

Evaluation Brief EB15

May 14, 2008

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**April 2008 On-Site Testing
of TAT Markers, MT Waysides, and TAT/MT Transition Area**

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Dates: Trail installed Sunday and Monday, April 13 & 14; data collected Tuesday through Saturday, April 15 through 19; trail de-installed Saturday, April 19.

Names: In this document these working titles are used: MT (Main Trail. Unless specified otherwise, MT refers to just the markers); TAT (Time Accelerator Trail. Unless specified otherwise, TAT refers to just the markers); TOT (Trail of Time, i.e. the combined MT, TAT, and all accompanying waysides and activities; in other words, the whole thing); WIS (Wayside Integration Strip along the bottom of all MT waysides).

Overall TOT: There was strong evidence that The Trail is coming together nicely. Many visitors were using the trail in intended ways, and using the waysides to help them make sense of things. Hands on activities and experiences seemed to be working particularly well. The sample rocks attracted visitors' attention, and were often a useful "starting point" for visitors. They also provided engaging sensory experiences for many visitors. There was solid evidence that many of the "action verbs" were effective at getting visitors to engage. And this is the first time when we had no "vandalism" of the prototypes.

Recommendations:

- Include as many touchable sample rocks as possible along The Trail.
- Continue testing/refining the "action verbs."

TAT: Kids in particular were walking the trail, walking along the markers, and celebrating when they reached 1 million years. Having additional signage will help adults make sense of the TAT. We also found that in some cases, the TAT appeared to provide some motivation for walking further from Yavapai than was originally intended because it provided a goal, i.e. let's keep walking until we get to one million.

Many adult visitors ignored the trail at the beginning near the Yavapai museum. Even without the colored scale changes, most visitors that paid attention to the TAT recognized that the scale was changing, and in fact some appreciated "the joke," i.e. that the developers cheated, and they weren't really going to have to walk a million steps after all. We were not able to adequately test the visitor experience when they walked the TAT "backwards," i.e. west-to-east, so we still don't know how visitors make sense of the TAT when they enter it after having walked the MT. When visitors experienced the phrase "Trail of Time," most found it helpful for making sense of the TAT, but when visitors encountered the phrase "Time Accelerator" they found it less helpful.

Many visitors entered the TAT from one of two side trails to the parking lot. This meant that they by-passed the beginning of the trail and also the intro panel.

Recommendations:

- Keep all the markers one color.
- Label the top of the TAT markers with *Trail of Time* rather than *Time Accelerator*.
- Consider shortening the overall length of the trail so that it starts after the two side trails enter and after the cut off to the viewing point. Be careful not to shorten it too much however as it will be important that visitors (a) are able to find their birthdays (at least children and younger parents); (b) start to worry that it will be a million steps long; (c) get the “joke” and feel that continuing is something worth doing; (d) get distracted and tune in and out as they walk the trail, but still notice the markers and scale changes; and (e) feel a sense of accomplishment when they reach one million years.
- Rather than testing/comparing different lengths of the trail, develop a 140 meter version and then test this on the rim to see if there are any unanticipated red flags. (This assumes that a 140 meter version starts after the two side trails from the parking lot and the cut off to the viewing point.)

MT: Many east-to-west visitors did not notice the beginning of the MT. The ones coming from the west tended to notice the markers quite readily, although sometimes did not pay very much attention to them. Sometimes the waysides helped draw attention to the markers.

Recommendations:

- Label each of the first 10 meters/10 million years of the Main Trail with large “10-meter” markers.
- Make sure each wayside has a large marker associated with it, even if the wayside is not located at a “10-meter” mark.

WIS: When visitors stopped and engaged with the wayside panels that had the original WIS across the bottom, most ignored the timestrip. The few that did pay attention to it tended to use it to place themselves in time (e.g. this wayside is about this particular time) and also sometimes along the trail (e.g. this wayside is at this position along a timeline that I am walking). Most visitors who paid attention to the WIS used the *What lived on earth?* to orient themselves.

When the strip was simplified, more visitors who stopped at a wayside paid attention to it, and more used it to position themselves in time and along the timeline. When facsimiles of the 10-meter markers were added to both ends, more visitors tended to make the connection between the timestrip and the walking trail.

Recommendations:

- Take the very rough hand-drawn final sketch that was tested at the rim, and have it professionally designed keeping it 2D and without adding any additional “content.” Include small facsimiles of trail markers at each end of the timestrip to reinforce the connection with the walking trail. Consider including each panel’s main message in large type inside the moving “balloon” (see *All Waysides* below).
 - Test this version at the rim, slowly adding additional “content” and information as appropriate until its effectiveness is maximized.

- Move additional information and concepts to a walking brochure perhaps including a cool fold-out timestrip that is more complex.

When the original WIS included the cross-section of the canyon (*Where in the Canyon?*) most visitors who noticed it tended to be confused about both its primary message (i.e. this is where in the canyon this wayside is talking about) and its primary function (i.e. making the connection between the horizontal timeline and the vertical walls of the canyon).

Recommendations:

- Develop/design a new version of the *Where in the Canyon?* icon and test/refine it offsite.
- Alternatively, redesign it so that the horizontal timestrip includes a vertical component.
- After off-site testing is completed, design a final version for on-site testing.

All Waysides: We found that when visitors stopped at the waysides, most tended to connect to the content when they found something of personal interest to them. An example of this was when a woman saw the *Magic Meter* wayside and immediately focused on the stick horse figure, while her visiting partner focused on the volcano. This phenomenon is typical in informal science, and is supported in the visitor studies literature (Doering & Pekarik, 2000). We also found however, that most visitors tended to walk away with rather idiosyncratic ideas about what the main message of the panel was. While the messages they took away were usually not incorrect messages, visitors often missed the single most important main message. In addition we found that many visitors walked by the waysides, giving them a cursory glance rather than stopping to read them in any depth. Another interesting finding was the number of visitors who took pictures of the waysides rather than reading them. Data indicated that this was because visitors perceived there was a lot of information that they wanted to process at a later point when they had more time available. We identified two concerns with this: (a) there is a good chance that many of those visitors never will actually sit down and read the information; and (b) one of our goals from the beginning has been to make sure the waysides are about the rocks and views right there. Reading the information later results in a less meaningful experience, and violates the spirit of the Trail. In fact, it could be argued that if people are taking pictures of the signs instead of reading them right there, the perception is that there is too much information to absorb quickly and on the spot. Finally, in some places the range of dates is formatted older-to-younger; in other places it is younger-to-older.

Recommendations:

- Re-design the waysides so that when visitors walk by and don't stop but do read-at-a-glance, they will still get the main message. The moving "bubble" along the timestrip might be one place to do this. A one-sentence "headline" might be another. This will also help ensure that all visitors get the same main message. Then once they get drawn into the interpretation, they will get the secondary or more idiosyncratic messages.
- Streamline the design of all the waysides so that visitors are encouraged to read them onsite, and to feel immediately successful and confident in their ability to glean the important messages, almost effortlessly.
- Be consistent about how ranges of dates are portrayed.

Transition Zone: Most visitors who noticed the markers on the TAT and the MT quickly recognized that they were two "different" trails. Of the visitors who stopped in the Transition Zone, most stopped at both the portal panel and the *Magic Meter*. Most who stopped at the single

portal panel tended to see it as describing a single experience and became confused about what they were about to experience depending on which direction they were headed. For example, one respondent walking from east to west explained that they expected to both (a) *Walk 320 meters* and see the scale change, and (b) *See and touch rocks*. We also found that when visitors engaged with the TAT, when they reached the Transition Area many of them—particularly children—tended to “celebrate” the accomplishment of walking one million years.

Recommendations:

- Replace the single portal panel with two portal panels, one at the end of each of the MT and the TAT. Re-design the portal panels to include (a) a summary/celebration of what visitors have just completed, as well as (b) a sense of anticipation/expectation for what they are about to encounter.
- Do extensive iterative testing/refinement of this area—including design and placement of the portals—during the next on-site visit to maximize visitors making the connection and also differentiating between the two trails.

Magic Meter Panel: A lot happened in one million years!

This panel did not appear to communicate its intended messages to most respondents. Visitors tended to be attracted to the large, colorful, and interesting photographs. Although they sometimes made connections between the photos and things they had seen elsewhere in the Park, most did not recognize that all of the things depicted happened in the last one million years, and that this one million year period is just the first step of the Trail of Time. Most respondents were not able to accurately interpret the section/information about volcanoes. Some respondents assumed it meant that the Grand Canyon or the rocks they were seeing along the Trail were formed primarily from volcanic activity. Most did not notice the volcanic graphic bars on their own, and some had trouble interpreting them when they were pointed out to them. Some visitors were amazed at how many ice ages there have been in the last one million years. Some used the ice age graph to reinforce the notion that the Grand Canyon was formed by either a large flood and/or a glacier, or that our current global warming had natural causes. Most respondents did not understand the magnifying glasses, sometimes even after significant guidance.

Recommendations:

- Have Mark re-design the panel to more clearly indicate the four key human-related dates and where they fall on the timeline: 1869; 1,000ya; 4,000ya; 10,000ya. Keep the graph of the Ice Ages, but make the photos showing the warmer/drier times and cooler/wetter times much (much!) smaller so they aren't overshadowing the other more important content. Right now these photos are the biggest thing on the panel, but are (perhaps) the least important. Make all the photos for each time range the *same* size.
- Redesign the references to volcanic activity and re-test to ensure it communicates more effectively with visitors. For example, have an illustration of lava pouring into the Canyon, rather than showing a generic volcanic cone.
- Revise the two remaining paragraphs of text so that they are easier to read/understand. For example: “Today the Grand Canyon is warm and dry. When there were glaciers to the north, the Canyon’s climate was cool and wet.” For example: “Humans have been in Grand Canyon for only the last 10,000 years. The story of the Canyon and its rocks is much much longer.”

- Replace the phrase “interglacial periods” with something that is easier to understand quickly, and a phrase that doesn’t imply the canyon was formed primarily by a glacier. For example: “warm periods.”
- Add an action verb: *Imagine* all the things that happened here in the last one million years.
- “The modern era is represented by the width of a hair on the Trail of Time.” What does *the modern era* mean? And is the “width of a hair” on the walking trail (zero to 1,840my) or on the 1 million year timeline at the bottom of the sign?

6my: It took 6 million years to make the Canyon!

This panel worked fairly well for most visitors. The saw metaphor was not particularly popular with some visitors, but did not appear to confuse or intimidate them. Many visitors appeared amazed by the *thickness of a piece of paper* analogy. Touching the river polished rock was a popular and effective tool for helping visitors understand the power of the river. Most visitors appreciated being able to touch a rock from the bottom of the canyon. Some visitors became frustrated when they couldn’t find the Colorado river after being directed to do so. Even with guidance, some visitors had a difficult time locating it.

Recommendations:

- Change the title to something more active, for example: It took 6 million years to carve the canyon! Or perhaps: Grand Canyon was carved 6 million years ago through today.
- If necessary, remove the section (photo, caption, and action statement) about *Find the Colorado River* to make room for a more prominent WIS.
- Remove the sentence about imaging the Colorado river as a saw. Visitors did not tend to read it, and they still got the metaphor without it.
- *Imagine Carving the Canyon* s/b *Imagine carving the Canyon*.
- *Touch river-polished rocks* x/b *Touch river-polished rock*.

70my: Without uplift, there would be no Grand Canyon! [or is this now 65my?]

While many respondents had some fun trying the hand activity and were able to get bits and pieces of interesting information from this panel, few respondents understood the main message, i.e. that without uplift there would be no Grand Canyon. Largely because it showed a human hand doing something, many respondents were initially attracted to the middle photograph. However, many other respondents either did not pay much attention to it, or were not able to effectively do the activity. The original subduction drawing was too complex for almost every respondent and it had too much information for novice visitors. The revised five-block diagram seemed to be more effective for some respondents but tended to be too diagrammatic and abstract for most. In addition, a few respondents expressed frustration because they wanted to understand not just that uplift took place, but what forces made it happen. Most respondents did not find the map on the right to be helpful for understanding uplift and erosion, and many of them found it confusing.

Finally, it became clear during testing that there were two distinct main ideas: (a) without uplift there would be no Grand Canyon; and (b) a lot of erosion took place before the Grand Canyon started to be carved.

Recommendations:

- Change the title of the panel to state the main message, and also be more conversational. For example: Without uplift, there would be no Grand Canyon (since that is the more important of the two ideas).
- Design two panels, one for each of the two main ideas. If this is not possible, then the design should help visitors recognize these two important ideas. For instance, make the left side deal with uplift and the right side deal with erosion.
- On the uplift side emphasize both the incredible scale of the uplift (from sea level to almost 2 miles), and also say something about the cause, for example *The same immense forces that produced the Rocky Mountains*.
- For the erosion side, get a photograph for the erosion activity that eliminates the shadows and more clearly shows the top layer.
- Revise the text to emphasize two points: (a) The erosion removed all the rocks younger than 270 million years old including those with dinosaur fossils in them, and (b) That's why the *Trail of Time* has no rocks displayed between the 6 and 270 million year markers. Include a brief sentence that says: To see dinosaur fossils, visit other nearby National Parks such as Zion and Bryce.
- Develop a new, less abstract, and slightly more representational graphic to more clearly communicate the idea of uplift.
- Be consistent. In one paragraph it is km with miles in parentheses; in another it's miles with km in parentheses.
- Eliminate the map and accompanying two paragraphs of text, especially if the larger timestrip is to be included.

270my: The horizontal rock layers were formed 525-270 million years ago.

Each of the four activities in this panel appeared to work quite well with many respondents. Depending on the individual visitor, different parts of the wayside attracted their attention. Many visitors used the viewing tubes, but often were not sure what they were (supposed to be) looking at. Touching and examining the rock with fossils was a popular activity. The mnemonic worked well with some visitors, but many did not pay much attention to it. People still had trouble pronouncing some of the words like Kaibab. The photograph of the rock layers that visitors can see from this vantage point appeared to work well for many visitors, and numerous times folks commented that they really appreciated having the photograph labeled so clearly. Only a very few visitors made the connection between the top four layers in the photograph and the top four in the rock column diagram. One respondent in particular expressed confusion and frustration because there were only five layers labeled on the photograph and nine layers on the rock column. Many respondents were confused about where the river was, locating it at the bottom of the rock column. One of the challenges of this wayside is that it is not clear what the main point is, especially whether it is focusing on just the top four or five layers, or whether it is about all the horizontal layers. But more than that, it's unclear what is the most important, e.g. that they are sedimentary rocks, that the rock layers are different because they were formed during different climates, or that the rock layers were continuous before there was a hole in the ground.

Recommendations:

- Decide on a compelling read-at-a-glance conversational main message that can also serve as a title, but does not sound like a chapter from a text book.
- If more room is needed to accommodate the new WIS, eliminate the rock column mnemonic in the middle. This is readily available in the park newspaper which is given to all visitors when they enter the park, and it really is something you need to carry with you and repeat as you walk along the trail. It could also easily be included in a walking guide.

References

Doering, Z. D., & Pekarik, A. J. (2000). Questioning the entrance narrative. In J. S. Hirsch & L. H. Silverman (Eds.), *Transforming practice* (pp. 261-267). Washington DC: Museum Education Roundtable.