdf (38)

partnerships with various local churches, parks, sports fields/complexes, and department stores to create spaces without incurring significant leasing costs.⁷⁵

- **Use in Vermont:** The examples above provide many options for consideration by VTTrans. Working with big box stores, venues of worship, and employers, VTTrans could gain access to spaces along or near transit routes throughout the state for minimal costs.
- **Obligations/Limitations:** Requires negotiations and compromises with local businesses.

Figure 10 summarizes potential local funding options for VTTrans consideration.

FIGURE 10: POTENTIAL LOCAL FUNDING SOURCES



4.3 | FUTURE FEDERAL AND STATE FUNDING

Table 18 provides a breakdown of four different growth scenarios for the VTTrans park-and-ride program and the sketch cost estimates associated to accommodate the growth. The four scenarios include:

- Maintain existing (i.e. no new capacity);
- Focus on expanding existing facilities;
- Focus on constructing new facilities; and
- Blended approach (focus on highest ranking new and expanded facilities).

⁷⁵ http://www.gohart.org/ride_guide/center_parknrides/P&Rs.html

TABLE 18: PARK-AND-RIDE PROGRAM GROWTH SCENARIO COSTS

Scenarios	Maintain	Expand	Construct	Expand/ Construct
Federal				
CMAQ Grants	\$2.5M	\$2.5M	\$2.5M	\$2.5M
Section 5307 Urbanized Area Formula Grants	N/A	N/A	Consider Allocation for Construction	Consider Allocation for Construction
Section 5339 Bus & Bus Facilities	N/A	N/A	Consider Allocation for Construction	Consider Allocation for Construction
Section 5311 Formula Grants for Rural Area	N/A	Consider Allocation for MO/Construction	Consider Allocation for MO/Construction	Consider Allocation for MO/Construction
MAP-21 Flexible Funding Programs	N/A	N/A	Consider Request for Reallocation	Consider Request for Reallocation
TIGER Grants	N/A	N/A	Consider Application for Larger-Scale Construction Projects	Consider Application for Larger-Scale Construction Projects
State				
State Transportation Fund	\$250K for CP/MO \$25-50K/lot for MO	\$250K for CP/MO \$25-50K/lot for MO	\$250K for CP/MO \$25-50K/lot for MO (Consider allocating to MO and using CMAQ for muni lots)	\$250K for CP/MO \$25-50K/lot for MO (Consider allocating to MO and using CMAQ for muni lots)
State-Owned Right-of-Way	NO	Review State-Owned Property Options	Review State-Owned Property Options	Review State-Owned Property Options
Local				
Contributions from Munis (Funds/Services)	Consider Partnership Opportunities for MO	Consider Partnership Opportunities for MO	Consider Partnership Opportunities for MO	Consider Partnership Opportunities for MO
Operator Revenues	Consider Partnership Opportunities for MO Funding	Consider Partnership Opportunities for MO Funding	Consider Partnership Opportunities for MO Funding	Consider Partnership Opportunities for MO Funding
Development Fees/ Impact Fee Exemption	N/A	N/A	Consider Agreements for Construction/ Space Allocation	Consider Agreements for Construction/ Space Allocation
Condition of Approval for New Development	N/A	N/A	Consider Agreements for Construction/ Space Allocation	Consider Agreements for Construction/ Space Allocation
Public-Private Partnerships	N/A	Consider Partnership Opportunities for Construction/ Space Allocation/ MO/ etc.	Consider Partnership Opportunities for Construction/ Space Allocation/ MO/ etc.	Consider Partnership Opportunities for Construction/ Space Allocation/ MO/ etc.
BUDGET RANGE	<\$4M	\$4-5M	\$5-6M	\$7M+

5.0 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

This study has investigated existing conditions of the VTTrans park-and-ride system. It has inventoried existing design features and calculated utilization rates. It has also noted inefficiencies in the existing data collection program. We examined park-and-ride best practices from four states that have innovative practices, and we have recommended what practices may be applied to Vermont. We have enumerated the different funding sources these states use and compared that with VTTrans historical funding. We have also recommended areas that VTTrans can consider for future park-and-ride funding. Finally, we explored areas where the park-and-ride system will need additional capacity and different construction and funding strategies to achieve this strategy.

The park-and-ride program has grown organically, driven by popular demand, over several decades. Historically, VTTrans has used CMAQ funds to construct park-and-ride facilities. However, maintenance procedures and budget have not kept pace with the Program and facility growth. VTTrans maintenance staff have by default been accountable for the maintenance and upkeep of these facilities, utilizing highway maintenance dollars. The capital budget for this program remains separate from the maintenance budget due to different funding sources. A clear understanding of total facility costs needs to be analyzed and then accounted for in the maintenance budget. The agency does not currently have standardized inventory and monitoring practices for park-and-ride facilities.

We recommend VTTrans does the following steps in its park-and-ride program:

- Develop a Program Partners Group to implement the identified Plan recommendations and to develop general Program Guidance to define how the Park-and-Ride program will operate. These would include outlining the appropriate roles, responsibilities, communication chains and funding streams. In addition, program goals and objectives (program metrics) should be established. The Partners Group should also develop standards regarding installation, inventorying, and maintenance basic design features (i.e. signage, lighting, shelters where appropriate).
- Refine the facility expansion and siting process that will focus resources in over-capacity catchment areas and population centers greater than 10 miles from existing park-and-ride lots with the following priorities:
 - Develop new facilities in areas of unmet needs, and
 - Expand existing over-capacity lots where possible, then
 - Facilitate municipal/private development to meet demand
- Develop supportive permitting rules:
 - Required in over-capacity, transit-proximate, large developments requiring a Traffic Impact Study (i.e. greater than 75 peak hour trips)

- Possible with impact fee reduction as part of larger TDM incentives in moderate priority areas
- Standardize data management:
 - Monitor park-and-ride usage
 - Inventory park-and-ride facility conditions
 - Monitor park-and-ride operations and maintenance costs
- Ensure that maintenance and operations costs are accounted for and included incorporated into the facility scoping process:
 - Accurately track maintenance and operations costs associated with the facilities.
 - Develop guidance that details the acceptable level of service associated with facility maintenance and operations as well as the necessary preventative maintenance.
 - Ensure maintenance and operations budget is adequate to meet defined needs.
- Develop supporting guidance:
 - P&R facility priorities for facility expansion and new facility siting should be based on the prioritization methodology.
 - Highway projects should continue to be evaluated for opportunities to establish P&R lots.
 - The P&R Program should prioritize medium -(40-79 space) and large (80+ space) lots. The Municipal Program should prioritize smaller lots (less than 40 spaces)
 - A P&R Design Features Guidance shall be developed and will address required features that are supporting functional components of multi-modal facilities such as signage, lighting, transit shelters where appropriate, and pedestrian crossings.



FORMAL COMMENTS



Plan Comments

A draft of this Plan was circulated amongst the Internal Agency Working Group (IWG), the external Stakeholder Advisory Committee (SAC), and Regional Planning Commissions upon request in October 2015. The draft was updated as appropriate. Formal comments submitted to the Agency via email or hard copy comprise this Appendix.





110 West Canal Street, Suite 202
Winooski, Vermont 05404-2109
802-846-4490
www.ccrpcvt.org

MEMORANDUM

TO: Jackie Cassino
FROM: Peter Keating (CCRPC), Sandy Thibault (CATMA), Meredith Birkett (CCTA), and Jason Van Driesche (Local Motion)
DATE: June 4, 2015
RE: VTrans Park and Ride Plan

Thanks for the opportunity to be involved in the VTrans Statewide Park and Ride Facility Plan. As organizations based in, and having a primary focus on, Chittenden County, our comments reflect a largely urbanized area concern. From that perspective we would like to point out what we feel is the omission of other viable types of park and rides.

While regional needs assessments were summarized as part of the Existing Conditions report (p. 5), Chittenden County intercept facility priorities were notably absent. Intercept facilities are closer to trip destinations vs. origins and are located outside congested activity centers in order to reduce the number of cars entering that center. Our 2011 Regional Park and Ride Plan further described these facilities:

“The primary advantage and purpose of an intercept parking facility is to allow for the redevelopment of existing parking facilities within the urban core to higher and better uses. Intercept lots reduce vehicle trips within the heart of an urban core...”

The 2011 Plan also recognized several priority locations for this type of facility, including:

- I-89 Exit 14 in South Burlington,
- I-89 Exit 16 in Colchester, and
- near the I-189/US RT 7 intersection in South Burlington (a site of particular interest to CCTA to serve a significant segment of Link Express riders).

The VTrans report cites a best practice of locating facilities ideally 10 miles from an activity center which would preclude making intercept facilities state priorities. While we understand VTrans may desire to leave such facility types out of their priority recommendations, it seems there should be an acknowledgement that, at least in Chittenden County, these types of facilities are a priority.

We feel that the VTrans plan should include some focus on parts of the state with congestion problems -- particularly on intercept lots coming into the Burlington metro area. To focus only on catchment areas of over-capacity lots, the VTrans plan may leave out important sites around our urban core.

Other comments:

- Consider identifying other study objectives/goals, such as reducing congestion and/or a desire for a fair geographic park and ride funding distribution statewide.
- Consider quantifying the magnitude of trip reduction from park and rides relative to the overall statewide trip picture; i.e., identify the overall impact of these facilities on reducing trips, saving fuel and reducing emissions.
- One of the park and ride best practices mentioned is to have transit stops within a quarter mile of park and rides. It's also important to assess how safely pedestrians can make that quarter mile trip.
- Consider incorporating regional park and ride priorities into the State's project development process in order to ensure that local knowledge of particular park and ride or intercept facility demand is accurately captured.
- Consider conducting (or at least highlight the need for) a more nuanced evaluation of bike access, with reference to shoulder width, AADT, and posted speed
- Differentiate between bike parking and secure bike parking (i.e., lockers) and plan for both
- Review and correct per-user cost data for bike lockers (data presented appears to inflate the cost)

We applaud the state in undertaking this work as park and ride facilities - properly located, well maintained, and safely operated – will help VTrans meet important transportation, financial and environmental goals.



Subject: FW: VTrans Park & Ride Facility Plan- Plan Draft to review by 10/30

From: Jason Rasmussen [mailto:jrasmussen@swcrpc.org]

Sent: Friday, October 23, 2015 11:19 AM

To: Cassino, Jackie <Jackie.Cassino@vermont.gov>

Subject: RE: VTrans Park & Ride Facility Plan- Plan Draft to review by 10/30

Hi Jackie,

It looks good to me. Just a few comments for your consideration:

- a) Include "bicycle parking" under Program Priority #4 on page XI.
- b) I think the following additional items should be included somewhere under the recommendations:
 - i. New and improved park-and-ride facilities shall be designed to accommodate safe, easy transit bus circulation.
 - ii. New and improved park-and-ride facilities should include electric vehicle charging stations
 - iii. VTrans will coordinate with NHDOT regarding facilities along the broader I-91 corridor. For example, a new lot in Claremont, NH may be a good solution to address capacity issues at the I-91 Exit 8 park-and-ride facility.

Jason

Jason Rasmussen, AICP
Southern Windsor County Regional Planning Commission
38 Ascutney Park Road
PO Box 320
Ascutney, Vermont 05030-0320
802-674-9201

From: Peter G. Gregory <pgregory@trorc.org>
Sent: Wednesday, October 28, 2015 3:18 PM
To: Cassino, Jackie
Cc: Pelletier, Dave; Rita Seto

Subject: Re: VTrans Park & Ride Facility Plan- Plan Draft to review by 10/30

Hi Jackie,

Thank you very much for the call and a copy of this draft. I appreciate the fact that input will never be too late, but I wanted to give you some quick thoughts now.

On the last page under Program Priorities (4) I would add "bus movement analyses" as a required design input, regardless whether a current transit connection exists.

I suggest adding a new recommendation. "Development of Program Metrics for measuring and evaluating the effectiveness and efficiency of Program delivery".

Somewhere else in the Plan, I would add discussion and/or policies that discuss and highlight other state planning documents or policies that are strongly connected to park and ride lot capacity such as greenhouse gas emission reductions and energy conservation.

I would also suggest you discuss the need to ensure private sector financial participation in park and ride lot capacity development/expansion as a method to mitigate private sector development that runs counter to GHG emission reductions and energy conservation.

Finally, given the slow pace at which Vermont has developed new lot locations and increased the size of existing ones, please indicate that a greater investment needs to happen immediately if we are going to begin to address VTrans' vision of an (improved) quality of life and progress in meeting the goals of the Vermont Comprehensive Energy Plan.

Thanks again Jackie.
Peter

Peter G. Gregory, AICP
Executive Director

Two Rivers-Ottawaquechee Regional Commission
128 King Farm Road | Woodstock, Vermont 05091
(802) 457-3188 | (802) 457-4728 - fax | (802) 558-9064 - cell
pgregory@trorc.org | trorc.org | [TRORC facebook](#) | [ECVermont facebook](#)



From: Tom Chittenden <tchittenden@sburl.com>
Sent: Monday, October 12, 2015 6:34 PM
To: Cassino, Jackie; 'cbaker@ccrpcvt.org'
Cc: Bell, Amy; Pelletier, Dave; 'Karen Walton - CCTA (kwalton@cctaride.org)'; 'David Armstrong - CCTA (darmstrong@cctaride.org)'; 'Peter Keating'; 'Eleni Churchill'; Chris Shaw
Subject: RE: Park and Ride Plan comments

Jackie and Charlie,

Thank you for this email. The comment made at the October 5th South Burlington City Council was offered as a follow up to Councilor Chris Shaw's remark regarding possible future transit hubs in the envisioned SB City Center. My comment, partly inspired by the previous day article about Kmart closing its doors on Shelburne road and partly inspired by a comment raised at the CCTA Board of Commissioners Annual Retreat in September, was that future park & rides along interstate 89 or 189 would draw more 'choice' passengers if their determined location and design was amenity oriented (as opposed to thoroughfare proximity or traffic flow oriented).

I apologize if this is a naïve observation as I am new to many of these conversations but I would offer that the Park & Rides would attract more usage from 'choice-riders' if they were attached or within huddle distance of a facility with restrooms, gas, convenient items and hot coffee. I reflect (not fondly) waiting on cold January mornings at the Richmond park & ride looking longingly at the gas station a stone's throw from the pickup site but just a little too far to sprint for a coffee refill.

In this same conversation, the notion of Solar Panels being built over these impermeable parking surfaces would serve as car ports shielding parked cars from snow & ice making the 6 pm drop off on a cold, snowy February night less taxing on park & ride subscribers (because they'd have less ice & snow to scrape off their vehicles).

Again, I apologize if these are naïve comments – the comment was mostly inspired by the possibilities of the Southern Connector aligning with a reinvigorated Kmart shopping plaza. A solar paneled cover park & ride lot in this space within walking distance of a Maplefields seems like an amenity oriented design that would draw more demand from choice riders (including myself).

If you'd like this comment/feedback in different form, please advise.

I hope this is worth considering and thank you, Charlie, for following up on this,

Tom Chittenden
South Burlington City Councilor
Newly Appointed CCTA Board Commissioner
802.233.1913