

The Virtual Staff Ride: Leveraging Simulations to Overcome Constrained Resources

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The current Army Training Strategy (ATS) states that, “Commanders must mitigate resource limitations through increased use of virtual, constructive, and gaming capabilities.” Current fiscal realities are causing Army leaders at all levels to seek out blended live, virtual, constructive, and gaming (LVC&G) training solutions. Utilizing virtual, constructive, and gaming in concert with the traditional live training environment enables accomplishment of training objectives at a fraction of the cost. The focus is taken off of the resource-intensive live training environment when the training audience is spread across the LVC&G spectrum.

Simulation operations officers from Functional Area 57 (FA57), who are assigned at the brigade thru Army Service Component Command (ASCC) echelon, are specifically trained in the use of LVC&G enablers to provide technical solutions for their commander’s training requirements. FA57 typically focuses on satisfying unit mission essential task list (METL) requirements and strives to provide the most efficient solutions for maintaining effectiveness in combined arms maneuver (CAM) and wide area security (WAS) operations. However, the cost-saving benefit of technical training solutions can also be called upon to preserve non-essential, team-building training events that fall outside the realm of decisive action and unified land operations. The following case details how virtual and gaming technology enabled the execution of a first-rate staff ride despite limited time and resources.

Training Objectives and Limited Resources

In 2013, while serving at Fort Knox, Ky., with the Human Resources Command (HRC) as the FA57 assignments officer, I was tasked by the chief of the Operations Support Division (OSD) to provide a no-cost virtual solution for a staff ride focused on Morgan’s 1863 Raid. The chief’s primary training objective was to have the officers of OSD return to the core warfighting functions (WFF) of their various branches and functional areas, which are not exercised in daily HRC operations.

Confederate cavalry commander BG John Hunt Morgan’s 1,600 kilometer incursion up through the border state of Kentucky and across the northern states of Indiana and Ohio was intended to create fear within the northern populace. The raid coincided with southern losses at Vicksburg, Gettysburg, and Tullahoma. The disruptive effect of Morgan’s raid on northern public opinion forced the Union Army to shift attention to Ohio and Indiana and bought the weakened Confederate Army some time to consolidate and reorganize during this pivotal period. Morgan’s crossing of the Ohio River into Indiana and his first significant engagement in northern territory are located in the local Fort Knox area.

While two significant raid events occurred in the vicinity of Fort Knox, key events of the entire route, which originated in middle Tennessee and ended on the Ohio/West Virginia border, needed to be examined to provide strategic context. HRC was not funded to support non-mission essential travel, and human resources mission requirements in OSD limited conduct of the staff ride to two duty days. As the resident simulation operations officer, I was tasked with delivering a technical training solution that would allow staff ride participants to address the 1,600 kilometer 1863 raid route in-depth within the space of two days and without leaving the greater Fort Knox area.

Virtual Staff Ride vs Traditional Staff Ride

According to Center for Military History (CMH) Publication 7-21, *The Staff Ride*, the traditional staff ride consists of three phases. The preliminary study phase prepares the officer for the visit to the site of the

selected campaign. A combination of formal classroom and individual study is utilized to prepare staff ride participants in this phase. In the field study phase, participants walk the physical terrain where campaign events occurred, which places the visual and spatial relationships studied in the preliminary study phase into perspective. It is in the field study phase that participants garner lessons learned by placing the events of the studied campaign into context through the reading of vignettes and by discussing strategic and WFF estimates. The integration phase is where participants are provided the opportunity to organize and articulate their thoughts and lessons learned through the staff ride process. This may be accomplished by means of a structured discussion, after action review (AAR), or publication of relevant findings for use in future staff rides or continued study.

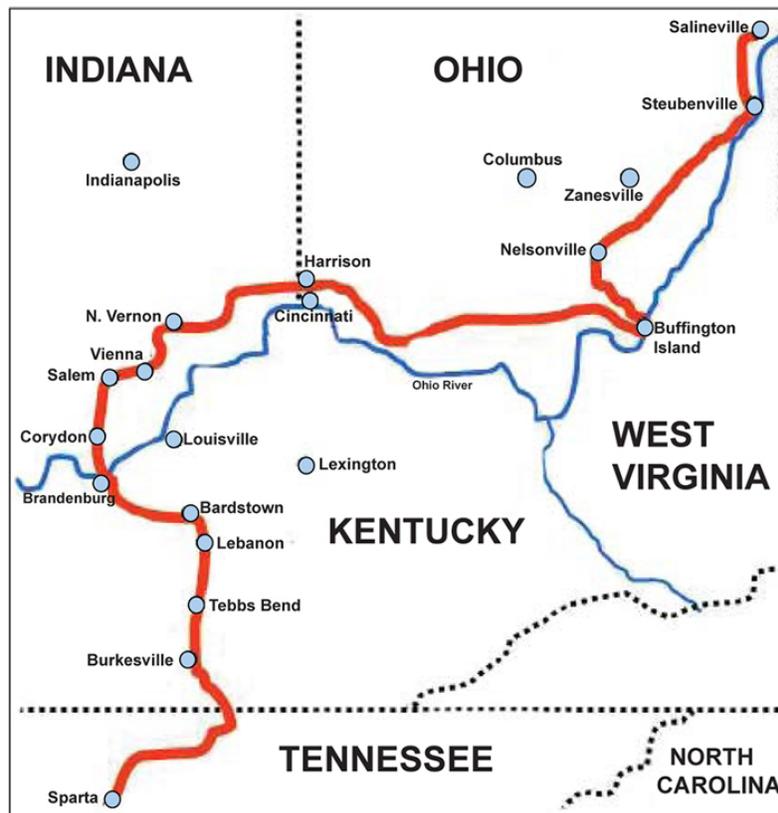


Figure 1 — Route of Morgan's 1863 Raid

The Combined Arms Center's (CAC) Combat Studies Institute (CSI) states that, "A virtual staff ride (VSR) follows the same methodology as a 'live' or 'field' staff ride, but because travel restrictions preclude a trip to battlefield sites, the terrain is replicated in a virtual environment." In short, the field study phase is conducted at the Mission Training Complex (MTC), utilizing a virtual simulation such as Virtual Battle Space 2 (VBS2), instead of going to the physical location of the studied campaign. To serve as an effective substitute, the virtual terrain must be "geo-specific," or a true three-dimensional representation of the natural and man-made terrain features as they appeared at the time of the campaign. If the physical fidelity of the virtual terrain is high, the participants can gain the first-person perspective without visiting the actual site of the campaign.

The Staff Ride Team at CSI has developed comprehensive VSRs for contemporary Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF) operations such as the March to Baghdad, the Battle of

Wanat, and Operation Anaconda. CSI gets more bang for the buck by limiting VSR development to these select few engagements considering the counterinsurgency (COIN)-centric nature of operations over the last decade. Development of geo-specific digital terrain is a labor-intensive process, and it is not economical to expend man-hours in the development of a Civil War raid that would be of use to a narrow training audience. Additional work is also required to develop models of period weapon systems and vehicles which are not found in VBS2's extensive catalogue of modern weapons and vehicular platforms. It became readily evident that a local solution would be required to execute a VSR of Morgan's Raid.



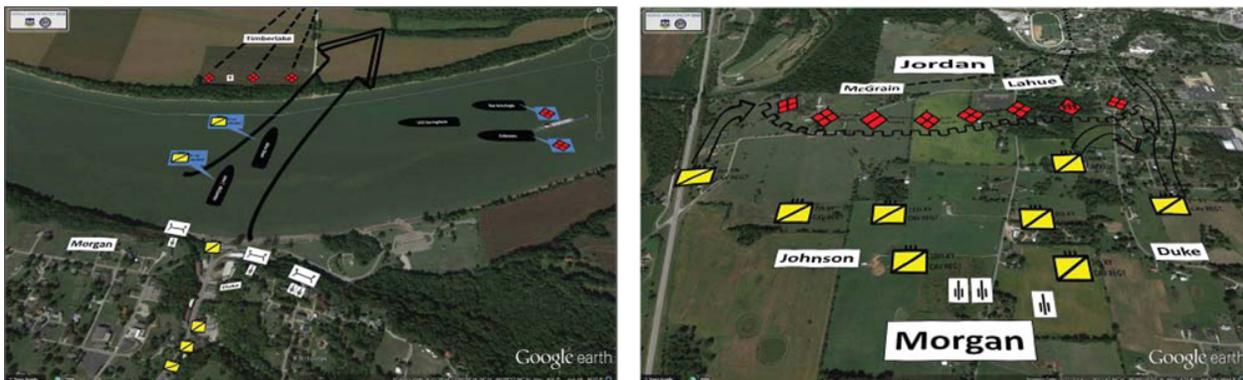
Figure 2 — VBS2 Imagery of Buffington Island Looking North

Morgan's 1863 Raid Virtual Staff Ride Solution

It had already been determined that VBS2 would be utilized to provide the first-person perspective on geo-specific terrain during the field study phase. The Fort Knox MTC possessed the requisite number of VBS2 systems to accommodate all of OSD, and the existing contract at this facility supported the development of the desired geo-specific terrain along the Ohio River Valley. The contractors trained in the use of VBS2's terrain generation tools were located at the Fort Hood MTC, and due to competing III Corps taskings, we were allocated a finite number of contractor man-hours to develop our terrain. In order to stay within this allocation, the OSD chief was required to choose three key engagements along Morgan's raid route. He chose Morgan's Ohio River crossing site at Brandenburg (Ky.), the Battle of Corydon (Ind.), and the raid's culminating Battle of Buffington Island as the three locations for which boxes of "digital dirt" would be developed for VBS2. As indicated earlier, Brandenburg and Corydon are located in the vicinity of Fort Knox. Brandenburg is a key location as it represents Morgan's decision point to cross over into northern territory, and Corydon was the raid's first engagement in the north. Buffington Island was the raid's culminating battle, which occurred on the edge of the Ohio River, just short of West Virginia.

Google Earth was leveraged to place the three key engagements of Brandenburg, Corydon, and Buffington Island into the larger context of Morgan's 1,600 kilometer raid. Google Earth provides a robust set of virtual tools to anyone with access to the Internet. Google Earth is a virtual globe that

utilizes space shuttle-collected Digital Elevation Model (DEM) data from NASA to provide accurate 3D imagery of terrain and man-made structures for the entire surface of the earth. Imagery resolution ranging from 2.5 meters to 15 meters per pixel exceeded the level of detail required for our purposes. The *tours* function of Google Earth was used to examine those portions of the raid not addressed in VBS2. This function allows the user to program an overflight route at varying speeds and altitudes ranging from ground level to 800,000 meters above mean sea level (AMSL). It is possible to alter the programmed tours route in progress if the discussion requires this. Additionally, an image overlay function makes it possible to place appropriately sized Mil Std 2525 DoD military symbols and other illustrative images along the chosen route for briefing and discussion purposes. Proprietary and Army accreditation issues made it difficult to download Google Earth onto a government laptop without additional coordination through the Fort Knox Network Enterprise Center (NEC). However, it was discovered that Google Earth's free, open-source search analytical and mapping tools were available for use by anyone with a .mil address through the U.S. Northern Command's Situational Awareness Geospatial Enterprise (SAGE). SAGE provides commands within the Department of Defense the ability to access unclassified geospatial mission data via Google Earth network links. After registering for a SAGE account, which took 10 minutes, we were able to access Google Earth from a secure government website. This alleviated proprietary concerns and the need to conduct extraneous coordination with the NEC.



Figures 3 and 4 — Google Earth (SAGE) Views of the Crossing at Brandenburg (left) and Battle of Corydon (right)

A classroom at the Fort Knox MTC with 50 VBS2 terminals was configured to conduct the field study phase of our VSR. The front of the classroom had a screen on which it was possible to toggle between projection of the view from the master VBS2 system and Google Earth. Each branch within OSD was assigned a portion of the raid and tasked to develop an assessment by WFF during the preliminary study phase, which would be presented during the virtual field study phase.

Simulations are never intended to replace live training but to supplement or enhance it. Therefore, we determined that only the first day of the two-day VSR would be spent in the Fort Knox MTC. The second day would be dedicated to actual field study of Brandenburg Crossing and the Battle of Corydon, which were in close proximity to Fort Knox. While it has been previously discussed that simulations assist primarily with the field study phase in a VSR, in this particular case simulations would also be utilized somewhat in the preliminary study phase. Google Earth and VBS2 would orient participants prior to onsite visits at Brandenburg and Corydon by permitting them to walk and visualize key terrain in a virtual environment while assessing WFFs. The same technical means would be utilized to enable virtual field study of the distant Buffington Island, where resources did not permit an onsite visit.

We started Day 1 of the VSR at the Fort Knox MTC with Google Earth. The tours and overlay functions enabled the training audience to cover the initial raid route from Sparta, Tenn., to the incursion into

Indiana at Brandenburg Crossing. This first section of the raid route was flown at 1,000 meters AMSL to gain a sense for the terrain over which Morgan was navigating. The tour route for this portion of the raid was built to zoom in and pause where significant actions had shaped the situation and Morgan's decision to cross at Brandenburg. Graphics applied to the ground with the overlay function aided select OSD personnel in leading discussion. Following discussion driven by an overhead Google Earth view of Brandenburg Crossing, the projector view was toggled over to the master VBS2 view. Following a quick orientation of key terrain and points of interest, each participant was free to walk and visualize the virtual terrain within VBS2. This would serve as both a virtual rehearsal for the onsite visit to Brandenburg and an opportunity to confirm or deny WFF assessments. After a Google Earth fly over and initial discussion of the 10-mile route north to Corydon, we toggled back to VBS2 for a more detailed discussion of the battle within geo-specific virtual terrain. Google Earth was used to study the route from Corydon to Buffington Island in the same manner it had been used to look at Sparta to Brandenburg. We ended our day in the Fort Knox MTC by walking the digital dirt within VBS2 at Buffington Island. Additional time was spent discussing and drawing out lessons learned from this culminating battle as OSD did not have the resources for travel to West Virginia.



Soldiers and civilians with the Operations Support Division of the U.S. Army Human Resources Command conduct the field study phase of the staff ride at Corydon, Ind., on 17 April 2014. (Photo courtesy of author)

Post Execution Assessment

Employment of Google Earth to examine Morgan's three-state raid in-depth and furnish strategic context for the key actions at Brandenburg, Corydon, and Buffington Island worked well. This low-overhead source of accurate and highly detailed 3D terrain permitted variable views of Morgan's entire 1863 raid route that were easily manipulated on the fly to drive discussion. The beauty of Google Earth is that there is no need to build terrain and its use only requires an Internet connection and registration for a SAGE account.

VBS2 was a little more labor intensive as all of the geo-specific terrain had to be built from scratch by contractors at Fort Hood. Brandenburg, Corydon, and Buffington Island are fairly rural locations that have changed little since 1863. Many of the rural roads and structures still remain, and its continued use in agriculture has preserved natural terrain features. Therefore, it was a little easier to replicate the engagement areas as they appeared in 1863. Most of the coordination for terrain build was conducted over the phone and Internet. By chance, a TDY trip to conduct assignment officer duties at Fort Hood coincided with the end of the terrain-build process, facilitating a face-to-face confirmation of the virtual terrain.

It was discussed during a post-VSR hot-wash that a more controlled use of VBS2 may have improved the focus of discussions. After a quick orientation of key terrain, participants were turned loose to navigate the virtual terrain within VBS2 on their own. After 15 minutes of individual exploration of the terrain, a discussion was conducted. The gaming system became a distraction to the larger discussion of terrain in the context of WFF for many of the participants. A better focus could have been maintained by moving as a group within VBS2 and stopping at each "stand" for a more comprehensive discussion on each piece of key terrain.

Overall, the use of simulations was effective in accomplishing the OSD chief's staff ride objectives in a resource constrained training environment. The virtual environment provided by Google Earth and VBS2 proved to be an apt surrogate for the live field study phase. The time spent at the Fort Knox MTC also provided the training audience with an additional level of preparation prior to onsite field study at Brandenburg and Corydon.

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