

SECTION 504 COMPLIANCE REVIEW REPORT



Denver Museum of Nature and Science

Denver, Colorado

Office of Diversity and Equal Opportunity

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Executive Summary

Section 504 of the Rehabilitation Act of 1973 prohibits discrimination against qualified individuals with disabilities by Federal fund recipients. Because NASA provides funding to the Denver Museum of Nature and Science (DMNS) in Denver, CO, DMNS needs to take steps to provide equal opportunities for people with disabilities. NASA's review has determined that DMNS is cognizant of its responsibility and diligent in its overall efforts to provide accessible programs, services, exhibits and facilities for individuals with disabilities. The promising practices detailed in this report are an example of these efforts. However, NASA has determined that several Section 504 requirements are currently not being met by DMNS. Accordingly, NASA has developed a remediation plan which appears at the end of this report, to assist DMNS in meeting these requirements, thereby strengthening compliance, prohibiting discrimination and enabling DMNS to provide accessible programs, services and activities to for individuals with disabilities. NASA highlights the following areas with respect to DMNS's Section 504 compliance posture:

- **Grievance Processes.** Our review found that grievance processes at DMNS need to be strengthened greatly by slightly expanding the scope of the complaint process and by making the grievance process more readily available and better known to employees and the public.
- **Designation of Responsible Employee.** While DMNS has a Designated Responsible Employee (DRE) for Section 504 compliance, this individual would be better served in her Section 504 compliance efforts by an in-house working-group of staff tasked to oversee Section 504 compliance. NASA found that DMNS had such a working group, called the "Accessibility Committee", but it was subsumed into a more recently-created "Inclusivity Committee", which deals with a broader range of equal access issues beyond disability (i.e., minority population access). Given the complexity of disabilities, DMNS's Accessibility Committee should be renewed and should coordinate its efforts with DMNS's Designated Responsible Employee. This person should also be prepared to address accessibility issues in all their forms (including an awareness of barrier removal, path of travel requirements, effective communication, etc.) and not solely from a human resources compliance perspective.
- **Notification of its Section 504 Obligations.** DMNS's website provides detailed information on the availability of accessible facilities, services, programs and exhibits, as well as the availability of auxiliary aids to provide accessibility (i.e., sign language interpreters). It also provides contact information for the DRE. However, DMNS has not adopted a notification that it will not discriminate on the basis of disability and that comports with the requirements of the Section 504 regulation.
- **Self-Evaluation.** The museum must conduct a self-evaluation, as required by NASA's Section 504 regulations, which includes all elements of the museum's facilities as well as its programs, services, and activities for the public. This review should seek input from the disability community and should be an ongoing part of the Museum's efforts to ensure full and equal participation by its patrons, volunteers, and employees with disabilities.

- **Eligibility Criteria, Education, and Awareness.** The Museum has enjoyed success in ensuring program access for its visitors with disabilities. It may consider, however, additional training to help bolster its staff's understanding of disability-related issues and legal requirements.
- **Effective Communication.** DMNS works diligently to ensure that its visitors with sensory impairment are afforded effective communication. The Museum's facilities use state-of-the-art technologies and its staff is well-versed in understanding their requirements and how to meet them. The museum should undertake more robust surveys and feedback mechanisms to ensure that the needs of patrons with disabilities (particularly deaf and hard of hearing visitors) are being fully met.
- **Architectural Accessibility.** Like many older museums, DMNS faces significant challenges in architectural accessibility. Ensuring compliance in architectural elements is a very technical subject and the Museum needs to be more careful about demanding full compliance in altered spaces, the areas serving altered spaces, and newly constructed areas. Unfortunately, with the constant remodeling that the Museum has performed over the last three decades, many of its obligations under Federal disability rights law have not been met because its architects and engineers have not focused enough on compliance with accessibility standards.
- **Transition Plan.** While the DMNS has conducted informal surveys in the past, it has neither conducted an extensive review of its facility nor maintained a publicly available transition plan. Given the number of barriers in the facility, these planning documents must be developed and implemented as soon as possible.

Background

A. DMNS History

The Museum was incorporated on December 9, 1900, as the Colorado Museum of Natural History. Construction of the first wing began in the following year and the museum opened to the public in 1908.¹ In the past 100 years, the Museum has grown immensely. It now includes nine separate wings and receives approximately 1.5 million visitors a year.²

The Museum is a private 501(c)(3) organization that has close ties to the City of Denver, but presents a complex relationship with respect to control and ownership of property and assets³. The City owns the buildings and surrounding park of the Museum. , The City also owns the Museum's vast collection of artifacts (e.g. fossils, minerals, archeological items) in the museum, but not the temporary equipment or exhibits that comprise much of the day-to-day visitor experience at the museum.⁴ The Museum further advised NASA that it also owns collections

¹ Volunteer and Intern Orientation Handbook (2009).

² Interview with George Sparks (Mar. 2, 2010).

³ DMNS Draft Investigative Report Comments (January 14, 2011)

⁴ Interview with Sandi Garcia (Chief Financial Officer) (Mar. 3, 2010).

of other entities (i.e. State of Colorado) While the City owns the Museum’s buildings and facilities, the Museum addresses almost all of the maintenance and minor upgrades to the facility; only major alterations or new construction requires approval (and potentially funding) from the City and the Museum is otherwise free to make changes to the building or its collections.

B. DMNS Resources and Funding

NASA has provided a number of grants to DMNS.

- December 31, 2008 (\$93,745-- The Longevity Of Oceans On Terrestrial Planets Research Grant)
- September 18, 2008 (\$51,000-- Tectonic And Geochemical Manifestions Of Climate Change On Venus Research Grant)
- April 14, 2010 (\$40,000—Venus Express Research Grant)
- April 14, 2010 (\$10,000—Venus Express Research Grant)
- April 21, 2010 (\$820,866—Sceince on a Sphere)

In addition, the Museum receives a number of other financial grants from other Federal agencies.

Most of the Museum’s revenue, however, comes from other sources. The Museum operates on a multimillion dollar annual budget of approximately \$30 million. This funding comes from several sources⁵:

- SCFD Funding (20%)
- Admissions (30%)
- Membership Fees (15%)
- Retail Sales (10%)
- Museum Foundation (10%)
- Other Sources (15%)

Most of this income goes towards paying the salaries of the Museum employees (approximately 50%), operating expenses, and minor facility maintenance. More significant changes to the building are addressed through a formal Capital Improvement Plan submission to the City for \$150,000 to \$200,000 a year.⁶ The City also issued a one-time \$19.2 million bond for deferred maintenance at the Museum that was used for renovations to the Phipps Gallery in 2009 and other renovation activities.

C. Compliance Review Background

The following chronology summarizes the events relevant to developing this compliance review.

October 8, 2009 NASA sent initial information requests to DMNS.

⁵ Interview with Sandi Garcia (Chief Financial Officer) (Mar. 3, 2010).

⁶ Interview with Elaine Harkins (Director of Facilities) (Mar. 2, 2010); Interview with Sandi Garcia (Chief Financial Officer) (Mar. 3, 2010).

November 14, 2009 Museum responded to information request, including a description of its programs and facilities, a description of the facilities affected by NASA funding, and identification of its Section 504 Designated Responsible Employee. This response also included a copy of the DMNS's grievance procedure.

March 3-4, 2010 Site visit to Museum by NASA team. During this site visit, the team interviewed the following DMNS employees:

- George Sparks (President and CEO)
- Maria Hannon (Human Resources Director)
- Nancy Walsh (Director of Museum Programs)
- Elaine Harkins (Director of Facilities)
- Damon McLeese (Exec. Director, VSA Arts of Colorado)
- Paula Meadows (Director of Visitor and Volunteer Services)
- Sandi Garcia (Chief Financial Officer)
- Matthew Gargan (Chief of Security)
- Rebecca Smith (Manager of Visitor Programs)
- Maryann Stack (Architect of Software and Database Development)
- Polly Andrews (Director of Youth and Teacher Programs)
- Jodi Schoemer (Director of Exhibits)
- Cori VanHorn (Assistant Supervisor of Admissions Department)

The team also performed an extensive architectural survey of the main DMNS where programs or services for the public are provided.

Throughout this review, the Museum was cooperative and forthcoming with information.

Analysis

Section 504 prohibits discrimination on the basis of disability. Specifically, Section 504 requires that,

*No otherwise qualified individual with a disability ... shall, solely by reason of her or his disability, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance....*⁷

This requirement has been adopted by the NASA nondiscrimination regulations,⁸ which itemizes specific prohibitions against forms of discriminatory conduct.

The following discussion divides the Museum's response into five subsections where these regulations are applicable. Each subsection includes a summary of our review, a description of promising practices, and a listing of

⁷ 29 U.S.C. § 794(a) (2008).

⁸ 14 C.F.R. § 1251.103 (2008).

compliance issues and recommendations for additional changes for the Museum to pursue. These five subsections are:

- Grievance procedures,
- Designation of responsible employee
- Eligibility criteria, education, and awareness,
- Effective communication, and
- Architectural accessibility

A. Grievance Procedures

The NASA Section 504 regulations require grantees to adopt adequate grievance processes.

(b) Adoption of grievance procedures. A recipient that employs 15 or more persons shall adopt grievance procedures that incorporate appropriate due process standards and that provide for the prompt and equitable resolution of complaints alleging any action prohibited by this part. Such procedures need not to be established with respect to complaints from applicants for employment or from applicants for admission to postsecondary educational institutions.

1. Findings of Fact

In further support of its non-discrimination policy, the Museum also has a detailed grievance process:

Section 504/ADA - Grievance Procedure

The Denver Museum of Nature and Science has adopted an internal grievance procedure for prompt and equitable resolution of complaints alleging any action prohibited by federal regulation implementing Section 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act of 1990 (ADA). Section 504 and ADA state, in part, that "no qualified individual with a disability shall, by reason of such disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of a public entity, or be subjected to discrimination by such an entity."

Issues that are grievable include, but are not limited to, a denial of a requested accommodation, the inadequacy of an accommodation, the inaccessibility of a program or activity due to disability, or discrimination or harassment based on disability. All such complaints should be addressed to the attention of the Denver Museum of Nature and Science, Human Resources Box 28, 2001 Colorado Blvd, Denver, CO 80205 Tel: (303)370-6425, who has been designated as Compliance Officer for the Museum's Section 504 and ADA compliance efforts. Complaints which are received through other means, i.e. Visitor Comment Forms or the Museum's web- site feedback mechanism, will be promptly forwarded to the Compliance Officer.

The following steps explain the procedure:

1. A complaint should be filed in writing or verbally, and shall contain the name and address of the person filing it, and briefly describe the nature of the complaint and the alleged violation of the regulations.

2. A complaint should be filed within thirty (30) days after the complainant becomes aware of the alleged violation. Complaints received later than thirty (30) days after complainant became aware of the alleged violation will be dismissed as untimely.

3. An investigation, as may be appropriate, will follow the filing of a complaint. The investigation shall be conducted by the Museum's Compliance Officer (or another Museum office acting at the Compliance Officer's request). These rules contemplate a prompt and informal, but thorough investigation which afford the complainant, the subject of the complaint, other interested persons, and their representatives, if any, an opportunity to submit documents and information relevant to the consideration of and resolution of the complaint.

4. A written determination as to the validity of the complaint and a description of the resolution, if any, shall be issued by the Museum's Compliance Officer or another Museum office acting at the Compliance Officer's request and a copy forwarded to the complainant no later than fifteen (15) working days after receipt of the complaint.

5. The Museum's Compliance Officer shall maintain the files and records of the DMNS relating to complaints filed.

6. The complainant or the affected department or business unit can request reconsideration of the resolution if he or she is dissatisfied with the resolution. Requests for reconsideration should be made within seven (7) days to the appropriate vice president of the Museum, i.e., the VP of Operations in complaints where an issue regarding the physical building are concerned or the VP of Finance in complaints where a staff member is the accused. The senior officer has thirty (30) days to respond to the request for reconsideration. Decisions of the senior officer are final.

7. The right of a person to a prompt and equitable resolution of the complaint filed hereunder shall not be impaired by the person's pursuit of other remedies, such as the filing of a Section 504/ADA complaint with the responsible federal department or agency. Use of this grievance procedure is not a prerequisite to the pursuit of other remedies.

8. This procedure shall be construed to protect the substantive rights of interested persons, to meet appropriate due process standards, and to assure that the Museum complies with Section 504/ADA and implementing regulations.

9. Retaliation against any complainant under this grievance procedure or against any person who assists a complainant in his/her pursuit of a complaint under this grievance procedure is prohibited.⁹

⁹ Letter from George Sparks to David Chambers (undated). The current grievance process was created about two years ago. It is based on information from the Mountain States Employer Council as well as information from the NASA website. During interviews, it was stated that information about the grievance process is available to the public through the museum website and from the visitor services desk. Interview with Maria Hannon (Human Resources Director) (Mar. 2, 2010). A quick review of the museum's website, however, failed to uncover this information suggesting that it is either absent or not very easy to find.

In our interviews, none of the witnesses were able to discuss the specifics of the grievance process—only that it existed. Instead, witnesses were more forthcoming on the three main avenues that DMNS uses to obtain feedback: (a) Visitor Comment Cards available throughout the facility, (b) by providing feedback through the Museum's website, and (c) making a report through security.¹⁰ In these cases, the feedback is logged, tracked, and forwarded to the appropriate department. In our interviews, all of the witnesses with whom we discussed the complaint process indicated their familiarity with this process, but implemented it in different ways. When asked where disability-related complaints would go to, some witnesses stated that they would go to Visitor Services¹¹ or to security.¹² In general, most witnesses indicated that only more serious issues would go to Maria Hannon or to the DMNS's legal counsel. The Museum further advised NASA that its staffs' unfamiliarity with the Grievance Procedure may be due to the fact that the Museum doesn't routinely receive complaints from visitors regarding accessibility issues.

2. Compliance Analysis and Recommendations

The Museum's grievance process is no doubt well-intended given the DMNS's strong visitor focus. Nevertheless, our review does reveal that the grievance process falls short in a number of critical areas.

Specifically, the grievance process is set forth in the employee manual but is not made easily available to members of the public. As a consequence, a member of the public has no idea what information the Museum needs in order to conduct an internal assessment or what his or her rights are in an investigation. Furthermore the grievance process asks for the name and address of the person filing the complaint, but no other information that may be particularly valuable to an investigator, such as the name and telephone number of any witnesses or even the date and time of the alleged violation. This makes it almost impossible for an investigator to verify the veracity of any claim and, because DMNS's grievance process does not ask for this information, an aggrieved program participant has no reason to provide this information when it can be readily remembered by the aggrieved party.

The review team also found that DMNS's grievance process is inconsistent and implemented on an ad hoc basis. For instance, the Museum's security team uses a special form for capturing information. This form is not widely known by the staff even though it is in the Employee Manual (all new hires are required to review the employee manual and acknowledge via signature that they have received the Employee Manual).¹³ Our interviews with employees revealed that they would go to a variety of different people if they were faced with a possible issue of discrimination instead of one single Section 504 Coordinator (see *B. Designation of Responsible Employee*, below). This diffusion of responsibility may address immediate concerns, but it also means that the Museum cannot gain a cross-organization picture of potential issues. For instance, some witnesses have never heard of a disability-

¹⁰ Letter from George Sparks to David Chambers (undated).

¹¹ Interview with Polly Andrews (Director of Youth and Teacher Programs)(Mar. 3, 2010).

¹² Interview with Cori Van Horn (Assistant Supervisor of Admissions Department)(Mar. 4, 2010). Interview with Rebecca Smith (Manager of Visitor Programs)(Mar. 3, 2010).

¹³ DMNS Draft Investigative Report Comments (January 14, 2011)

related complaint,¹⁴ while others have only faced disability-related issues sporadically in their areas of responsibility.¹⁵ While it is important for issues to be addressed within the department directly responsible for affected operations, information needs to also be centralized to ensure it is consistent and to make sure that patterns of common problems can be dealt with effectively. In general, however, DMNS has had relatively few complaints (none were documented or retained by DMNS for the review team to analyze). Among the complaints it does receive, a common issue is often inadequate parking, particularly with popular temporary exhibits¹⁶, but other issues include exhibits that are too crowded, or inadequate family restrooms.¹⁷

To remedy these problems, we believe that DMNS should undertake the following measure as soon as possible.

1. **Make a Clear, Easily-Available Grievance Process For All Program Participants.** The Museum's current grievance process is an excellent beginning that, with slight modification as described above, can serve as a useful model for employees, volunteers, visitors, and all program participants. This policy should be freely available both to ensure fair treatment to all program participants and to clearly articulate DMNS's policy of taking its obligations seriously. This information should be prominently available through the Museum's website, visitor information desk, and other places where the Museum regularly receives feedback from the public. DMNS should promptly advise all employees (including existing employees) of the locations where this information is provided.
2. **Ensure that the Designated Responsible Employee is Notified of Every Disability-Related Request or Complaint.** As discussed in greater detail in the next section (see *B. Designation of Responsible Employee*, below), the Museum should ensure that the Designated Responsible Employee is advised of every complaint or issue involving persons with disabilities at DMNS. This policy needs to be clearly articulated to all employees and volunteers. While the Museum's Designated Responsible Employee need not

¹⁴ Interview with Nancy Walsh (Director of Museum Programs) (Mar. 2, 2010); Interview with Rebecca Smith (Manager of Visitor Programs)(Mar. 3, 2010); Interview with Polly Andrews (Director of Youth and Teacher Programs)(Mar. 3, 2010).

¹⁵ For instance, The Director of Exhibits recalled one accessibility complaint during the Titanic exhibit (2008). In this exhibit, the museum tried to re-create different zones of the ship and thresholds where installed between the carpeted flooring and the historically-accurate flooring in each of the exhibits. For some visitors with disabilities, these thresholds created mobility difficulties. Because the exhibit was leased (and could not be altered), the museum believed that they could not address this complaint. Interview with Jodi Schoemer (Director of Exhibits)(Mar. 3, 2010). Similarly, one person in the Admissions Department recalled an incident in which a person with a disability went to the wrong door for the IMAX presentation. Interview with Cori Van Horn (Assistant Supervisor of Admissions Department)(Mar. 4, 2010).

¹⁶ Even with parking, the museum has provided special accommodations for visitors with disabilities. "When individual contact information is provided by the complaining party relative to the need for handicap parking, we have offered to reserve a spot for them the day of their next planned visit provided the contact our Security desk in a timely manner." Letter from George Sparks to David Chambers (undated).

¹⁷ Interview with Jodi Schoemer (Director of Exhibits)(Mar. 3, 2010).

respond directly to every request or complaint, they should be advised of every request or complaint—and its outcome.

B. Designation and Notification of Responsible Employee and Section 504 Obligations

Closely related to grievance processes, Section 504 and the NASA regulations make clear that fund recipients must designate a responsible employee.

(a) Designation of responsible employee. A recipient that employs 15 or more persons shall designate at least one person to coordinate its efforts to comply with this part.

While Section 504 provides relatively little specific guidance for implementing this requirement, technical assistance materials developed for comparable requirements under Title IX of the Education Amendments of 1972 and Title II of the ADA provide additional assistance. References to Title IX below are intended to shed light on policy guidance issued by the Departments of Justice and Education in a context similar to Section 504, that is, a civil rights law intended to ensure equal opportunities in federally funded programs.

The Department of Justice and NASA regulations under Title IX of the Education Amendments of 1972 include roughly similar requirements for a designated responsible employee and grievance procedures. Outside the formal regulatory process, the Department of Education has developed technical assistance material to further inform grant recipients of how to fulfill their Title IX obligations.¹⁸ The Department of Justice has recommended fund recipients to abide by these recommendations¹⁹ and has summarized the responsibilities and job requirements for the designated responsible employee. These responsibilities include,

- Providing consultation and information to potential complainants,
- Distributing and receiving grievance forms,
- Notifying parties, scheduling hearings, moderating procedures, monitoring compliance and timeliness, maintaining records, and training staff regarding grievance processes, and
- Providing ongoing training and technical assistance.

The core competencies of the designated responsible employee include,

- In-depth knowledge of Section 504 and general related knowledge of Federal and state non-discrimination laws,
- Knowledge of the recipient's grievance procedures and personnel policies/practices, and
- Ability to prepare reports on compliance activities, make recommendations to appropriate decision makers, diagnose and mediate differences of opinion.

¹⁸ Department of Education (Office of Civil Rights), *Title IX Grievance Procedures: An Introductory Manual* (2d ed. 1987), available at <http://www.eric.ed.gov/>.

¹⁹ Department of Justice, *Questions and Answers Regarding Title IX Procedural Requirements*, available at <http://www.usdoj.gov/crt/cor/coord/TitleIXQandA.htm>.

According to the Department of Justice, for the designated employee to be effective,

- The functions and responsibilities of the designated employee must be clearly delineated and communicated to all levels of the entity, employees, and program participants, and
- The designated employee must be provided all information, authority, and access necessary to enforce compliance requirements.

Because these requirements are not specifically included as part of the Section 504, they should be used as rough guidelines for Section 504 compliance and not as strict requirements.

Title II of the ADA closely mirrors the requirements of Section 504. Technical assistance material developed under Title II provides consistent guidance for choosing the central responsible employee (identified as the "ADA Coordinator") within the organization.²⁰ While these ADA Title II resources are not as specific as the Title IX resources, above, they do add that an effective ADA Coordinator should have experience with disabilities and a familiarity with local disability organizations.

In addition, the NASA regulation makes clear that fund recipients must notify its program/service beneficiaries of their obligation to comply with Section 504 and identify to them the Designated Responsible Employee:

A recipient that employs 15 or more persons shall take appropriate initial and continuing steps to notify participants, beneficiaries, applicants, and employees, including those with impaired vision or hearing, ... that it does not discriminate on the basis of handicap in violation of section 504 and this part. The notification shall state, where appropriate, that the recipient does not discriminate in admission or access to, or treatment or employment in, its programs or activities. The notification shall also include an identification of the responsible employee designated pursuant to 1251.106(a... Methods of initial and continuing notification may include the posting of notices, publication in newspapers and magazines, placement of notices in recipient's publication, and distribution of memoranda or other written communications.

1. Findings of Fact

The Museum has identified Maria Hannon, Human Resources Director, as responsible for coordinating Section 504 compliance.²¹ She has worked at DMNS for 15 years and in Human Resources for the last ten years. Ms. Hannon has worked as the Section 504 Coordinator for DMNS for two and a half years. This was apparently the first time that the role was created, possibly in response to a need for compliance with external mandates, including Section 504. The HR Director oversees all human resources issues within the Museum. For disability-related issues

²⁰ Department of Justice, *ADA Best Practices Tool Kit for State and Local Governments*, ch. 2 (available at <http://www.ada.gov/pcatoolkit/chap2toolkit.htm>); Adaptive Environments Center, *ADA Title II Action Guide* (1992)(reviewed and approved by the U.S. Department of Justice). The *ADA Title II Action Guide* is available upon request by contacting the Department of Justice ADA Technical Assistance Line at (800) 514-0301 (voice) or (800) 514-0383 (TTY).

²¹ Letter from George Sparks to David Chambers (undated).

involving employees, she works with employees on reasonable accommodations and the development of policies and procedures. Non-employment disability-related issues involving the public generally go first to Paula Meadows (Director of Visitor and Volunteer Services), but the HR Director would likely also get involved as well if there were any complaints. The HR Director reports directly to the Chief Financial Officer. The Chief Financial Officer does not have a background specific to accessibility and has relatively little direct involvement with the public.²²

In our interviews of staff within DMNS, Ms. Hannon's role as the Section 504 coordinator was not as clearly defined. In several instances, witnesses indicated that, if a question came up regarding accommodating a visitor with a disability, they would either go first to visitor services or security—but would likely go to Ms. Hannon if it were an employment-related issue.

A review of DMNS publications and other media (i.e., website) revealed that DMNS does notify website visitors of the existence of the "DMNS Compliance Coordinator" and contact information (postal address and phone number), but in only one location: at the bottom of its "Access and Special Needs" web page. The review team observed no signage or similar notification of the Designated Responsible Employee posted in the museum or on its grounds.

In response to our investigation, the museum provided a copy of its non-discrimination policy detailed below:

Non-Discrimination Policy

It is the policy of the Denver Museum of Nature & Science not to discriminate on the basis of age, sex, sexual orientation, race, color, religion, national origin, disability, marital status, military status, gender expression or any other classification protected by applicable state or local law. It is our policy to maintain a non-discriminatory environment free from intimidation, harassment or bias based upon these grounds.

Any individual who believes they have been discriminated against should promptly discuss the matter with their immediate supervisor who should then consult Human Resources within 30 days of the incident. If for any reason it is inappropriate to go to the supervisor, then employees should contact Human Resources directly.

No person shall be subjected to discharge, suspension, discipline, harassment, or any form of discrimination for filing a complaint of discrimination.²³

In support of this non-discrimination policy was a non-retaliation policy:

No hardship, no loss of benefit, and no penalty may be imposed on an employee as punishment for:

a) Filing or responding to a bona fide complaint of discrimination or harassment;

²² Interview of Maria Hannon (Mar. 2, 2010).

²³ Letter from George Sparks to David Chambers (undated).

b) *Assisting in the investigation of a complaint; or*

c) *Coming forward as a witness to the complaint of discrimination or harassment.*

Retaliation or attempted retaliation in violation of this policy. If DMNS determines that an employee's behavior is in violation of this policy, appropriate disciplinary action will be taken against the offending employee, up to and including termination of employment.²⁴

Although DMNS provided us with this statement, the review team could not locate it in any publication or other media that is made available to the general public or posted in the museum or on its grounds. A similar statement does appear on the Jobs web page, but it only covers the DMNS obligation of non-discrimination for employment and is not geared towards its program participants under Section 504. For example, the Museum's non-discrimination policy set forth above advises employees that they should promptly discuss with their supervisor if they believe that *they* have been subject to discrimination

2. Promising Practices

The Museum created an accessibility committee to ensure that DMNS provided a welcoming and positive experience for everyone.

This involves making the building physically accessible as well as psychologically, emotionally, and intellectually safe and inviting for guests and employees. Through the Accessibility Committee the Museum works with Very Special Arts of Colorado, an affiliate of VSA Arts International... in cooperation with VSA Arts Colorado the Museum completes periodic walk-through's to ensure our building is accessible for all audiences the most recent walk-through was conducted on November 15, 2007. In addition to walk-through's, VSA Colorado conducted Customer Service Accessibility training for all front-line visitor-facing staff and volunteers and a general accessibility information session/training open to all staff in February and June of 2007.²⁵

In general, the work of the Accessibility Committee and the Museum's partnership with VSA were both highly received. Damon McLeese has been the Executive Director of VSA Arts of Colorado for 13 years. VSA Arts is a national organization, which receives funding from the Department of Education. Damon has been working in disability issues for his entire career. The bulk of his work is in the Denver area, but he also works with other organizations outside of Denver (e.g. the Grand Junction Symphony). VSA in Colorado works with the Rocky Mountain Disability & Business Technical Assistance Center (DBTAC). VSA has been working with DMNS for about three years. The relationship started with Paula Meadows, the Director of Visitor and Volunteer Services, around 2005 and focused initially on public facing staff. The effort started as a workshop and gradually picked up momentum. They reached out to the deaf and other disability community for feedback.²⁶

²⁴ Letter from George Sparks to David Chambers (undated).

²⁵ Letter from George Sparks to David Chambers (undated).

²⁶ Interview with Damon McLeese (Exec. Director, VSA Arts of Colorado) (Mar. 2, 2010).

When George Sparks took over leadership at DMNS, he formed an Inclusivity Committee to further the Museum's mission of serving a broader cross-section of the Denver community. The Inclusivity Committee is based on a blueprint document developed by the Denver Foundation.²⁷ As noted in DMNS's 2020 Strategic Plan, a key objective is to "Diversify the ethnic and economic makeup of the Museum's visitors and members by increasing participation by underserved audiences." This includes "implement[ing] the Blueprint for Inclusiveness with annual benchmarks" and "achiev[ing] annual improvement against 2008 baseline." Each year, the committee develops a blueprint that sets forth its overall focus. The committee meets once a month and the current focus is on ethnic diversity. The goal is to ensure that DMNS reflects the needs of the community. Currently, there are 22 people on the Inclusivity Committee -- 20 staff members and two volunteers. Each member of the Inclusivity Committee serves a term of two years.²⁸ In 2009, the Inclusivity Committee created a blueprint with a strong focus on Title VI issues (i.e. accessibility for services to Limited English Proficient populations) policy. This focus continues into 2010, specifically on the Latino community. Despite the large number of participants, there is no attempt at dividing the Inclusivity Committee into subcommittees (such as an accessibility subcommittee) because of a lack of resources.²⁹ As a consequence, the Accessibility Committee spearheaded by Paula Meadows has been subsumed into the Inclusivity Committee and the momentum of its positive efforts is no longer felt. The members that we spoke with were generally supportive of the work of the Inclusivity Committee and appreciate its openness to creative solutions,³⁰ but some questioned its effectiveness given its short existence and limited resources. This also means that the Inclusivity Committee currently lacks the expertise or enthusiasm for accessibility issues to continue to be addressed at the Museum.

3. Compliance Analysis and Recommendations

In our interviews, there was a general lack of awareness of special technical requirements, such as DMNS's Designated Responsible Employee or awareness of the Museum's specific grievance process. In general, at best those interviewed "knew that a policy existed" but did not know what it stated. Few interviewees knew of the Museum's obligations under Federal law, including the Americans with Disabilities Act or Section 504 of the Rehabilitation Act. Understanding Federal disability laws is a complex matter that extends far beyond the area of human resources. It requires a detailed understanding of different laws, such as the Americans with Disabilities Act and the Rehabilitation Act. Furthermore, as society changes, new avenues of potential liability exist. The Museum's dissolution of its Accessibility Committee only serves to make DMNS less able to keep up with understanding its legal obligations.

As this report makes clear, Section 504 compliance involves many moving parts. Section 504 compliance at a science museum as large and complex as DMNS requires balancing such needs as customer service, exhibit design, and architectural improvements on a daily basis. One person within the organization needs to have the global view of how these different parts interoperate, as well as working knowledge of Section 504/ADA regulations, standards and practices to ensure that program access is always maintained. However, since the Section 504

²⁷ Interview of George Sparks (Mar. 2, 2010).

²⁸ Interview with Sandi Garcia (Chief Financial Officer) (Mar. 3, 2010).

²⁹ Interview with Sandi Garcia (Chief Financial Officer) (Mar. 3, 2010).

³⁰ Interview with Rebecca Smith (Manager of Visitor Programs)(Mar. 3, 2010).

Coordinator cannot be expected to have a high level of expertise in all areas and operations of the museum, this individual can be assisted by other staffs who do possess that expertise. This may require having an Accessibility Committee to address each of the specific areas; while the members of this committee may not report to the Section 504 Coordinator (and may even have a higher position within the organizational structure), their work should be coordinated with the Section 504 Coordinator to the extent that accessibility for people with disabilities may be affected. One person within the organization should be intimately familiar with all aspects of Section 504 as part of their day-to-day job duties and should stay abreast of new developments and trends. It may also make sense for this person to understand the Museum’s parallel obligations under the Americans with Disabilities Act and Colorado’s antidiscrimination laws for people with disabilities. Understanding the similarities and differences between these laws will help ensure that DMNS is a model in accessibility practices under all sets of requirements. NASA regulations envision that one individual will have the lead responsibility for Section 504 compliance and have a more global “bird’s eye view” of the different moving parts that comprise Section 504 compliance.

Another important “moving part” to Section 504 compliance is that proper notice must be given to patrons, visitors and all other participants and beneficiaries of DMNS’ Section 504 obligation to not discriminate in its programs, services and activities. The current level of notification provided by the DMNS is insufficient for 504 compliance purposes and as a practical matter, may hinder its participants and beneficiaries from seeking full redress of any concerns regarding Section 504 compliance from DMNS.

DMNS should bolster the expertise of its Section 504 program and should ensure that its Designated Responsible Employee is firmly in control of coordinating these activities. Specifically, the Museum should:

- Renew the efforts of the Accessibility Committee to include the same diversity and disability awareness information for all staff members. While many elements of disability awareness are common sense, others are not—and only being having continued refresher training will staff be able to develop a full appreciation of disability culture.³¹
- Develop specific areas of expertise in all areas of the Museum identified by this report. This includes program design, effective communication, and particularly architectural accessibility (which has been overlooked as DMNS has altered its structure several times each year). More so than in other disciplines, disability rights issues requires a high degree of specialization in each of these subspecialties.
- Ensure that DMNS’s Designated Responsible Employee acts as a central hub in coordinating these efforts. Having a single spokesperson and coordinator for Section 504 will:
 - make it easier for the Museum to be proactive in meeting the future needs of people with disabilities;
 - give the Section 504 coordinator the authority envisioned by Department of Justice regarding coordination of Section 504;
 - help the Museum develop and articulate a clear vision and mission with regard to its visitors with disabilities—as well as the steps to getting there;

³¹ This is particularly important because the Denver area has a highly active and litigious disability rights community.

- reduce confusion and improve DMNS’s day-to-day operations with respect to visitors with disabilities.
- create a final "go to person" for coordinating issues involving people with disabilities (e.g. provide effective communication for hearing impaired /deaf patrons or making reasonable modifications of policies for users with severe mobility impairments);
- enable employees and program participants to respond more quickly to needs as they arise because they would have a central point-of-contact for addressing these needs; and,
- ensure that employees and visitors have a clear understanding of their rights and responsibilities under Section 504.

C. Self Evaluation

A self-evaluation plan is required of all NASA grant recipients. Through the self-evaluation, the agency identifies and changes policies or practices that discriminate against qualified individuals with disabilities so that individuals with handicaps can participate fully in the Museum's programs and activities. The NASA regulation requiring a self-evaluation plan is stated below³²:

c) Self-evaluation. (1) A recipient shall, within 1 year of the effective date of this part; or within 1 year of first becoming a recipient:

(i) Evaluate, with the assistance of interested persons, including handicapped persons or organizations representing handicapped persons, its current policies and practices and the effects thereof that do not or may not meet the requirements of this part;

(ii) Modify, after consultation with interested persons, including handicapped persons or organizations representing handicapped persons, any policies and practices that do not meet the requirements of this part; and

(iii) Take, after consultation with interested persons, including handicapped persons or organizations representing handicapped persons, appropriate remedial steps to eliminate the effects of any discrimination that resulted from adherence to these policies and practices.

The process itself should:

A) Review the inventory of programs, activities, services and functions conducted by and at the Museum. These programs and activities include visitor services, architectural elements, exhibits, classroom-type learning sessions, special programming (sleepovers), special events for fundraising (weddings, galas). This review also includes the Museum’s employment policies and practices (full-time, part-time and volunteer) and contracting practices to ensure compliance with 504 (and ADA, as appropriate) requirements.

B) Assess the Museum’s compliance with Section 504 “procedural requirements”. This includes the designation of a Section 504 coordinator, publication and implementation of a grievance procedure, notification to the public of its Section 504 obligations, development and implementation of the self-evaluation and transition plans.

³² 14 CFR 1251.105

C) **Collect and document the policies and practices that govern the administration** of the Museum's programs and activities. NASA grantees policies may be in the form of regulations, administrative manuals, memoranda, or simply be a matter of customary practice. Some policies may not be written down at all. It is important that this review be complete, both to ensure that all relevant policies are identified and to enable the agency to identify potential problem areas when no policy exists.

D) **Analyze how the Museum's policies and practices affect individuals with a full range of disabilities (visual, hearing, cognitive/learning, medical, orthopedic)**, who seek to participate in the Museum's programs and activities. In this analysis, the Museum must take into account the fact that discrimination can happen not only as a result of what is in its policies, but also as a result of what is not in its policies.

E) **Make and document changes and additions to Museum policy.** The changes required by the self-evaluation process should not require an extended period of time to complete.

F) **Obtain comments on the draft self-evaluation from individuals with disabilities** and other interested persons (such as VSA Colorado). Based on these comments, the self-evaluation should be revised as necessary, put in final form, and fully implemented. Periodically, it should be reviewed and updated to ensure that new policies are not discriminatory and that individuals with disabilities continue to be able to participate fully in the Museum's programs.

The NASA regulations also require the following be performed when the Self-Evaluation is completed.

(2) A recipient that employs 15 or more persons shall, for at least 3 years, following completion of the evaluation required under paragraph (c)(1) of this section, maintain on file, make available for public inspection, and provide to the Assistant [Associate] Administrator upon request:

(i) A list of the interested persons consulted;

(ii) A description of areas examined and any problems identified; and

iii) A description of any modifications made and of any remedial steps taken

1. Findings of Fact

The review team found that the Museum did not have (and could not produce) a written self-evaluation or a similar document that comports with the NASA regulation.³³ This review also revealed that any attempts at assessing the Museum's accessibility posture are either contained in documents other than a formal self-assessment, or not written at all. As previously stated, the Museum created an Accessibility Committee to coordinate the Museum's accessibility efforts. The Accessibility Committee is not in active status, with its core mission having been recently co-opted by the Museum's Inclusivity Committee. Museum staff informed the review team that the Inclusivity Committee has been focused on other efforts (access for Limited English Proficient Populations). The most recent attempt that parallels the tasks of a self-evaluation was the 2007 walk-through by VSA Colorado.

³³ 14 C.F.R § 1251.105.

2. Compliance Analysis and Recommendations

Linked to the above recommendation to reconvene the Accessibility Committee, the Museum must develop and implement a 504 self-evaluation plan in the manner describe above that comports with the requirements of NASA’s Section 504 regulation.³⁴ Furthermore, the Museum should commit to a self-evaluation that is a constantly evolving, “living” document that is revisited and updated periodically, to keep pace with new technologies and best practices in providing accessible programs and services.

D. Eligibility Criteria, Education, and Awareness

Section 504 prohibits discrimination against qualified persons with disabilities. In general, this means that people who would otherwise be qualified to participate in a program cannot be discriminated against based on their disability. This obligation prohibits discrimination in the forms of segregation, denial of participation, discriminatory eligibility criteria, and other possible forms of discrimination. It also requires active steps to ensure equal participation by people with disabilities, such as making reasonable modifications of policies.

3. Findings of Fact

DMNS’s mission is educating about nature and science. It does this primarily through its exhibits, but also through lectures, training, and tours conducted by its staff. Each of these areas raise specific issues and promising practices that will be discussed separately.

a. Exhibit Design

DMNS also incorporates the best elements of universal design in its exhibits and displays. They typically work with experts, architects, and design consultants with a high degree of specialization in this area.³⁵ Each design team also includes an educator, who brings a focus on teaching with different modalities of learning that include multiple senses. For instance, exhibits may include visual, auditory, and touch related experiences that replicate the same information through different senses. There is also considerable attention paid to ensuring that information is provided in such a way that it meets the attention-span requirements of visitors. They constantly focus on alternatives that guide visitors through the experience. For instance, they may work with different elements in the mobile carts that replicate visual displays.

Both the Space Odyssey and the Expedition Health permanent exhibits are both highly focused on multiple modalities of learning and were very highly researched to involve multiple senses.³⁶ For instance, in the Expedition Health exhibit, there is a large visual representation of a heart. To reinforce this information (and also to make this information meaningful to visually- impaired visitors), they provide physical models and actual animal hearts on

³⁴ *Id.*

³⁵ Interview with Jodi Schoemer (Director of Exhibits)(Mar. 3, 2010).

³⁶ Interview with Jodi Schoemer (Director of Exhibits)(Mar. 3, 2010).

the mobile carts that visitors can touch and feel.³⁷ In general, they know that things are going well because visitors continue to visit and return to the Museum without complaint.³⁸

b. Training

The Museum's volunteer handbook sets forth a fairly comprehensive policy regarding disabilities,

ADA Accommodations

The Americans with Disabilities Act gives civil rights protections to individuals with disabilities. It guarantees equal opportunity for individuals with disabilities in public accommodations, employment, transportation, State and local government services, and telecommunications.

DMNS will make reasonable accommodation for qualified individuals with known disabilities unless doing so would result in an undue hardship to the DMNS, as required by Section 504 of the Rehabilitation Act of 1973, as amended.

If you believe there has been a violation of the ADA policy, inform the Director of Visitor and Volunteer Services or your immediate supervisor, who will promptly investigate the matter and work with the Security Department to take appropriate corrective action. Your complaint will be kept as confidential as practicable. If DMNS determines that a violation has occurred, appropriate action will be taken, unless doing so would result in an undue hardship to the DMNS.

In the event a request for access to programs, services or facilities cannot be resolved with the assistance of the of the Director of Visitor and Volunteer Services, your immediate supervisor or the DMNS Security team, a grievance may be filed with the DMNS Section 504 Compliance Officer, Box 28 2001 Colorado Blvd. Denver, CO 80205. (303) 370-6045.³⁹

This policy only sets forth DMNS's obligation to provide "reasonable accommodations"-- a term limited to the employment sections of the Rehabilitation Act and the Americans with Disabilities Act. It does not describe the broader duty that the Museum has to prevent discrimination against qualified individuals with disabilities in any program, service, or activity provided by the Museum. The orientation manual also provides a description of basic diversity and political correctness suggestions to assist volunteers and interns interfacing with the public⁴⁰, but fails to give practical examples of what would constitute a denial of program access required under Section 504.

Upon hiring, all new employees go through a New Hire Orientation which details all of DMNS's policies and procedures, including Section 504 grievances and complaints processes.⁴¹ The Museum has 430 employees. All

³⁷ Interview with Nancy Walsh (Director of Museum Programs) (Mar. 2, 2010).

³⁸ Interview with Jodi Schoemer (Director of Exhibits)(Mar. 3, 2010).

³⁹ Volunteer and Intern Orientation Handbook, p. 27 (2009).

⁴⁰ Volunteer and Intern Orientation Handbook, p. 25 (2009).

⁴¹ Letter from George Sparks to David Chambers (undated).

employees are required to attend orientation training when they start work. In addition, supervisors are required to attend periodic legal refresher training about once every three years. Customer service personnel get periodic training specific to customer service, but exact policies are not in writing. In general, some description of accessibility is folded into legal and customer service training.

DMNS's success—both as a member of the Denver community and as a place of learning—is made evident by its extensive corps of volunteers. DMNS also has about 1,600 volunteers at any one time. Orientation for new volunteers is done monthly.⁴² All new volunteers are provided six hours of general orientation training plus additional training in their specific areas. In addition, staff who will be supervising volunteers provide their own specific training. In addition, temporary exhibit volunteers get at least 12 hours of training before even encountering the exhibits. Each volunteer is carefully monitored by a supervisor and, if there are any problems or suggestions for improvement, the volunteers are quickly advised and are subject to being disciplined or terminated.⁴³

There is a higher focus on public-facing employees and volunteers. DMNS also has training DVDs, which includes vignettes focused on accessibility among a variety of other topics.⁴⁴ The Museum also has specific emergency procedures for the evacuation and designation of areas for people with disabilities. All personnel (including volunteers) have access to this document or a shorter version. It is one of the first things that all new employees learn.⁴⁵ Training for staff and volunteers working in exhibits is created by Volunteer Services and Visitor Programs. Each of these departments creates the training programs that go out to the teams educating the staff and volunteers. This training includes exhibit-specific training (e.g. the heart on display). Volunteer Services also covers training for people with disabilities.⁴⁶ The Museum also conducts basic training, customer training, and emergency training each time there is a major temporary exhibit (about twice a year). The training is very role-based. For instance, cashiers are trained about recommended accessible entrances and accessible seating -- but the specifics are handled by ushers to whom visitors are handed off when they buy tickets for an IMAX theater presentation.⁴⁷

4. Promising Practices

DMNS partnered with Very Special Arts of Colorado, an affiliate of the International Organization on Arts and Disabilities, to provide a one-day panel training to help the Museum understand the day to day needs of people with disabilities at the Museum. All of the public-facing staff were required to attend the training and everyone we interviewed remembers the training clearly and thought that it was particularly useful. Some participant recalled that the training enabled them to think more broadly about what accessibility meant -- particularly in the

⁴² Interview with Maria Hannon (Human Resources Director) (Mar. 2, 2010).

⁴³ Interview with Paula Meadows (Director of Visitor and Volunteer Services) (Mar. 2, 2010).

⁴⁴ Interview with Paula Meadows (Director of Visitor and Volunteer Services) (Mar. 2, 2010).

⁴⁵ Interview with Matthew Gargan (Chief of Security)(Mar. 3, 2010).

⁴⁶ Interview with Nancy Walsh (Director of Museum Programs) (Mar. 2, 2010).

⁴⁷ Interview with Cori VanHorn (Assistant Supervisor of Admissions Department)(Mar. 4, 2010).

area of cognitive disabilities.⁴⁸ Other witnesses remember it as the only effective training regarding disabilities that they received.⁴⁹ We also interviewed the Executive Director for VSA Colorado and they indicated that they would be more than willing to conduct additional panel presentations if asked. The sessions were inexpensive -- about \$1,000 for a four-panelist session.⁵⁰

DMNS also engages in extensive efforts to reach out to and work with various organizations to bring home best practices for helping its visitors with disabilities. The Museum has worked with science coordination teams in different school districts and other cultural institutions that face similar challenges in meeting the needs of visitors with disabilities. The Museum also has worked with the Anchor Center for the Blind, which is one of their customers. The Anchor Center appreciates the fact that DMNS has so many touch-based experiences for students and has a generally accessible route throughout the facility. DMNS has created a Youth and Teacher Initiative, which includes members from the community (such as the Boys Club and Girls Club), K-12 participation, higher education (such as University of Colorado) and other organizations. Some of the work that they have been doing recently influences design of the new facility to incorporate different modes of learning. The Museum's Edge of the Wild exhibit was recently given an award by the American Association of Museums (AAM) for accessibility. In addition, they worked with an outside consultant to develop descriptive audio and the Mineral Hall. In general, they work with other groups whenever possible.⁵¹ Also critical to DMNS's Section 504 compliance efforts is its relationship with VSA of Colorado. It is hoped that this relationship in particular will deepen in the future to bring even greater awareness of disability-related issues to the Museum.

DMNS's flexibility and willingness to accommodate people with disabilities is evident in its ability to provide accommodations for its visitors with disabilities. In the past year, for instance, they have received two or three calls requesting accommodations. For visually impaired visitors, they assign a volunteer to accompany the visitor and provide information and assistance with only a request about two or three weeks notice in advance to provide this accommodation.⁵² About once a month, they receive a request from a school group for touch-based exhibits to assist school children with vision disabilities.⁵³ The Museum also lets children stay overnight (as part of their camp programs) and they have little difficulty providing accommodations in the setting. They also offer summer and weekend camps (sometimes with parents) and they had provided accommodations in this setting.⁵⁴ The review team observed that the DMNS is able to tailor accommodations requests to the context of the exhibit experience. For example, they were able to allow deaf students in the planetarium to communicate through ASL using flashlights in the back of the planetarium and then used glow-in-the-dark gloves which provide an even more

⁴⁸ Interview with Jodi Schoemer (Director of Exhibits)(Mar. 3, 2010).

⁴⁹ Interview with Cori VanHorn (Assistant Supervisor of Admissions Department)(Mar. 4, 2010); Interview with Maryann Stack (Architect of Software and Database Development)(Mar. 3, 2010).

⁵⁰ Interview with Damon McLeese (Exec. Director, VSA Arts of Colorado) (Mar. 2, 2010).

⁵¹ Interview with Rebecca Smith (Manager of Visitor Programs)(Mar. 3, 2010).

⁵² Interview with Paula Meadows (Director of Visitor and Volunteer Services) (Mar. 2, 2010).

⁵³ Interview with Polly Andrews (Director of Youth and Teacher Programs)(Mar. 3, 2010).

⁵⁴ Interview with Polly Andrews (Director of Youth and Teacher Programs)(Mar. 3, 2010).

tailored experience for deaf students.⁵⁵ DMNS staff also has great facility for effectively accommodating the needs of people with developmental or cognitive disabilities.⁵⁶ Additionally, the Museum allows attendees for people with disabilities free admission to the Museum. Wheelchairs are also available at the front desk on a "first come first serve" basis -- but a visitor can call ahead and reserve one.⁵⁷

5. Compliance Analysis and Recommendations

In general, DMNS has been quite successful in this area and no compliance issues or concerns are apparent. As an improvement, the Museum may consider implementing mandatory refresher training specific to disabilities as a key first step to developing baselines of expectations of policies and basic needs of visitors with disabilities. The basic panel presentation and training provided by VSA Colorado was universally supported by all persons interviewed. Some considered it useful diversity information while others saw it as a vital way to understanding how a people with disabilities interact and learn from exhibits. In addition, while there is a basic understanding about the need to treat visitors with disabilities fairly, it is also important to have an understanding of the legal reasons for specific requirements. Good accessibility training should include the following elements:

- awareness training regarding interacting with people with disabilities,
- the different legal mandates (including Section 504 and the Americans with Disabilities Act) that cover DMNS
- situation-based training for meeting the needs of different types of disabilities (e.g. blindness, deafness, mobility impairments, etc.), and
- a clear delineation of points of contact within the Museum and required processes for seeking additional accommodations (e.g. requesting a sign language interpreter for a deaf visitor or a guide for a user with a developmental disability).

This information should also be made available through DMNS's internet and employee manual.

E. Effective Communication

The NASA regulations provide that,

*Recipients shall take appropriate steps to ensure that no handicapped individual is denied the benefits of, excluded from participation in, or otherwise subjected to discrimination in any program or activity receiving Federal financial assistance because of the absence of auxiliary aids for individuals with impaired sensory, manual, or speaking skills.*⁵⁸

⁵⁵ Interview with Cori Van Horn (Assistant Supervisor of Admissions Department)(Mar. 4, 2010).

⁵⁶ Interview with Maryann Stack (Architect of Software and Database Development)(Mar. 3, 2010).

⁵⁷ Interview with Cori Van Horn (Assistant Supervisor of Admissions Department)(Mar. 4, 2010).

⁵⁸ 14 C.F.R. § 1251.103(b)(3).

This “effective communication” requirement means that Federal fund recipients must take steps to ensure that people with disabilities are not excluded based on disabilities that affect communication. This requirement may include providing sign language interpreters, transcripts, or braille or audio information.

The term “auxiliary aids” is not specifically defined in the NASA Section 504 definitions.⁵⁹ The Department of Justice Section 504 regulation, which agency regulations must conform with, defines “auxiliary aid” as:

*Auxiliary aids means services or devices that enable persons with impaired sensory, manual, or speaking skills to have an equal opportunity to participate in, and enjoy the benefits of, programs or activities conducted by the agency. For example, auxiliary aids useful for persons with impaired vision include readers, Brailled materials, audio recordings, telecommunications devices and other similar services and devices. Auxiliary aids useful for persons with impaired hearing include telephone handset amplifiers, telephones compatible with hearing aids, telecommunication devices for deaf persons (TDD’s), interpreters, notetakers, written materials, and other similar services and devices.*⁶⁰

1. Findings of Fact

The Museum regularly accommodates patrons with sensory disabilities in its IMAX and planetarium presentations. Both the Phipps IMAX Theater and the Gates Planetarium include assistive listening devices (ALD's) and closed captioning for films. ALD's may be requested from an usher or box office attendant at least 20 minutes before show time. Closed captioning is provided using the Rear Window closed captioning-- a state of the art process by which captions are displayed on a window at the back of the theater and viewable through a mirror that is floor-mounted or placed on the patron's armrest.⁶¹ The cashiers and ushers use two-way radios -- for instance, if a cashier sells a ticket to a visitor who needs seating in front of the rear window captioning. The cashier will radio ahead to the usher so that they can be prepared to guide the customer to the appropriate seating areas.⁶² The ushers at the theater handle ALD distribution. If a request is made to a cashier for an ALD, the visitor is told to return 20 minutes in advance of the presentation and to tell the usher. The cashier then contacts the usher by radio, who then handles the request.⁶³ This process appears to be well-understood at DMNS as several witnesses described a roughly identical process. A third accommodation is descriptive narrative, in which blind or low vision visitors are provided assistive listening devices through which an audio description of video content is provided.⁶⁴ The Museum advised NASA subsequent to the onsite visit that the IMAX has been updated to a digital 3-D system and the Museum's technical staff has not been able to construct a descriptive audio system in this new format. However, the Museum advised NASA that the company that developed the system has not been helpful. They

⁵⁹ 14 C.F.R. § 1251.102.

⁶⁰ 28 C.F.R. § 39.103.

⁶¹ Letter from George Sparks to David Chambers (undated).

⁶² Interview with Cori Van Horn (Assistant Supervisor of Admissions Department)(Mar. 4, 2010).

⁶³ Interview with Cori Van Horn (Assistant Supervisor of Admissions Department)(Mar. 4, 2010).

⁶⁴ Interview with Cori Van Horn (Assistant Supervisor of Admissions Department)(Mar. 4, 2010).

continue to work on it but until a solution is found, the IMAX does not have this feature. The planetarium also does not have this feature.⁶⁵

The review team learned that the DMNS Museum front-line cashiers occasionally communicate through writing on a clipboard with deaf customers (once or twice a week during busy times or once or twice a month otherwise). Requests for sign language interpreters are generally handled through adult programs.⁶⁶ In the past, DMNS would provide interpreters for lectures or for classrooms, but not for individual walk-through's. More recently, they have been getting fewer requests for sign language interpreters; in 2009, they may have received only one request.⁶⁷

The Museum noted that they have removed TTY telephone number. This was because no one was using the TTY line and the city (which pays for the telephone service) noted that it was not being used. Instead, incoming TTY calls are handled through the relay system. Before removing the TTY line, DMNS sought the input of the local deaf community.⁶⁸

The Museum has devoted resources towards ensuring that its web content is accessible.(Interview with Maryann Stack (Architect of Software and Database Development)(Mar. 3, 2010). All web content goes through a well-defined web development process. However, it is unclear if accessibility is considered during that process. Nevertheless, the Museum is innovative insofar as it includes a web accessibility policy.

Denver Museum of Nature & Science Website Accessibility Efforts

The Denver Museum of Nature & Science is constantly looking at new ways and new technologies to engage all of our visitors to our Museum and our website. New efforts are being developed by the DMNS Technology Department to include more accessibility options for people with visual impairments. These efforts are researching and implementing ways to make our website accessible for persons with partially sighted, low vision, legally blind and totally blind visual impairments. This will include easy access for persons using Screen Readers.

Efforts for online accessibility at the Denver Museum of Nature & Science for our website migration and redesign include:

1. Text Enlargement Option on all pages

2. Text Only Option across the website, which excludes images, visual formatting, and other items so persons using Screen Readers will not have to sift through multiple visual elements to find information.

⁶⁵ DMNS Draft Investigative Report Comments (January 14, 2011)

⁶⁶ Interview with Cori Van Horn (Assistant Supervisor of Admissions Department)(Mar. 4, 2010).

⁶⁷ Interview with Paula Meadows (Director of Visitor and Volunteer Services) (Mar. 2, 2010).

⁶⁸ Interview with Paula Meadows (Director of Visitor and Volunteer Services) (Mar. 2, 2010).

3. *High Contrast Option across the website, which will cater to persons who are Low Vision or Legally Blind but still can see contrast between items. This option will ensure readability for these users by switching the page to a black background, with yellow links and lighter blue or white content text following current trends and recommendations by The World Wide Web Consortium (W3C).*

Our site will employ ease of navigation, style sheet switching, "jump to content" options, and alt/title tag applied to all items rendered in the HTML complying with recommendations of the W3C.

In addition to our efforts for the visually impaired, we are also looking at options for the hearing impaired. Our current in-house theatres (IMAX) include devices for subtitles for these shows. Our efforts online are to include subtitles to our online IMAX and Planetarium trailers, as well as, our videos posted on our website at dmns.org.⁶⁹

The Museum is also constantly exploring new technologies, including audio guides (similar to the ones provided that art museums). In addition, they had a very successful pilot program using cell phones and text messaging to assist visitors who are hearing impaired through the use of an SMS aggregator.⁷⁰

2. Compliance Analysis and Recommendations

No Section 504 compliance issues or concerns are apparent in this area. Specifically, DMNS provides accommodations for its patrons and visitors with sensory impairments. The Museum has researched, implemented, and put into daily practice many best practices, such as audio descriptions of video content (for blind and low vision users) and rear window captioning (for deaf and hard of hearing users). In our interviews with staff members, they were clearly aware of their obligations to provide effective communication and were quick to describe policies for providing auxiliary aids and services.

The Museum has also taken steps towards achieving website accessibility. Internet accessibility is an increasingly important topic as demonstrated by the *NFB v. Target* settlement (\$6 million settlement to class action brought by blind advocacy organization)⁷¹ and the nationwide settlement in early September 2009 by the New York State Attorney General's Office with HSBC Card Services, Inc. over its inaccessible website.⁷² The HSBC settlement, in particular, follows the W3C's Web Content Accessibility Guidelines (WCAG) 2.0 (level AA) just as the Museum has identified W3C best practices as the measure of its accessibility.

⁶⁹ Denver Museum Web Accessibility Policy (Mar. 2, 2010).

⁷⁰ Interview with Maryann Stack (Architect of Software and Database Development)(Mar. 3, 2010).

⁷¹ See <http://www.nfbtargetlawsuit.com>.

⁷² See http://www.oag.state.ny.us/media_center/2009/sep/sep1a_09.html.

F. Architectural Accessibility

The NASA Section 504 regulations distinguish between existing facilities and newly constructed or altered facilities. Newly constructed⁷³ facilities and alterations⁷⁴ must be “readily accessible to and usable by” people with disabilities.⁷⁵ In general, this means that such facilities and alterations must meet the stringent Uniform Federal Accessibility Standards (UFAS).⁷⁶ By contrast, for existing facilities, NASA fund recipients must ensure that their programs or activities are accessible “when viewed in their entirety.”⁷⁷ This requirement does not mean that every physical feature of a facility must meet the UFAS standards, but the UFAS standards generally provides a useful benchmark for those portions of a facility that are used for programs, services, or activities. Instead, the recipient may choose to redesign equipment, reassign services to accessible locations, or choose other methods that ensure accessibility for people with disabilities.⁷⁸ “In choosing among available methods for meeting the requirement of paragraph (a) of this section, a recipient shall give priority to those methods that offer programs and activities to handicapped persons in the most integrated setting appropriate.”⁷⁹ The UFAS standards generally provide a useful benchmark for those portions of a facility that are used for programs, services, or activities.

1. Findings of Fact

Shortly after the ADA went into effect, a survey of the facility was performed by DMNS and, over the next several years, most of the existing barriers identified in that survey has been completed.⁸⁰ DMNS also leverages its relationship with VSA Colorado, which conducted a facilities review and recommended that disabled parking

⁷³ 14 C.F.R. § 1251.302(a) provides,

Design and construction. Each facility or part of a facility constructed by, on behalf of, or for the use of a recipient shall be designed and constructed in such manner that the facility or part of the facility is readily accessible to and usable by handicapped persons, if the construction (ground breaking) was commenced after the effective date of this part.

⁷⁴ 14 C.F.R. § 1251.302(b) provides,

Alteration. Each facility or part of a facility which is altered by, on behalf of, or for the use of a recipient after the effective date of this part in a manner that affects or could affect the usability of the facility or part of the facility shall, to the maximum extent feasible, be altered in such manner that the altered portion of the facility is readily accessible to and usable by handicapped persons.

⁷⁵ 14 C.F.R. § 1251.302(a)-(b).

⁷⁶ 14 C.F.R. § 1251.302(c). UFAS is available at <http://www.access-board.gov/ufas/ufas-html/ufas.htm>.

⁷⁷ 14 C.F.R. § 1251.301.

⁷⁸ *Id.* at § 1251.301(b).

⁷⁹ *Id.*

⁸⁰ Interview with Elaine Harkins (Director of Facilities) (Mar. 2, 2010).

spaces near the IMAX entrance be moved and that the door on the family restroom should be made ADA compliant. Otherwise, according to VSA, relatively few barriers existed in the facility.⁸¹

In September 2009, the Museum completed an upgrade to Phipps Exhibit Hall. This construction was based on funding that was awarded in November 2007 through a local \$19.2 million bond election.⁸² Otherwise, structural improvements to the building are budgeted and prioritized as part of the Museum's Capital Improvement Plan (CIP) and need to follow the rules of the City. DMNS uses this CIP approach for major changes -- improvements that cost, for instance, only \$10,000 are financed by DMNS using existing operating funds.⁸³ The review team found that architectural barrier removal at the Museum is the responsibility of Director of Facilities, Elaine Harkins. She has been working on facility maintenance at DMNS for over 20 years (since 1988) and Director of Facilities since the position was created in 2003. She currently supervises approximately 45 people in building maintenance and security. While she has no background specific to accessibility, she does have extensive training related to accessibility and facilities. This includes training by Building Owners and Managers Association (BOMA).⁸⁴ She is aware of the previous review conducted by VSA. DMNS faces some unique challenges in this regard. First, everything outside of the building is technically the responsibility of the city -- the Museum frequently addresses them for simplicity⁸⁵, but big changes are harder and need to be negotiated with the city. Another problem is that DMNS serves lots of children. For instance, children push the buttons that activate the automatic door openers and workers near the door cannot work comfortably inside on cold days. Although DMNS could seek historic preservation status, it has refrained from doing so because it would be too restrictive for the Museum if it wanted to make capital improvements.⁸⁶ Complaints about the facility come directly to Ms. Harkins. Usually, the complaints come as written complaint forms. On occasion, she will receive a question through a phone call (such as inquiries about recent painting by visitors with chemical sensitivities or inquiries about alterations by users with physical disabilities). She has never received a complaint, however, about accessibility.⁸⁷

DMNS has been actively engaged in new construction and alterations over the last several decades. In 1987, two wings (four stories of the NE and SE wings totaling approximately 120,000 sf excluding mechanical support areas) were added. In 2002, the West Atrium addition was built. These are the two most significant alterations in the last two decades. In addition, the Museum is building a new 125,000 square-foot addition to the south of the existing facility. The City has issued a bond to pay for this work. \$20 million will go to remedying deferred maintenance

⁸¹ Letter from Damon McLeese to Paula Meadows (Nov. 9, 2009); Letter from George Sparks to Miguel Torres (Nov. 14, 2009).

⁸² Letter from George Sparks to Miguel Torres (Nov. 14, 2009); Museum 2020 Strategic Plan, p. 9.

⁸³ Interview with Elaine Harkins (Director of Facilities) (Mar. 2, 2010).

⁸⁴ Interview with Elaine Harkins (Director of Facilities) (Mar. 2, 2010).

⁸⁵ Ms. Harkins noted that the Museum is constantly making capital improvements around accessibility -- for instance, they just recently installed automatic door openers to assist disabled volunteers. Interview with Elaine Harkins (Director of Facilities) (Mar. 2, 2010).

⁸⁶ Interview with Elaine Harkins (Director of Facilities) (Mar. 2, 2010).

⁸⁷ Interview with Elaine Harkins (Director of Facilities) (Mar. 2, 2010).

items (primarily life safety systems) and \$30 million will go to the new building. The total cost of the new building is \$53 million -- therefore DMNS must privately raise \$23 million (they have already reached \$15 million).⁸⁸

In addition, alterations occur within the exhibit space as permanent exhibits are refreshed, redesigned or replaced, including in 1995, 2008, and 2009.⁸⁹ There are also nationally traveling exhibits designed and constructed by third-party vendors that are installed in the Phipps Gallery section on a temporary basis, usually twice a year.⁹⁰ DMNS was unaware that any alteration triggered a 20% "path of travel" requirement under Title III of the ADA which was enacted in 2010.⁹¹ For instance, the Expedition Health renovations cost approximately \$8.7 million. 20% of that cost would have been attributable to path of travel changes and would have covered necessary renovations to the bathrooms, entrances, and other key elements of serving that exhibition space. Since the ADA went into effect, the other significant renovations would have included the Space Odyssey and West Wing (in 2003).⁹² However, the Department of Justice's Title III regulation, 28 C.F.R. § 36.403 (2010) was not enacted at the time of design of those areas.

2. Compliance Analysis

As noted above, Section 504 requires the museum to make architectural changes for two separate reasons. First, DMNS must ensure that all new construction or alterations fully comply with UFAS.⁹³ Second, the Museum must ensure that its programs or activities are offered in accessible locations, which may entail make architectural

⁸⁸ Interview with George Sparks (Mar. 2, 2010).

⁸⁹ Interview with Elaine Harkins (Director of Facilities) (Mar. 2, 2010).

⁹⁰ Interview with Jodi Schoemer (Director of Exhibits)(Mar. 3, 2010).

⁹¹ The ADA's path of travel obligation is a detailed requirement set forth in the Department of Justice's Title III regulation, 28 C.F.R. § 36.403 (2010); see also, 42 U.S.C. §12183(b). It requires places of public accommodation, like the museum, to make accessibility upgrades to its existing facility when those upgrades serve primary function areas being directly altered. Furthermore, places of public accommodation like the museum are required to spend up to 20% of the total cost of the alteration in making these upgrades before they are considered "disproportionate" to the cost of the alteration.

⁹² Interview with Sandi Garcia (Chief Financial Officer) (Mar. 3, 2010).

⁹³ Specifically, the Museum must ensure that all new construction or alterations after the latter of the Museum's first receipt of Federal funding and the effective date of UFAS (August 1984) fully complies with UFAS. Note that the ADA has similar new construction and alterations requirements, 28 C.F.R. §36.401-06, that apply to any new construction or alterations after January 26, 1993.

changes to existing spaces.⁹⁴ As also noted above, each alteration would have triggered separate path of travel obligations under the ADA⁹⁵; over the course of the many years that these changes have been undertaken, this would have like addressed all of the architectural deficiencies noted in this report.

After decades of such changes, it is impossible to differentiate (a) which elements were covered by the UFAS new construction or alterations requirements, (b) which elements were in areas affected by NASA funding, and (c) which elements would have been affected by the ADA path of travel changes. To avoid these complications, we have examined all public areas of the museum because each public area attracts significant crowds (and may

⁹⁴ Specifically, Federal fund recipients must ensure that their programs or activities are accessible “when viewed in their entirety”—and should make architectural changes where necessary to meet this requirement. NASA’s Section 504 regulation states,

§ 1251.301 Existing facilities.

(a) Program accessibility. A recipient shall operate each program or activity to which this part applies so that the program or activity, when viewed in its entirety, is readily accessible to handicapped persons. This paragraph does not require a recipient to make each of its existing facilities or every part of a facility accessible to and usable by handicapped persons.

(b) Methods. A recipient may comply with the requirement of paragraph (a) of this section through such means as redesign of equipment; reassignment of classes or other services to accessible buildings; assignment of aides to beneficiaries; home visits; delivery of health, welfare, or other social services at alternate accessible sites; alteration of existing facilities and construction of new facilities in conformance with the requirements of § 1251.302; or any other methods that result in making its program or activity accessible to handicapped persons. A recipient is not required to make structural changes in existing facilities where other methods are effective in achieving compliance with paragraph (a) of this section. In choosing among available methods for meeting the requirement of paragraph (a) of this section, a recipient shall give priority to those methods that offer programs and activities to handicapped persons in the most integrated setting appropriate.

14 C.F.R. § 1251.301.

⁹⁵ Title III of the ADA, which includes the path of travel obligation, follows the ADA Accessibility Guidelines (ADAAG), 28 C.F.R. pt 36, App. A (2010), *available at* <http://access-board.gov/adaag/html/adaag.htm>. In addition to the path of travel requirements, there are a number of added requirements that are missing from a number of areas of the Museum’s facilities. Should the museum wish to maximize compliance under its separate ADA Title III obligations, it should address the following elements in addition to those identified in this report:

- Path of Travel, 28 C.F.R. § 36.403.
- Van Accessible Parking, ADAAG § 4.6.
- Detectable Warnings, ADAAG § 4.29.
- Braille Signage, ADAAG § 4.30.
- Companion Seating at Wheelchair Locations, ADAAG § 4.32.

Ideally, elements specified by ADAAG should be provided in the location and number specified by ADAAG § 4.1.

create significant risks) and because the functionality of many spaces change (e.g. presentations, exhibit space, etc.), thereby making it difficult to develop an accurate risk assessment at any one point in time. We believe that all of these changes are necessary for the Museum to stay in compliance with the ADA and Section 504 and that the Museum should address them as soon as possible. Given the museum's large number of visitors and its integral role in the Denver community, we also believe that these changes are necessary for the Museum to fully achieve program access under Section 504. In general, our on-site review identified the following immediate deficiencies in a number of areas throughout the facility:

- New or existing protruding objects, some of which pose significant safety risks for users who were low-vision (particularly those relying on cane detectable warnings),
- Many technical violations of new construction or alterations requirements,
- Common violations in restrooms, particularly those serving altered areas and which would have been included in path of travel changes.

The following analysis was undertaken by Bill Hecker, one of the nation's foremost experts on accessibility, both from an architectural and programmatic perspective. It is divided into different subsections and considers each area of the facility with respect to the UFAS accessibility requirements. In general, the subsections fall into one of two categories:

- **Rooms and Assembly Areas.** Because this facility is a science museum, the exhibit areas, classrooms, and assembly areas are critical elements because visitors come to Museum in order to use these portions of the facility. Because these elements are critical to program access under Section 504 and because the Museum will likely want to address these issues on an area-by-area basis, they are addressed separately.

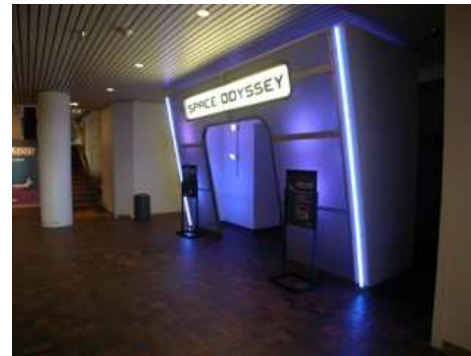


Figure 1-- Slanted Wall Entry to Space Odyssey Exhibit

- **Other Elements.** Other elements within DMNS provide critical support to these program areas and the Museum needs to conform to the UFAS requirements to the same extent critical program areas (such as rooms and assembly areas). For instance, there is little point to ensuring that an exhibit room fully meets the UFAS requirements if a person with the disability cannot get to the room because of barriers along approach routes required to be accessible. Also, because equal enjoyment and use of a program area also requires that persons with disabilities have the same level of access to convenience, hygiene, and safety



Figure 2 - Protruding Plaques and Controls

requirements as persons without disabilities, certain elements that affect the usability of program areas need to be considered including student support areas, restrooms, drinking fountains, pay phones, ticket counters, retail facilities and food service areas. Because these barriers are often scattered throughout the DMNS facility, they are organized on a standard-by-standard basis.

a. Exhibit Areas (Various UFAS Standards)

Our onsite review evaluated the accessibility in all public exhibit areas, except the Phipps Special Exhibits Gallery which was under construction at the time of our survey.

UFAS Non-Conformant Elements

In the exhibit areas, our on-site review identified the following conditions relative to 504 facility compliance:

1. **Level 1 - Insects & Butterflies Display** in Central Circulation Core.

This appears to be an older area of the facility. The post

mounted "Secrets of the Dioramas Tour" sign does not provide at least 80" head height (UFAS 4.4). The display cases on the east wall project further (at 12") from the wall than 4" with the leading edge at 38" high and the carpeted step under part of this display does not extend all the way across to act as a cane detectable barrier (UFAS 4.4).

2. **Level 1 - Gems & Minerals Exhibit.** This appears to be an older area of the facility and the programs offered in this exhibit space are substantially compliant with UFAS and the program access provisions of 504.

3. **Level 1 - Space Odyssey Exhibit.** This appears to be an older area of the facility. The following elements pose a risk of injury to blind and visually impaired visitors due to limited head height or protruding objects along circulation routes within the exhibit space (UFAS 4.4):

- a. The slanted walls adjacent to the exhibit entrance off the main circulations core do not provide at least 80" head height. See Figure 1
- b. There are no cane detectable barriers below the suspended TV's, the slanted wall mounted "space walking" plaque and cylindrical display below these TV's just left of the "Astrotot Training" area (UFAS 4.4).
- c. The 3 slanted information plaques adjacent to the "Maneuver the Space Shuttle" controls lack cane detectable warnings and project into the circulation route above 27", at 31"-32" high (UFAS 4.4). See Figure 2
- d. The circular display table with the globe that moves with the months of the year has a leading edge of 32" and no cane detectable barriers (UFAS 4.4).
- e. The large white plaque listing "Space Odyssey Contributors" and positioned to the left of the little theater area is mounted on a slanted wall such that the bottom projects more than 4" into the main approach route to the exhibits with its leading edge above 27" (UFAS 4.4). See Figure 3



Figure 3 -- Protruding Donor Plaque



Figure 4 - Information Ring Not Cane Detectable



Figure 5 - Display Top Not Cane Detectable

- f. The circular information element surrounding the large globe showing the topography of the seas has its leading edge at 34" and no cane detectable barriers (UFAS 4.4). See Figure 4
 - g. The 4 wall mounted display tables at the "How do telescopes work?" area are supported by angled brackets that project further than 4" into the circulation route above 27" without cane detectable barriers below (UFAS 4.4).
 - h. The wall mounted monitor for the "Your body gives off infrared light" exhibit (UFAS 4.4).
 - i. The circular interactive satellite photo display which lacks cane detectable barriers along the main circulation route to minimize the risk of blind visitors hitting it as they walk throughout the exhibit space (UFAS 4.4). See Figure 5
4. **Level 2 - Expedition Health Exhibit.** This appears to be recently renovated area of the facility. The following elements pose a risk of injury to blind and visually impaired visitors due to limited head height or protruding objects along circulation routes within the exhibit space (UFAS 4.4):
- a. The docent counter at the main entrance to this exhibit projects further than 4" into the circulation route above 27".
 - b. The wall mounted "Sign In" monitors along the walls at the main exhibit entrance have their leading edge 1/2" higher than the 27" high cane detectable height specified in UFAS 4.4, but are within industry recognized construction tolerances and thus substantially compliant with 504. There are a number of wall mounted displays in this exhibit area that protrude into the circulation route but are also acceptable because of the limited nature of the deviation from the maximum 27" cane detectable height.
 - c. The monitor mount for the display just to the left of the "Tykes Peak" entry has a curved bottom that projects further than 4" into the circulation route above 27" without a cane detectable barrier. (See Figure 6)
 - d. The plaques and chrome rails surrounding the "Balance Challenge" display project further than 4" into the circulation route above 27".
 - e. The post mounted display with the solar panel to the left of the screen in the Body Trek Theater has elements that project further than 4" into the circulation route above 27".
 - f. The wall mounted lavatory in the "Biology Base Camp" area projects further than 4" into the circulation route above 27" without a wing-wall or bollard on the left side to establish an alcove into which this element may appropriately be located (See Figure 7). The addition of a wing-wall or bollard on the left side of the lavatory to create a compliant alcove will necessitate the relocation of the wall mounted paper towel dispenser so it is in an alternate accessible location nearby with adequate clear floor space.



Figure 6 - Protruding Monitor



Figure 7 - Lavatory and Bench Issues

The rubber floor transition strip along the edge of the "Size Up Your Stride" interactive display creates a level change higher (at 3/4") than 1/2" with a slope steeper (at 37.5%) than 8.3%, creating a potential tripping hazard for ambulatory disabled visitors (UFAS 4.5.2). The dispenser control button on the wall mounted soap dispenser to the right

of the lavatory in the "Biology Base Camp" area is mounted higher (at 48") than the maximum specified 46" for an element that requires reaching over an obstructing lavatory (UFAS 4.2.5).

5. **Level 2 - Discovery Zone.** This appears to be an older area of the facility and the programs offered in this exhibit space are substantially compliant with UFAS and the program access provisions of 504.

6. **Level 2 - North American Wildlife Exhibits.** This appears to be an older area of the facility and the programs offered in this exhibit space are substantially compliant with UFAS and the program access provisions of 504.

7. **Level 2 - Edge of the Wild Exhibits.** This appears to be an older area of the facility and the programs offered in this exhibit space are substantially compliant with UFAS and the program access provisions of 504.



Figure 8 - Low Doorway in Hogan

8. **Level 2 - Bears & Sea Mammals Exhibits.** This appears to be an older area of the facility and the programs offered in this exhibit space are substantially compliant with UFAS and the program access provisions of 504.

9. **Level 2 - South Pacific Islands Exhibits.** This appears to be an older area of the facility and the programs offered in this exhibit space are substantially compliant with UFAS and the program access provisions of 504.

10. **Level 2 - Australia Exhibits.** This appears to be an older area of the facility and the programs offered in this exhibit space are substantially compliant with UFAS and the program access provisions of 504.

11. **Level 2 - North American Indian Cultures Exhibits.** This appears to be an older area of the facility and the programs offered in this exhibit space are substantially compliant with UFAS and the program access provisions of 504.

This conclusion is predicated on the infeasibility of ensuring adequate head height (only 67") at the door of the timber and earthen Hogan - a

programmatic accommodation for blind and visually impaired visitors to this exhibit might include a cautionary reminder of the low head height when tickets are purchased. See Figure 8

12. **Level 3 - Prehistoric Journey.** This appears to be recently renovated area of the facility that includes two levels connected with a pair of enclosed platform lifts. The following elements pose a risk of injury to blind and visually impaired visitors due to limited head height or protruding objects along circulation routes within the exhibit space (UFAS 4.4):

a. The "Explore Human Evolution" monitor display near the exit of this exhibit on the lower level. See Figure 9



Figure 9 - Protruding Monitor

13. **Level 3 - Egyptian Mummies Exhibit.** This appears to be an older area of the facility and the programs offered in this exhibit space are substantially compliant with UFAS and the program access provisions of 504 with the exception of providing visual fire alarm strobes (UFAS 4.28.3).

14. **Level 3 - Phipps Special Exhibits Gallery.** This area was under construction at the time of our survey and was unavailable for review.

15. **Level 3 - Birds of the Americas Exhibit.** This appears to be an older area of the facility and the programs offered in this exhibit space are substantially compliant with UFAS and the program access provisions of 504.

16. **Level 3 - Explore Colorado Exhibit.** This appears to be an older area of the facility and the programs offered in this exhibit space are substantially compliant with UFAS and the program access provisions of 504.
17. **Level 3 - Northern & Rare Birds.** This appears to be an older area of the facility and the programs offered in this exhibit space are substantially compliant with UFAS and the program access provisions of 504.
18. **Level 3 - Botswana Africa Exhibit.** This appears to be an older area of the facility and the programs offered in this exhibit space are substantially compliant with UFAS and the program access provisions of 504.
19. **Level 3 - Konovalenko Gem Carvings Exhibit.** This appears to be recently renovated area of the facility and the programs offered in this exhibit space are substantially compliant with UFAS and the program access provisions of 504.
20. **Level 3 - South America Exhibit.** This appears to be an older area of the facility and the programs offered in this exhibit space are substantially compliant with UFAS and the program access provisions of 504.

Classrooms and Meeting Rooms (Various UFAS Standards)

In the classrooms open to visiting students, our on-site review identified the following conditions relative to 504 facility compliance:

1. **Level 1 - El Pomar Space Education Center.** This appears to be recently renovated area of the facility and the programs offered in this classroom space are substantially compliant with UFAS and the program access provisions of 504.
2. **Level 2 - Classrooms at Expedition Health.** This appears to be recently renovated area of the facility. The approach maneuvering space at the entry door to the classroom area from the "Biology Base Camp" area has a movable bench located within the required 60" deep clear floor space to the side of this door preventing wheelchair users from opening the door (UFAS 4.13.6). There was no evidence of assistive listening devices available for any of these classrooms which include audiovisual equipment.
3. **Level 3 - The Naturalist's Nook.** This classroom just off the Explore Colorado Exhibition area has a pair of narrow (29") entry doors which should be replaced with an accessible door (UFAS 4.13.4). See Figure 10
4. **Level 3 - Lewis Community Room.** This unique glass meeting room has a curved ceiling that extends down to the floor level in such a manner that the head height along circulation routes within the room is less than the minimum 80" required (UFAS 4.4). See Figure 11
5. **Level 3 - Classrooms 303, 303 & 311 near Bailey Library.** Each of the classroom doors into these spaces used by visiting students has inaccessible knob style door hardware and less than the minimum 18" latch side, pull side maneuvering space required for independent wheelchair use (UFAS 4.13.9; 4,13.6). At classroom 311, the pair of doors leading into this classroom provides less (at only 27") than the minimum 32" clear passage width for one leaf (UFAS 4.13.5). See Figure 12



Figure 10 - Narrow Entry Doors



Figure 11 - Low Head Height Issues

b. Assembly Areas (UFAS 4.33)

The Museum has several assembly areas where live or video presentations are held. These include the following:

UFAS Non-Conformant Elements

1. **Level 1 - Space Odyssey Theater.** This appears to be an older area of the facility. The route from the top landing of the ramp

on the left side of the stage to the performing portion of the stage is (at only 22") not at least 32" wide at the support post of the ramp handrail. (UFAS 4.3.3). There is inadequate level maneuvering space for the push side of this stage door (UFAS 4.13.6). See Figure 13

Level 1 - Ricketson Auditorium. This appears to be an older area of the facility. In this 250 seat auditorium, none of the 7 required wheelchair seating spaces are provided and a sloping floor (5%-6.6%) without any level seating areas integral with the fixed seats will make modifications more challenging (UFAS 4.1.2(18)). Assistive listening systems are provided. The route to the stage includes a very steep (30.2%) ramp that is dangerous for wheelchair use and must be replaced (UFAS 4.5.2). See Figure 14

Level 1 - Charles C. Gates Planetarium. This appears to be an older area of the facility. There is space at the back row of this planetarium for 5 wheelchairs, which is compliant with the number required for an assembly space such as this with approximately 150 seats (See Figure 15). Assistive listening systems and rear-view

captioning are provided.

The tape-stanchions used here and elsewhere in the Museum are not cane detectable because the underside of the tape (at 37") is higher than the maximum 27" cane detectable height (UFAS 4.4) and should be



Figure 16 - Planetarium Wheelchair Seating

modified to include an additional tape barrier at or below 27" (See Figure 16). While the sound and light control booth behind the wheelchair seating is positioned such that there is not a minimum 36" accessible route (UFAS 4.33.3) behind the central wheelchair



Figure 12 - Knob Hardware on Narrow Doors

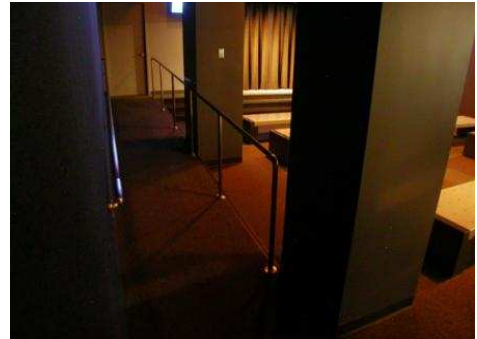


Figure 13 - Inaccessible Route to Stage



Figure 14 - Ricketson Auditorium



Figure 15 - Planetarium Entrance

seats, it is technically infeasible to modify this space and a programmatic accommodation is acceptable under 504 compliance.

Level 1 - Leprino Family Atrium. This appears to be a recent addition to the facility that includes a monumental stair to Level 2 and curved metal sculptural elements that track the changes in sun angles. The following elements pose a risk of injury to blind and visually impaired visitors due to limited head height or protruding objects along circulation routes within the exhibit space (UFAS 4.4):

- a. The tape stanchions along the sides of the curved sculptural metal panels and the monumental stair are not cane detectable; See Figure 17
- b. The wall mounted stainless steel fire extinguisher cabinet to the right of the Gates Planetarium entrance; See Figure 18
- c. The angled end of the monumental stair guardrail at the bottom of the steps; See Figure 19
- d. The stainless steel guardrails under and behind the curved sculptural metal panels in the lobby area opposite the doorway into the Space Odyssey exhibit space. See Figure 20



Figure 17 Tape Barriers Not Cane Detectable

Level 1 - North Atrium. This appears to be an older area of the facility and the programs offered in this atrium space are substantially compliant with UFAS and the program access provisions of 504. Specific T-Rex Cafe issues will be covered in that section of the report.

Level 1 - South Atrium. This appears to be an older area of the facility and the programs offered in this atrium space are substantially compliant with UFAS and the program access provisions of 504.



Figure 19 - Protruding Fire Extinguisher Box on Wall

Level 2 - Body Trek Theater at Expedition Health. This small theater has 35 fixed seats in a tiered stadium style layout



Figure 20 - Protruding Stair Railings

with wheelchair spaces flanking the first row. These two wheelchair spaces offer the same interactive controls mounted on the stainless steel rail that are offered to the fixed seats. There was no evidence of assistive listening

devices available for this auditorium.



Figure 18 - Unprotected Guardrail

Level 2 - Summit Science Stage at Expedition Health. This small theater has movable benches and adequate wheelchair seating areas, but there was no evidence of assistive listening devices available for this auditorium.

Level 2 - Phipps IMAX Theater. This appears to be an older area of the facility and depending on when the IMAX show is scheduled to begin, there are two approaches to the theater. If the show is during regular business hours of DMNS, then those who cannot use stairs are asked to go to an accessible Level 3 waiting area, from which an usher will escort the visitor(s) to the wheelchair seating areas on the upper level of the auditorium. If the show starts after regular business hours for the Museum, there is an "after-hours" entrance on the east side of the exterior of the building and accessible parking serves this entrance. The designated accessible "after-hours" entrance is to the right of the main "after-hours" entrance and leads to an elevator lobby from which a disabled visitor can proceed to the box office level to purchase tickets and have an usher escort the visitor(s) to the wheelchair seating areas on the upper level of the auditorium. This elevator also serves the designated accessible restrooms below the box office level. DMNS must ensure that an usher is available whenever a wheelchair user needs to get to their seat and restroom. While the box office ticket counter is higher than 36", it is acceptable as an historic element and because alternate programmatic accommodations may be provided as needed for wheelchair users. See Figure 21



Figure 21 - Historic IMAX Box Office

The main interior entrance to the IMAX during business hours is on Level 2 just off the Main Circulation Core balcony area and that door leads into a large waiting room from which ushers lead visitors without disabilities down steps to the IMAX auditorium. In the entrance queuing areas on each side of this main interior entrance are established by tape stanchions which are not cane detectable to blind and visually impaired visitors (UFAS 4.4). See Figure 22



Figure 22 - IMAX Queuing Area on Level 2

Assistive listening systems and rear-view captioning are provided upon request for the IMAX theater. In the designated accessible restroom lobby area below the IMAX auditorium the higher of the two drinking fountains adjacent to the Men's restroom door projects further than 4" from the wall surface with its leading edge above 27" in such a manner as to be a potential hazard to blind and visually impaired visitors (UFAS 4.4).

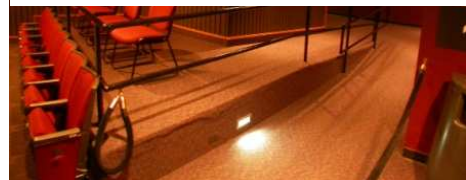


Figure 23 - IMAX Wheelchair Seating Area

There are two wheelchair seating areas located in the upper right and upper left sides of the IMAX auditorium (See Figure 23). Each of

these wheelchair seating areas is smaller than would be required for newer construction, but under the 504 program access provisions they will accommodate 4 wheelchair users on each side for a total of 8 wheelchair seating spaces. Padded stacking chairs are available for companion seating. This auditorium seats approximately 400

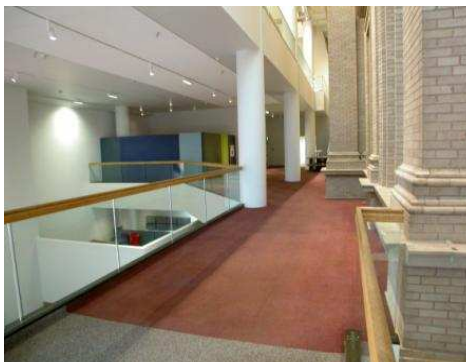


Figure 24 - Protruding Trim at South Atrium

visitors and UFAS 4.1.2(18) requires 8 wheelchair spaces be provided for the auditorium. The handrail in front of the wheelchair seating areas is so high (32") that it blocks sight lines from these wheelchair areas as compared with other visitors in the theater (UFAS 4.33.3) and the upper handrail should be removed or lowered to provide unobstructed lines of sight comparable to those offered to others without disabilities.

Level 2 - Discovery Zone Demo Stage. There was no evidence of assistive listening devices available for this assembly area which includes audiovisual equipment.

Level 4 - Anschult Family Sky Terrace. This area of the new addition is substantially compliant with the 504 facility compliance requirements of UFAS and includes an automatic door opener for the door between the elevator lobby and the roof terrace.

c. **Interior Accessible Circulation Routes (UFAS 4.6)**

Our review revealed that the Museum has an interior accessible route that begins at the following building entrances and leads to each of the program spaces in DMNS:

1. The automatic doors at the main lobby entrance on the Ground Floor;
2. The automatic doors at the IMAX theater "after-hours" entrance;
3. The automatic doors at the School Group Entrance;
4. The automatic doors at the Special Events Entrances at the Leprino Family Atrium.

UFAS Non-Conformant Elements

While specific elements related to route barriers within the program spaces are included in the portions of the report associated with those elements and spaces, the major circulation areas of DMNS are listed below:

1. **Level 1 - Central Circulation Core Area.** The underside of the monumental stair near the Gem & Minerals Exhibit entry does not offer at least 80" head height (UFAS 4.4) and is protected currently by a velvet rope stanchions that are cane detectable, but are movable and must remain in place for the safety of blind and visually impaired visitors. This is particularly important during events where the grand piano under this stair landing is used for entertainment.
2. **Level 1 - Leprino Family Atrium Corridor.** See comments in the Leprino Family Atrium portion of the Assembly Areas section of this report.
3. **Level 2 - Central Circulation Core Balcony Area.** This area includes the circulation routes that adjoin the old historic structure that includes a stone plinth in the brick facade that



Figure 25 - Protruding Trim at North Atrium



Figure 26 - Railing Not Cane Detectable on Level 2



Figure 27 - Stair Rail is Protruding Barrier

projects into the corridor more than 4" above 27" and could seriously injure a blind or visually impaired visitor if cane detectable barriers designed to be sensitive to the historic character of the old building facade were not installed (UFAS 4.4). See Figures 24 & 25. Just to the left of the central entry doors into the "Wildlife Halls" there is a pair of drinking fountains and the higher of the two drinking fountains projects further than 4" from the wall surface with its leading edge above 27" in such a manner as to be a potential hazard to blind and visually impaired visitors (UFAS 4.4). The northern balcony area lacks visual fire alarm strobes for hearing impaired visitors.

4. **Level 2 - Leprino Family Atrium Corridor.** This appears to be a recent addition to the facility that includes a monumental stair to Level 3 and curved metal sculptural elements that track the changes in sun angles. The following elements pose a risk of injury to blind and visually impaired visitors due to limited head height or protruding objects along circulation routes within the exhibit space (UFAS 4.4):



Figure 28 - Drinking Fountains Not Cane Detectable

- a. The stainless steel guardrails under and behind the curved sculptural metal panels in the lobby area opposite the doorway into the Australia exhibit space; See Figure 26



Figure 29 - Guardrail Not Cane Detectable on Level 3

- b. The wall mounted stainless steel fire extinguisher cabinet to the right of the North American Wildlife entrance;
- c. The angled end of the monumental stair guardrail at the bottom of the steps. See Figure 27

5. **Level 3 - Central Circulation Core Balcony Area.** Just to the left of the central entry doors into the "Wildlife Halls" there is a pair of drinking fountains and the higher of the two drinking fountains projects further than 4" from the wall surface with its leading edge above 27" in such a manner as to be a potential hazard to blind and visually impaired visitors (UFAS 4.4). See Figure 28. The balcony area next to the Prehistoric Journey lacks visual fire alarm strobes for hearing impaired visitors.

6. **Level 3 - Leprino Family Atrium Corridor.** This appears to be a recent addition to the facility that includes a curved metal sculptural element that track the changes in sun angles. The following elements pose a risk of injury to blind and visually impaired visitors due to limited head height or protruding objects along circulation.

- a. The stainless steel guardrails behind the curved sculptural metal panel in the lobby area opposite the doorway into the Botswana/South America exhibit space; See Figure 29
- b. The wall mounted stainless steel fire extinguisher cabinet to the right of the Botswana Africa Exhibit entrance on the south end of the atrium balcony;

- c. The curved sculptural metal panel at the north end of the lobby area opposite the doorway into the Botswana/South America exhibit space; See Figure 30

d. Public Entrances and Exterior

Accessible Routes (UFAS 4.6)

Our review revealed that there are five site arrival points from which UFAS requires an accessible route linking to the accessible public DMNS entrances. These include: (1) the bus stop at the public sidewalk in front of the Museum along Colorado Blvd. which serves the east side "after hours" entrance to the IMAX theater and links along the northeast corner of the building to the main public entrance; (2) the designated accessible parking just in front of the Museum on the east side which serves the "after hours" entrance to the IMAX theater; (3) the school bus loading zone on the south side of the building which serves the School Group Entrances there; (4) the main accessible parking near the main public entrance on the north side of the building, as well as the Special Event Entrance on the west side of the building; and, (5) the accessible parking spaces in the subterranean parking deck which also serves the main public entrance on the north side of the building, as well as the Special Event Entrance on the west side of the building.

The following exterior deficiencies appear to be limited to the portion of the facility that may not be under the control of the DMNS as defined by the agreement with the City of Denver. At the very least, the Museum should contact the City and request that these deficiencies be addressed to ensure ADA compliance for each of the parties as stipulated in the agreement and when the proposed new south wing addition to DMNS is designed, ADA "path of travel" provisions in the ADA Standards 4.1.5 & 4.1.6(2) will require each of these site arrival points and approach routes to be modified for accessibility to the maximum extent feasible up to a limit of 20% of the total cost of the new addition/alteration (see 28 CFR 36.403).

UFAS Non-Conformant Elements

These entrance approach routes include the following non-conformant elements:

1. **Main Public Entrance (North Side)** - The pedestrian approach route from the bus stop and public sidewalk



Figure 30 - Panel & Railing on Level 3 are not Cane Detectable



Figure 31 - Steep (4.9%) Cross Slope on Approach Walk new IMAX "After Hours" Entrance



Figure 32 - Lip in Concrete at Main Entry Plaza



Figure 33 - Lip at End of Walk from Parking Garage

along Colorado Blvd. and the "After-Hours" Entrance at the IMAX includes steep (up to 4.9%) cross slopes along the sidewalk at the northeast corner of the building at an abandoned tree grate - this inaccessible section of the sidewalk must be replaced to achieve an accessible route per UFAS 4.3 & 4.1.1(1). See Figure 31. At least one accessible route to each of the main public entrances from the main accessible surface parking located in front of the north facade (east side) and the designated accessible surface parking immediately in front of the main entrance plaza is substantially compliant with UFAS provisions. When the proposed addition to the south side of the Museum is constructed, it would improve the safety of these pedestrian approach routes if new accessible approach walks were to link each of the access aisles in this accessible parking area to the existing approach sidewalk just in front of these parking spaces. This "best practices" approach to the key accessible site arrival point would lessen the likelihood that slow moving disabled pedestrians who often have the lower profile of one seated in a chair and who are currently forced to travel in active traffic lanes behind parked cars might be hit by cars and injured.



Figure 34 - Lip New Sign Kiosk near Main Entry

The approach route to the main public entrance near the Members Ticket Counter from the elevators at the upper level of the parking deck includes the following barriers (The Museum reports that a-c were corrected since the onsite review):

- a. There is an abrupt level change (at 5/8") higher than the maximum 1/4" allowed by UFAS 4.5.2 at the northwest corner of the main entrance plaza and on the route from the parking deck elevators to the main entrances; See Figure 32
- b. There is an abrupt level change (at 1/2") higher than the maximum 1/4" allowed by UFAS 4.5.2 at the junction of the walk leading from the parking deck elevators and the walk leading from the main entrance plaza to the Special Events Entrance on the east side of DMNS; See Figure 33
- c. There is an abrupt level change (at 5/8") higher than the maximum 1/4" allowed by UFAS 4.5.2 in the middle of the walk leading from the main entrance plaza to the Special Events Entrance on the east side of the Museum (located in front of the large square concrete directional sign kiosk); See Figure 34
- d. There is an abrupt level change (at 3/4") higher than the maximum 1/4" allowed by UFAS 4.5.2 at the expansion joint gap between the upper level parking deck elevator balcony and the walk leading from the parking deck elevators to the main entrance.



Figure 35 - High Threshold at the Eastern Most Main Entrance Doors

There are three sets of main entrance doors on the north side of DMNS and each set has a door with an automatic opening device



Figure 36 - "After-Hours" IMAX Parking & Approach Route

for accessibility. The eastern most doors are actually designated as the Main Exit on the map in the Museum Brochure, but are also identified by signage on the doors as an entrance for Members and "Will Call" ticket holders. This eastern set of doors have an inaccessible 1 3/8" high threshold that is steeper (at 40%) than the maximum allowable 8.3% per UFAS 4.5.2. See Figure 35. This is an element that must be modified when the proposed addition to the south side of the Museum is constructed under ADA Standards 4.1.6. The central and western sets of entrance doors serving the main ticket lobby are substantially compliant with UFAS.

2. **"After-Hours" Entrance at IMAX (East Side)** - The pedestrian approach route from the bus stop, and public sidewalk along Colorado Blvd. includes the following barriers that DMNS should petition the City of Denver to repair:
 - a. There is no curb ramp at the corner of 22nd Avenue and Colorado Blvd. yet the sidewalk there appears relatively new (UFAS 4.7; 4.1.1(1));
 - b. The benches in the bus stop shelter do not accommodate a 30"x48" wheelchair seating area and should be modified so wheelchair users can sit out of the rain and snow like others (UFAS 4.33).
 - c. There is an abrupt level change on the sidewalk greater (at 7/8") than the maximum allowed 1/4" where the sidewalk meets the curb ramp nearest the bus shelter (UFAS 4.5.2) which should be corrected.
 - d. While the walkway and curb ramp leading from the bus shelter area to the driveway in front of the "After-Hours" Entrance to the IMAX is substantially compliant with UFAS, the City should reconstruct the curb ramp on the west side of this driveway because there is no level (at 2.9%) by-pass space or top landing at this curb ramp (UFAS 4.3.7); See Figure 36
 - e. When the proposed addition to the south side of the Museum is constructed, it would improve the safety of these pedestrian approach routes if a new accessible curb ramp were installed in front of the access aisle in this accessible parking area. This "best practices" approach to the key accessible site arrival point would lessen the likelihood that slow moving disabled pedestrians who often have the lower profile of one seated in a chair and who are currently forced to travel in active traffic lanes behind parked cars would be hit by cars and injured.

The actual designated entry door to the elevator lobby for the "After-Hours" IMAX programs is substantially compliant with UFAS.

3. **Special Events Entrance (West Side)** - This approach leads to the newly constructed west-side entrance vestibule of the Leprino Family Atrium. The approach can begin at the bus stop on Colorado Blvd., the main accessible parking spaces or the accessible parking in the parking deck. Beginning at the juncture of the sidewalk from the parking deck elevators, the walkway around the northwest corner of DMNS leading to this entrance has the following accessibility barriers:



Figure 37 - Steep Cross Slope at Special Events Entrance Approach

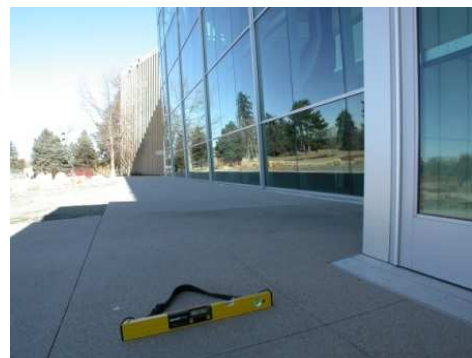


Figure 38 - Inaccessible Landing at the Automatic Doors of the Special Events Entrance (Steep 5.7% Cross Slope)

- a. The cross slope of a portion of this approach walk exceeds (at 3.5%-4.4%) the maximum allowable 2% (UFAS 4.3.7). That portion runs between the existing park bench/statuary and the L-shaped narrow approach walk installed as an alternative accessible route to using the steep (8.0 %) main approach ramp in front of the entry doors. See Figure 37
- b. This L-shaped narrow approach walk installed as an alternative accessible route to using the steep (8.0%) main approach ramp in front of the entry doors must be identified by a sign at this intersection having a symbol of accessibility and an arrow pointing up the alternate accessible walkway (UFAS 4.1.1(&)(c)).
- c. The concrete pad for the park bench noted above has adequate space for a wheelchair user to sit next to his/her companion, but there is a 1 3/4" abrupt level change at the edge of the pad where it meets the main approach sidewalk (UFAS 4.5.2).
- d. Because the designated accessible door with the automatic opener must be approached from the left side of this entrance vestibule due to the location of the alternate accessible approach route and because the surface of the pavement immediately in front of this designated accessible entry door is not level (at 5.7%), there is cross slope steeper (at 5.7%) than the maximum allowable 2% along the approach route to this door (UFAS 4.3.7).
- e. The threshold on the exterior side of the designated accessible door with the automatic opener slopes (at over 10%) more than the maximum 8.3% per UFAS 4.5.2 and higher than the maximum allowable 1/2" per UFAS 4.13.8.
- f. At the exterior doors of this vestibule, one door (the northern most) has an automatic opener, but the interior side of the threshold is higher (at 3/4") than the maximum allowable 1/2" for such doors (UFAS 4.13.8). See Figure 39



Figure 39 - High Threshold at Special Event Entrance

4. **School Group Entrance (South Side)** - This entrance approach is generally compliant with UFAS, but a sign and/or surface markings on the pavement should be provided for bus drivers designating the area at which wheelchair lifts on the buses should be deployed. This designated area must be located at the curb directly in front of the entry doors because this area has accessible surface slopes and is on an accessible route to the entry doors. If the school buses deploy their lifts further around the circular driveway, they will force wheelchair visitors to negotiate an inaccessible (4.4%) cross slope created by the intersection of the loading dock driveway and the sidewalk running along the circular drive (UFAS 4.3.7). The door with the automatic opener was malfunctioning at the time of our survey (only opening 25"



Figure 40 - School Group Loading Zone & Student Entrance Area

wide) and needs to be adjusted so it will open the door fully 90 degrees for the required minimum 32" clear passage width (UFAS 4.13.5). See Figure 40.

e. Accessible Surface Parking (UFAS 4.6):

There are a total of 28 accessible spaces for 360 total parking spaces serving the main Museum entrance and 2 accessible spaces for 26 total parking spaces serving the "After-Hours" IMAX entrance, which is more than twice the minimum number of designated accessible parking spaces at the main entrance.

UFAS Non-Conformant Elements

We identified the following non-conformant elements in the

designated accessible surface parking areas:

1. The asphalt surface at the designated accessible parking space serving the "After-Hours" IMAX entrance is cracked and the striping deteriorated creating gaps greater than the 1/2" maximum specified in UFAS 4.3 - this area should be patched, sealed and restriped. See Figure 36
2. The painted striping for the designated accessible parking spaces directly in front of the main entrance (over the parking deck) has deteriorated and is hard to see (UFAS 4.6).
3. Two of the 11 designated accessible parking spaces on the east side of the main entrance parking area lack post mounted signs that cannot be obstructed when a vehicle is parked in the space (UFAS 4.6.4). See Figure 41
4. Four of the 13 designated accessible parking spaces directly in front of the main entrance (over the parking deck) lack post mounted signs that cannot be obstructed when a vehicle is parked in the space (UFAS 4.6.4).



Figure 41 - Accessible Parking at Main Entry

f. Parking Deck (UFAS 4.6):

There are a total of 5 accessible spaces for 399 total parking spaces in the two-level subterranean Museum Parking Deck. The route from the designated accessible parking spaces to the main DMNS entrance uses a pair of exterior elevators that arrive at an open air lobby near the surface parking on the north side of the Museum. There is no fee for parking in this deck.

UFAS Non-Conformant Elements

We identified the following non-conformant elements in the parking deck areas:

1. There are fewer than the minimum number of accessible parking spaced in the parking deck levels - Level L2 has 201 total spaces and needs 7 accessible parking spaces (only 2 provided) and Level L3 has 198 total spaces and needs 6 accessible parking spaces (only 3 provided) to comply with UFAS 4.1.1(5).

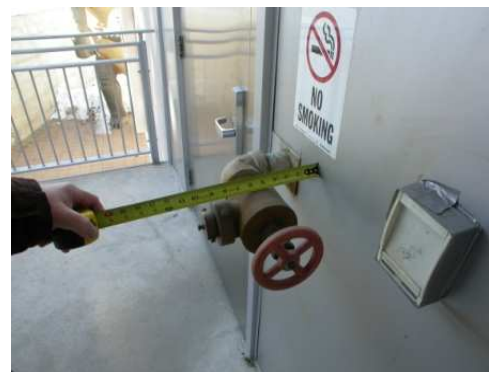


Figure 42 - Sprinkler Stand Pipes Protrude into Garage Approach Routes

2. The valve for the fire sprinkler standpipe system on the wall between the door to the fire stairs and the elevators on each of the levels of the parking deck projects further than 4" into the circulation route above 27" (UFAS 4.4). See Figure 42
3. The blue security light bracket for the emergency call box system on each of the levels of the parking deck near the elevators projects further than 4" into the circulation route above 27" (UFAS 4.4). See Figure 43
4. The route (just in front of each elevator) between the L3 (lowest level) accessible parking and the elevators leading to the DMNS main entrance has cross slopes (at 3.9%-5.6%) steeper than the maximum allowable 2% per UFAS 4.3.7.
5. On Levels L3, the overhead signs at the 3 designated accessible parking spaces are positioned over the two access aisles and there are no overhead signs provided at the 3 actual parking spaces as required by UFAS 4.6.4.
6. The large "Elevator Stairs" sign at the east end of the elevator tower on both Levels L2 & L3 is on the approach circulation route to the elevators and lacks the minimum required 80" head height per UFAS 4.4. See Figure 44
7. There is an abrupt level change (at 1/2") higher than the maximum 1/4" allowed by UFAS 4.5.2 at the expansion joint gap between the L2 parking deck elevator balcony and the L2 parking spaces.



Figure 43 - Protruding Blue Lights

g. Ramps (UFAS 4.8)

UFAS Non-Conformant Elements

The following non-compliant features were identified on the ramps provided at the Museum:

1. **Level 1 - Space Odyssey Exhibit Ramps.** This ramp links the main exhibition space to the live-action space walk performance space. While the upper ramp run has a slope slightly steeper (at 9.2%) than the maximum 8.3% specified in UFAS 8.2, it is within recognized construction tolerances and the handrails are slightly larger than specified in UFAS 4.8.5, this ramp is substantially compliant with UFAS provisions and may remain until it is altered in the future. The ramp leading up to the raised stage area in the science theater portion of the Space Odyssey Exhibit lacks: horizontal extensions on the handrails; adequate top landing space before the stage door; edge protection on the open side of the ramp (UFAS 4.8.5; 4.8.4; 4.8.7). See Figure 13
2. **North Ramp in IMAX Auditorium.** This wheelchair seating area is accessed via a short ramp that lacks

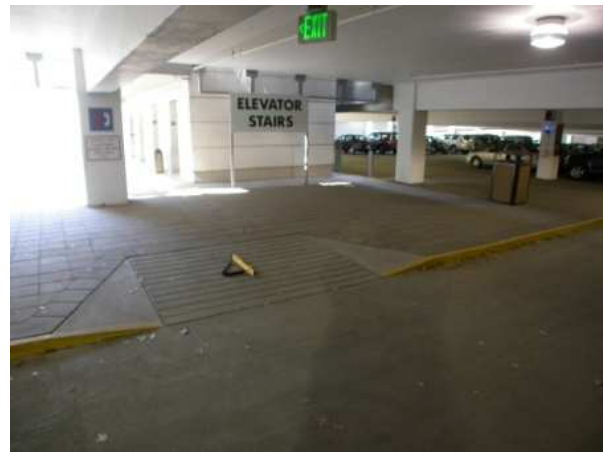


Figure 44 - Low Head Height at "Elevator/Stair" Sign in Parking Garage



Figure 45 - Discovery Zone Ramp & Stage

edge protection on the open side and also lacks an accessible handrail on the wall side of the ramp (UFAS 4.8.7; 4.8.5).

3. **South Ramp in IMAX Auditorium.** This wheelchair seating area is accessed via a short ramp that lacks edge protection on the open side and also lacks an accessible handrail on the wall side of the ramp (UFAS 4.8.7; 4.8.5).
4. **Level 2 - Discovery Zone Demo Stage.** This raised stage is accessed by a carpet covered plywood ramp which lacks edge protection on the open side (UFAS 4.8.7). See Figure 45
5. **Level 3 - Prehistoric Journey.** The ramp leading away from the lower level exit door from the second enclosed platform lift slopes (at 6.1%-9.1%) more than 5% and lacks required accessible handrails (UFAS 4.8.5). See Figure 46

h. Elevators (UFAS 4.10)

DMNS has five public elevators used for accessing program spaces. There is one elevator serving each of the three main exhibition levels from the west end of the north atrium. There is one elevator serving each of the three main exhibition levels from the west end of the south atrium. The third elevator serves each of the three exhibition space levels, the Leprino Family Atrium and also the Anschutz Family Sky Terrace on the west end of the building within the recently constructed Leprino Family Atrium addition. The fourth elevator serves the "after-hours" accessible entrance lobby to the IMAX, IMAX wheelchair seating areas, IMAX box office and the designated accessible IMAX restrooms. The fifth elevator serves the parking deck on the north side of the facility. All but the IMAX Theater elevator met UFAS accessibility provisions.



Figure 46 - Inaccessible Prehistoric Journey Ramp

UFAS Non-Conformant Elements

The only non-compliant elevator was the elevator serving the IMAX Theater. This elevator lacked raised floor indicators on the control buttons in the cab (UFAS 4.10.12) and each of the hoistway jambs at the four levels in the theater lacked raised floor characters (UFAS 4.10.5).

i. Toilet Rooms (UFAS 4.17-4.19)

DMNS has 33 public restrooms and not all of them are required under the 504 facility compliance provisions to be accessible. Program accessibility recommendations will be provided below, but those restrooms noted below which have been recently altered or newly constructed must be modified to meet a higher level of UFAS accessibility. Given these facts, the Museum has the following public restrooms, which include varying levels of accessible features:

1. T-Rex Cafe men's and women's restrooms on Level 1 (recently altered for greater accessibility);
2. Central Core men's and women's restrooms on Level 1 (recently altered for greater accessibility);

3. Three separate and adjacent single-user Family Restrooms at the Gems Exhibit entrance on Level 1 (recently constructed new) with a semi-private family lounge area from which these three restrooms are entered;
4. Planetarium men's and women's restrooms on Level 1 (recently altered for greater accessibility);
5. Leprino Family Atrium men's and women's restrooms on Level 1 (included in this new addition);
6. IMAX men's and women's restrooms served by the IMAX "after hours" elevator (altered in the past for limited accessibility);
7. IMAX men's and women's restrooms at the Level 2 IMAX central core lobby (no accessibility provisions) - this lobby area is not used by mobility impaired visitors who are directed to an alternate Level 3 accessible entrance and approach route to the wheelchair seating areas in the IMAX theater;
8. Australia Exhibit men's and women's restrooms on Level 2 (altered in the past for limited accessibility);
9. Central Core men's and women's restrooms on Level 2 (recently altered for greater accessibility);
10. Leprino Family Atrium men's and women's restrooms on Level 2 (included in this new addition);
11. Expedition Health Classroom men's and women's restrooms on Level 2 (included in this recent alteration);
12. Botswana Exhibit men's and women's restrooms on Level 3 (altered in the past for limited accessibility);
13. Central Core men's and women's restrooms on Level 3 (recently altered for greater accessibility);
14. Leprino Family Atrium men's and women's restrooms on Level 3 (included in this new addition);
15. Bailey Library men's and women's restrooms on Level 3 (altered in the past for limited accessibility);
16. Men's and women's single-user restrooms serving the Anshutz Family Sky Terrace on Level 4 (included in this new addition).

UFAS Non-Conformant Elements

Non-Structural Restroom Modifications - The flexibility of the 504 program access compliance strategy allows the following inaccessible public men's and women's restrooms to remain inaccessible if the room identification signs currently identifying them as accessible are replaced with signs that do not show the symbol of accessibility and the replacement signs include directions to the nearest accessible restrooms:

1. IMAX men's and women's restrooms at the Level 2 IMAX central core lobby (no accessibility provisions) - this lobby area is not used by mobility impaired visitors who are directed to an alternate Level 3 accessible entrance and approach route to the wheelchair seating areas in the IMAX theater;
2. Australia Exhibit men's and women's restrooms on Level 2;
3. Botswana Exhibit men's and women's restrooms on Level 3;
4. Bailey Library men's and women's restrooms on Level 3.

Structural Restroom Modifications - The following restrooms have been altered or newly constructed recently and therefore must be modified for UFAS accessibility to the maximum extent feasible given existing building constraints based on the listed non-conformant elements below:

1. **T-Rex Cafe Men's and Women's restrooms on Level 1** (recently altered for greater accessibility) -
 1. Men's Restroom. This restroom has an automatic door opener and a directional sign to the accessible "Family Restroom". The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4). The designated accessible urinal has a lip (at 20") above the maximum 17" (UFAS 4.18.2). The rear grab bar is 12" shorter than the minimum 36" length (UFAS 4.17.6).
 2. Women's Restroom. This restroom has an automatic door opener and a directional sign to the accessible "Family Restroom". The wall mounted hand dryers project more than 4" into the circulation route above

27" without cane detectable barriers provided (UFAS 4.4). The rear grab bar is 12" shorter than the minimum 36" length (UFAS 4.17.6).

3. **Central Core Men's and Women's restrooms on Level 1** (recently altered for greater accessibility) -
 - a. **Men's Restroom.** This restroom has an automatic door opener and a directional sign to the accessible "Family Restroom". The paper towel dispenser above the diaper changing table is mounted 2" higher than the maximum 46" allowable height (UFAS 4.22.7). The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4). The designated accessible urinal has a lip (at 20") above the maximum 17" (UFAS 4.18.2). The lowered urinal is positioned within privacy shields (deeper than 24") that provide less (at only 24") than the minimum 36" clear width. The rear grab bar is mounted 9" higher than the maximum height due to a chase panel (UFAS 4.17.6) - install 12" grab bar to the right of the panel and a 24" grab bar to the left of the panel at accessible heights. The accessible stall door lacks a U-shaped pull on the interior side (UFAS 4.17.5). The coat hook on the interior side of the accessible stall door is mounted above the maximum 54" height (UFAS 4.25.3). The side grab bar is positioned further (at 15 1/2") than 12" from the rear wall (UFAS 4.17.6). The side grab bar is positioned (2") higher than the maximum 36" height (UFAS 4.17.6). The layout of the designated accessible stall has the out-swinging stall door positioned directly opposite the toilet, rather than diagonally opposite the toilet as required by UFAS 4.17.3 and the stall door must be relocated.
 - b. **Women's Restroom.** This restroom has an automatic door opener and a directional sign to the accessible "Family Restroom". The paper towel dispenser above the diaper changing table is mounted 3" higher than the maximum 46" allowable height (UFAS 4.22.7). The diaper changing table has no corner post to act as a cane detectable barrier and the leading edge is higher than 27" (UFAS 4.4). The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4). The rear grab bar is positioned 2" further from the side wall than allowed (UFAS 4.17.6). The accessible stall door lacks a U-shaped pull on the interior side (UFAS 4.17.5). The coat hook on the interior side of the accessible stall door is mounted above the maximum 54" height (UFAS 4.25.3). The side grab bar is positioned further (at 15 1/2") than 12" from the rear wall (UFAS 4.17.6). The side and rear grab bars are positioned (2") higher than the maximum 36" height (UFAS 4.17.6). The layout of the designated accessible stall has the out-swinging stall door positioned directly opposite the toilet, rather than diagonally opposite the toilet as required by UFAS 4.17.3 and the stall door must be relocated.
4. Three separate and adjacent single-user Family Restrooms at the Gems Exhibit entrance on Level 1 (recently constructed new) with a semi-private family lounge area from which these three restrooms are entered. These 3 restrooms are not numbered on their signs, so for this report the left restroom (as you view them from the semi-private lounge) is Family Restroom A, the center restroom is Family Restroom B and the right restroom is Family Restroom C. The entry door into the semi-private family lounge has an automatic door opener.
 - a. **Semi-private Lounge Area.** The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4). A lounge chair is positioned so it blocks the minimum 48" wide door maneuvering space at Family Restroom C and must be relocated (UFAS 4.13.6). See Figure 47



Figure 47 - Typical Protruding Hand Dryer

- b. **Family Restroom A.** The granite threshold at the entry door is 5/8" high with bevels on each side that are (at 1:1) steeper than the maximum allowable 1:2 bevel per UFAS 4.13.8. This non-fire rated entry door has a closer force (at 14 lbf) heavier than the maximum 5 lbf required by UFAS 4.13. 11(b). The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4). See Figure 48
- c. **Family Restroom B.** The entry door has inaccessible round knob hardware (UFAS 4.13.9) and must be replaced even though there is an automatic door opener for this door. The granite threshold at the entry door is 5/8" high with bevels on each side that are (at 1:1) steeper than the maximum allowable 1:2 bevel per UFAS 4.13.8. The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4).
- d. **Family Restroom C.** The granite threshold at the entry door is 5/8" high with bevels on each side that are (at 1:1) steeper than the maximum allowable 1:2 bevel per UFAS 4.13.8. This non-fire rated entry door has a closer force (at 13 lbf) heavier than the maximum 5 lbf required by UFAS 4.13. 11(b). The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4).



Figure 48 - Inaccessible Threshold at Typical Family Restroom Doors

5. **Planetarium Men's and Women's restrooms on Level 1** (recently altered for greater accessibility) - These large public restrooms have automatic door openers.

- a. **Men's Restroom.** The granite threshold at the entry door is 5/8" high with bevels on each side that are (at 1:1) steeper than the maximum allowable 1:2 bevel per UFAS 4.13.8. The accessible stall door lacks a U-shaped pull on the interior side (UFAS 4.17.5). The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4).
- b. **Women's Restroom.** The granite threshold at the entry door is 5/8" high with bevels on each side that are (at 1:1) steeper than the maximum allowable 1:2 bevel per UFAS 4.13.8. The accessible stall door lacks a U-shaped pull on the interior side (UFAS 4.17.5). The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4). The feminine napkin dispensers have inaccessible round knob controls that are mounted higher than 54" (UFAS 4.22.7).



Figure 49 - Typical Inaccessible Feminine Napkin Dispenser

6. **Leprino Family Atrium Men's and Women's restrooms on Level 1** (included in this new addition) This restroom has an automatic door opener and a directional sign to the accessible "Family Restroom".

- a. **Men's Restroom.** The granite threshold at the entry door

- is 5/8" high with bevels on each side that are (at 1:1) steeper than the maximum allowable 1:2 bevel per UFAS 4.13.8. The accessible stall door lacks a U-shaped pull on the interior side (UFAS 4.17.5). The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4).
- b. Women's Restroom. The granite threshold at the entry door is 5/8" high with bevels on each side that are (at 1:1) steeper than the maximum allowable 1:2 bevel per UFAS 4.13.8. The accessible stall door lacks a U-shaped pull on the interior side (UFAS 4.17.5). The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4). The feminine napkin dispensers have inaccessible round knob controls that are mounted higher than 54" (UFAS 4.22.7).
7. **IMAX Men's and Women's restrooms** served by the IMAX "after hours" elevator (altered in the past for limited accessibility) - - These large public restrooms have automatic door openers.
- a. Men's Restroom. The designated accessible urinal has a lip (at 22") above the maximum 17" (UFAS 4.18.2). The accessible stall door hardware requires tight pinching and twisting of the wrist (UFAS 4.17.5). The coat hook on the interior side of the accessible stall door is mounted above the maximum 54" height (UFAS 4.25.3). The toilet is centered further (at 20 1/4") than 18" from the adjacent side partition (UFAS 4.17.3) in this 64" wide toilet stall. The side grab bar is 12" too short at 36" long (UFAS 4.17.3).
- b. Women's Restroom. The feminine napkin dispensers have inaccessible round knob controls (UFAS 4.22.7). See Figure 49. The accessible stall door hardware requires tight pinching and twisting of the wrist (UFAS 4.17.5). The coat hook on the interior side of the accessible stall door is mounted above the maximum 54" height (UFAS 4.25.3). The toilet is centered further (at 22 1/4") than 18" from the adjacent side partition (UFAS 4.17.3) in this 64" wide toilet stall. The side grab bar is 12" too short at 36" long (UFAS 4.17.3). The rear grab bar is positioned (2 1/2") higher than the maximum 36" height (UFAS 4.17.6). The toilet paper dispenser is mounted with its forward edge further (at 42") than the maximum 36" specified (UFAS 4.17.3).
8. **Central Core Men's and Women's restrooms on Level 2** (recently altered for greater accessibility) -
- a. Men's Restroom. This restroom has an automatic door opener and a directional sign to the accessible "Family Restroom". The paper towel dispenser above the diaper changing table is mounted 3" higher than the maximum 46" allowable height (UFAS 4.22.7). The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4). The designated accessible urinal has a lip (at 18 3/4") above the maximum 17" (UFAS 4.18.2). The lowered urinal is positioned within privacy shields (deeper than 24") that provide less (at only 24 1/2") than the minimum 36" clear width. The rear grab bar is mounted 9" higher than the maximum height due to a chase panel (UFAS 4.17.6) - install 12" grab bar to the right of the panel and a 24" grab bar to the left of the panel at accessible heights. The side grab bar is 12" too short at 36" long (UFAS 4.17.3). The side grab bar is mounted 1" higher than the maximum 36" height (UFAS 4.17.6). The accessible stall door lacks a U-shaped pull on the interior side (UFAS 4.17.5). The coat hook on the interior side of the accessible stall door is mounted above the maximum 54" height (UFAS 4.25.3). The side grab bar is positioned further (at 14") than 12" from the rear wall (UFAS 4.17.6). The layout of the designated accessible stall has the out-swinging stall door positioned directly opposite the toilet, rather than diagonally opposite the toilet as required by UFAS 4.17.3 and the stall door must be relocated.
- b. Women's Restroom. This restroom has an automatic door opener and a directional sign to the accessible "Family Restroom". The paper towel dispenser above the diaper changing table is mounted 3 3/4" higher than the maximum 46" allowable height (UFAS 4.22.7). The diaper changing table has no corner post to act as a cane detectable barrier and the leading edge is higher than 27" (UFAS 4.4). The wall mounted

- hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4). The rear grab bar is positioned 2" further from the side wall than allowed (UFAS 4.17.6). The accessible stall door lacks a U-shaped pull on the interior side (UFAS 4.17.5). The coat hook on the interior side of the accessible stall door is mounted above the maximum 54" height (UFAS 4.25.3). The side grab bar is positioned further (at 14") than 12" from the rear wall (UFAS 4.17.6). The side and rear grab bars are positioned (1") higher than the maximum 36" height (UFAS 4.17.6). The layout of the designated accessible stall has the out-swinging stall door positioned directly opposite the toilet, rather than diagonally opposite the toilet as required by UFAS 4.17.3 and the stall door must be relocated.
9. **Leprino Family Atrium Men's and Women's restrooms on Level 2** (included in this new addition) - This restroom has an automatic door opener and a directional sign to the accessible "Family Restroom".
 - a. Men's Restroom. The granite threshold at the entry door is 5/8" high with bevels on each side that are (at 1:1) steeper than the maximum allowable 1:2 bevel per UFAS 4.13.8. The accessible stall door lacks a U-shaped pull on the interior side (UFAS 4.17.5). The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4).
 - b. Women's Restroom. The granite threshold at the entry door is 5/8" high with bevels on each side that are (at 1:1) steeper than the maximum allowable 1:2 bevel per UFAS 4.13.8. The accessible stall door lacks a U-shaped pull on the interior side (UFAS 4.17.5). The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4). The feminine napkin dispensers have inaccessible round knob controls that are mounted higher than 54" (UFAS 4.22.7).
 10. **Expedition Health Classroom Men's and Women's restrooms on Level 2** (included in this recent alteration) -
 - a. Men's Restroom. This non-fire rated entry door has a closer force (at 13 lbf) heavier than the maximum 5 lbf required by UFAS 4.13. 11(b). The designated accessible urinal has a lip (at 20") above the maximum 17" (UFAS 4.18.2). The coat hook on the interior side of the accessible stall door is mounted above the maximum 54" height (UFAS 4.25.3). The side grab bar is 12" too short at 36" long (UFAS 4.17.3).
 - b. Women's Restroom. This non-fire rated entry door has a closer force (at 14 lbf) heavier than the maximum 5 lbf required by UFAS 4.13. 11(b). The designated accessible urinal has a lip (at 20") above the maximum 17" (UFAS 4.18.2). The coat hook on the interior side of the accessible stall door is mounted above the maximum 54" height (UFAS 4.25.3). The side grab bar is 12" too short at 36" long (UFAS 4.17.3). The side grab bar is positioned further (at 14") than 12" from the rear wall (UFAS 4.17.6).
 11. **Central Core Men's and Women's restrooms on Level 3** (recently altered for greater accessibility) -
 - a. Men's Restroom. This restroom has an automatic door opener and a directional sign to the accessible "Family Restroom". The paper towel dispenser above the diaper changing table is mounted 3" higher than the maximum 46" allowable height (UFAS 4.22.7). The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4). The designated accessible urinal has a lip (at 19") above the maximum 17" (UFAS 4.18.2). The lowered urinal is positioned within privacy shields (deeper than 24") that provide less (at only 23 1/2") than the minimum 36" clear width. The side grab bar is 12" too short at 36" long (UFAS 4.17.3). The rear and side grab bars are mounted 1 1/2" higher than the maximum 36" height (UFAS 4.17.6). The accessible stall door lacks a U-shaped pull on the interior side (UFAS 4.17.5). The coat hook on the interior side of the accessible stall door is mounted above the maximum 54" height (UFAS 4.25.3). The side grab bar is positioned further (at 14") than 12" from the rear wall (UFAS 4.17.6). The layout of the designated accessible stall has the out-swinging stall door positioned directly opposite the toilet, rather than diagonally opposite the toilet as required by UFAS 4.17.3 and the stall door must be relocated.

- b. Women's Restroom. This restroom has an automatic door opener and a directional sign to the accessible "Family Restroom". The paper towel dispenser above the diaper changing table is mounted 2 1/2" higher than the maximum 46" allowable height (UFAS 4.22.7). The diaper changing table has no corner post to act as a cane detectable barrier and the leading edge is higher than 27" (UFAS 4.4). The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4). The rear grab bar is positioned 2" further from the side wall than allowed (UFAS 4.17.6). The accessible stall door lacks a U-shaped pull on the interior side (UFAS 4.17.5). The coat hook on the interior side of the accessible stall door is mounted above the maximum 54" height (UFAS 4.25.3). The side grab bar is positioned further (at 14") than 12" from the rear wall (UFAS 4.17.6). The side and rear grab bars are positioned (1") higher than the maximum 36" height (UFAS 4.17.6). The layout of the designated accessible stall has the out-swinging stall door positioned directly opposite the toilet, rather than diagonally opposite the toilet as required by UFAS 4.17.3 and the stall door must be relocated.
12. **Leprino Family Atrium Men's and Women's restrooms on Level 3** (included in this new addition) - - This restroom has an automatic door opener and a directional sign to the accessible "Family Restroom".
- a. Men's Restroom. The granite threshold at the entry door is 5/8" high with bevels on each side that are (at 1:1) steeper than the maximum allowable 1:2 bevel per UFAS 4.13.8. The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4).
 - b. Women's Restroom. The granite threshold at the entry door is 5/8" high with bevels on each side that are (at 1:1) steeper than the maximum allowable 1:2 bevel per UFAS 4.13.8. The accessible stall door lacks a U-shaped pull on the interior side (UFAS 4.17.5). The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4). The feminine napkin dispensers have inaccessible round knob controls that are mounted higher than 54" (UFAS 4.22.7).
13. **Men's and Women's single-user restrooms serving the Anshutz Family Sky Terrace on Level 4** (included in this new addition) - - These restrooms have an automatic door opener.
- a. Men's Restroom. The metal threshold at the entry door is 5/8" high with bevels on each side that are (at 1:1) steeper than the maximum allowable 1:2 bevel per UFAS 4.13.8. The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4). The coat hook on the interior side of the entry door is mounted above the maximum 54" height (UFAS 4.25.3).
 - b. Women's Restroom. The metal threshold at the entry door is 5/8" high with bevels on each side that are (at 1:1) steeper than the maximum allowable 1:2 bevel per UFAS 4.13.8 (See Figure 50). The wall mounted hand dryers project more than 4" into the circulation route above 27" without cane detectable barriers provided (UFAS 4.4). The feminine napkin dispensers have inaccessible round knob controls that are mounted higher than 54" (UFAS 4.22.7). The coat hook on the interior side of the entry door is mounted above the maximum 54" height (UFAS 4.25.3).



Figure 50 - Typical Inaccessible Metal Threshold Sky Terrace Restrooms

j. [Drinking Fountains \(UFAS 4.15\)](#)

The drinking fountains in this facility are substantially compliant with UFAS and the program access provisions of 504.

k. [Telephones \(UFAS 4.31\)](#)

Generally, the pay phones in DMNS are accessible with TTY's in Leprino Atrium on Level 1 and at the IMAX "after-hours" box office for those who have hearing or speech impairments.

UFAS Non-Conformant Elements

1. **Level 2 - Wildlife Halls Entrance.** The pay phone here is mounted above a bench with the coin slot (at 64") above the maximum 48" for a forward wheelchair approach (UFAS 4.31). An alternative 504 programmatic accommodation would allow for a sign to be mounted next to this phone describing the location of the nearest accessible pay phone.
2. **Level 3 - Wildlife Halls Entrance.** The pay phone here is mounted above a bench with the coin slot (at 64") above the maximum 48" for a forward wheelchair approach (UFAS 4.31). An alternative 504 programmatic accommodation would allow for a sign to be mounted next to this phone describing the location of the nearest accessible pay phone.

l. [Accessible Alarm System \(UFAS 4.28\)](#)

UFAS Non-Conformant Elements

No accessible alarm system (strobe lights) was observed in the following public areas of the facility and strobes need to be provided to accommodate hearing impaired visitors:

1. **Level 2 - Central Circulation Core Balcony Area near the Restrooms.**
2. **Level 3 - Egyptian Mummies Exhibit.**
3. **Level 3 - Central Circulation Core Balcony Area near the Prehistoric Journey exit route.**

m. [Informational & Room Identification Signage \(UFAS 4.30\)](#)

UFAS Non-Conformant Elements

The review revealed that all informational and room identification signs were UFAS compliant except for signs noted in the restroom portion of the report regarding directions from inaccessible restrooms to accessible restrooms.

n. [Restaurants and Food Service Areas \(UFAS 5.0\)](#)

The primary public dining area, the T-Rex Cafe, is located on Level 1 near the main entrance lobby and is divided into two different food service options - there is a full service hot food cafeteria area with an adjacent main dining area and there is a quick service area, called "Grab & Go!" in the North Atrium which includes self-serve options and casual dining tables set in the atrium space. There is also a private "VIP" Meeting Room near the cafeteria. There is also a School Lunchroom near the south end of the main circulation core on Level 1 which includes

vending machines, but no kitchen. There were no accessibility barriers identified in the VIP Room or the School Lunchroom.

UFAS Non-Conformant Elements

We noted the following non-compliant elements in the "Grab & Go!" food service area:

1. The stainless steel shelves just to the left of the Coke machine and just under the Pizza-by-the-Slice dispenser create protruding hazards for blind and visually impaired visitors as they project into the circulation route further than 4" with their leading edge above 27" (UFAS 4.4).
2. DMNS staff must be available to assist disabled diners with some of the food service items (pizza, fruit, sodas in coolers, etc.) that are out of wheelchair reach range.

We noted the following non-compliant elements in the T-Rex Cafe food service area:

1. The lids for the soda cups are located above (at 54" high 24" back) the maximum 46" height for side wheelchair reach range over and obstruction (tray slide) per UFAS 5.3). See Figure 51

We noted the following non-compliant elements in the North Atrium dining area:

1. There is a large potted tree with branches that extend into the circulation route around the dining tables and they do not offer the minimum 80 head height for blind and visually impaired users (UFAS 4.4).



Figure 51 - T-Rex Cafe Drink Dispensers & Lids

o. Mercantile (UFAS 7.0)

Our review revealed that DMNS has a **Museum Store** on Level 1 near the main ticket lobby where gifts, apparel, toys and other items can be purchased. This shop is generally accessible, but the two sales counters need to be modified to correct the barriers identified below.

UFAS Non-Conformant Elements

The only UFAS 7.2 non-compliant issues we found were:

1. height of two sales counters exceeded the maximum height of 34" at 38" and
2. no alternative counter with a maximum height of between 28" to 34" was provided.

p. Alfred M. Bailey Library (UFAS 8.0)

On Level 3 there is a library for use by staff and the public that does not appear to have been renovated in many years. It is immediately adjacent to the classrooms for visiting students located on this level. This library includes designated accessible workstations and accessible routes through the stacks.

UFAS Non-Conformant Elements

1. The rubber transition strip at the main library entrance door is 1/2" high with a slope steeper than the maximum allowable 1:2 (UFAS 4.5.2).

q. Main Ticket Lobby (Various UFAS Sections)

The main ticket lobby is divided into four different service desks. The first is the counter where a Member's purchase tickets to tour the Museum. The second is the general ticket sales counter for the Museum, Planetarium and IMAX Theater. The third is a service desk where general information and rentals (wheelchairs, walkers, assistive listening headsets, etc.) can be obtained. The fourth desk is a "Will Call" counter for those who arranged ticket purchases before arriving at DMNS. Many of the public lockers in this area are within the accessible reach range of wheelchair users.

UFAS Non-Conformant Elements

Each of these four counters has a portion that is lowered for wheelchair use, but those lowered portions also create protruding objects that could be hazardous to blind and visually impaired visitors because of the lack of cane detectable barriers (UFAS 4.4). This is also true for the brochure storage element on the Information counter and the wall hung TV to the right of the main ticket counter which does not provide a minimum 80" head height along the circulation route. The queuing areas at the



Figure 52 - Main Ticket Counter with Protruding TV at Right Side of Image

ticket counters are established by tape stanchions which are not cane detectable to blind and visually impaired visitors (UFAS 4.4.). See Figure 52

r. Security & First Aid Desk (Various UFAS Sections)

The security staff occupy a command post desk just east of the main ticket sales lobby that is also available for first aid issues. This area has an entrance which is not used by the public visitors, but is available for public information.

UFAS Non-Conformant Elements

1. The door between the Security & First Aid desk and the T-Rex Cafe has a threshold with an abrupt level change (at 1/2") that exceeds the maximum 1/4" allowed (UFAS 4.5.2).

3. Compliance Recommendations

The architectural barriers identified in this report should be remedied as soon as possible by DMNS. The obligation to correct most of these barriers arose each time the Museum altered its facilities. While this obligation should have been pointed out to DMNS by its architects and engineers, this obligation is also a basic principle under both Section 504 and the ADA. As a Section 504 federal fund recipient, the Museum should have ensured that its Section 504 Designated Responsible Employee had the requisite knowledge and expertise to address these issues in a timely manner when the liability was first created.

G. Transition Plan

When a grantee receives funding from NASA, Section 504 requires that each program or activity, when viewed in its entirety, is readily accessible to persons with disabilities. While this does not mean that every area of every facility must be accessible, it may mean relocating programs and activities to other locations, while giving priority to those methods that offer access to people with disabilities in the most integrated setting possible.⁹⁶ Because many older facilities included architectural barriers, Section 504 permitted grantees generous time periods for making their programs accessible.⁹⁷

In order to plan for making the changes required by Section 504, grantees were required to develop a detailed transition plan within six months of the application of Section 504 to their programs. This document is required by NASA regulations to be available for public inspection.

(d) Transition plan. In the event that structural changes to facilities are necessary to meet the requirement of paragraph (a) of this section, a recipient shall develop, within 6 months of the

⁹⁶ 14 C.F.R. § 1251.301(a)-(b).

⁹⁷ Section 504 gave grantees up to three years to make appropriate structural changes or relocation of activities to accessible locations.

(c) Time period. A recipient shall comply with the requirement of paragraph (a) of this section within 60 days of the effective date of this part except that

where structural changes in facilities are necessary, such changes shall be made within 3 years of the effective date of this part, but in any event as expeditiously as possible.

14 C.F.R. § 1251.301(c).

effective date of this part, a transition plan setting forth the steps necessary to complete such changes. The plan shall be developed with the assistance of interested persons, including handicapped persons or organizations representing handicapped persons. A copy of the transition plan shall be made available for public inspection. The plan shall, at a minimum:

(1) Identify physical obstacles in the recipient's facilities that limit the accessibility of its program or activity to handicapped persons;

(2) Describe in detail the methods that will be used to make the facilities accessible;

(3) Specify the schedule for taking the steps necessary to achieve full program accessibility and, if the time period of the transition plan is longer than 1 year, identify steps that will be taken during each year of the transition period; and

(4) Indicate the person responsible for implementation of the plan.

(e) Notice. The recipient shall adopt and implement procedures to ensure that interested persons, including persons with impaired vision or hearing, can obtain information as to the existence and location of services, activities, and facilities that are accessible to and usable by handicapped persons.⁹⁸

1. Findings of Fact

As noted above, Damon McLeese from VSA Arts of Colorado conducted a careful walk-through of the facility. However, the report from VSA Arts identified very few of the barriers that the review team identified during their extensive review of the DMNS facility. In addition, the Museum had conducted a survey of the facility shortly after the ADA went into effect, but the files of the person who conducted this survey and plan are no longer available.⁹⁹ In addition, neither of these surveys evolved into definitive transition plans that are available to the public.

2. Compliance Analysis and Recommendation

As this report makes clear, while the Museum's programs and activities are generally accessible for people with disabilities, there remain a number of barriers (architecturally and otherwise). This deficiency is exacerbated by the lack of a publicly available transition plan. If the Museum lacks a transition plan, it cannot fully meet its program access obligations and cannot make capital planning decisions for addressing larger problems. By not making a transition plan publicly available, the Museum risks loss of goodwill with the disability community and heightened exposure because of a seeming indifference towards accessibility. All of these factors auger in favor of developing a transition plan as soon as possible.

⁹⁸ 14 C.F.R. §§ 1251.301(d)-(e).

⁹⁹ Interview with Elaine Harkins (Director of Facilities)(Mar. 2, 2010).

Conclusion/Remediation Plan

NASA’s review has determined that DMNS is cognizant of its responsibility and diligent in its overall efforts to provide accessible programs, services, exhibits and facilities for individuals with disabilities. However, NASA has determined that several Section 504 requirements are currently not being met by DMNS. Accordingly, NASA has developed a remediation plan which appears at the end of this report, to assist DMNS in meeting these requirements, thereby strengthening compliance, prohibiting discrimination and enabling DMNS to provide accessible programs, services and activities to for individuals with disabilities.

As noted above, DMNS both includes a number of architectural barriers and also requires a publicly available transition plan. This will enable it to eliminate barriers (and some hazards) for disabled visitors and demonstrate its leadership in the Denver community. As also described above, there are additional steps that the museum can take to improve accessibility. The following table summarizes our suggested Remediation Plan, broken down by report section or pertinent responsible area.

	Short Term (0-60 Days)	Medium Term (60-180 Days)	Long Term (180 Days and Beyond)
Grievance Processes	<ul style="list-style-type: none"> Advise all employees and volunteers of the current processes and advise them that they will be changing in the coming months. 	<ul style="list-style-type: none"> Accessibility Committee develops more robust grievance processes. Accessibility Committee develops better grievance forms for capturing visitor information. Improve process so that Designated Responsible Employee is aware of complaint involving accessibility. 	<ul style="list-style-type: none"> Revised grievance process made more publicly available in print, website, etc. Information forms made more readily available for visitors. Grievance process incorporated into training so all employees have a clear understanding of it.
Designated Responsible Employee (DRE)	<ul style="list-style-type: none"> Clearly establish the identity of the DRE to employees, volunteers, and members of the public through existing avenues. Renew the Museum’s Accessibility Committee with membership from across the Museum. Ensure that all activities of the Accessibility Committee involve oversight from the DRE. 	<ul style="list-style-type: none"> Explore additional learning opportunities to ensure that the DRE understands all facets of disability rights laws, to include architectural issues, program access, path of travel, etc. Develop educational resources for Museum staff and FAQs to develop consistent answers to common accessibility questions. 	<ul style="list-style-type: none"> Re-evaluate and refine efforts based on experience. Continue to develop knowledge assets around accessibility to facilitate knowledge transfer to others.
Eligibility Criteria, Education, and Awareness	<ul style="list-style-type: none"> Explore available training opportunities. Schedule mandatory panel sessions with VSA Colorado. 	<ul style="list-style-type: none"> Continue training, obtain feedback, and refine programs. 	<ul style="list-style-type: none"> Continue training, obtain feedback, and refine programs.
Effective Communication		<ul style="list-style-type: none"> Accessibility Committee develops general customer feedback mechanisms. 	<ul style="list-style-type: none"> Museum solicits disability groups in the local Denver area for feedback.

	Short Term (0-60 Days)	Medium Term (60-180 Days)	Long Term (180 Days and Beyond)
Architectural Accessibility	<ul style="list-style-type: none"> • Inform architects retained for the new Museum addition of ADA "path of travel" barriers applicable to the new addition project so the project's "scope of work" and budget can be revised. • Museum management should review and digest architectural barriers to 504 program accessibility identified in this report. • Investigate in-house and outside accessibility consulting resources for the development of the Transition Plan. 	<ul style="list-style-type: none"> • Have in-house or outside accessibility consultant analyze accessibility of the Phipps Special Exhibits Gallery which was not included in NASA's evaluation because the space was under construction. • Recommend management review the extent to which the new ADA regulations published by the US Department of Justice (www.ada.gov) on July 26, 2010 might be leveraged into the required Museum accessibility modifications for 504 compliance. 	<ul style="list-style-type: none"> • Museum executes self evaluation and transition plan.
Self-Evaluation and Transition Plan	<ul style="list-style-type: none"> • Museum management reviews NASA recommendations. • Museum begins capital planning on major barriers identified in NASA report. 	<ul style="list-style-type: none"> • Based on input from Accessibility Committee, Museum creates publicly available self evaluation and transition plan and publicizes through available avenues to the public. 	<ul style="list-style-type: none"> • Museum executes self evaluation and transition plan. • Museum develops cyclical processes to ensure that self-evaluations are regularly conducted and transition plans renewed.