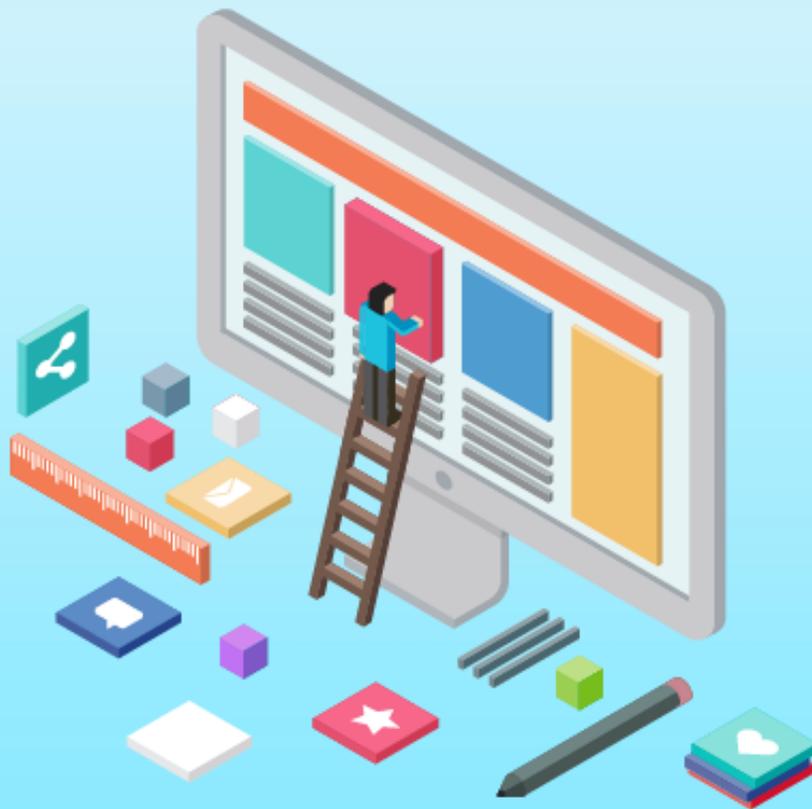


# Heuristic Evaluation of Official Website for Virginia's EZ Pass System

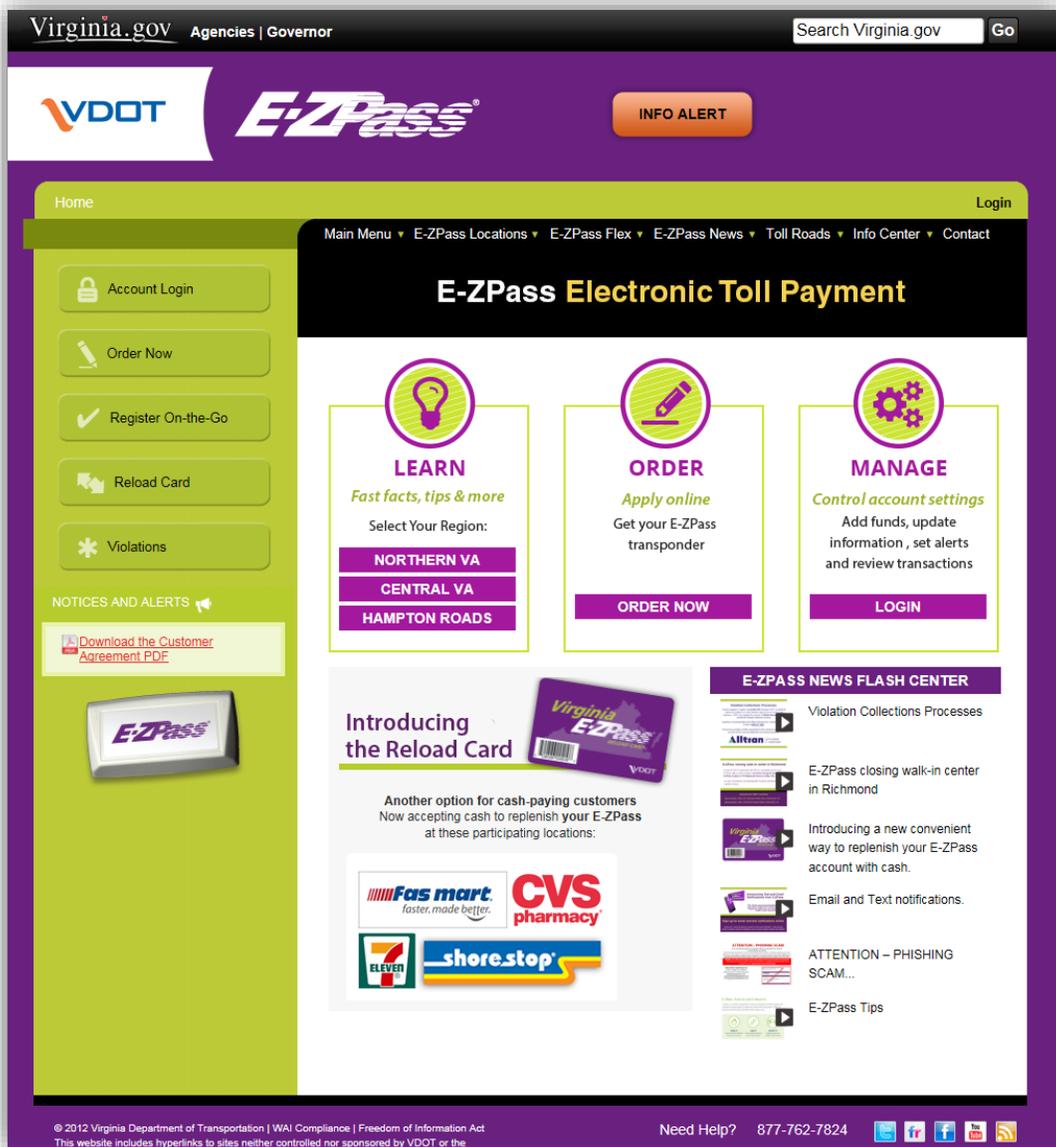


In Fulfillment of the Exercise 5  
HCIN – 610 Foundations of Human-Computer Interaction  
Presented by Group 2

**General Information**

<b>Organization</b>	Official Website for Virginia's EZ Pass System
<b>URL</b>	<a href="http://www.ezpassva.com">http://www.ezpassva.com</a>
<b>Set of Guidelines</b>	<ol style="list-style-type: none"> <li>Nielsen's 10 principles</li> <li>WebAim's WCAG 2.0 Checklist</li> <li>Gestalt Principles</li> </ol>

**Visualization of the Website**

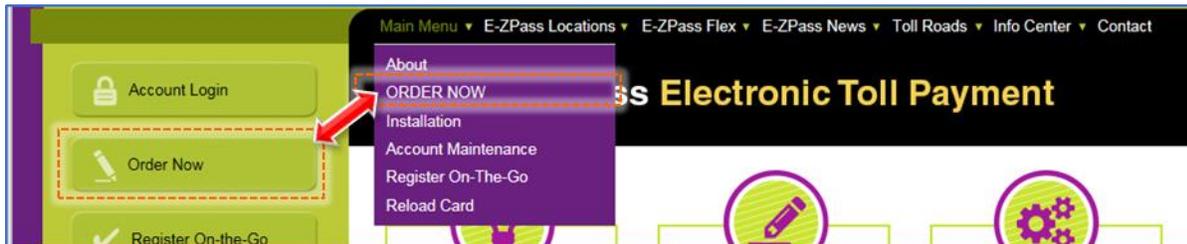


## Heuristic Evaluation Results

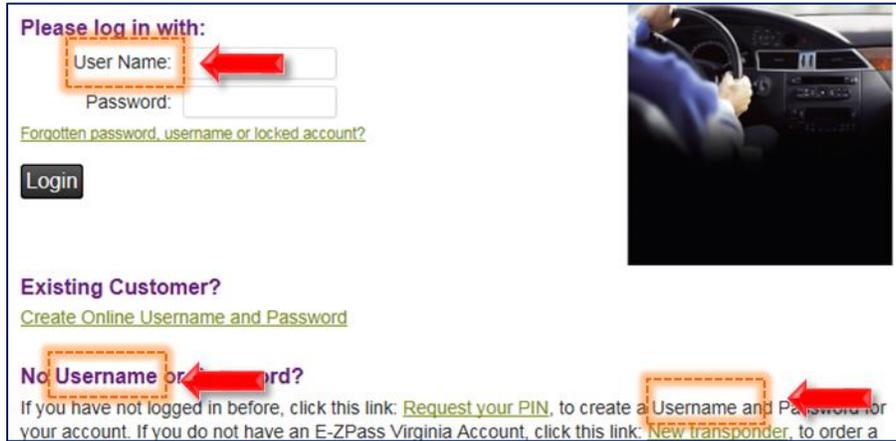
PROBLEM 1	
<b>STANDARD</b>	Consistency and Standards (Nielsen’s 10 Heuristics)
<b>SEVERITY</b>	3
<b>DESCRIPTION</b>	There are many menus and submenus with too many confusing options. The hierarchy of the website organization is not clear. Many menu options are similar, but not quite the same, leading to confusion due to the inconsistency.
<b>SOLUTION</b>	Rework information architecture and establish a clearer navigation system with more streamlined menu options.
<b>SCREENSHOT (IF ANY)</b>	



PROBLEM 2	
<b>STANDARD</b>	Consistency and Standards (Nielsen’s 10 Heuristics)
<b>SEVERITY</b>	1
<b>DESCRIPTION</b>	The “ORDER NOW” menu option is sometimes listed in ALL CAPS and in CamelCase elsewhere, leading to confusion due to the inconsistency.
<b>SOLUTION</b>	Convert any instances of “ORDER NOW” to “Order Now”.
<b>SCREENSHOT (IF ANY)</b>	



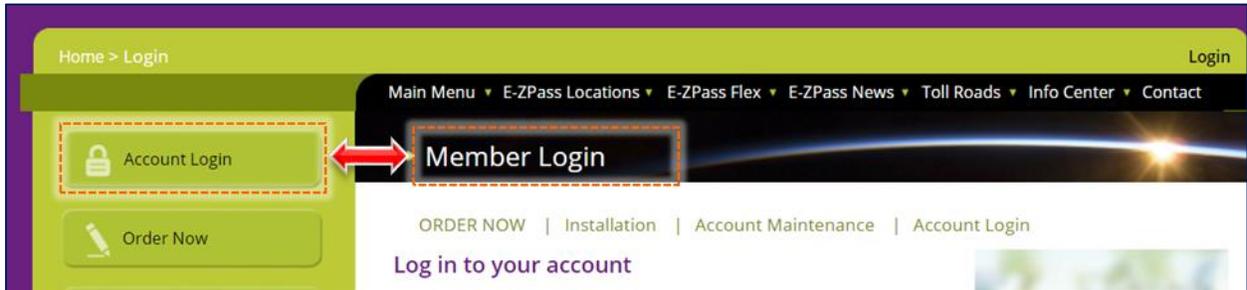
<b>PROBLEM 3</b>	
<b>STANDARD</b>	Consistency and Standards (Nielsen’s 10 Heuristics)
<b>SEVERITY</b>	1
<b>DESCRIPTION</b>	The “Username” field name is sometimes listed as one word, and as two words elsewhere, leading to confusion due to the inconsistency.
<b>SOLUTION</b>	Convert any instances of “User Name” to “Username”.
<b>SCREENSHOT (IF ANY)</b>	



<b>PROBLEM 4</b>	
<b>STANDARD</b>	Consistency and Standards (Nielsen’s 10 Heuristics)
<b>SEVERITY</b>	1
<b>DESCRIPTION</b>	On the Info Center page, the dropdown Submenu says “Forms/Agreement”, the page’s submenu says “Forms” and the header says “E-Zpass transponder forms” leading to confusion due to the inconsistency.
<b>SOLUTION</b>	Convert “Forms/Agreement” and “E-Zpass transponder forms” to “Forms”.
<b>SCREENSHOT (IF ANY)</b>	



PROBLEM 5	
<b>STANDARD</b>	Consistency and Standards (Nielsen’s 10 Heuristics)
<b>SEVERITY</b>	2
<b>DESCRIPTION</b>	The “Account Login” menu option phrase is sometimes used and “Member Login” is used elsewhere. This confuses users as to what the difference is between these two phrases or are these both the same?
<b>SOLUTION</b>	Convert any instances of “Member Login” to “Account Login”.
<b>SCREENSHOT (IF ANY)</b>	



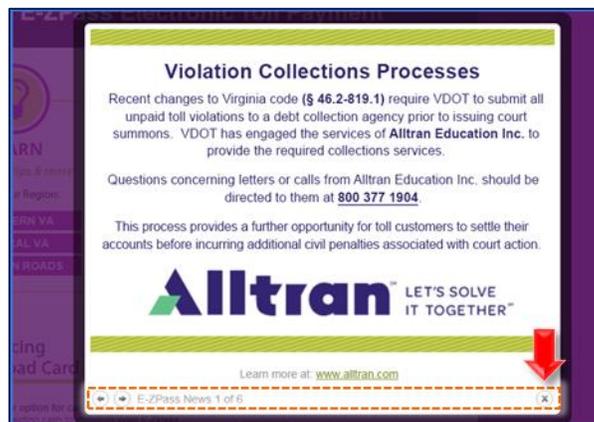
PROBLEM 6	
<b>STANDARD</b>	Consistency and Standards (Nielsen’s 10 Heuristics)
<b>SEVERITY</b>	2
<b>DESCRIPTION</b>	After clicking “E-Z Pass Locations” menu option, the page title and breadcrumb say “Store Locations”. There is some confusion due to the inconsistency whether E-Z Pass Locations is the same thing as Store Locations.
<b>SOLUTION</b>	Change any instances of “Store Locations” to “E-Z Pass Locations”.
<b>SCREENSHOT (IF ANY)</b>	



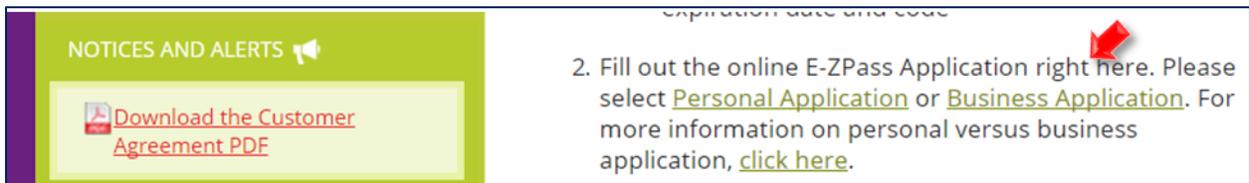
PROBLEM 7	
<b>STANDARD</b>	Consistency and Standards (Neilsen’s 10 Heuristics)
<b>SEVERITY</b>	1
<b>DESCRIPTION</b>	On the Violations page, there are 2 different formats for phone numbers- one with hyphens and one without. One of the instances has the phone number split onto 2 lines which hinders readability and understanding.
<b>SOLUTION</b>	phone numbers should all be in the same format – (XXX) XXX-XXXX and kept on the same line
<b>SCREENSHOT (IF ANY)</b>	



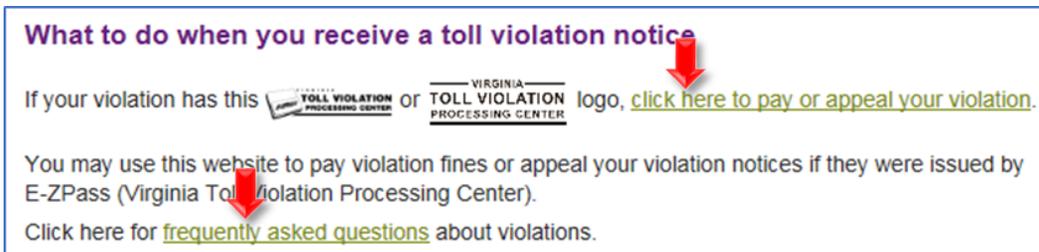
PROBLEM 8	
<b>STANDARD</b>	Consistency and Standards (Neilsen’s 10 Heuristics)
<b>SEVERITY</b>	3
<b>DESCRIPTION</b>	After clicking the play buttons on the home page, the popup windows have an “X” for closing in the bottom right corner instead of the top right, not following standard conventions which users are used to.
<b>SOLUTION</b>	Move the X in the popup windows to the upper right corner.
<b>SCREENSHOT (IF ANY)</b>	



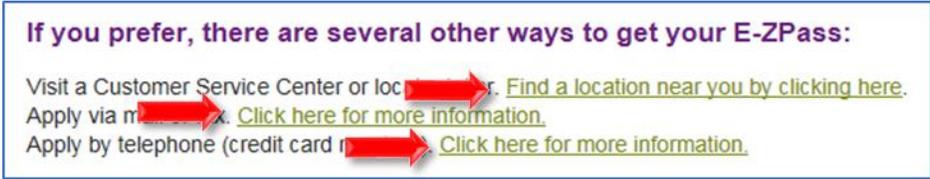
PROBLEM 9	
<b>STANDARD</b>	Link Purpose - Link Only (WebAIM 2.4.9)
<b>SEVERITY</b>	2
<b>DESCRIPTION</b>	On "ORDER NOW" page, Step 2: "Fill out the online E-Z Pass Application right here", there is no link on "right here" and the words "right here" are not necessary. The "click here" link is not descriptive for screen readers or concise for easy reading. "Fill out the online E-Z Pass Application" should be hyperlinked.
<b>SOLUTION</b>	Make hyperlink text more concise. Remove words such as "click here" or "right here".
<b>SCREENSHOT (IF ANY)</b>	



PROBLEM 10	
<b>STANDARD</b>	Link Purpose - Link Only (WebAIM 2.4.9)
<b>SEVERITY</b>	1
<b>DESCRIPTION</b>	On the Violations page, "Click here for frequently asked questions about violations". There is no link on "click here" and the words "click here" are not even necessary. The link is not descriptive for screen readers or concise for easy reading.
<b>SOLUTION</b>	Make hyperlink text more concise. Remove phrases such as "click here". "Frequently Asked Questions about violations" would be better hyperlink text.
<b>SCREENSHOT (IF ANY)</b>	



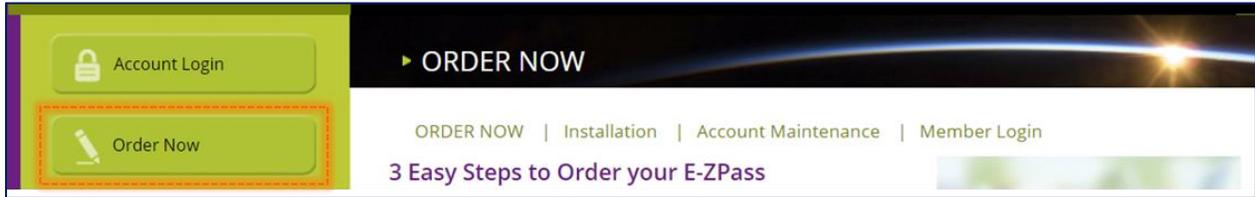
PROBLEM 11	
<b>STANDARD</b>	Link Purpose - Link Only (WebAIM 2.4.9)
<b>SEVERITY</b>	1
<b>DESCRIPTION</b>	On the ORDER NOW page, the links are not concise or descriptive. "Click here for more information" is not necessary. The link is not descriptive for screen readers or concise for easy reading.
<b>SOLUTION</b>	Shorten links and make them descriptive for screen readers. Remove "click here for more information" as it's not necessary or descriptive.
<b>SCREENSHOT (IF ANY)</b>	



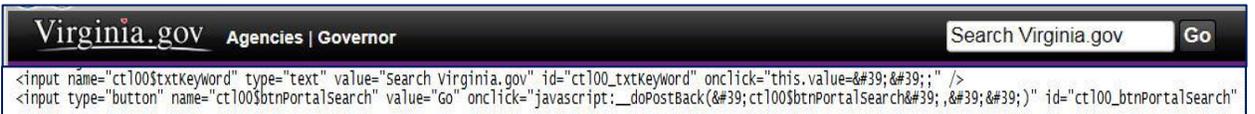
PROBLEM 12	
<b>STANDARD</b>	Images of Text (WebAIM 1.4.5)
<b>SEVERITY</b>	3
<b>DESCRIPTION</b>	On the Violations page, these images which contain important information do not have descriptive enough alt tags so the information is accessible to those using screen readers. The current alt tags say "Violation Logo". How will those using screen readers know what these logos actually display?
<b>SOLUTION</b>	The alt tags should say "EZPass Toll Violation Processing Center" and "Virginia Toll Violation Processing Center" so that users relying on screen readers will perceive the same content as fully sighted users.
<b>SCREENSHOT (IF ANY)</b>	



<b>PROBLEM 13</b>	
<b>STANDARD</b>	Visibility of System Status (Nielsen’s 10 Heuristics)
<b>SEVERITY</b>	2
<b>DESCRIPTION</b>	(Sub)Menu options are not highlighted or visibly differentiated from other menu options after being clicked on. This makes it harder for users to understand where they are on the site and to remember what they clicked to get there. With all of the possible menu options on this site, this lack of visual cues makes it more difficult to understand the organization of the site.
<b>SOLUTION</b>	Although the header of the page shows the appropriate title, additional reinforcing visuals to highlight the selected menu option would be helpful, especially for those with reading difficulties, for instant recognition on where one is and what the user had selected
<b>SCREENSHOT (IF ANY)</b>	



<b>PROBLEM 14</b>	
<b>STANDARD</b>	Non-text Content (WebAIM 1.1.1)
<b>SEVERITY</b>	1
<b>DESCRIPTION</b>	According to the HERA evaluation tool, there is no label for the search form at the top of the site in the HTML, which makes it not accessible for screen readers.
<b>SOLUTION</b>	Add a label to the search form field in the code.
<b>SCREENSHOT (IF ANY)</b>	



PROBLEM 15	
<b>STANDARD</b>	Help users recognize, diagnose, and recover from errors (Neilsen's 10 Heuristics)
<b>SEVERITY</b>	2
<b>DESCRIPTION</b>	On the Member Login page, the error message should be displayed closer to the applicable fields so that it is more visible and noticeable to where the user is visually focused. The feedback could be more specific whether the problem is the username or the password to aid in troubleshooting.
<b>SOLUTION</b>	Move error message up closer to the fields. Specify whether the issue is the username, the password, or both.
<b>SCREENSHOT (IF ANY)</b>	

The screenshot shows a login form with the following elements:

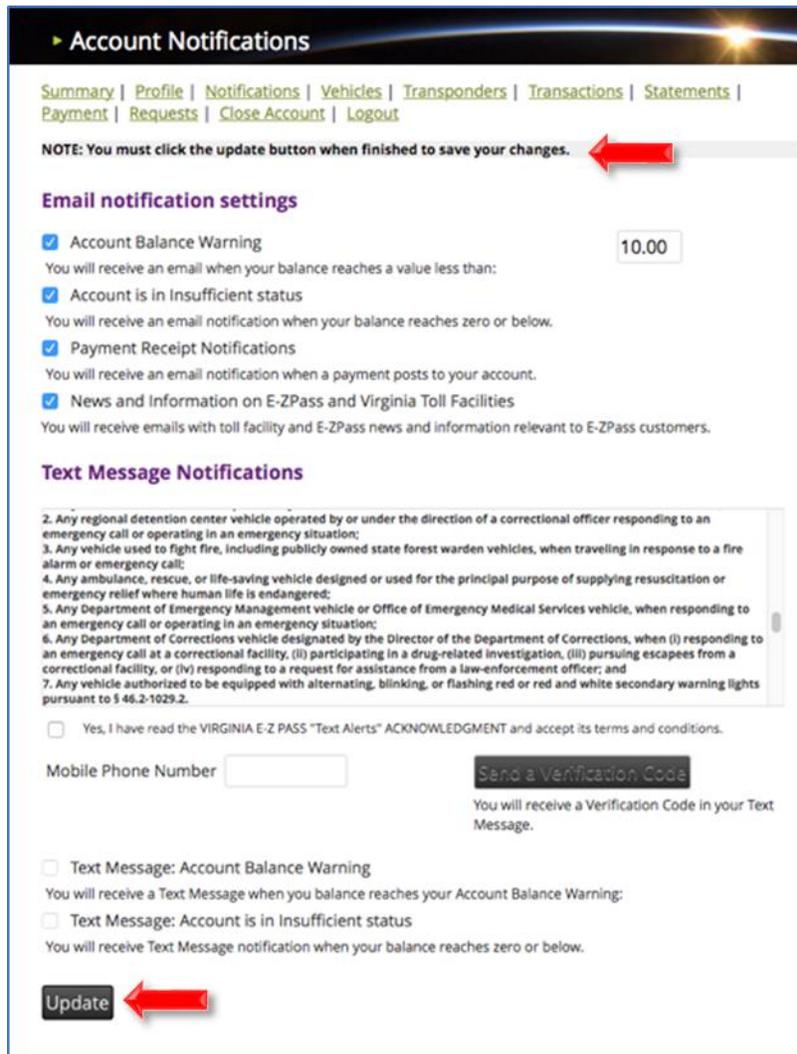
- Header: "Please log in with:"
- User Name field: contains "hrerere"
- Password field: empty
- Link: "Forgotten password, username or locked account?"
- Login button: "Login"
- Error message: "Invalid username or password." (highlighted with a red dashed box)

PROBLEM 16	
<b>STANDARD</b>	Proximity (Gestalt Principles)
<b>SEVERITY</b>	2
<b>DESCRIPTION</b>	On the Transactions page, the field input is displayed very far from its label. Therefore it is unclear if they belong together.
<b>SOLUTION</b>	Move field and label much closer together.
<b>SCREENSHOT (IF ANY)</b>	

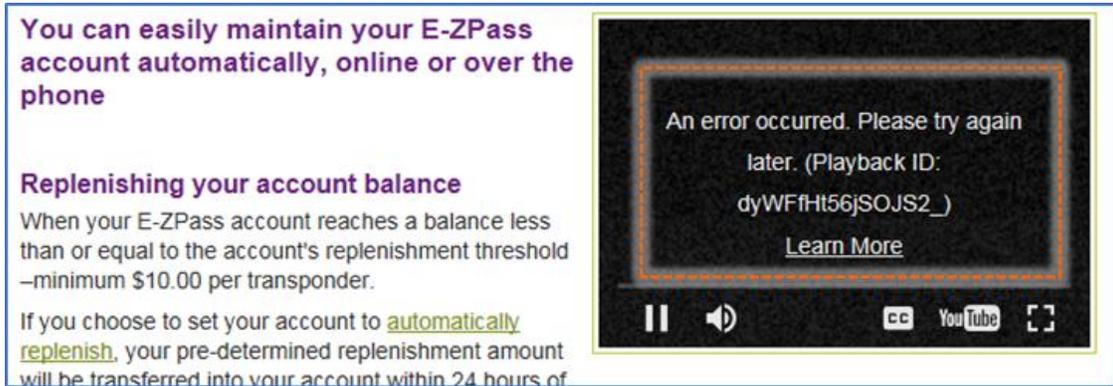
The screenshot shows a "Transactions" page with the following elements:

- Header: "► Transactions"
- Navigation links: "Summary | Profile | Notifications | Vehicles | Transponders | Transactions | Statements | Payment | Requests | Close Account | Logout"
- Note: "NOTE: You can see transactions for up to 360 days using this page. To sort columns click on the header section. To download your transactions click link on the bottom of the page"
- Form field: "Transactions per page:" with a value of "30" (highlighted with a red dashed box)

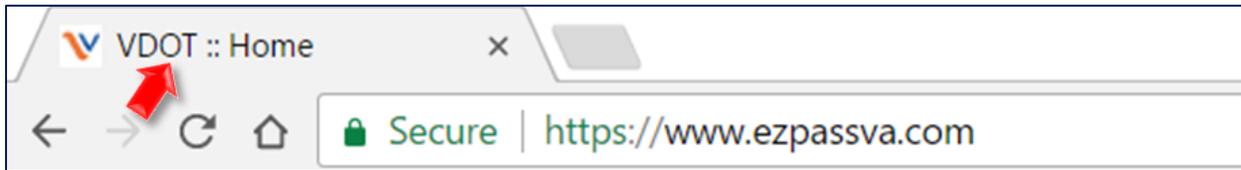
<b>PROBLEM 17</b>	
<b>STANDARD</b>	Error Prevention (Nielsen’s 10 Heuristics)
<b>SEVERITY</b>	2
<b>DESCRIPTION</b>	On the Account Notifications page, the note “NOTE: You must click the “Update” button when finished to save your changes” should not be necessary. The “Update” button is at the very bottom of the long screen where users would likely need to scroll. Users would likely forget to save their changes because they cannot see the Update button, which is why they needed to add this note on this already busy page.
<b>SOLUTION</b>	Place an additional Update button near the top of the page, make the button stand out, and this Note would not be necessary. When leaving the page, ask the user if they want to save their changes if they have not clicked Update button after making changes.
<b>SCREENSHOT (IF ANY)</b>	



PROBLEM 18	
<b>STANDARD</b>	Error Prevention (Nielsen’s 10 Heuristics)
<b>SEVERITY</b>	3
<b>DESCRIPTION</b>	On the Account Maintenance page, the video did not play as expected and an error displayed with technical jargon (the long Playback ID number) which could be confusing and intimidating to the user.
<b>SOLUTION</b>	Troubleshoot video link/upload.
<b>SCREENSHOT (IF ANY)</b>	



PROBLEM 19	
<b>STANDARD</b>	Page Titled (WebAIM 2.4.2)
<b>SEVERITY</b>	1
<b>DESCRIPTION</b>	The HTML page title is not very descriptive, stating simply "VDOT : Home". There is no mention that it is the home page for E-ZPass, which makes it less accessible.
<b>SOLUTION</b>	Solution- make HTML page title more descriptive, saying it is the home page for Virginia E-ZPass
<b>SCREENSHOT (IF ANY)</b>	



PROBLEM 20	
<b>STANDARD</b>	Page Titled (WebAIM 2.4.2)
<b>SEVERITY</b>	1
<b>DESCRIPTION</b>	The language of the site is not identified using the HTML language attribute.
<b>SOLUTION</b>	Add language (English) tag to the HTML
<b>SCREENSHOT (IF ANY)</b>	None

PROBLEM 21	
<b>STANDARD</b>	Focus Visible (WebAIM 2.4.7)
<b>SEVERITY</b>	2
<b>DESCRIPTION</b>	When tabbing through the page, the selected menu items and fields are not visibly highlighted when using Tab on the keyboard for those who use keyboards to navigate the website.
<b>SOLUTION</b>	Make all menu options available by tabbing.
<b>SCREENSHOT (IF ANY)</b>	None

PROBLEM 22	
<b>STANDARD</b>	Match Between System and the Real World (Nielsen's 10 Heuristics)
<b>SEVERITY</b>	2
<b>DESCRIPTION</b>	There is no description of what On-The-Go is. It is unclear if this is their name for all transponders or if this is a special type of transponder, since they just use the term "transponder" frequently on the website and also use the phrase "Flex Transponder" elsewhere.
<b>SOLUTION</b>	Begin this section with a sentence or two about what On-The-Go is and if it is synonymous with "transponder".
<b>SCREENSHOT (IF ANY)</b>	



<b>PROBLEM 23</b>	
<b>STANDARD</b>	Match between system and the real world (Neilsen's 10 Heuristics)
<b>SEVERITY</b>	3
<b>DESCRIPTION</b>	In the "Log in" page – when a user want to create his/her new account, it is prone to be confusing for the user. The phrase "Existing Customer?" is not clear in terms of what it means. Moreover, the user can be uncertain about the difference between the "Existing Customer" and "No Username or Password" options.
<b>SOLUTION</b>	In this case, the user needs to have account number and PIN before hands. The page should be redesigned with logical order with step-by-step methods or using wizard to prevent user from being confused.
<b>SCREENSHOT (IF ANY)</b>	

**Log in to your account**

Please log in with:

User Name:

Password:

[Forgotten password, username or locked account?](#)



**Existing Customer?**

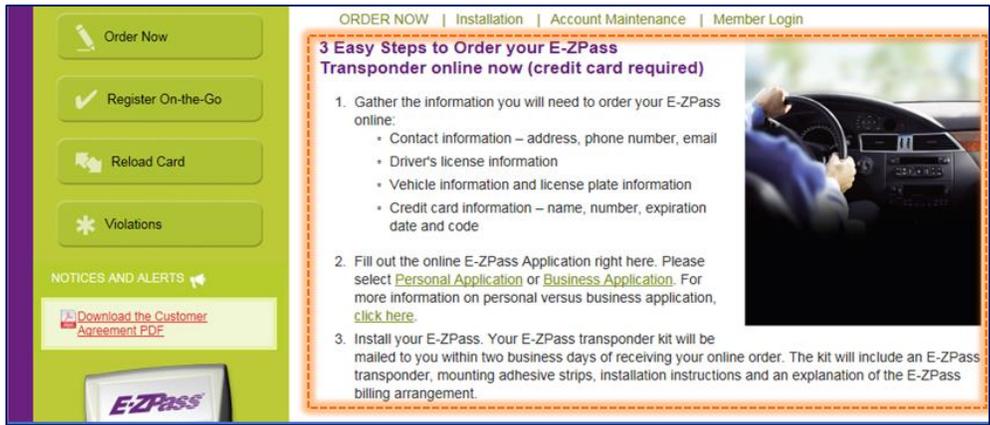
[Create Online Username and Password](#)

**No Username or Password?**

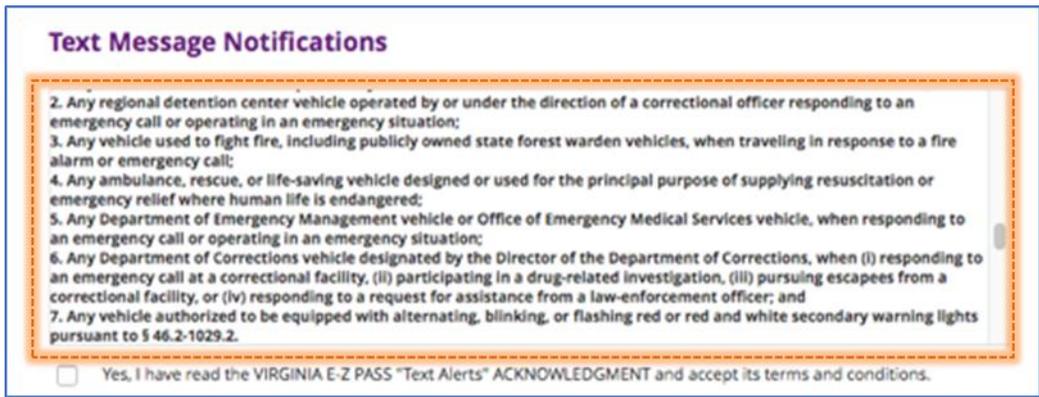
If you have not logged in before, click this link: [Request your PIN](#), to create a Username and Password for your account. If you do not have an E-ZPass Virginia Account, click this link: [New transponder](#), to order a new transponder and open an account. If you are registering a retail transponder and do not have an existing account, click this link: [Register retail tag](#), to register your transponder by opening a new account.

You will receive your PIN and account reset instructions by email.

<b>PROBLEM 24</b>	
<b>STANDARD</b>	Aesthetic and Minimalist Design (Nielsen’s 10 Heuristics)
<b>SEVERITY</b>	2
<b>DESCRIPTION</b>	On the “ORDER NOW” page, the “3 Easy Steps to Order” section is very verbose, lengthy, and could be hard to understand for users, especially for those with cognitive dysfunction. There are many steps, sub-steps, and links which could be confusing to some users.
<b>SOLUTION</b>	Simplify text and make it more concise.
<b>SCREENSHOT (IF ANY)</b>	



<b>PROBLEM 25</b>	
<b>STANDARD</b>	Aesthetic and Minimalist Design (Nielsen’s 10 Heuristics)
<b>SEVERITY</b>	2
<b>DESCRIPTION</b>	On the Notifications page, the Terms and Conditions section is very wordy and hard to read. It may not be legally necessary to display all of this content, and may be able to be simplified.
<b>SOLUTION</b>	If deemed unnecessary by legal department, remove or simplify as much as possible by lawyers.
<b>SCREENSHOT (IF ANY)</b>	



**PROBLEM 26****STANDARD** Aesthetic and Minimalist Design (Nielsen's 10 Heuristics)**SEVERITY** 2**DESCRIPTION** On the Vehicles page, all of the fields for a new vehicle do not need to display right away unless the user wants to add a new vehicle. There is too much-crowded information and the Add Vehicle link is buried in content and hard to notice.**SOLUTION** Move the new vehicle form fields to a new page or hidden screen. User can come to this page, see the existing vehicles, and click a button to add a new vehicle if they choose.**SCREENSHOT (IF ANY)**

License Plate No \*  State VA

Make \*  Model \*

Year \*  Color \*

Vehicle Type

Vehicle Description

**Add Vehicle**

Plate No	State	Plate Type	Vehicle Description	Make	Model	Year	Color	
VA		Automobile and Sport Utility	2 axes, 4 tires (up to 7,000 lbs) = class 72	FORD	FUSION	2012	BLUE	Delete Edit

**PROBLEM 27****STANDARD** Aesthetic and Minimalist Design (Nielsen's 10 Heuristics)**SEVERITY** 1**DESCRIPTION** On the Vehicles page, this note is too wordy and unnecessary. If users want to add a new vehicle, it should be intuitive that they click a distinctive Add Vehicle button or link and fill out the forms. If form fields are on a page, users should know they can be filled out. Clear Edit and Delete buttons or links should also be self-explanatory without needing detailed instructions.**SOLUTION** Remove the note. The form fields should be enough to inform users that they can be filled out.**SCREENSHOT (IF ANY)**

**Vehicle Information**

**NOTE:**  
 To add a new vehicle to your account, enter the vehicle information in the form below, and click 'Add Vehicle'.  
 To make changes to an existing vehicle, click on the 'Edit' link next to the vehicle, edit the information in the form below, and click 'Update Vehicle'.  
 To remove a vehicle from your account, click the 'Delete' link next to the vehicle.

License Plate No \*  State VA

<b>PROBLEM 28</b>	
<b>STANDARD</b>	Aesthetic and Minimalist Design (Nielsen's 10 Heuristics)
<b>SEVERITY</b>	2
<b>DESCRIPTION</b>	On the Account Maintenance page- The verbiage is too wordy and the columns are too wide (over 80 characters). This makes it too difficult to read, especially for those with reading and other cognitive dysfunction disabilities.
<b>SOLUTION</b>	Simplify and make the language more concise. Make columns <80 characters wide.
<b>SCREENSHOT (IF ANY)</b>	

▶ Account Maintenance

Installation | Account Maintenance | Member Login

**You can easily maintain your E-ZPass account automatically, online or over the phone**

**Replenishing your account balance**

When your E-ZPass account reaches a balance less than or equal to the account's replenishment threshold—minimum \$10.00 per transponder.

If you choose to set your account to [automatically replenish](#), your pre-determined replenishment amount will be transferred into your account within 24 hours of reaching the replenishment threshold. If you experience problems, you should contact the E-ZPass Customer Service Centers.

If you choose to [replenish manually](#), that's easy, too. You can add funds to your account by phone or online with a credit card, or mail your payment to one of our [E-ZPass Customer Service Centers](#). It can take up to 24 hours for new accounts, payments, and new transponders to be activated and reflected at Virginia toll plazas, and up to 48 hours out of state.

If you are traveling out of state and replenish your account by cash, it's a good idea to check your balance before you go.

**Managing your account information**

[Free quarterly account statements](#) are available online to help you keep track of your E-ZPass expenses. [Detailed monthly statements](#) are also available starting at \$1.00 per month. Additionally, free transaction reporting is available online.

If you move, get a new vehicle, or change your credit card or bank account, you can update that information securely online, by phone at (877) 762-7824, or at your nearest [E-ZPass Customer Service Centers](#).

Should you wish to get an additional transponder, transfer a transponder, get a privacy statement or close an account, you can download all the necessary [forms and information](#), or log into your account to request these actions to be processed.

**Introducing convenient email and text notifications**

Email notifications are a convenient way to be alerted when you reach a low balance threshold and/or run out of funds. Now, E-ZPass also offers convenient text notifications.

You can [sign-up](#) to receive email and text alerts when your account reaches a low level or insufficient status.

*(Please note: A valid email address is required to receive email notifications. A valid cell phone number is required to receive text notifications, and your carrier's standard text message rates will apply.)*

Email is the fastest way for us to contact you regarding other issues with your account so please make sure we have a current email address for you.

**Exchanging for a new transponder**

If your transponder stops working or you would like to exchange your transponder for a different type, you can log into your account online and request an exchange on the transponders page, mail it to the E-ZPass Customer Service Centers, P.O. Box 1234, Clifton Forge, VA 24422-1234, or drop it by the [E-ZPass Customer Service Centers](#) nearest you.

## Conclusion

After evaluating the Virginia E-ZPass website, our team has concluded that this website has various usability and accessibility issues that need to be worked on. Although none of the issues we found were considered catastrophic, there are many website issues regarding consistency of terminology and formatting, especially involving menu options, which could lead to confusion for users. Content and information are often displayed in a haphazard way with lengthy text sections and require simplification so that users can comprehend the content easily. The organization and hierarchy of the website is unclear, and we believe that further efforts to organize content in a more user-friendly way, perhaps by detailed task analysis or card sorting, would be beneficial. Although some effort has been made to make this website accessible, including the use of 'alt' tags, a 'skip to main content' link and closed captioning for videos; there is more work that needs to be done to make this site fully accessible, especially to those using screen readers. This website provides a valuable service to drivers and passengers in Virginia and should be improved to make E-ZPass tasks easier to accomplish for all users.