VISSIM Applications for a Knowledge Base Web Interface on Unconventional Arterial Intersection Designs

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This abstract addresses the application of VISSIM to a knowledge base web interface on unconventional arterial intersection designs (UAIDs). Rising as a new alternative to relieve arterial congestion, the UAID concept generally attempts to enhance operational efficiency at major arterial intersections by reducing the negative impacts of turning movements through various innovative intersection designs. General principles of operation and management strategies of the UAID include: 1) an emphasis on through-traffic movements along the arterial, 2) a reduction in the number of signal phases (e.g., left-turn arrow phases), and 3) a reduction in the number of intersection conflict points. As a collaborative research effort among the University of Maryland at College Park, Maryland State Highway Administration, and Parsons Brinckerhoff Inc., the knowledge base web interface (http://attap.umd.edu/uaid.php) has been built to help traffic engineers, community planners, and elected officials to consider the UAID as a feasible solution for relieving arterial congestion and to select proper unconventional design schemes given actual traffic patterns. The current version of the web interface was designed to provide

collective information on a total of 22 unconventional intersection types with respect to "Design Description", "Visual Animation", "Image Library", "Evolution of Design", "Design and Operations", "Studies and Research", "Lessons Learned", and "Locations Found". Figure 1 presents the main page of the knowledge base UAID web interface.

Figure 1. The Main Page of the Knowledge Base UAID Web Interface

In this UAID website, VISSIM simulations were applied especially for "Visual Animation" by modeling all of 22 unconventional intersection types and recording their 3D video files. Due to the complexity and the originality of unconventional designs, it

was a tough challenge to well reflect their operation and management strategies in simulations. All of 22 UAIDs consist of a variety of 11 at-grade designs and 11 grade-separated designs. A signalized intersection is included in 10 at-grade designs and 8 grade-separated designs. Figure 2 shows the visual animation of the median u-turn intersection, a type of at-grade and signalized intersections. Visual animations for all designs can be played and downloaded with 3D video files from the website.

Figure 2. Visual Animation of the Median U-Turn Intersection

Being a No.1 website in Google search with a key word of the unconventional arterial intersection design, as shown in Figure 3, the knowledge base UAID web interface has been a huge success. For example, the monthly number of visitors and page views reached about 20,000 and 100,000, respectively in February, 2007. See Figure 4. In

considering the UAID concept for arterial management or developing new unconventional designs, the use of VISSIM will significantly increase in the future.

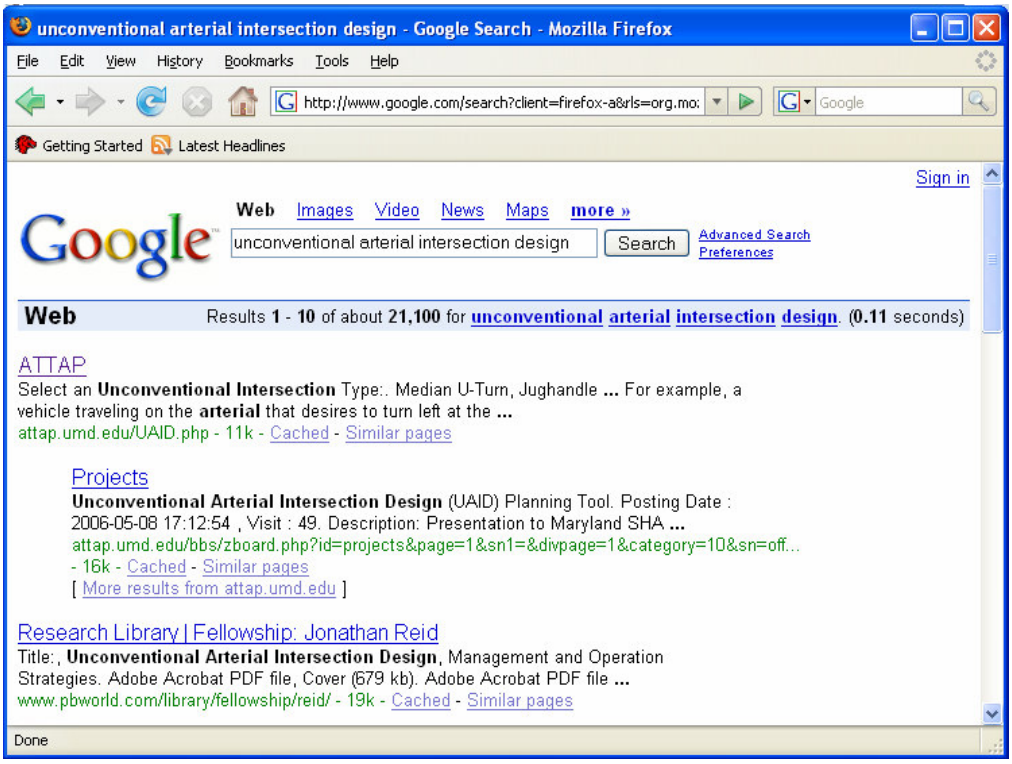
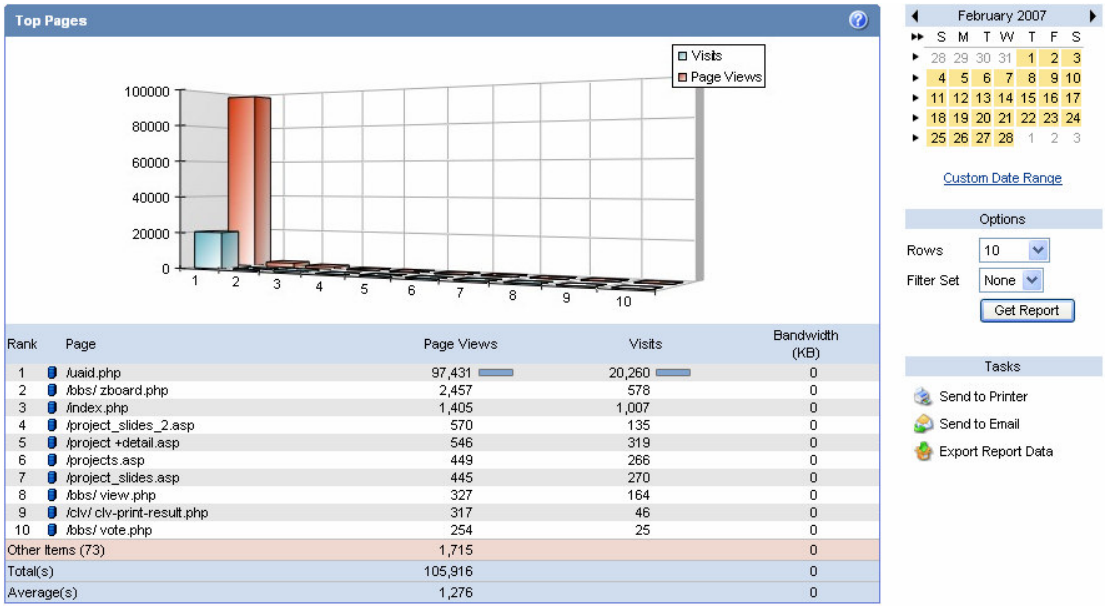


Figure 3. Google Search Result on the UAID



Rank	Page	Page Views	Visits	Bandwidth (KB)
1	/uaid.php	97,431	20,260	0
2	/bbs/ zboard.php	2,457	578	0
3	/index.php	1,405	1,007	0
4	/project_slides_2.asp	570	135	0
5	/project +detail.asp	546	319	0
6	/projects.asp	449	266	0
7	/project_slides.asp	445	270	0
8	/bbs/ view.php	327	164	0
9	/clv/ clv-print-result.php	317	46	0
10	/bbs/ vote.php	254	25	0
Other Items (73)		1,715		0
Total(s)		105,916		0
Average(s)		1,276		0

Figure 4. Visitors Statistics on the UAID Web Interface (Feb. 2007)