

# Using Evaluation to Improve the Design of a Hand-Held Museum Map

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The map used in this study is a rather complex design which was subjected to a critical appraisal by the design team prior to conducting a visitor study. In a previously published map evaluation (Talbot, Kaplan, Kuo, & Kaplan, 1993), major changes were made to the proposed map at the critical appraisal stage, reflecting the evaluator's own bias toward a simplified design. However, visitors respond best to tangible options — in other words, they need to see a complex design so they may react to it. If a complex design is edited prematurely, you may not get a complete picture of visitor preferences.

Museum maps are not merely way-finding devices. They also (1) familiarize visitors with the organization of the museum's public spaces, (2) help visitors acquaint themselves with the Museum attractions, and (3) allow visitors to budget their time by helping them make selections based on their interests and length of visit. Therefore, one cannot always rely on the adage that "simple is better." Visitors likely to be map users may find an overly simplified map inadequate for their needs.

## Introduction

Formative evaluation of *exhibits* is becoming commonplace at the Denver Museum of Natural History, but only recently have we extended our evaluation process to include printed products and publications. In this case study, the in-house exhibit evaluator was asked to develop an evaluation process for obtaining visitors' responses to a new museum map design. There are no extensive behavioral studies associated with this evaluation — only the testing of a prototype map with potential users.

Many older museums have been cursed with the architectural remnants of the past, and the Denver Museum of Natural History is no exception. Over the Museum's 100-year history, no less than six separate expansions have resulted in a rather complex and sprawling asymmetrical arrangement of auditoriums and galleries with the main Museum entrance on the north side. The most recent revision to the Museum's architecture (in 1987) provides visitors with a lovely sun-drenched atrium, but hides exhibitions from the visitor's line-of-sight. A novice visitor may be heard to ask, "Where is the museum?" while making their ticket purchases at the entrance. The design of a new museum map will not resolve all of these

problems, but is the beginning of long-range plan that intends to address many way finding issues.

The old, and very simple, two-color map was serviceable (See Figure 1) with the help of paid and volunteer staff. However, it was inadequate for the visitor who was reluctant or unable to enlist staff or volunteer assistance. Note that the old map was designed using compass directions — with north on top. This is exactly the opposite of the way visitors enter the museum.

### Critical Appraisal

During early discussions, the evaluator, designers, and Visitor Services staff reviewed available research concerning way finding and looked at a number of maps designed by other institutions. Consensus was reached with the following statements:

- A map should be oriented the way visitors would be likely to approach the museum, even if this does not conform with a compass. The old map's compass orientation is more appropriate to an exterior map, not an interior one (Finke, 1992);
- Names of galleries and halls need to be obvious to visitors;
- A color map is a lot easier to read than a black-and-white map;
- Icons and keys need to be clear and kept to a minimum;
- The map should include only permanent exhibits (previous maps included temporary exhibits and quickly became obsolete);
- During the evaluation process, map users need to be presented with any potential choice so they may identify the relative merits of a map through a subtractive process. Designers developed a functional map that incorporated all of their best ideas. The evaluator made a few suggestions but was not directly involved in the design process;
- The Museum should consider extending the hand-held map design to its walls. In addition to identifying problems with the prototype map, the evaluation should touch on wall signage without focusing on it.
- Since a full-color map is an expensive proposition, the cost-effectiveness of formative evaluation prior to production was fully recognized and supported by the team.

A first-draft design was prototyped (in the exact size and shape of the proposed finished map). After we had an opportunity to review the draft, twenty copies were created for testing. The maps used for testing were reproduced in full color using a color copier.

The main questions the design team wanted answered were clearly articulated at the beginning of the process:

1. Are visitors able to navigate easily using the map?
2. Do visitors understand the terms and icons used?
3. Does the map improve a visitor's ability to make choices in the Museum without causing confusion?
4. What landmarks do visitors use on the map and in the Museum?
5. Do visitors feel the map makes their visit more enjoyable?

## Methodology

To limit the cost of the prototypes and to keep within a fairly tight deadline, we opted to use cued testing with a random, but limited, sampling of visitors. Potential participants were approached as they entered the Museum. Visitors were told that the evaluation of the maps would take anywhere from 1/2 hour to an hour and were encouraged to complete the study before proceeding with their visit. They were compensated for their time — each person who agreed to participate was given free passes to the Museum for all members of their group. They were also given two IMAX theater passes as an incentive for completing the process. Seventy-two visitors and visitor groups participated. Of those, nearly half had never been to the Museum before.

The evaluation process was fairly demanding for each participant, requiring them to

- complete an introductory survey;
- use the map mockup (see Figure 2) to locate three separate places in the Museum. (Trained volunteers were stationed at each location to talk to the participants);
- complete personal journals as they used the map;
- participate in an exit interview.

DMNH was hosting the *Star Trek: Federation Science* traveling exhibition during this evaluation, which attracted many new and novice visitors to the Museum. Participants were encouraged to complete the task as a group and to include the opinions of their friends and families in their journals. Each participant was assigned alternate routes for three locations marked on the map so that three common routes around the Museum were covered.

This activity was viewed by many of the participants as an entertaining way to pass the time — much like a treasure hunt. Due to the cued nature of the evaluation, many of these visitors were more motivated than typical visitors, but this bias was somewhat alleviated by the time limit imposed upon them, the fact that their participation was unexpected, and their novice status. Most of the participants took the activity very seriously and wrote detailed accounts of how they found their way through the Museum. Only a few of the participants did not fully complete their tasks — usually because

of time constraints or the impatience of small children. When all of the findings were tallied, over 3,000 responses were collected. The sample was fairly evenly divided by gender, and several participant groups included members who were differently-abled. The group size also varied a great deal—there were nine groups of 5-6 persons and seven participants were alone. The rest were in groups of 2-4 persons.

### Findings/Actions

Even before we examined the findings, there were hints that visitors reacted to the map positively. Visitors were more willing to participate in the evaluation once they saw the maps, and they often wanted to keep them when the testing was over. (Because we didn't have very many, visitors had to return them during the exit interview.) Most visitors (45 of 72, or 63%) opened the maps without hesitation and were able to point to where they stood easily.

We wondered if visitors would be confused by having the first floor of the museum on the top of the page, but this did not seem to be a problem. About 57% of the sample said their first impression of the map was positive. The eight people who responded negatively to the map offered the following criticisms: one said that it was a little busy, two said that the restrooms could not be located immediately, and two people were confused that "north" was not on top. Ten comments were neutral with one person saying, "the museum has changed so much since I was last here," and another saying, "we missed a lot the last time I was here, I can see." A couple of visitors questioned why the Museum offered certain exhibits and said such things as, "why Islands, why Botswana?"

Without being asked, about a fourth of the sample mentioned the color as positive, lively, and helpful. One-third said they thought that the map was simple and easy, although only half of our sample said they would be likely to use a map during a typical visit.

About 60% of the visitors we interviewed rated the map good-to-excellent, although about a fourth said that the map could use some improvements. Well over half of the sample felt that the map helped them find their way around, and many people said that they would be likely to keep the map for a souvenir.

Main landmarks that visitors found helpful in negotiating their way around were the escalators, the insect exhibit on the main floor, IMAX, and the *Hall of Life*. Visitors seem to find the main paths (which were yellow on the color map) particularly helpful. Several people used the existing wall signs to help them. Interestingly enough, the names of exhibits provided on the map rarely caused problems, but old signage in existing galleries did. (For example, our bird hall has a sign that says "James Hall" and a couple of our visitors saw signs in "Explore Colorado" that said "Mead Hall.") Museums often juggle the requirements of their donors with the needs of

their visitors. We stuck with the more descriptive names on the map and made a note to address the donor signs at a later time.

Visitor comments suggested many improvements (see Figure 3). The icons for the stairs and the escalators were too similar. People could not find the elevators although they often looked for them first. We thought the restroom icon was obvious, but visitors did not. The areas that were not public spaces also seemed to cause some confusion for visitors. Several people suggested that our wall signage needs to be visible from a distance. A number of people pointed out that the ticket-takers were not shown on the map.

Evaluation findings determined critical changes in the final version of the map. While these changes seemed subtle, they made a difference to visitors. Restroom icons were added to the legend and were made larger in their various locations on the map. The icons for the elevators were changed to a large "E." The main escalator was added to the icon list and the stairs which are used less frequently were de-emphasized. Since the IMAX theater is used as a landmark, the IMAX name was placed horizontally so that it would be easier to read and the outside entrance more clearly marked. Colors were lightened to make the titles clearer to visitors who use them in darker areas of the Museum.

The featured highlights along the left side of the map were reduced and descriptions were made more specific (i.e. a "trip through the galaxy" was changed to "laser light shows.") Each visitor comment was reviewed by the designers one-by-one to ensure that the map was made as clear as possible.

Research has established the value of "you-are-here" maps in museums for key transitional spaces. (Howes, 1990). New wall treatments were designed by enlarging and reproducing sections of the hand-held map. These wall maps add the "you-are-here" that the hand-held maps lack and mimic the hand-held map's color scheme and design. These help visitors to get their bearings at the entrances to the main exhibit galleries on each floor.

## Conclusion

After the new maps were in use for several months, an informal summative evaluation helped us to apply our initial questions to the final design:

1. Are visitors able to navigate easily using the map?  
*Yes, although a number of visitors still rely on our guards and volunteers. Because the new maps are in use fairly frequently, support staff can easily identify visitors who need help.*
2. Do visitors understand the terms and icons used?  
*Yes, although we still need to deal with the confusion caused by donor signs in exhibit galleries and areas closed to the public.*

- Additional signage is needed to identify each floor where visitors step off of the escalators.*
3. Does the map improve a visitor's ability to choose what they visit? *Staff has noticed that visitors appreciate the new maps and frequently use them to budget their time and plan their visit. Orienting visitors so they are better able to make their ticket purchases has been evaluated in a separate study.*
  4. What landmarks do visitors use on the map and in the Museum? *The visitors use the insect exhibit on the first floor as a point of departure. They also tend to meet each other around the escalators and the Hall of Life. Individual diorama halls are not easily distinguishable to the average visitor.*
  5. Do visitors feel the map makes their visit more enjoyable? *Yes, the map has received many favorable remarks from visitors. They are also not left around the museum or thrown away as often as the old maps were. When visitors were shown both maps and asked to compare them, they overwhelmingly felt that the new, color maps were superior.*

One positive finding is that more visitors make it into our difficult-to-find galleries. One visitor, asked how she felt about the map said, "I have lived by it. I have been here before and didn't follow the map and missed sections. I saw things today I haven't seen before." Another person said that he used the map "all the time. Section by section."

About 50,000 maps are distributed to the public every three months. The cost of this can be adequately justified by a perceived increase in visitor satisfaction. This evaluation has helped us gain valuable insights as to how our visitors feel when they enter the Museum and it has given us a jump-start toward solving some of our other pressing signage and orientation problems.

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## References

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Figure 1

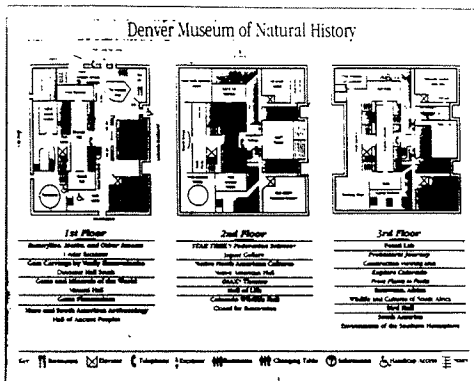


Figure 2  
Map Used in Evaluation

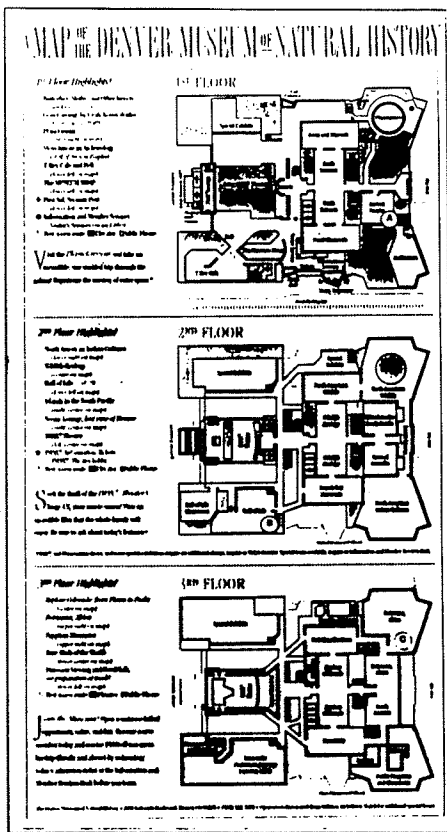


Figure 3  
Final Version

