

6. PHASED SERVICE IMPROVEMENT PLAN

VRE is running very close to its practical capacity on both the Fredericksburg and Manassas Lines, with some peak trains having standees on a regular basis. VRE ridership has grown to the point where demand warrants an increase in the number of trains. The decision by VRE to acquire available Gallery coaches from the Chicago commuter rail system will provide sufficient rolling stock for VRE to meet its needs through about 2007. However, there remain constraints in the immediate near term which limit VRE's ability to add trains to its schedule:

- The memorandum of understanding (MOU) among VRE, VDOT and CSX limits VRE to 32 daily train movements until such time as additional capital projects to increase line capacity are completed. The next projects to be implemented – the L'Enfant third track and the Arkendale crossovers – are delayed beyond their originally anticipated 2003 completion date.
- Lack of mid-day train storage space in Washington Terminal effectively precludes the operation of additional trains that would need storage in Washington during the day. The Coach Yard, where VRE stores its 11 trainsets during the mid-day period, is filled to its absolute maximum.

Absent the ability to increase the number of trains, the logical goal for VRE would be to increase the number of coaches as needed on the existing peak trains to provide enough seating capacity for those who wish to ride. VRE currently possesses enough equipment to be able to add coaches to the peak trains, but they are precluded from doing so by the lack of any additional capacity for mid-day train storage. Equipment assignments already have been juggled to ensure that the peak trains are operated with bi-level coach equipment, which have a higher seating capacity than the single-level Mafersa cars. Therefore, VRE will be constrained to its existing operating plan and existing consists (train lengths) until:

- additional mid-day storage capacity is created, or
- VRE is able to bring some of its equipment back to Manassas for mid-day storage, freeing up space in the Coach Yard to lengthen the remaining ten trains.

When the next round of CSX capacity-related capital projects is completed (including the construction of third main tracks on Franconia Hill and through the Crystal City area), VRE will be able to increase the number of trains it operates. Until these projects are completed, VRE will not be able to add trains – even including deadhead (non-revenue) or reverse-peak trains back to Manassas for mid-day storage.

One possibility that would give VRE the opportunity to increase the length of some of its peak trains would be to couple the last two morning peak trains together at the platform in Union Station and run them together as the 8:30 am Manassas train. One of the two trains would be uncoupled at Broad Run station and stored in the yard, returning to Washington coupled up with the return trip of the early afternoon Manassas train. This would enable VRE to reduce the number of trains stored during



the mid-day at the Washington Coach Yard from 11 to 10, enabling additional coaches to be placed on at least two other peak trainsets.

Another potential short-term remedy for the lack of storage capacity at Washington Terminal would be to construct an interim storage track in available right-of-way adjacent to the L'Enfant Station. Two VRE trainsets up to eight cars long could be stored at this location during the mid-day period, reducing the number of trains that would have to be stored in the Coach Yard and enabling some of those trains to be lengthened.

Aside from these or other possible short-term measures to increase train lengths, the Strategic Plan assumes that VRE will generally maintain its existing pattern and frequency of service until at least the 2006-2007 timeframe, when the first order of new coaches will have been received and the next round of MOU capital projects will have been completed.

From that point forward, the Strategic Plan provides a three-step plan for incrementally increasing the quantity of VRE service in response to ridership demand. These improvements in service are assumed to be implemented in phases and coordinated with capital investments that provide sufficient capacity for the increased service. This three-step plan depicts a more simplified process than will likely be the case in actuality, but it is useful as a means of envisioning the evolution of rail service and analyzing the effects of improved service on ridership, costs and financial performance.

Three hypothetical schedules and operating plans have been developed for three periods of time, roughly corresponding to increasing levels of ridership demand:

1. Phase 1: Adding one trainset to each line (prior to 2010 in the Targeted and Aggressive Growth scenarios)
2. Phase 2: Growing to eight trainsets on each line and initiating service to Gainesville (in the 2010-2015 period for the Targeted and Aggressive Growth scenarios)
3. Phase 3: Service extensions to Haymarket and Spotsylvania and Fauquier Counties, with nineteen total trainsets (post-2015 for Targeted Growth Scenario and by 2015 in Aggressive Growth Scenario).

Sample timetables for each of these three phases, on each VRE line, are included in an appendix to the report. These timetables are illustrative rather than definitive and were used as the basis for estimating ridership potential, evaluating infrastructure needs, and calculating operating costs. Table 6.1 summarizes their key characteristics and illustrates the anticipated growth in train service over the course of the three phases.

The **Phase 1** plan adds one trainset to each line in the 2006-2007 timeframe, or when sufficient rolling stock becomes available and additional MOU capital projects are completed.

On the Fredericksburg Line, the new schedule will respond to demand patterns by starting service earlier in the morning. At the height of the peak, the interval between trains will be shortened from 30 minutes to between 20 and 25 minutes. Seven trains will be stored overnight at Crossroads Yard, each making a round trip to Washington

and back – northbound in the morning peak and southbound in the afternoon peak. The Cherry Hill station is assumed to be in operation.

On the Manassas side, adding a trainset will enable the start-up of VRE service to Gainesville, along the Norfolk Southern 'B' Line west of Manassas. New stations are assumed at Gainesville, to the east of the US 29 grade crossing, and at the proposed extension of Sudley Manor Road. Three morning peak trains originate at the Broad Run storage yard, deadhead to Gainesville, and then run as revenue trains to Washington spaced about 50 minutes apart. The remaining three trainsets would originate at Broad Run and operate directly to Washington. The current reverse-peak and mid-day trains would operate to Broad Run as they do today.

Table 6.1
Operating Plan Characteristics of
VRE Phased Service Improvement Plan

	Current Schedule	Phase 1 2007-2010	Phase 2 Low 2010-2015	Phase 2 High 2010-2015	Phase 3 by 2025
<u>Fredericksburg Line</u>					
Revenue trainsets	6	7	8	8	9
Daily train movements	14	16	18	28	34
Coaches in revenue service	32	49	55	61	70
<u>Manassas Line</u>					
Revenue trainsets	5	6	8	8	10
Daily train movements	18	20	28	36	42
Coaches in revenue service	26	38	47	50	66
<u>TOTAL</u>					
Revenue trainsets	11	13	16	16	19
Daily train movements	32	36	46	64	76
Coaches in revenue service	58	87	102	111	136

Sometime in the 2010-2015 period, a **Phase 2** schedule is assumed to be implemented which increases the total number of trainsets in revenue service from 13 to 16, with 8 trainsets operating on each line. For purposes of this analysis, VRE service is assumed to remain within the existing VRE service territory. In this phase, VRE will be able to offer on the Fredericksburg Line either peak headways reduced to 20 minutes (the "Low" case in Table 6-1) or the start of a zone express service at 30 minute headways (the "Phase 2 "High" case). In the latter case, peak trains serving the stations beyond Rippon would skip the innermost stations. The stations between Rippon and Franconia-Springfield would be served by different trains. The first two early morning trains arriving in Washington would turn and head back to Rippon for a

second peak period trip serving the inner zone. The high case also assumes additional mid-day and evening service. The “high” case operates a higher number of daily trains on the line (28) versus the “low” case (18). Infrastructure projects beyond the MOU will likely be required to support the high level of operations.

On the Manassas Line, The US 29 grade separation project is assumed to be completed, and commuter service extended another three miles to Haymarket. Two additional trainsets will enable VRE to provide improved peak headways (30 minutes) for each of the two branch lines beyond Manassas (Haymarket and Broad Run). The largest quantity of service in this phase is allocated to the Gainesville-Haymarket branch, with more limited rush hour only service from Broad Run. During off-peak and peak shoulder hours, train service out of Broad Run can be supplemented by a feeder bus service Between Broad Run and Manassas (where Broad Run passengers could transfer to and from other Gainesville-Haymarket trains), provided the incremental operating cost is supportable.

The split service at rush hours will enable some peak trains to operate as expresses or partial expresses east of Manassas, without having to lengthen headways at the inner stations. The number of daily Manassas Line trains will increase to between 28 and 36. The high end of this range assumes that bi-hourly mid-day service and later evening service is added. Operations analysis of projected passenger and freight train activity during the off-peak periods will need to be undertaken to determine any additional rail infrastructure requirements. However, off-peak service should be easier to add on the Manassas Line, than on the Fredericksburg Line, because the level of freight traffic is lower, at least on the part of the railroad between Alexandria and Manassas.

In total, the number of daily VRE trains is projected to grow to between 46 and 64 – well beyond the 40 train limit provided by the current memorandum of understanding (MOU) with CSX. This will require modifying or extending this agreement, which should become a high priority for VRE. As the capital improvement projects listed in the MOU are completed between Virginia Avenue in Washington, DC and AF Interlocking in Alexandria, the railroad will have received virtually all of the capacity enhancement that is possible without a new bridge across the Potomac River. One main track in this area will be effectively dedicated to carrying nothing but peak direction VRE (and a limited number of Amtrak) trains. The remaining railroad will effectively be a double-track line that carries freight traffic in both directions and any reverse-peak direction commuter or Amtrak trains – with a relatively short single-track section in the middle across the Long Bridge over the Potomac River. In this scenario, it would be logical for CSX to closely control access by reverse-peak and off-peak passenger trains, as well as all VRE service on the CSX RF&P Subdivision, but VRE should not be limited in the number of trains it is permitted to operate from the Manassas Line to Washington, as long as they can fit comfortably in-between other VRE trains and operate single-file on a single track between AF and Virginia Avenue.

The **Phase 3** schedule in effect represents full VRE service in the years approaching 2025, incorporating multiple line extensions to enable VRE to fully tap potential ridership markets in the outlying counties of the region. A third new trainset is added to the Fredericksburg Line (bringing the total to 9), which will permit *both* zone express service and 20-minute peak headways at all stations. A new VRE station at Spotsylvania (Crossroads) is assumed. On the Manassas side, VRE service is assumed to be extended to Fauquier County (Bealeton and Remington). The



operating plan provides for a total of 10 trainsets, six on the Gainesville-Haymarket branch and four on the Fauquier branch. Additional off-peak service and weekend service is assumed to be provided on both lines as warranted by demand, with sufficient capacity improvements to permit reliable freight and passenger operations.

Though not shown in the appended timetables, the Phase 3 operating plans are compatible with extensions of VRE service to Richmond and/or Charlottesville, as well as run-through service to Maryland. For example:

- One or two of the outer zone express trains on the Fredericksburg line could be stored overnight and originate at Richmond instead of Crossroads. This would provide basic Washington commuter service from Richmond, Ashland and other communities in the I-95 corridor. One or more VRE trains could provide a late morning, mid-day and early afternoon service from Washington to Richmond and back – in part duplicating Amtrak's service but offering a greater number of station stops. This can be accomplished without additional equipment (but perhaps requiring additional train crews). Adding rush hour commuter service to Richmond, however, would require the acquisition of additional trainsets.
- Similarly, one or two of the Remington trains could be stored overnight and originate at Charlottesville instead of Remington – providing Washington commuter service from Charlottesville, Culpeper and points in-between. As in the Richmond corridor, Washington commute and mid-day service could be provided with the same fleet of equipment, but providing a morning peak train from Washington that would arrive in Charlottesville at the start of the work day and return in the afternoon peak would require an additional trainset.
- Given the relatively long distances involved, it might be desirable from a passenger comfort point of view to use coaches for this service that have a seating type, configuration and amenities comparable to intercity trains.
- The increased number of reverse-peak trains included in the Phase 3 VRE schedule provide a greater number of opportunities for these slots to be filled by run-through MARC trains instead of VRE trains. (An equivalent number of VRE trains would fill the MARC reverse-peak slots.)

This high level of service in Phase 3 would be greatly facilitated by the construction of a new 2-track Potomac River railroad bridge, which would completely separate freight and passenger traffic north of AF Interlocking and greatly improve VRE's scheduling flexibility. Without a new bridge crossing, the extent of MARC run-through service to Virginia and intercity service to Richmond, Charlottesville or points further south (both of which generate passenger traffic across the Potomac in the reverse-peak direction) would be restricted during weekday peak periods.

Though service extensions are shown in the Phase 3 long-range plan, it would be possible to advance some or all of these extensions within the timeframe of Phase 2, provided the required core network investments are fully funded and the overall level of capital investment can be increased to provide the necessary supporting infrastructure.

On the other hand, financial constraints could conceivably reduce the level of capital funding available to VRE or spread capital projects, including line extensions, over a longer period of time. In this case, the level of VRE service would grow more slowly,



and, consequently, VRE would capture a smaller share of the CBD work trip market, and development in the locations beyond the reach of the VRE network would tend to be less transit-focused than if VRE expansion progressed more rapidly.

7. PHASED CAPITAL INVESTMENT PLAN

The VRE Strategic Plan includes a three-phase program of capital investments to support and enable the planned steps in increased service and to respond to increasing levels of demand. The planned investment program corresponds with the three-phase evolution of the VRE operating plan described in the preceding section and attempts to keep pace with projected ridership demand. These costs exclude current projects for which funding already has been committed, such as the CSX MOU rail infrastructure capacity projects and the current parking lot expansion projects at Manassas and Woodbridge.

Three illustrative scenarios have been developed for the phased implementation of VRE capital projects, corresponding to the three potential strategies outlined in Section 3:

1. Targeted Growth
2. Aggressive Growth
3. Deferred Growth

These scenarios bracket the low and high ends of the range of investment levels that will achieve VRE's long-term objectives. All three fully invest in VRE's core network needs – providing for parking expansion, new rolling stock, yard storage and fleet maintenance facilities. They vary with respect to the pace of investment and service expansion.

Through 2025, total required capital investment is projected to average in the range of \$35 million to as high as \$100 million per year in the case of the Aggressive Growth scenario (in constant 2003 dollars). Approximately \$10 million per year is currently available for discretionary capital projects. Unfortunately, Federal funds available to support the capital program are not keeping pace with ridership growth. This gap will need to be closed and the level of funding increased if VRE is to satisfy the increasing demands for its service and maintain its high standards of service quality.

The first scenario – Targeted Growth – spends capital money at an increasing rate through 2015 and focuses investment on the core network. It includes a phased program of line extensions that is limited in the early years, while core network needs are being addressed. However, it targets initial expansion into the Gainesville corridor, where the early presence of VRE can encourage transit-oriented development and provide a viable public transportation option for commuters to the central business district as well as reverse commuters. This is the “middle-of-the-road” scenario that matches the phased service improvement plan outlined in the previous section. Estimated capital costs by category of projects for this scenario are presented in Table 7-1. Capital needs are approximately \$47 million per year through the first six-year period (2009), and grow to approximately \$76 million per year in the 2010-2015 period. This program defines the investment that will be required, even in a fiscally-constrained