

**RAMEY KEMP ASSOCIATES**

Moving forward.



Virginia Military Institute  
**Parking Demand Study**  
**Lexington, Virginia**  
**September 2021**

**PARKING DEMAND STUDY**

**FOR**

**VIRGINIA MILITARY INSTITUTE**

**LOCATED**

**IN**

**LEXINGTON, VIRGINIA**

Prepared for:  
Wiley Wilson  
127 Nationwide Drive  
Lynchburg, Virginia 24502



Prepared By:  
Ramey Kemp & Associates, Inc.  
4343 Cox Road  
Glen Allen, Virginia 23060



September 2021

RKA Project No. 21163

Prepared By: JRP  
Reviewed By: CAH

# VIRGINIA MILITARY INSTITUTE PARKING DEMAND STUDY

## LEXINGTON, VIRGINIA

### 1. EXECUTIVE SUMMARY

At the request of the Virginia Military Institute (VMI), Ramey Kemp & Associates (RKA) performed a parking demand study for the VMI Post, in order to determine the effects of planned reductions in parking capacity on Post. VMI currently has 1,205 parking spaces on Post, but in the coming years, this is expected to decrease to approximately 966 spaces. On a typical day, VMI is expected to see approximately 906 to 997 vehicles parking on Post, with a majority on Main Post and South Post. It is expected that these two areas (excluding parking on North Post) will experience a parking deficit in the future, ranging from 88 to 179 spaces on any given day. However, there is a surplus of 148 parking spaces on North Post that could be used to help offset this deficit.

VMI is exploring the option of constructing a parking deck to accommodate the daily parking needs on Post, while also providing adequate parking capacity for special events. RKA has estimated the parking demand for a mid-size event during a typical weekday, and a larger event (up to 650 attendees) on an evening or weekend. Based on this analysis, RKA estimates that a potential future parking deck would need between 344 and 446 parking spaces in order to accommodate VMI's parking needs. This report also includes recommendations to better utilize existing parking spaces and reduce the number of additional spaces needed by approximately 50%.

## **2. INTRODUCTION**

The Virginia Military Institute (VMI) is located northeast of downtown Lexington, Virginia. The Post covers approximately 200 acres and is home to 1,700 cadets with supporting faculty and staff. VMI is currently constructing a new aquatic facility and has plans to construct a new building (CLE Phase 2 – Leadership Development Facility) and parking deck where the Marshall Hall parking lot currently exists. The Institute is also in the early stages of concept development for potential expansion of Moody Hall.

VMI hosts numerous special of events during the year, and for many events, a portion of the Parade Ground is used for overflow parking. Based on discussions with VMI staff, the main objectives of this study are to:

- Field verify current parking available on Main Post
- Estimate projected parking demand for typical weekday operations and a mid-sized special event such as a conference, alumni week events, or an Admissions open house
- Estimate future anticipated parking supply for Main Post in coordination with the following planned or potential changes to parking:
  - Future Leadership Development Facility and parking structure
  - Moody Hall renovation programming and concept development
  - Removal of North Main Street parallel parking by the City of Lexington and the Virginia Department of Transportation (VDOT)
  - Available parking at the MLFTG lot and behind Foster Stadium after cadet parking transitions to Lackey Park
- Determine how many additional parking spaces are needed on Post, in the proposed parking deck or elsewhere, to accommodate daily functions and a mid-size event such as a class reunion or guest speaker

**2.1. Current Parking Capacity**

There are currently 20 surface parking lots on Post, and parallel parking along both sides of North Main Street. RKA performed a field visit on April 22 to confirm the number of spaces in every lot, and estimate the number of parallel spaces along North Main Street. The field visit was conducted between 10:30 AM and 2:30 PM. Other than spaces that are reserved for leadership, cadets, and maintenance vehicles, most spaces on Post are available for anyone to park.

During the field visit, RKA also recorded the number of vehicles parked in each lot since that required no additional effort, and that data is included in Table B in the appendix. The parking demand that was observed was lower than normal because many employees were working remotely due to the COVID-19 pandemic, so the projected parking demand is based on the current employee count and the expected attendance of a special event on Post during the day.

For this analysis, the Post was split into four zones:

- North Post – north of Woods Creek
- Main Post – between North Main Street and Woods Creek
- South Post – south of North Main Street
- Parallel parking along North Main Street



**Lot #1 - Marshall Parking Lot**

There are currently 1,205 parking spaces available on Post, including 38 handicapped-accessible spaces:

- North Post – 149 spaces
- Main Post – 675 spaces
- South Post – 258 spaces
- North Main Street – 123 parallel spaces



## 2.2. Future Changes to Parking Capacity

There are three factors that will reduce the parking capacity on Post:

- The Virginia Department of Transportation (VDOT) is planning to restripe North Main Street to create dedicated bicycle lanes in both directions, which will eliminate 123 parallel parking spaces. Construction of the bike lanes, as part of VDOT SmartScale Project #1247, is set to begin in 2023 and conclude in 2025.
- The proposed CLE Phase 2 Building (Leadership Development Facility) and bus loop will eliminate the existing surface lot at Marshall Hall (149 spaces).
- VMI is currently evaluating programing requirements for Moody Hall and developing concepts to address the program requirements. While the number of daily staff occupants is not expected to change, an expansion of the building is under consideration for large events and may greatly increase the event parking demand.

In addition, VMI plans to move cadet parking, which is currently located in the Clarkson-McKenna lot, the Marshall Hall lot, and the MLFTG lot, to Lackey Park in order to open up more parking on Post. Upon completion of the projects listed above, the parking capacity on Post will drop from 1,205 spaces to 966 spaces. VMI plans to retain the existing number of 38 handicapped spaces.

Table 1 shows the Parking Demand Index, which quantifies the desirability of each parking lot. At the request of VMI, RKA estimated the peak parking demand for each parking lot based on the number of employees and staff in each building, and the number of VMI service vehicles on Post. VMI provided a summary spreadsheet with the maximum number of people working in each building across the Post on a typical weekday, which is summarized in Table A in the appendix. Most people desire to park as close to their building as possible, and very few people desire to walk more than 5 minutes (+/- 0.25 mile) to their building.

In order to estimate the parking demand based on building occupancy, RKA evaluated each building independently, and assigned the people in each building to the most convenient parking lot. The Parking Demand Index, as shown in Table 1, depicts the number of people that would prefer to park in each lot, divided by the capacity of the lot. For this measure, higher numbers equate to more desirable parking locations, with any number greater than 1.0 indicating that demand exceeds capacity.

Figure 1 provides a visual representation of the Parking Demand Index in the parking lots across the Post. This does not take into account future buildings or any special events.

**Table 1  
Projected Parking Capacity and Parking Demand Index**

Lot #	Lot Name	Capacity	Parking Demand Index
1	Marshall Hall	--	--
2	VMI Parade (Southern / Lots)	53	1.77
3	VMI Parade (Northern / Loop)	88	0.81
4	South Institute Hill (Upper)	68	1.54
5	South Institute Hill (Lower)	105	0.44
6	Letcher Avenue	34	3.00
7	Engineering Dr. / Preston / Mallory	26	2.50
8	Burma Road / Barracks	29	1.76
9	Scott Shipp Hall	6	2.50
10	Health Center / Crozet Hall	43	2.51
11	North Institute Hill	107	1.06
	<b>Main Post</b>	<b>559</b>	<b>1.38</b>
12	Corps Physical Training Facility	126	0.32
13	Cameron Hall	15	1.00
14	Clarkson-McKenna Hall	80	0.29
15	Kilbourne / Cormack Hall	37	1.54
	<b>South Post</b>	<b>258</b>	<b>0.52</b>
16	Paulette Hall	52	0.00
17	MLFTG	53	0.02
18	Woods Creek Trail / Firing Range	8	0.00
19	Tennis Courts	5	0.00
20	Jordan's Point	31	0.00
	<b>North Post</b>	<b>149</b>	<b>0.01</b>
	<b>Total</b>	<b>966</b>	<b>0.94</b>

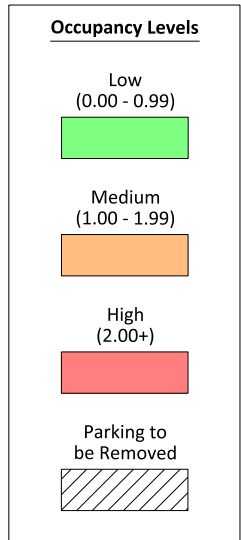
The Parking Demand Index values highlighted in green are below 1.0, the values highlighted in yellow are between 1.0 and 2.0, and the values highlighted in red are greater than 2.0.



# Figure 1: VMI Post Parking Demand Index

## VMI Post Parking Demand Study

Based on Building  
Occupancy, Table 1



**RKA**  
RAMEY KEMP ASSOCIATES  
4343 Cox Road, Richmond, Virginia 23060  
Phone: 804-217-8562 www.rameykemp.com

Overall, there are 857 faculty, staff, and employees on Post, along with 49 service vehicles, for a total of 906 vehicles on Post. If everyone drove to work alone, then the overall parking occupancy on Post would be 94%.

Table 1 shows that the parking demand index in the Main Post exceeds the available capacity by approximately 38%. The demand index suggests that the most attractive and convenient parking spaces are on the eastern side of Main Post, in the Letcher Avenue lot, Engineering Drive lot, Scott Shipp Hall lot, and the Health Center / Crozet Hall lot. This is because there are a large number of employees working in this area, but there is limited parking capacity nearby. The parking demand index in the South Post is relatively low at 52%, which explains why these lots are generally under-utilized. The parking demand index in the North Post is the lowest at just 1%, because there are very few employees in that zone. The spaces in North Post are more than a five minute walk (0.25 mile) from the core academic buildings in Main Post, and there are significant elevation changes between the two areas, making the North Post parking lots undesirable.

Table 2 summarizes the surplus or deficit of parking in each area of Post, utilizing the building occupancy numbers to forecast parking demand. The “Low” column accounts for all VMI faculty being present on Post, and the “High” column adds an additional 10% to the building occupancy numbers, in order to account for visitors and construction vehicles that may be present on any given day.

**Table 2: Post Parking Supply Summary**

Post Area	Parking Spaces	Parking Demand		Surplus or (Deficit)	
		Low <sup>1</sup>	High <sup>2</sup>	Low <sup>1</sup>	High <sup>2</sup>
Main Post	559	738	812	(-179)	(-253)
South Post	258	167	184	91	74
North Post	149	1	1	148	148
<b>Post Total</b>	<b>966</b>	<b>906</b>	<b>997</b>	<b>60</b>	<b>(-31)</b>

1. Based on Building Occupancy Data
2. Based on Building Occupancy Data, with 10% added for visitors and construction vehicles

This analysis yielded a large deficit of parking in the Main Post area, with surpluses in North Post and South Post. Due to the close proximity of Main Post and South Post to one another, along with the under-utilization of the Corps Physical Training Facility Parking Lot, RKA assumed that some of the additional vehicles from Main Post could be reassigned to South Post. RKA estimates that, once the expected reductions in parking supply on VMI's Post occur, the Main Post and South Post areas will have a deficit of approximately 88 to 179 parking spaces on a typical weekday.

In the short term, the surplus of parking in the North Post area could be used to offset this, if VMI faculty were directed to park here and provided with a shuttle service back to Main Post. VMI could also look to stripe out additional street parking that may be available or expand any of its existing surface lots, though space to do so is limited. VMI plans to construct a new parking deck in place of the existing Marshall Parking Lot to address the parking deficit on Post.

**3. PARKING DEMAND FOR A SPECIAL EVENT**

VMI hosts many events throughout the year, and the attendance at these events varies widely. The events that draw the most visitors to Post are home football games, matriculation, and graduation. For these events, the Parade Ground is used for overflow parking. Based on discussion with VMI staff, the purpose of this analysis is to evaluate the parking needs for a mid-size event during a typical weekday and a larger event in the evening or on a weekend, but not for the largest events such as home football games, matriculation, and graduation.

Based on discussions with VMI staff, this analysis is based on a need to support a typical mid-size event such as a conference, alumni week events, or an Admissions open house. The parking demand analysis was based on a mid-size daytime event with up to 200 attendees, and a larger evening event with up to 650 attendees – based on current programming development for Moody Hall that includes two large meeting rooms capable of hosting up to 650 people.

The parking demand was estimated assuming an average vehicle occupancy of 1.50 people per vehicle (represented in the Low columns), and 1.25 people per vehicle (represented in the High columns).

Table 3 provides an estimate of the future parking demand on Post with a mid-size daytime event and with a large evening event. The large event assumes that Post will be largely unoccupied, allowing some attendees to park in the VMI Parade Parking lots (141 spaces total). The demand for a mid-size event factors in the projected daytime parking deficit on Post.

**Table 3: Future Parking Demand**

	Event Size		Parking Demand	
	Low <sup>1</sup>	High <sup>2</sup>	Low <sup>1</sup>	High <sup>2</sup>
<b>Post Parking Deficit</b>	--	--	88	179
<b>Mid-Size Event During Typical Weekday</b>	170	200	<b>237</b>	<b>399</b>
<b>Large Event on an Evening or Weekend</b>	650	650	<b>344</b>	<b>446</b>

1. Based on 1.50 people/vehicle  
 2. Based on 1.25 people/vehicle

Based on this analysis, a future parking deck would require between 237 and 399 parking spaces to accommodate a mid-size event during the day concurrent with daily operations at 85% occupancy. The deck would require between 344 and 446 parking spaces to accommodate a large evening event at 85% occupancy. With a deck this size, VMI will be able to comfortably accommodate a mid-size event concurrent with daily operations.

#### 4. RECOMMENDATIONS

Based on the future parking demand calculations in Table 3, the proposed parking deck will require between 344 and 446 spaces to serve a large evening event, assuming the following:

- Vehicle occupancy of 1.25 to 1.50 people per vehicle
- Peak occupancy of 85%
- Event attendees also utilize the 141 existing spaces in the VMI Parade Parking lots

There are several lots on Post that are under-utilized – especially the lot under the Corps Physical Training Facility, and the North Post lots. It is recommended that VMI instruct event visitors to park in under-utilized lots on North Post and South Post, then shuttle them to and from Main Post.

As shown in Table 1, there are 149 spaces in the North Post. The Paulette Hall and MLFTG lots are within a 0.25 mile from Marshall Hall and Moody Hall. The pedestrian pathway has recently been improved along Anderson Drive, but it is unlikely that visitors will park there on their own for events due to the elevation changes. However, if event attendees are instructed to park in these lots, and a shuttle bus delivers them to and from the event, then approximately 126 event vehicles could park there (85% of 149 spaces).

The parking lot under the Corps Physical Training Facility is also under-utilized. As shown in Table 1, there are 126 spaces in this lot. This lot is just within a 0.25 mile from Marshall Hall and Moody Hall, and at the bottom of the hill, so it is unlikely that visitors will park there on their own for events. If event attendees are instructed to park in this lot, and a shuttle bus delivers them to the event, then approximately 107 event vehicles could park there (85% of 126 spaces).

If the existing lots in the North Post and under the Corps Physical Training Facility are fully utilized for events, and up to 233 vehicles were parked in those two areas, that would reduce the number of spaces needed in the proposed parking deck to 111 to 213 spaces. Considering the expense of parking deck construction (approximately \$30,000 per space for above ground levels, and approximately \$60,000 per space below ground), fully utilizing the existing surface



lots on North Post and South Post with shuttle service for large events would cut the construction cost of a potential parking deck by more than 50% – a significant cost savings to VMI.

VMI should also evaluate vertical expansion of the existing surface lots on Main Post. For example, the North Institute Hill and South Institute Hill lots are both large enough that the addition of a second level would add a significant number of parking spaces. The topography on Main Post could allow an opportunity to provide access to a second level on these lots. If a second level is added, some spaces on the first level would be lost to support columns for the second level.

# APPENDIX

Figures, Background Data and Calculations

**Table A  
Projected Parking Demand Based on Building Employee Count**

<b>Building Name</b>	<b>Employee Count</b>	<b>Main Post</b>	<b>South Post</b>	<b>North Post</b>	<b>Post Total</b>
<b>Number of Parking Spaces</b>	--	559	258	149	966
301 Letcher - VMI Police	19	19	0	0	19
303 Letcher - VMI Protocol	10	10	0	0	10
305 Letcher - Letcher House / HR	5	5	0	0	5
307 Letcher – Admissions / Financial Aid	10	10	0	0	10
309 Letcher - Admissions	7	7	0	0	7
320 Institute Hill - Freeland House	11	11	0	0	11
Barracks	59	59	0	0	59
Carroll Hall	31	31	0	0	31
Cocke Hall	9	9	0	0	9
Crozet Hall	45	45	0	0	45
Heating Plant	5	5	0	0	5
Jackson Memorial Hall	5	5	0	0	5
King Hall	0	0	0	0	0
Mallory Hall	43	43	0	0	43
Marshall Hall	10	10	0	0	10
Marshall Library	9	9	0	0	9
Maury-Brooke Hall	32	32	0	0	32
Moody Hall	14	14	0	0	14
Morgan Hall	0	0	0	0	0
Nichols Engineering Building	72	72	0	0	72
Niekerk Hall	33	33	0	0	33
Old Post Hospital	6	6	0	0	6
Post Hospital Health Center	21	21	0	0	21
Preston Library	26	26	0	0	26
Richardson Hall	47	32	15	0	47
Scott Shipp Hall	101	101	0	0	101
Shell Hall	11	11	0	0	11
Smith Hall	52	52	0	0	52
<b>Main Post Total</b>	<b>693</b>	<b>678</b>	<b>15</b>	<b>0</b>	<b>693</b>

**Table A (continued)  
Parking Demand Based on Building Employee Count**

<b>Building Name</b>	<b>Employee Count</b>	<b>Main Post</b>	<b>South Post</b>	<b>North Post</b>	<b>Post Total</b>
<b>Number of Parking Spaces</b>	--	559	258	149	966
307 N Main - Aquatic Center / Legion Building	7	0	7	0	7
Cameron Hall	33	0	33	0	33
Clarkson-McKenna Hall	20	0	20	0	20
Cormack Hall	20	0	20	0	20
Corps Physical Training Facility	14	0	14	0	14
Kilbourne Hall	69	32	37	0	69
<b>South Post Total</b>	<b>163</b>	<b>32</b>	<b>131</b>	<b>0</b>	<b>163</b>
North Post Firing Range	0	0	0	0	0
North Post Physical Plant	0	0	0	0	0
Paulette Hall	1	0	0	1	1
<b>North Post Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>
<b>Post Total</b>	<b>857</b>	<b>710</b>	<b>146</b>	<b>1</b>	<b>857</b>

**Table B  
Observed Parking Lot Occupancy**

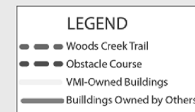
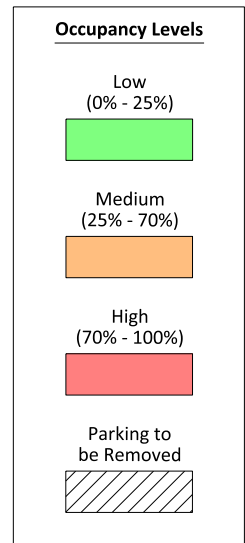
Lot #	Lot Name	Handicapped Spaces	Capacity	Spaces Filled	Occupancy
1	Marshall Parking Lot	6	149	75	50%
2	VMI Parade (Southern / Lots)	2	53	43	81%
3	VMI Parade (Northern / Loop)	6	88	51	58%
4	South Institute Hill (Upper)		68	49	72%
5	South Institute Hill (Lower)	3	105	61	58%
6	Letcher Avenue		34	25	74%
7	Engineering Dr. / Preston / Mallory	1	26	23	88%
8	Burma Road / Barracks		29	19	66%
9	Scott Shipp Hall		6	1	17%
10	Health Center / Crozet Hall		43	31	72%
11	North Institute Hill		74	63	85%
	<b>Main Post</b>	<b>18</b>	<b>675</b>	<b>441</b>	<b>65%</b>
12	Corps Physical Training Facility	5	126	9	7%
13	Cameron Hall	2	15	5	33%
14	Clarkson-McKenna		80	65	81%
15	Kilbourne / Cormack	4	37	29	78%
	<b>South Post</b>	<b>11</b>	<b>258</b>	<b>108</b>	<b>42%</b>
16	Paulette Hall	5	52	0	0%
17	MLFTG		53	4	8%
18	Woods Creek Trail / Firing Range	3	8	0	0%
19	Tennis Courts	1	5	1	20%
20	Jordan's Point		31	0	0%
	<b>North Post</b>	<b>9</b>	<b>149</b>	<b>5</b>	<b>3%</b>
21	N Main St - Route 11 to Cameron		123	66	54%
	<b>Total</b>	<b>38</b>	<b>1,205</b>	<b>620</b>	<b>51%</b>

# Figure 2: VMI Post Existing Parking Occupancy



## VMI Post Parking Demand Study

Based on Collected  
Field Data, Table B



**RKA**  
**RAMEY KEMP ASSOCIATES**  
 4343 Cox Road, Richmond, Virginia 23060  
 Phone: 804-217-8562 www.rameykemp.com



Table C: Parking Demand Index Assignment

Building Name	Max Building Occupancy	VMI Work Vehicles	2	3	4	5	6	7	8	9	10	11	Main Post
			VMI Parade (Southern / lots)	VMI Parade (Northern / loop)	South Institute Hill (Upper)	South Institute Hill (Lower)	Letcher Avenue	Engineering Dr / Preston / Mallory	Burma Road / Barracks	Scott Shipp Hall	Health Center / Crozet Hall	North Institute Hill	
			Main Post	Main Post	Main Post	Main Post	Main Post	Main Post	Main Post	Main Post	Main Post	Main Post	
Number of Parking Spaces			53	88	68	105	34	26	29	6	43	107	559
301 Letcher - VMI Police	19	7			26								26
303 Letcher - VMI Protocol	10				10								10
305 Letcher - Letcher House/HR	5				5								5
307 Letcher - Admissions/Fin Aid	10				10								10
307 N Main - Aquatic Ctr/Legion Bldg	7												0
309 Letcher - Admissions	7	2			9								9
320 Institute Hill - Freeland House	11	6			6	11							17
Barracks	59	10		39			20		10				69
BLDG 46	0												0
Cameron Hall	33	1											0
Carroll Hall	31								10	5	16		31
Clarkson-McKenna Hall	20	3											0
Cocke Hall	9									4		5	9
Cormack Hall	20												0
Corps Physical Training Facility	14												0
Crozet Hall	45	4									25	24	49
Heating Plant	5	1							6				6
Jackson Memorial Hall	5						5						5
Kilbourne Hall	69											32	32
King Hall	0												0
Mallory Hall	43				17			26					43
Marshall Library	9		5	4									9
Marshall Hall	10		10										10
Maury-Brooke Hall	32				20	12							32
Moody Hall	14		14										14
Morgan Hall	0												0
Nichols Engineering Building	72	3			6	6	34	26	3				75
Niekerk Hall	33		20		13								33
North Post Firing Range	0												0
North Post Physical Plant Bldg	0												0
Old Post Hospital	6										6		6
Paulette Hall	1												0
Post Hospital Health Center	21	2									21	2	23
Preston Library	26						13	13					26
Richardson Hall	47	10		15			10		22		5	5	57
Scott Shipp Hall	101						15			6	35	45	101
Shell Hall	11			6			5						11
Smith Hall	52		45	7									52
	857	49	1.77	0.81	1.54	0.44	3.00	2.50	1.76	2.50	2.51	1.06	1.38

Table C: Parking Demand Index Assignment (Continued)

12	13	14	15	South Post	16	17	18	19	20	North Post	Post Total
Corps PT Facility	Cameron Hall	Clarkson-McKenna	Kilbourne / Cormack		Drill Field	Paulette Hall	Woods Creek Trail / Firing Range	Tennis Courts	Jordan's Point		
South Post	South Post	South Post	South Post		North Post	North Post	North Post	North Post	North Post		
126	15	80	37	258	52	53	8	5	31	149	966
				0						0	26
				0						0	10
				0						0	5
				0						0	10
7				7						0	7
				0						0	9
				0						0	17
				0						0	69
				0						0	0
19	15			34						0	34
				0						0	31
		23		23						0	23
				0						0	9
			20	20						0	20
14				14						0	14
				0						0	49
				0						0	6
				0						0	5
			37	37						0	69
				0						0	0
				0						0	43
				0						0	9
				0						0	10
				0						0	32
				0						0	14
				0						0	0
				0						0	75
				0						0	33
				0						0	0
				0						0	0
				0						0	6
				0		1				1	1
				0						0	23
				0						0	26
				0						0	57
				0						0	101
				0						0	11
				0						0	52
0.32	1.00	0.29	1.54	0.52	0.00	0.02	0.00	0.00	0.00	0.01	0.94