

Module 2: The Draft Cumulative Effects Analysis Five-Step Framework

| Time Start | Time Stop | Onscreen Visual Description | Voiceover |
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| 0:00 | 0:02 | The Highway 413 project logo is on screen. Acoustic upbeat music plays in background. A friendly, male voice narrates throughout the video. | - |
| 0:03 | 0:11 | The logo fades to a video of a highway with a truck driving on it. Overlaid is text that says, “We are continuing our discussion of Cumulative Effects for the Highway 413 project, and will be reviewing how we study and measure Cumulative Effects.” | In this e-learning module we are continuing our discussion of Cumulative Effects for the Highway 413 project, and will be reviewing how we study and measure Cumulative Effects. |
| 0:12 | 0:18 | The video fades to an illustration of a computer with the text, “Module 1” overlaying it. | If you haven’t already, please watch Module 1, which gives a brief overview of the project and describes key definitions. |
| 0:19 | 0:21 | The text fades and a video of falling rain appears, with overlaying text stating, “How do we study and measure Cumulative effects?” | How do we study and measure Cumulative Effects? |
| 0:22 | 0:30 | The previous imagery fades into a white background with the text, “Five Step Framework” on top. The numbers 1, 2, 3, 4 and 5 float on top to form a timeline and illustrate the Five Step Framework. | The Ontario Ministry of Transportation has drafted a five-step Framework that will be used to assess Cumulative Effects for the Highway 413 project. |
| 0:30 | 0:43 | The screen fades to white, and an illustration of a man looking at an oversized sheet of paper featuring the Five Step Framework appears. On the left side of the illustration is the text, “Highway 413 draft Cumulative Effects Assessment Framework Development.” At 0:36 a magnifying glass appears | The Highway 413 draft Cumulative Effects Assessment Framework was developed based on a comprehensive review of background information, including federal and provincial guidance documents and completed Cumulative Effects Assessments. |

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| | | over the lower right corner of the oversized paper and is animated to wave. | |
| 0:43 | 0:53 | The white fades and is replaced with a photo of a person writing on a check list with an icon of a checklist. On the right hand side we see the text, "Cumulative Effects Assessment Framework." | Once the Framework is finalized and the preliminary studies to assess the impacts of the project are completed, if the Project is determined to have residual environmental effects, the Cumulative Effects Assessment will commence. |
| 0:53 | 0:58 | The illustration fades and is replaced by three images in columns. From left to right, the first column shows a small tree being held in someone's hands. The second column shows two stacks of coins; the left stack has a small leafed plant protruding from it, and the right stack is balancing a small wooden house figure. The third column shows a forest. Below this, text says, "The results of the Assessment will be documented as part of the Provincial Environmental Assessment" | The results of the Assessment will be documented as part of the Provincial Individual Environmental Assessment. |
| 0:58 | 1:18 | The images fade into white and are replaced by the text, "As we review the Framework, we encourage you to check out our Cumulative Effects Assessment Framework factsheet on our website." with an icon showing a check list and an unfurled scroll of paper on the right side with a download icon. | As we review the Framework, we encourage you to check out our Cumulative Effects Assessment Framework factsheet on our website – you can find this fact sheet at the bottom of this webpage. As well, we're going to use a lot of technical terms that were explained in Module 1. If you haven't |

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| | | | already, we recommend watching that module first. |
| 1:19 | 1:26 | The screen transitions to a world map overlaid with an image showing a target, and the following words, “Step 1: Scoping.” The timeline from the 5 Step Framework returns with “1” highlighted. | The first step in the Framework is called “Scoping.” This sets the parameters that will define the overall focus and scale of the Assessment. |
| 1:25 | 1:58 | The screen transitions to a blurred photo of a leaf overlaid with a white background, with the word “Scoping” floating in a black box to the left. In a bulleted list the following items float into frame: <ul style="list-style-type: none"> ■ Time Start 1:28 – Identify Valued Components ■ Time Start 1:34 – Determine Temporal Boundary ■ Time Start 1:42 – Determine Spatial Boundary ■ Time Start 1:50 – Examine other Physical Activities ■ | Scoping involves a few stages. First, we identify Valued Components that have potential residual environmental effects. Next, we determine how far into the past and the future the effects of each Valued Component may potentially occur, also known as the temporal boundary. Next, we decide how large an area to assess the potential Cumulative Effects for each Valued Component, also known as the spatial boundary. Then, we examine relevant activities that could have an effect on the project or can be affected by the project. . |
| 1:59 | 2:13 | The screen fades and a photo of a forest from the top view appears with a large icon in the centre of the screen showing a map and pencil. | Throughout this module, we will use a hypothetical project we’ll call “Project A” as an example of the potential approach and outcomes. We will focus on how |

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| | | <ul style="list-style-type: none"> Time Start 2:08 – The words, “Project A” enter in the top left of the icon | Cumulative Effects would be assessed specifically on one Valued Component: Greenhouse Gases. |
| | | <ul style="list-style-type: none"> | |
| 2:14 | 2:23 | <p>The image fades and transitions into a screen that is white on the left and green on the right. The green side has two icons with two arrows between them, pointing in opposite directions from one icon to the other. One icon is of a newspaper, and the other is of buildings.</p> <ul style="list-style-type: none"> Time Start 2:29 – The text, “Project’s direct effects and the effects of nearby existing and planned projects” floats onto the white side. | To identify the project’s Valued Components based on their potential to interact with the project and be impacted by both the project’s direct effects and the effects of nearby existing and planned projects... |
| 2:24 | 2:34 | <p>The white and green background fades and is replaced with a video of a person walking through a grassy area with fallen leaves on the ground. The text, “The Assessment established spatial boundaries for each Valued Component. As Greenhouse Gases are not locationally bound, they do not have a defined spatial scope within the Assessment” appears on top of the video.</p> | the Assessment established spatial boundaries for each Valued Component. As Greenhouse Gases are not locationally bound, they do not have a defined spatial scope within the Assessment. |
| 2:35 | 2:42 | <p>The video fades and is replaced with a photo of a beach area with icons showing various construction tools floating in the background. The text, “The Assessment was localized to areas where project</p> | However, when considering the project’s Greenhouse Gas emissions, the Assessment was localized to areas where project and project-related activities would occur. |

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| | | and project-related activities would occur” appears on top. | |
| 2:43 | 2:52 | The screen transitions to an image of a dump site where construction materials and a table have been discarded. The text on top states “Temporal Boundaries: The Assessment used the project’s planned phases to assess the potential for Cumulative Effects occurring in each phase.” | Temporal boundaries, the Assessment used the project’s planned phases to assess the potential for Cumulative Effects occurring in each phase. |
| 2:53 | 3:02 | <ul style="list-style-type: none"> ■ Time Start 3:02 – The screen fades to white. The text, “2: Construction Phase” appears in large font in the centre of the screen ■ Time Start 3:06 – The text is replaced with: “50: Operations and Maintenance Phase” ■ Time Start 3:09 – The text is replaced with: “30: Closure Phase” ■ Time Start 3:11 – The text is replaced with: “300: Post-Closure Phase” | For this hypothetical project, we’ll say that these included a two-year construction phase, 50-year operations and maintenance phase, a 30-year closure phase, and a 300-year post-closure phase. |
| 3:03 | 3:13 | The white screen transitions into an aerial view of a roadway with an overpass and merging lane. The text, “Construction, Operations, Maintenance” appears one after the other. | It is important to note that in the context of the Highway 413 Project, only the construction and operations and maintenance phases apply, since the proposed Highway will be a permanent facility; |
| 3:14 | 3:18 | The screen transitions into an office setting with two women reviewing documents. The text, “Closure or decommissioning is not anticipated for the Highway | therefore, closure or decommissioning is not anticipated. |

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| | | 413 Project” appears in large font over top the image. | |
| 3:19 | 3:24 | The screen transitions to a video showing a close up of documents and a person writing, with the text, “For each Valued Component, the extent of the available data will determine how far back the Assessment could go.” | For each Valued Component, the extent of the available data will determine how far back the Assessment could go. |
| 3:25 | 3:29 | The video fades and transitions to a person working at a laptop video. An icon displaying a process diagram is shown on the right hand side. The text, “Data would extend back to 1990” appears over top. | For Greenhouse Gases in Project A, this data would extend back to 1990. |
| 3:30 | 3:36 | The screen fades on a close up of a laptop corner, a hand and report containing a graph. The text, “Step 2: Analysis” appears, and the Five Step Framework timeline returns, with #2 highlighted. | Next is Step 2: Analysis. This step considers how all physical activities may affect each Valued Component. |

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| 3:37 | 3:45 | The video fades to show a person working at a laptop with the process map again. Text appears on screen that says, “We analyze available data and information within the temporal and spatial boundaries specific to each Valued Component.” | We analyze available data and information within the temporal and spatial boundaries specific to each Valued Component, and we also look at residual effects. |
| 3:46 | 3:54 | The video transitions to a woman working at a large desk. She is drawing on a map and has a tablet propped up next to her. The words, “Base Case, Application Case, Reasonably Foreseeable Development Case” appear in a table, with Base on the bottom, and Reasonably Foreseeable on top. | This allows us to look at and analyze the Base Case, Application Case, and the Reasonably Foreseeable Development Case. |
| 3:55 | 4:15 | The video of the woman fades, but the text in the table remains on screen. On the left side of the word, “Base” we see icons of a group of trees, a mountain range with trees, a large stalk of wheat and a car appear. On screen text below this says, “A Base Case represents existing conditions and characterizes effects from previous and existing developments and activities.” | A Base Case represents existing conditions and characterizes effects from previous and existing developments and activities. This could be things like forestry, transportation, agriculture, mining and residential and recreational development. As well, current effects of the existing operations and activities specific to the project site are considered part of the Base Case. |

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| 4:16 | 4:25 | The Base Case section of the table disappears, and an icon of gears appears next to the, “Application” section. The text on screen says, “An Application Case represents predictions of the effects of the Base Case, combined with the effects that may result from the project during the planned construction and operations phases.” | An Application Case represents predictions of the effects of the Base Case, combined with the effects that may result from the project during the planned construction and operations phases. |
| 4:26 | 4:37 | The table disappears and the words, “Valued Component” appear in large font with a broken black background. Behind the text, we see a video of falling leaves. | For our Project A – and for the Highway 413 Project- it is important to determine if these effects will contribute to the deterioration of a Valued Component, or if they will actually counteract past negative effects. |
| 4:38 | 4:51 | <p>The falling leaves disappear and the table with Applicable and Reasonably Foreseeable returns. Application disappears.</p> <ul style="list-style-type: none"> ■ Time Start 4:44 – Icons showing trees, a bridge and a train appear next to, “Reasonably Foreseeable.” The text on screen reads, “Reasonably Foreseeable Development Case represents predictions of the cumulative effects of the Application Case, which includes the Base Case, plus projects that are likely to go ahead, and can therefore be considered, “reasonably foreseeable.” | Lastly, a Reasonably Foreseeable Development Case represents predictions of the cumulative effects of the Application Case, which includes the Base Case, plus projects that are likely to go ahead, and can therefore be considered “reasonably foreseeable.” |

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| 4:52 | 5:09 | <p>The entire table reappears ovetop of an image of a peninsula with floating construction icons. The words, “Base, Application, Reasonably Foreseeable” appear again.</p> <ul style="list-style-type: none"> ■ Time Start 5:03 – The text, “Greenhouse Gas Emission” appears in a speech bubble in the Base Case section of the table. | <p>The Cumulative Effects Assessment for Project A employed a similar process to complete Step two. For Greenhouse Gas emissions, the Base Case considered the existing Greenhouse Gas sources in the surrounding area and relied on baseline emissions data to characterize the area’s contribution of Greenhouse Gas without the presence of the project.</p> |
| 5:10 | 5:17 | <p>Imagery transitions to a video of a factory setting. Text on screen reads, “For Project A the Base Case included two nearby major sources of Greenhouse Gas emissions.”</p> | <p>The Base Case included two nearby major sources of Greenhouse Gas emissions that existed prior to the project.</p> |
| 5:18 | 5:34 | <p>The imagery fades and we transition back to the peninsula with the base, application and reasonably foreseeable case table floating on top again. The text, “Project” appears in a speech bubble in the Application case box, with an icon of a bridge under construction and an icon depicting CO2 next to it.</p> | <p>In addition to the two major sources in the Base Case, the Application Case included the emissions predicted as part of the construction and operations phases of the project. The Application Case also considered the loss of natural Greenhouse Gas reducers, like forests, due to land clearing for the project.</p> |
| 5:35 | 5:42 | <p>The text, “Other Project” and an icon of a city with fumes emitting from it appears in the Reasonably Foreseeable box.</p> | <p>Finally, the Reasonably Foreseeable Development Case analyzed the additional Greenhouse Gas emissions resulting from the planned decommissioning of the project.</p> |

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| 5:43 | 5:53 | The screen transitions to a video panning over a beach side, with the text, “Step 3: Mitigation” appearing over top, and the Five Step Framework timeline appearing and highlighting number 3. | Next, Step 3: Mitigation. This is where we decide what effects can be addressed and don’t require any further assessment, and what effects we can’t address, and will therefore require further analysis. |
| 5:54 | 6:05 | The screen transitions to an aerial view of trees with an infographic, noting, “Valued Component” with an arrow pointing towards the word, “Project” to describe a pathway. The words, “No linkage, primary, or secondary” float above the graphic. | We use the term “pathway” to describe the relationship between a Valued Component and a project. We define a relationship or “pathway” as being “No Linkage, Primary, or Secondary.” |
| 6:06 | 6:22 | While the aerial view of the trees continues, the graphic shifts to the bottom right of the screen to make space for text that reads “The pathway between the two no longer exists because of environmental design feature or mitigation.” The arrow denoting a linkage disappears. | “No linkage” means there is no direct association between the project and the Valued Component, or the pathway between the two no longer exists because of environmental design features or mitigation. In short, the project will have no impact on the identified Valued Component. |
| 6:23 | 6:30 | The text fades and is replaced with an infographic showing a dotted line between the words, “Valued Component” and, “Project” with the words, “Secondary pathway” above. The text, “Secondary means the pathway could result in a measurable minor environmental change but would have small residual effects on a Valued Component.” appears below. | “Secondary” means the pathway could result in a measurable minor environmental change but would have small residual effects on a Valued Component. |

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| 6:31 | 6:39 | The aerial footage of the trees continues and the text fades and is replaced by a third infographic showing a solid line between the words, “Valued Component” and, “Project” with the words, “Primary pathway” above. The text, “Primary means the pathway is likely to result in an environmental change that could contribute to residual effects on a Valued Component relative to existing conditions” appears below. | “Primary” means the pathway is likely to result in an environmental change that could contribute to residual effects on a Valued Component relative to existing conditions. |
| 6:39 | 6:52 | The video transitions to an aerial view of a factory setting with text over top reading, “Despite planned mitigation measures for reducing the project’s Greenhouse Gas emissions, the Assessment predicted that the project would still have residual effects on Greenhouse Gas emissions.” An icon of a factory emitting smoke appears. | Let’s look again at Project A to understand this better. Despite planned mitigation measures for reducing the project’s Greenhouse Gas emissions, the Assessment predicted that the project would still have residual effects on Greenhouse Gas emissions. |
| 6:53 | 7:08 | The text on screen transitions to read, “The primary pathways for these Greenhouse Gases were associated with: <ul style="list-style-type: none"> ■ Time Start 6:56 – Fuel combustion ■ Time Start 6:57 – Waste decomposition, ■ Time Start 6:58 – Land clearing | The primary pathways for these Greenhouse Gases were associated with fuel combustion, waste decomposition and land clearing resulting in the loss of natural Greenhouse Gas reducers. As a result of these residual effects, Greenhouse Gas emissions were carried forward to Step 4. |
| 7:09 | 7:22 | The screen transitions to a close-up of a person writing, overlaid with an image showing a target and | This fourth step is called “Significance.” This is where each potential residual effect is assessed against each Valued |

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| | | the words, “Step 4: Significance.” The timeline from the 5 Step Framework returns with “4” highlighted. | Component to decide whether the residual environmental effects are adverse, significant, and their likelihood. |
| 7:23 | 7:34 | The existing text fades and is replaced with, “An adverse environmental effect is one that has negative widespread effects that can be reasonably anticipated” with the icon of an ear and a wind barometer next to it. | An adverse environmental effect is one that has negative widespread effects that can be reasonably anticipated. Examples of adverse effects include things like increased noise or a localized reduction of air quality. |
| 7:35 | 7:44 | The screen transitions to a blurred photo of a leaf overlaid with a white background, the word, “Significance” floating in a black box to the left. In a bulleted list the following words float into frame: <ul style="list-style-type: none"> ■ Magnitude ■ Geographic extent ■ Timing ■ Frequency ■ Duration ■ Reversibility | Significance is determined by considering the following factors: magnitude, geographic extent, timing, frequency, duration, and reversibility. |
| 7:45 | 7:54 | The screen transitions to footage of a person drawing with a marker and a line graph. Overlaid are the following subheadings: Unlikely, Possible, Likely and Highly Likely. | Likelihood is the probability of an effect. Four classification categories are typically used: unlikely, possible, likely, and highly likely. |
| 7:55 | 8:05 | The screen transitions to a video of a person writing with an inkwell pen with the text, “Step 5: Follow Up” appearing over top, and the Five Step | The fifth and final step is Follow Up. This involves monitoring, which is done to verify the predicted effects, identify any |

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| | | Framework timeline appearing and highlighting number “5”. | unanticipated effects, and helps us manage or limit these effects. |
| 8:06 | 8:23 | The image fades and transitions into a screen that is white on the left and green on the right. The white side has the following text: “Compliance Monitoring: Implementation of approved design standards or regulatory requirements, mitigation and conditions of approval and commitments.” The green side has an icon of a large magnifying glass focusing on two icons – the two-way arrows, and handshake. | Typically, monitoring includes one or more of the following, which may be applied during the development of the Highway 413 Project: Compliance monitoring, which confirms the implementation of approved design standards or regulatory requirements, mitigation and conditions of approval and commitments. |
| 8:24 | 8:34 | The text fades and is replaced with, “Environmental monitoring: Tracks conditions or issues during the construction and operational lifespan of a project, and subsequently provides options for the implementation of adaptive management.” Within the magnifying glass the two-way arrow remains but the handshake icon is replaced with a car icon. | Environmental monitoring, which tracks conditions or issues during the construction and operational lifespan of a project, and subsequently provides options for the implementation of adaptive management. |
| 8:35 | 8:57 | The text fades again and is replaced with, “Follow-up monitoring: Involves programs designed to test the accuracy of predicted effects, reduce or address uncertainties, determine the effectiveness of mitigation, or provide appropriate feedback for modifying or adopting new mitigation designs, policies and practices.” Within the magnifying glass the two-way arrow remains but the car icon is replaced with a check list icon. | Follow-up monitoring, which involves programs designed to test the accuracy of predicted effects, reduce or address uncertainties, determine the effectiveness of mitigation, or provide appropriate feedback for modifying or adopting new mitigation designs, policies, and practices- all of which can be used to |

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| | | | increase the certainty of effect predictions in future Environmental Assessments. |
| 8:58 | 9:03 | The screen transitions to an image of two workers in hard hats at a solar panel installation site. The text on the page reads, “With Project A, additional monitoring of Greenhouse Gases was proposed”. | With Project A, additional monitoring of Greenhouse Gases was proposed. |
| 9:04 | 9:14 | The text remains on the screen, but the background switches to a stylized image that has a forest in the background, overlaid with an image of planet earth, and further overlaid with various power and energy icons that float around the screen. | This involved periodic environmental monitoring of methane emissions from the site’s waste dumps during the operations phase to gauge the effectiveness of mitigation activities and inform potential solutions where needed. |
| 9:15 | 9:27 | The image fades to white and we see, “382 years” in large font. The text, “Following regulatory emissions requirements” flies in to sit beside the number. | It also involved compliance monitoring, which took the form of monitoring Greenhouse Gases annually over all phases of the project – a total of 382 years- to ensure the project was following regulatory emissions requirements. |
| 9:28 | 9:36 | The screen transitions into a person working. Overlaid on top of this image we see an infographic of various ecological benefits. There is text reading, “Annual follow-up monitoring was proposed to verify and compare Greenhouse Gas predictions with actual monitored emissions levels.” | Finally, annual follow-up monitoring was proposed to verify and compare Greenhouse Gas predictions with actual monitored emissions levels. |

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| 9:37 | 9:42 | The screen fades and is replaced with building blocks with letters on them spelling out, "Summary." The text, "5 Steps" and, "Reviewed the proposed 5-Step Cumulative Effects Assessment Framework" fly in above. | In this module we reviewed the proposed 5-step Cumulative Effects Assessment Framework. |
| 9:43 | 9:54 | The screen transitions to a green background with the text, "You can connect with the Project Team by going to the "Contact Us" tab on our website." An icon of a website, and an icon of a person speaking on the telephone appear. | As we discussed in Module 1, the Ministry of Transportation of Ontario wants to hear from you. If you have any questions or comments, you can connect with the Project Team by going to the "Contact Us" tab on our website. |
| 9:55 | 10:03 | The background remains and the text and icon are replaced with the words, "Please complete a short survey" with an icon of an internet browser beside it. | There is a short survey on this page that you can complete to let us know how you found these e-learning modules. We appreciate you taking the time to give us your feedback. |
| 10:04 | 10:06 | The background remains but the text and icon are replaced with the words, "Thank You." | Thank you for watching. |
| 10:07 | 10:10 | The full screen fades to white and the Highway 413 logo appears. | - |