Roanoke Intermodal Facility Parking Study

A parking study was conducted to determine a parking solution to support the future Roanoke Intermodal facility. This analysis included capturing the parking inventory and occupancy during a typical weekday to understand the amount of public parking available to support the displacement of existing parking and the additional parking demand generated by the proposed Roanoke Amtrak station. The proposed Amtrak station will not only generate parking demand, but it is displacing two existing public parking facilities. It is important to understand how these changes will impact the balance of parking

Existing Parking Demand Analysis

Figure 1 shows the study area and the public parking facilities that were analyzed. The parking facilities are color coded to show which facilities are within a block of the proposed station. Each facility also has a letter ID which correlates with parking tables presented later.

Figure 1 – Study Area

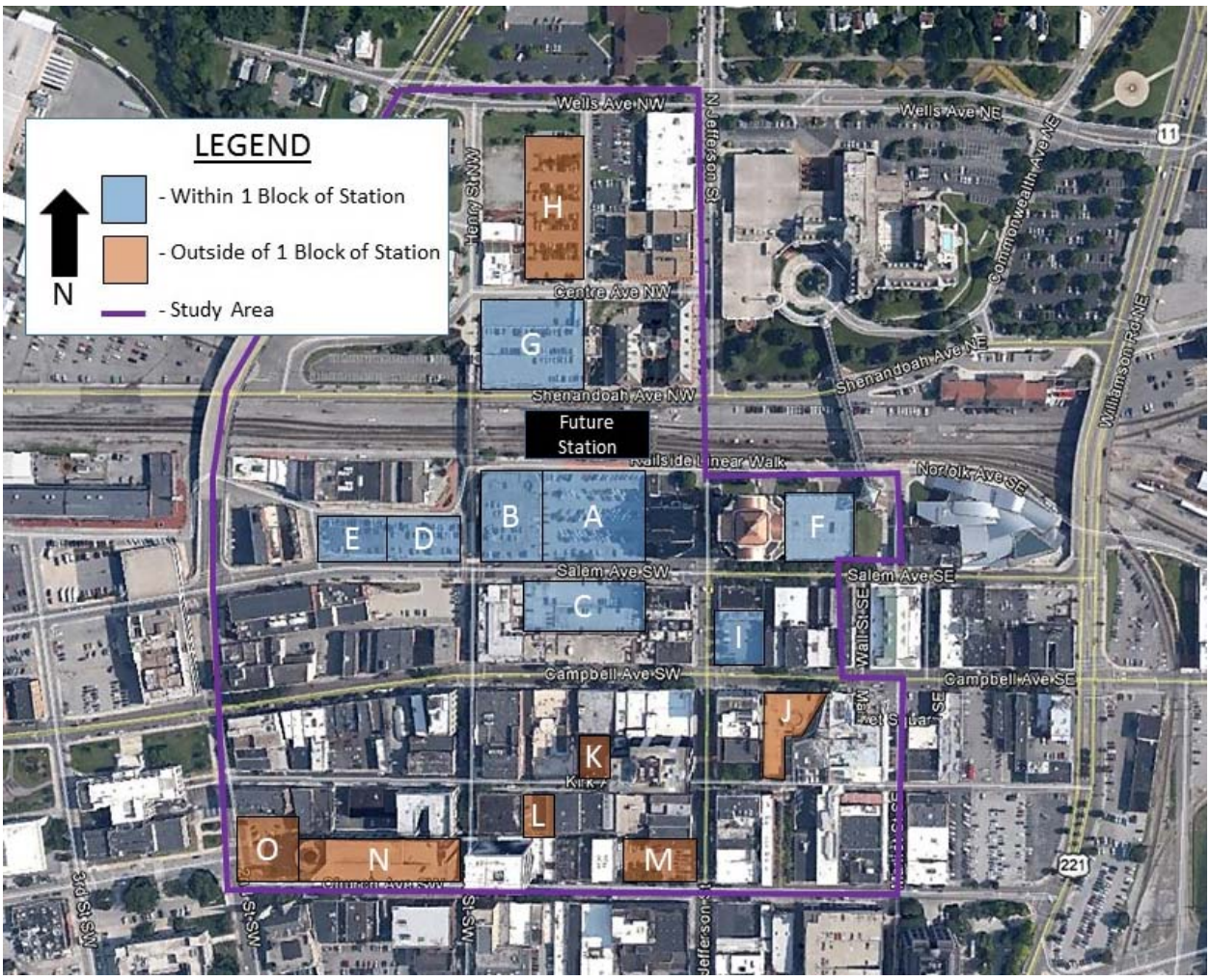

Table 1 shows the parking inventory and occupancy counts that were performed on Wednesday, February 11, 2015 of all public parking facilities in the study area surrounding the proposed Amtrak Intermodal Station. Occupancy counts were conducted at 9 AM, 11 AM, 1 PM, and 4 PM. Any reserved residential spaces in the parking facilities were removed from the analysis, since these spaces are not available for public parking. During the occupancy counts the 5th level and half of the 7th level of the Tower Garage (F) were closed for construction.

Based on the parking inventory counts there are a total of 3,032 public parking spaces in the study area, which includes a mix of both monthly, daily, and hourly parking. A peak occupancy was found at 11 AM when 58% of the parking in the study area was occupied. The two parking facilities to become displaced by the construction of the Amtrak station are the Knapsack Lot (A) and the Salem Avenue Garage (B), which total 465 spaces between the two facilities. Both of these facilities also had a peak occupancy at 11 AM when 252 of the 465 spaces were occupied, which is approximately 54% occupied.

Table 1 – Parking Inventory and Occupancy (Wednesday, February 11, 2015)

			Occupancy				Peak Occupancy
ID	**Name**	**Inventory**	**9:00 AM**	**11:00 AM**	**1:00 PM**	**4:00 PM**	**(11 AM)**
A	Knapsack Lot	164	102	135	110	127	82%
B	Salem Ave. Garage	301	114	117	110	91	39%
C	Campbell Court Garage	102	40	50	53	42	49%
D	Pollard Lot	55	28	30	32	26	55%
E	Warehouse Row Lot	44	31	30	30	31	68%
F	Tower Garage	691	316	346	319	327	50%
G	Gainsboro Garage	358	149	138	129	131	39%
H	Higher Ed. Center Lot	101	18	23	23	21	23%
I	Corned Beef Lot	40	15	31	27	12	78%
J	Center in the Square Garage	180	115	145	158	114	81%
K	Kirk Lot	34	31	31	31	29	91%
L	Amos Lot	20	11	13	9	11	65%
M	Sportsman Lot	42	28	32	31	17	76%
N	Church Avenue Garage	857	410	600	579	370	70%
O	Premier Parking Lot	43	17	24	20	18	56%
Parking Inventory and Occupancy Totals		**3,032**	**1,425**	**1,745**	**1,661**	**1,367**	
Percent Occupied			**47%**	**58%**	**55%**	**45%**	

Table 2 shows the parking inventory and occupancy of the parking facilities within a one block radius of the proposed Amtrak station. There are currently 1,755 public parking spaces within a block of the proposed station, which are approximately 50% occupied during the peak parking period (11 AM). There is substantial parking capacity available in the Tower Garage and Gainsboro Garage based on this analysis to support displaced parking and additional demand generated by the Amtrak station.

Table 2 – Parking Inventory and Occupancy within a One Block Radius of Proposed Station

			2015 Occupancy			
ID	**Name**	**Inventory**	**9:00 AM**	**11:00 AM**	**1:00 PM**	**4:00 PM**
A	Knapsack Lot	164	102	135	110	127
B	Salem Ave. Garage	301	114	117	110	91
C	Campbell Court Garage	102	40	50	53	42
D	Pollard Lot	55	28	30	32	26
E	Warehouse Row Lot	44	31	30	30	31
F	Tower Garage	691	316	346	319	327
G	Gainsboro Garage	358	149	138	129	131
I	Corned Beef Lot	40	15	31	27	12
Total Parking Inventory and Occupancy		**1,755**	**795**	**877**	**810**	**787**
Percent Occupied			**45%**	**50%**	**46%**	**45%**

Figure 2 shows the peak parking occupancy in each facility and the parking facilities located within a one block radius of the Amtrak station. This reveals that there is a substantial amount of parking available within a reasonable walking distance to the proposed Amtrak station. Only three of the parking facilities in the study area were greater than 80% occupied and only one was greater than 90% occupied. Most of the parking in the study area had substantial capacity available to support additional parking demand.

Future Parking Demand Analysis

As discussed previously, the proposed Amtrak station will displace the Knapsack Lot and Salem Avenue Garage, which is a loss of 465 spaces. There will also be additional parking demand generated by the station. In developing a future parking plan for the Amtrak station, it is essential to determine how much public parking will be available in the area. **Table 3** provides a parking surplus/deficit analysis of the parking located within a one block radius of the Amtrak station. This analysis considers the existing peak parking demand, displacement of the Knapsack Lot and Salem Avenue Garage, and an 80% practical capacity factor. Based on the parking surplus/deficit analysis there are approximately 155 spaces available to support the Amtrak parking demand within one block of the proposed station.

A practical capacity factor has been applied to the analysis to account for seasonality factors, surges in demand, and the efficiency of the parking facilities. A parking facility and parking system become difficult to circulate and locate a space when it reaches its capacity. Providing additional parking capacity improves the level of customer service and makes it easier for a person to locate a parking space efficiently. Other parking management strategies can also be implemented to improve level of customer service and ease of finding a parking space, including: real-time parking availability signage, way-finding signage, online parking map, and online parking payment options.

Figure 2 – Peak Parking Occupancy

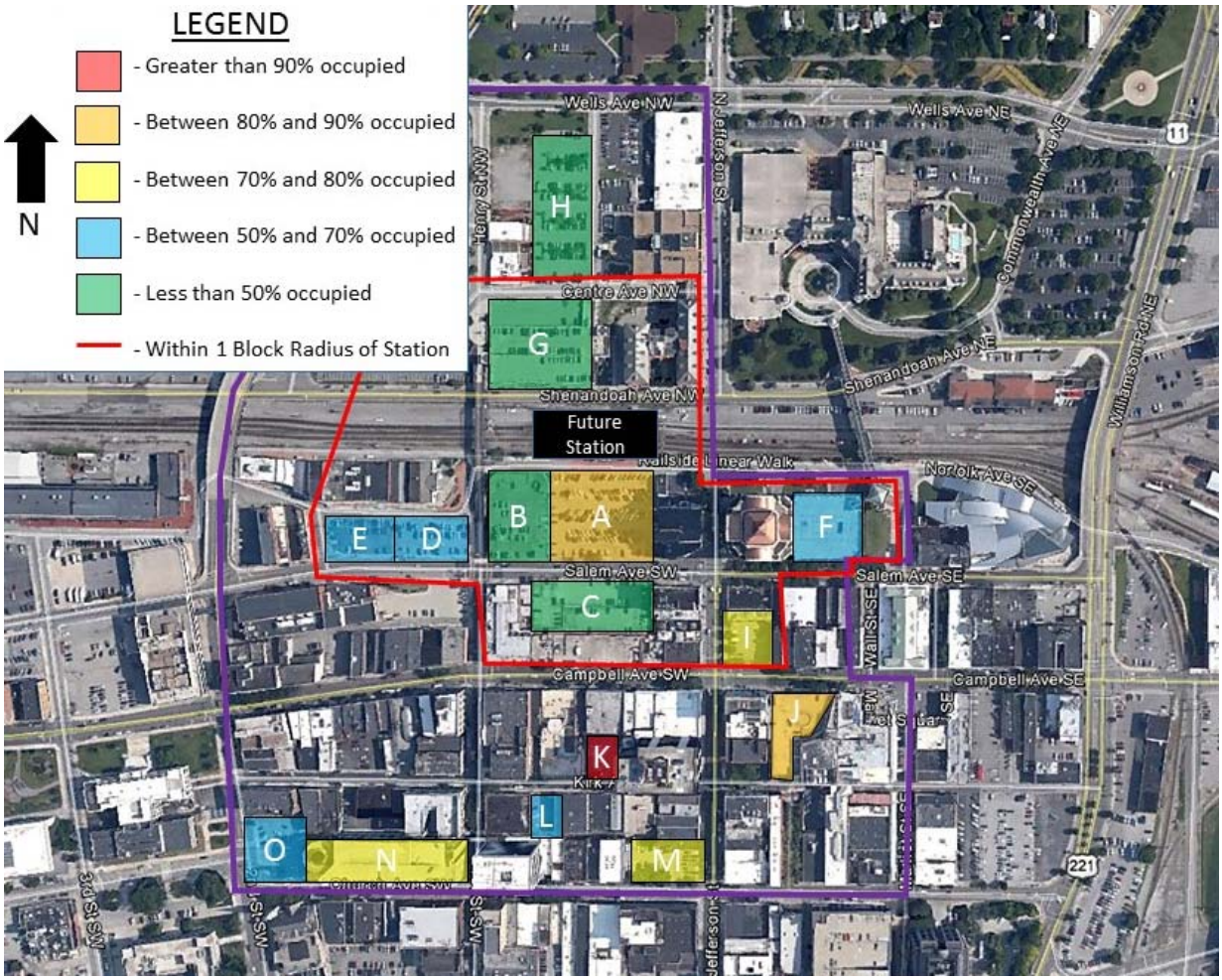

Table 3 – Future Parking Surplus/Deficit Analysis

A	**Existing Peak Demand (11 AM)**	**877**
B	Existing Parking Capacity	1,755
C	Loss of Knapsack Lot	164
D	Loss of Salem Ave. Garage	301
E	Future Parking Capacity (B-C-D=E) [1]	1,290
F	Practical Capacity Factor	80%
G	**Practical Parking Capacity (E x F = G)**	**1,032**
H	**Future Parking Surplus/Deficit (G - A = H)**	**155**

[1] *Loss of Knapsack Lot (A) and Salem Avenue Garage (B)*

Future parking demand for the proposed Roanoke Intermodal facility was estimated based on two strategies, which include: the number of parking spaces currently provided at similar Amtrak stations in Virginia and parking occupancy counts of similar stations. Annual boardings and alightings for the Roanoke Intermodal station were projected to be 65,534. The projected annual boardings/alightings for the station were also applied to estimate the future parking demand.

Table 4 shows the number of parking spaces provided at similar Amtrak stations in Virginia and the number of boardings/alightings in 2014. The ratio of parking provided versus annual boardings/alightings was calculated for each facility, along with the overall average rate. The overall average rate was applied to calculate the number of parking spaces needed at the Roanoke Intermodal facility. Based on this analysis, 113 parking spaces should be provided at the Roanoke Intermodal facility.

Table 4 – Roanoke Intermodal Facility Parking Projection

Stations	2014 Boardings/ Alightings	Parking Provided at Stations	Parking Rate per Boardings/ Alightings
Ashland	27,977	80	0.002859
Charlottesville	132,410	175	0.001322
Clifton Forge	2,432	10	0.004112
Culpepper	14,257	40	0.002806
Danville	7,741	30	0.003875
Fredericksburg	111,999	60	0.000536
Lynchburg	86,302	75	0.000869
Manassas	29,104	20	0.000687
Newport News Service	112,661	100	0.000888
Petersburg	29,383	65	0.002212
Richmond - Main Street	40,834	30	0.000735
Richmond - Staples Mill	358,615	308	0.000859
Williamsburg	61,074	40	0.000655
Average Space per Boardings/Alightings			**0.001724**
Roanoke Projection [(1)]	**65,534**		**113**

Note: Analysis does not include the Burke Centre, Woodbridge, Norfolk, Quantico, Staunton, and Alexandria stations since these facilities serve other train services or provide parking for other users.

[1] *Boarding/Alighting projection based on AECOM forecast.*

Table 4 shows the projected parking needed based on the current number of spaces provided at similar stations in Virginia. However, this is not a reflection of actual parking demand at these facilities. As shown in **Table 5**, parking occupancy counts were performed on typical weekdays in the month of February at the Lynchburg, Lorton, Alexandria, and Charlottesville Amtrak stations. These counts were all performed

before 5 PM. The parking occupancy counts and the number of boardings/alightings at each station in 2014 were used to project the parking demand at the Roanoke Intermodal facility. Based on the analysis, the station would experience a parking demand of approximately 20 vehicles.

Table 5 – Parking Occupancy at Similar Amtrak Stations

Amtrak Station	2014 Boardings/ Alightings	Parking Count Time	Vehicles
Lynchburg	86,302	3:00 PM	34
Lorton	274,445	3:00 PM	53
Alexandria	180,409	3:30 PM	34
Charlottesville	132,410	4:30 PM	88
Average Vehicle per Boarding/Alighting			**0.00031**
Roanoke Projections	**65,534**		**20**

The parking projection analysis for the Roanoke Intermodal facility based on both parking supply and demand shows a range between 20 and 113 vehicles. Since there is a parking surplus of 155 spaces projected within a block of the proposed Roanoke Intermodal facility, there is adequate supply available in the area to support the station without constructing additional parking. However, adequate ADA parking should be provided at a convenient location to the station.