Executive Summary

After thorough testing of the Mars Commuter website, it is my opinion that major changes need to occur in order to increase the accessibility options for all potential users visiting the page. While many users with disabilities would be affected if the website were to remain the same, users suffering from blindness and motor disabilities would be the most severely affected.

One of the biggest issues hindering users that employ screen readers is the illogical reading order of the website, and how the website renders without the use of any styling. Without the use of stylesheets to theme and structure the page, screen readers are left with a confusing and repetitive website to try and navigate. The use of multiple navigation bars, multiple search forms, multiple login-in prompts, and multiple shopping carts, all without proper context, would make the first introduction to the page on a screen reader very confusing to use. Once the user gets below this navigation, more problems occur. In the main content of the page, the Special Offers featured in the animated slider also causes that content to repeat many times over, inadvertently causing the user to have to scroll through the special offers many times before they are able to access the most important part of the page: the vacation booking forms.

When a user finally does arrive at these forms after the repetitive content, I believe the forms are a bit overwhelming for a screen reader to interpret. Without the styling and structure, the forms are all presented at once in a screen reader, so the user has to navigate this all at once when they may not all be relevant to the user at that moment. Improving the reading order by reducing repetitiveness and the overwhelming nature of the forms will increase the amount of users navigating the website properly, and doing what the website should be focused on—booking trips to Mars.

To further increase the number of users that utilize the website to book vacations, how the website operates in a keyboard-only environment should be reviewed as well. When testing the website for accessibility, this was the most frustrating experience because the navigation of the website by tabbing through the links is illogical. This mode of navigation on Mars Commuter takes the user to forms on the right first, and then back to the beginning of the page in a seemingly random way. When a user is finally able to get the main content of the page, since the some of the content repeats as mentioned above, the user has to click very quickly in order to break free from the never-ending cycle of the scrolling content. This is annoying if the user can click quickly enough to break free, but if the user does not have that ability due to disability, the scrolling content traps the user's focus for the rest of the session, breaking the users experience on the website until the user refreshes the page.

If the user is able to get through the repetitive tabbing needed to navigate to the entire website, there are also major portions of the website that are just not ever accessible when using just the keyboard. Options to select the language and country of the user in the dropdown menus in the top navigation menu are inaccessible. This could cause major problems if the international options are vital to the pricing calculation in the shopping cart. Without the ability to set these preferences before shopping, the website should not go live because of the potential errors it could cause when calculating credit card charges.

Perhaps more importantly, the radio buttons under "Let the Adventure Begin!" are not accessible to keyboard users. This means that user using the keyboard to navigate will only have the ability to manipulate the default form that loads when the page is loaded, and the other four options there will be lost. This oversight, no doubt, would lead to frustration, and ultimately, loss of revenue for the website.

While these are not all of the issues facing the website in terms of accessibility, the reading order and tab order are the most frustrating issues that would affect the widest section of people visiting Mars Commuter. Companies should not have to sacrifice looks for accessibility, and with the right design choices, the website can be beautiful and accessible at the same time.

Detailed List of Issues

Principle	Test	Pass/Fail	Analysis
Page must have title	Manual Source Code	Pass	Website does have a valid title.
Language must be specified.	Manual Source Code	Fail	No language is specified with the <html lang> tag. This lets screen readers know which language to use when interpreting the website, so not having this confuses screen readers and might default to the wrong language for users.
Page headings should create logical outline & Headings should not skip levels	Wave	Fail	Page headings should create logical flow for outlining/navigation software. Without proper headline structure, processing of the website into outline form could become muddled and confusing. I think the main 3-story structure is correct, but Special Offers could be improved with a <h1> tag. Also, I believe that the right <form> needs another <h1> tag, and then then the proper structure underneath the <h1>.
Reading order should be logical	Wave	Fail	The Mars Commuter logo does not show up in the reading order, so the navigation is the first thing the reader is introduced to which could be confusing to arrive at a website with no prober logo/masthead. The major problem with reading order is that the scrolling element after the 3-stories is repeated and would be very frustrating to navigate past for users utilizing screen readers. Also, it could be debated that the form to book a trip would need to be before the content to allow users the ability to skip the content and go straight to booking...perhaps if they were already familiar with the site.
The page should provide a way to skip over main navigation	Manual	Fail	The website template provides no way to skip over the main navigation. This will slow down users with limited mobility or keyboard users because they will have to tab through much of the navigation in order to actually access or manipulate the main content.
ARIA landmarks	Manual	Fail	The markup does in include landmarks, but the roles are missing from the definitions. With multiple <nav> definitions, the role attribute needs to be used to distinguish how they are being used on the page. Need to include roles for all ARIA markup to avoid confusion and to start the website toward a path of being able to skip over certain parts

			if necessary. Again with multiple different <nav> definitions, more needs to be done to distinguish.
The tab order must be logical	Manual	Fail	*These issues really depend on the browser, but I will try to organize the issues as best as I can:* Issue 1: The website's first tab stop is the "From" and "To" from the Booking form. Again, I could imagine for repeat users, this could be working as intended, but I think the website would need to be changed in reading order to support this change. Issue 2: The tab order doesn't start with the beginning of the booking process, and doesn't let you complete the process by going all the way to Search. Instead, before Who Is Traveling, it goes back up to the start of the logical reading order, where it is debated it should start in the first place. Issue 3: The slider element doesn't trap the keyboard focus, but it sure delays the user for a long time trying to tab through all the repetitions of the stories that are featured in the element. **BUT, if the user does not click fast enough, or more importantly, cannot click fast enough...they will never be able to leave the slider's content.** Issue 4: The keyboard focus then repeats where it began with Booking. The footer seems to tab in a logical order.
All links, form elements, media players, and scripted actions must be directly operable by keyboard.	Manual	Fail	Chrome and IE: Ironic that I can't get the tab order to access the YouTube embed with Chrome. Chrome and IE: The buttons to click on the video to change the video do not work via keyboard. The arrows do not show up in the tab order, and the circles do not work when spacebar/enter is pressed. IE Issue 1: The YouTube player does not have a logical tab order when you get into the iframe element. It keeps repeating between a few of the less important items in the player. The best option is to click on the link to watch on YouTube's site, but that is not optimal.

			IE Issue 2: When the video is finally started after clicking tab multiple times, the tab focus switches between the clock and gear icons for a long time before the user can get to the rest of the controls. The user can eventually operate the controls, but it takes many clicks and much repetition. Issue 3: The Let the Adventure Begin! Form never really receives proper tab order. So the radio buttons in that section are never really used in a keyboard-only environment. Issue 5: The dropdown menus for language and country are inaccessible via keyboard and also do not show up in the screen reader version of the site. Issue 7: I could be wrong because it also could just be a link to the site, but I'd assume the Facebook Login would be a quick-login dropdown? Not sure about this one. Issue 8: The "Add another" script is not accessible via the keyboard. "Add another planet" and "add another passenger" are all skipped in the tab order. ***The next section contains some overlap of these errors in regards to the different forms that are accessible by radio buttons.***
The keyboard focus must be visible on all links, form elements, media players and all scripted actions.	Manual	Fail	1. Lose focus on Add another trip. 2. Book Your Trip: Lose focus again around MarsElite Pass. 3. Book Your Trip: Round-Trip and Multi-Planet never get focus. 4. Book Your Trip: Time never gets focus. 5. Book a Hotel: Space Port never gets focus. 6. Book a Hotel: Lose focus around the calendars for Check-in and Check-out dates. 7. Book a Hotel: The tab order functions through the dates proper if starting from Space Port, but in the normal tab order of things, Space Port is skipped and goes straight to the calendar image, instead of the date field. 8. Unreliable tab order getting to search after the forms. 9. Facebook not accessible and no focus. 10. After Blast Off!, the focus is lost in the slider yet again. It is tabbing through stories at the top of the slider that are

			out of few. The user must tab through many times to see the focus in the visible part of the slider. 11. Lose focus again by add passenger/add planet. 12. Lose focus in Chrome while skipping over YouTube embed. 13. When viewing the plaintext version of the website, I see options to change/set preferences for Earth/USD that I actually cannot find in the CSS version of the site.
All images must have alt text. & Alt text should not duplicate the adjacent text	Wave	Fail	The "Crater Adventure" astronaut picture does not have alt text. Since the slider duplicates elements that are sliding past, then there are duplicate alt tags for every picture with an alt in the slider. The Date icons in Book Your Hotel have the same alt text, which could confuse a user trying to make arrangements.
All CSS background images should be decorative only.	Manual	Fail	The logo is defined within a link as an icon. Which is I'm assuming is HTML5 that I've never worked with. While this might not be a CSS definition, the end result is that the logo of the website does not show up in a screen reader or un-stylized version of the website. The Facebook scripts use background-image definitions in the CSS, but I actually couldn't find where those images render. I think maybe the Facebook login script is completely broken? I could be wrong because it also could just be a link to the site, but I'd assume it would be a quick-login dropdown? Not sure about this one.
All form elements must have labels	Wave	Fail	The highest level form of Let the Adventure Begin is missing a legend for the fieldset. This is necessary for screen readers to interpret the hierarchy of the forms correctly. This error also occurs for Book a Hotel and Find Activities. The different groups of radio buttons within the forms need to have fieldsets around them so that users can understand the context of the group of radio buttons. The form also contains controls that are not associated with the type of control they are, which is important for users to know what kind of input the form control is using.
All links must have text inside	Wave	Fail	Some links at the top of the website do not have text in them because they are

of them, or images within the alt text.			"structural" images. The planet and logo have empty link tags for this reason. When you are not logged in, the null field has a blank link. The YouTube controls buttons are links without text. Also, the circle images for controlling the video via mouse have the same problem. The footer link to the iPhone app also contained images/links without text.
The meaning or purpose of a link should be understandable in the link text itself, or the context in which the link occurs	Manual	Fail	The top navigation bar contains the biggest errors in purpose behind the links. When viewed without styling, there are multiple log-in links, and cart links, and that could be very confusing. Some are repeated multiple times which makes it hard to determine which one is which.
Users should be able to pause timed content, or content in motion.	Manual	Fail	The slider contains no options to pause or stop the sliding motion of the Special Offers div. This could be distracting, hard to read, and hard to navigate.
There must be sufficient contrast between the text and the background behind the text.	Wave	Fail	The blue links on blue-gray background does not provide enough contrast for users with low vision impairments. In the main body content, the middle blue title "Countdown..." is properly the worst offender of contrast because it is blue on blue. Also, the transparent bar on the light gray text does not provide the proper level of contrast either.
Videos with spoken words must have captions for dialog and narration.	Manual	Fail	Video 1: "Life was possible..." does not provide the proper captions for the dialogue.
Important visual aspects of the video that are not conveyed in the dialog or the narration should be made available through audio	Manual	Fail	Video 1: "Life was possible..."does not provide adequate descriptions for what the cut-away scenes are showing. There is a lot of CGI in the film that is not described by the people talking in the clip. Videos 2 and 3: While the videos might not completely describe the CGI animations, the science narration does explain it enough to allow a blind user to access the material.

descriptions			
The page must not flicker or contain strobe effects that might cause seizures	Manual	Fail	Main Page: The slider is the only thing on the main page that could be considered a flicker. Video 1: Some of the picture montages move a bit too quickly for comfort, but would probably pass. Video 2: Video 2 contains probably the worst strobe effects that should be reviewed or removed. Right around when the video is explaining the concept of "sputtering," there are animations involving ions that strobe. Also, the transitions fade-to-white in a strobe-like way that could cause seizures or irritation. Video 3: While not a strobe effect, the motion of the CGI animations could cause some users to become ill, almost like an IMAX movie. There are a few strobe effects when showing a NASA celebrating, there is a camera clicking the background. Also, there is a sequence of a volcano erupting that flashes and flickers and could cause some problems.
All frames and iframes must have titles	Manual	Fail	Facebook at the top and Twitter at the bottom: Yes YouTube and Facebook Counter: No Include titles for these two iframe elements so that the users understand the contents of the iframe.

Summary of Issues

Summary of accessibility barriers on this page for blind users:

The website for blind users would be a frustrating experience. There are multiple issues hindering their ability to navigate the site. The website's navigation at the top would be repeated multiple times with little context for logging in or shopping carts. Also, the website's content slider repeats itself in a screen reader version, so they would have to hear the same content over and over again. In order to use the money making item, the booking forms, the user will have to really be committed to scrolling through the sea repetitive links and text.

The videos also do not really do a good job to describe the images that are on the screen. This could be frustrating to try and learn without a vivid picture painted for the user. Including videos with some descriptions of the complex scientific processes would benefit these users.

Summary of accessibility barriers on this page for users with low vision:

The contrast of the website is not stark enough in order for low vision users to be able to read the website comfortably. The blueish-gray link colors on gray backgrounds make for the navigation/booking sections hard to read, and then the content text on the dark blue make main content unreadable. This could be improved by moving the color scheme more toward white and black, or having a CSS switcher for accessibility.

Summary of accessibility barriers on this page for deaf users:

The main hindrance for deaf users would be the videos again. The first video provides no captioning to aid in following the content of the video, and without captioning; they would not be able to use the video.

Summary of accessibility barriers on this page for users who are both deaf and blind:

Any issues of redundancy need to be eliminated so that any screen reader that converts to braille would be able to do efficiently. Repeat information would make this process more frustrating, so in much the same way, the issues with reading order and redundancy are the same for deaf and blind. The navigation is repetitive and lacking context, and the content slider repeats itself multiple times, which makes navigating the site using a specialized machine frustrating.

Summary of accessibility barriers on this page for sighted users who cannot use a mouse:

Keyboard-only access to the website is very frustrating because the tab order is illogical, and sometimes users can get caught in keyboard traps that take some time getting unstuck. There are also elements of the forms that seem to skip in certain browsers, which would make booking a trip almost impossible.

Summary of accessibility barriers on this page for users who are susceptible to seizures:

Users that are susceptible to seizures would have a hard time viewing the videos that were chosen for the site. Each video contains at least something about it that would probably trigger some uncomfort in these users. Whether it is a montage of pictures flashing too quickly, or starts/ions exploding on a space backdrop, these videos would need to be reviewed before making the website live.

Summary of accessibility barriers on this page for users who have cognitive disabilities:

The website layout is a bit confusing for users with cognitive disabilities. I think that the three-story featurette structure may not be the best design decision for this type of user.

Also, for users that have trouble focusing on text, the slider at the bottom at the edge of their site would cause problems when trying to read other portions of the content.