Slide 1 - Slide 1

Audio Script and Notes to Reviewers

Welcome to Module Two, Build the T-N-M. After completing this module, you will be able to obtain data for a noise analysis. Identify noise-sensitive receptors. And demonstrate modeling point placement.

Text Captions

Module 2: Build the TNM

You will be able to:

Build the TNM

- Obtain data for noise analysis
- Identify noise- sensitive receptors
- Demonstrate modeling point placement

Determine Study Area Limits

- Define a traffic noise study area

Validate the TNM

- Gather field noise measurements
- Validate the TNM

Predict Noise Levels and Impacts

- Predict traffic noise levels and impacts

Evaluate Noise Abatement

- Determine where to place noise barriers
- Analyze traffic noise abatement measures

Assess Construction Noise

- Evaluate and control construction noise

Provide Information to Local Officials

- Provide information to local officials for undeveloped lands

Prepare a Noise Report

- Prepare a noise report to NDOT standards

Slide 2 - Slide 2

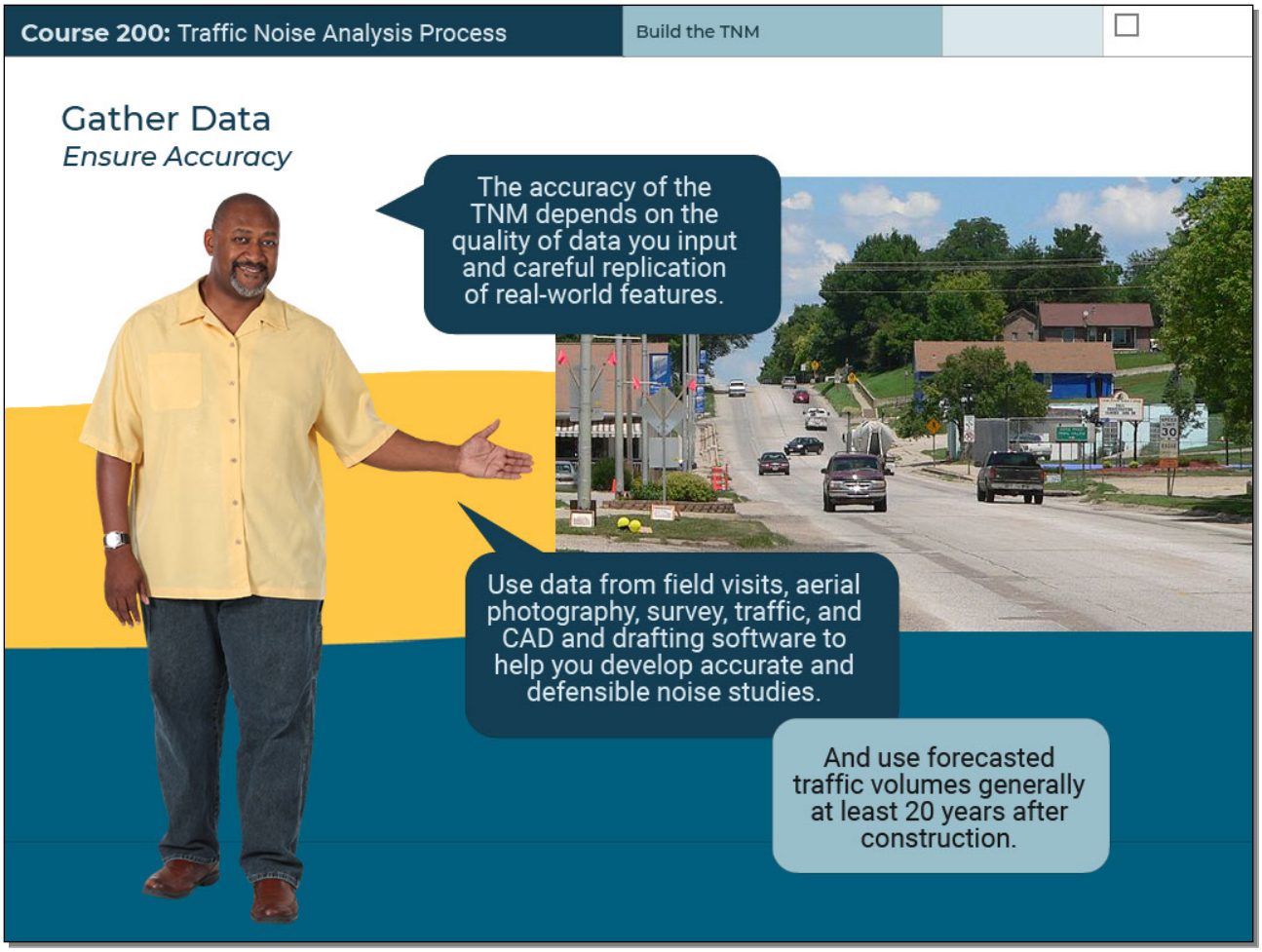
Audio Script and Notes to Reviewers

Work closely with project traffic and design engineers to obtain appropriate data. Gather traffic data, including information about peak-hour or design-hour traffic volumes, speeds, and vehicle mix to determine existing year and design year noise levels. Vehicle mix of autos, medium trucks, and heavy trucks. You should also gather roadway data, such as horizontal and vertical roadway data, including survey, profile, and cross-section files. And you should gather information about existing barriers and topography. This includes any existing noise barriers using top and bottom elevations, and dominant terrain features based on ground contours of two feet or less. Most inputs to the model will be based on X, Y, and Z coordinates.
Enter slide note

Text Captions

Gather Data
Work with Engineers
Work closely with project traffic and design engineers to obtain appropriate data, including:
Traffic Data
Gather information about peak-hour or design-hour traffic volumes, speeds, and vehicle mix to determine existing year and design year noise levels.
Roadway Data
Obtain horizontal and vertical roadway data, including survey, profile, and cross-section files.
Existing Barriers and Topography
Include any existing noise barriers (top and bottom elevations) and dominant terrain features (ground contours of 2 feet or less).

Slide 3 - Slide 3



Audio Script and Notes to Reviewers
The accuracy of the T-N-M depends on the quality of data you input and careful replication of real-world features. Use data from field visits, aerial photography, survey, traffic, and Cad and drafting software to help you develop accurate and defensible noise studies. And use forecasted traffic volumes at least twenty years after construction.

Text Captions
Gather Data
Ensure Accuracy
The accuracy of the TNM depends on the quality of data you input and careful replication of real-world features.
Use data from field visits, aerial photography, survey, traffic, and CAD and drafting software to help you develop accurate and defensible noise studies.
And use forecasted traffic volumes generally at least 20 years after construction.

Slide 4 - Slide 4

Audio Script and Notes to Reviewers
Use traffic conditions representing the worst-case noise hour as T-N-M inputs. The worst noise hour is usually the loudest noise condition and typically occurs when the highest volume of traffic is traveling at the highest possible speed.

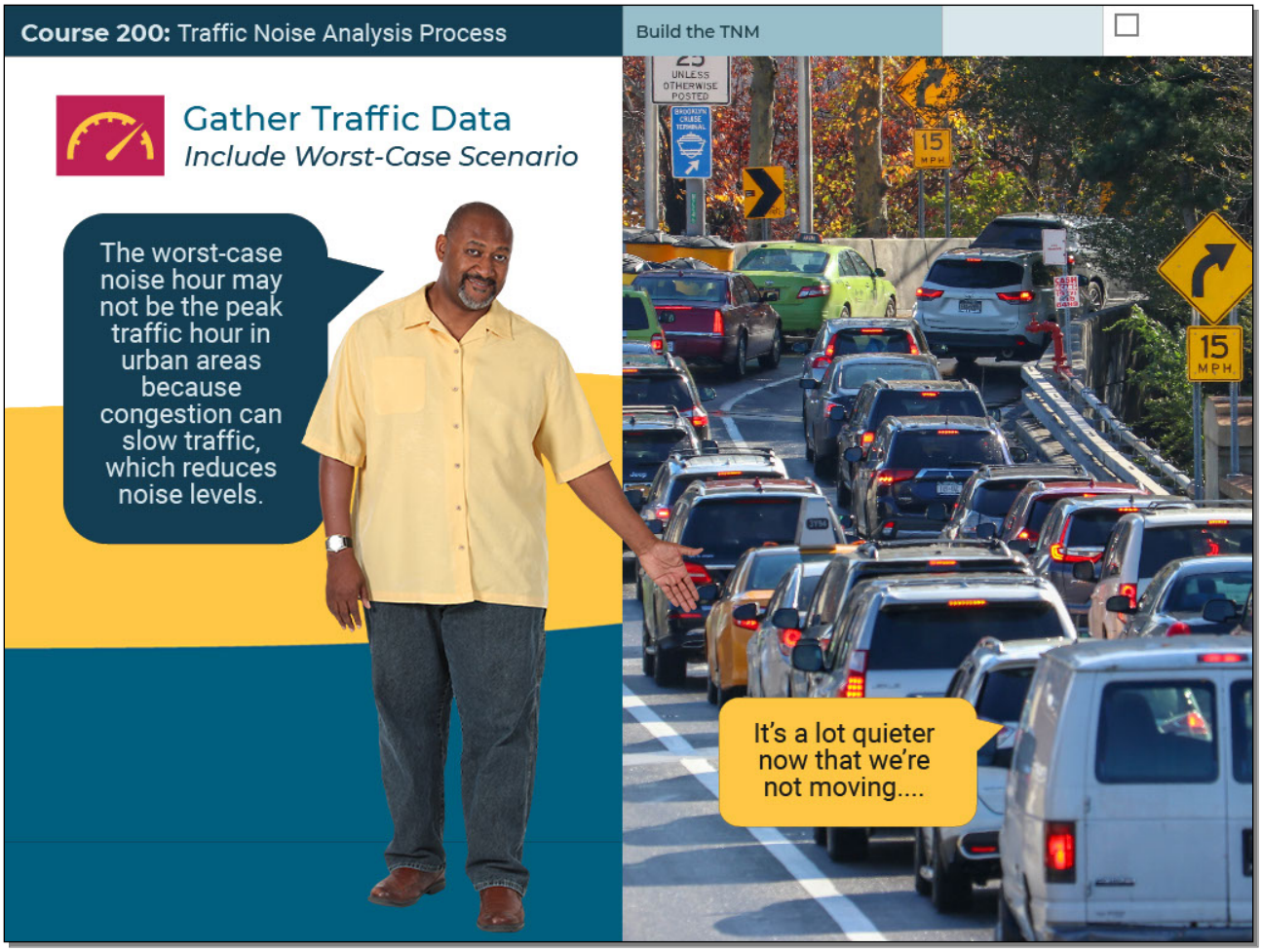
Text Captions
Gather Traffic Data
Include Worst-Case Scenario
Use traffic conditions representing the worst-case noise hour as TNM inputs.
The worst noise hour is usually the loudest noise condition and occurs when the highest volume of traffic is traveling at the highest possible speed.

Slide 5 - Slide 5

Audio Script and Notes to Reviewers
For simplicity, the worst noise hour often occurs during Level of Service C or D. N-dot typically uses Design Hourly Volume as the worst noise hour unless traffic conditions are congested.

Text Captions
Gather Traffic Data
Include Worst-Case Scenario
The worst noise hour often occurs during Level of Service C or D.
NDOT typically uses Design Hourly Volume as the worst noise hour unless traffic conditions are congested.

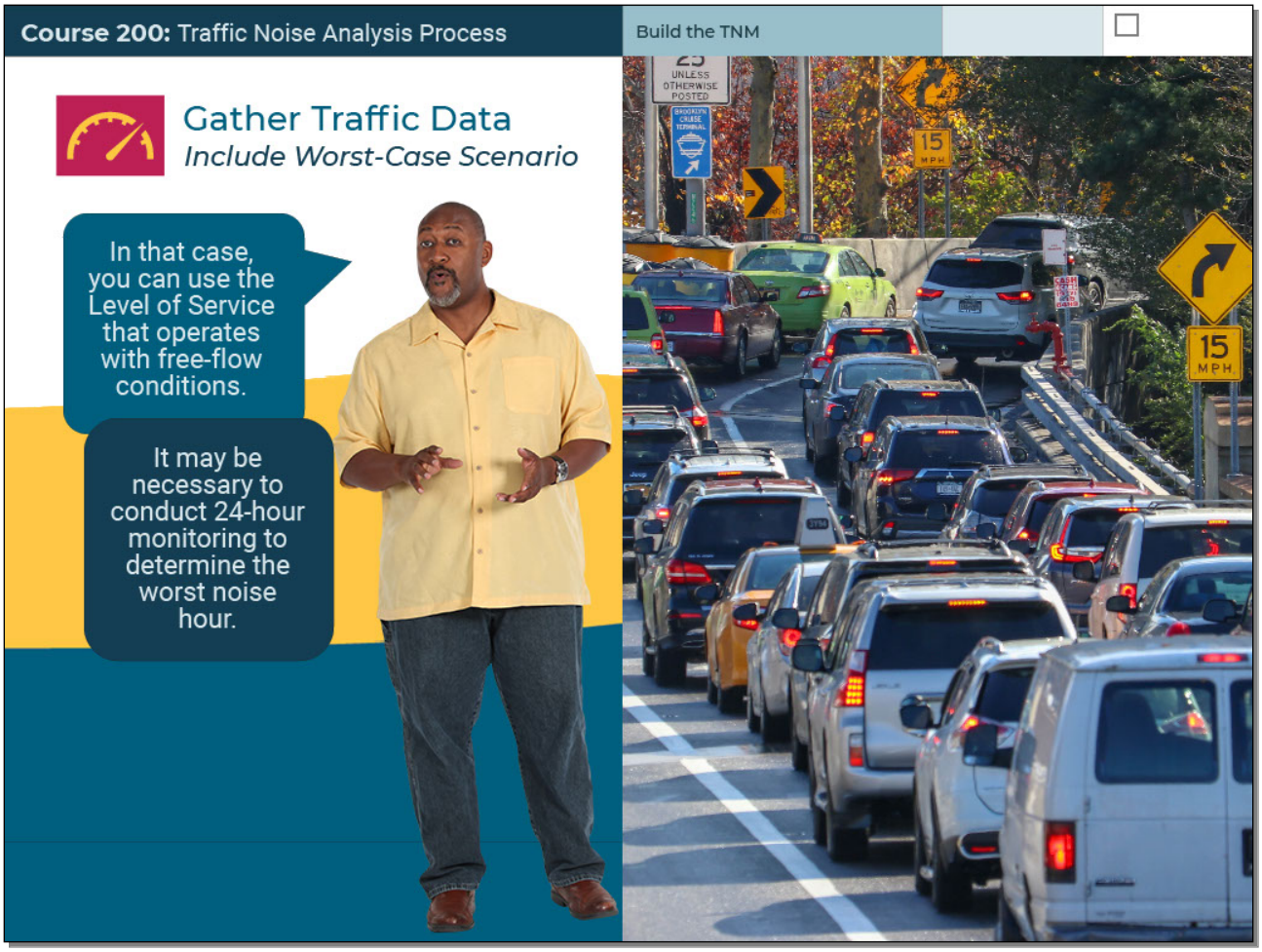
Slide 6 - Slide 6



Audio Script and Notes to Reviewers
The worst-case noise hour may not be the peak traffic hour in urban areas because congestion can slow traffic, which reduces noise levels.
It's a lot quieter now that we're not moving....

Text Captions
Gather Traffic Data
Include Worst-Case Scenario
The worst-case noise hour may not be the peak traffic hour in urban areas because congestion can slow traffic, which reduces noise levels.
It's a lot quieter now that we're not moving....

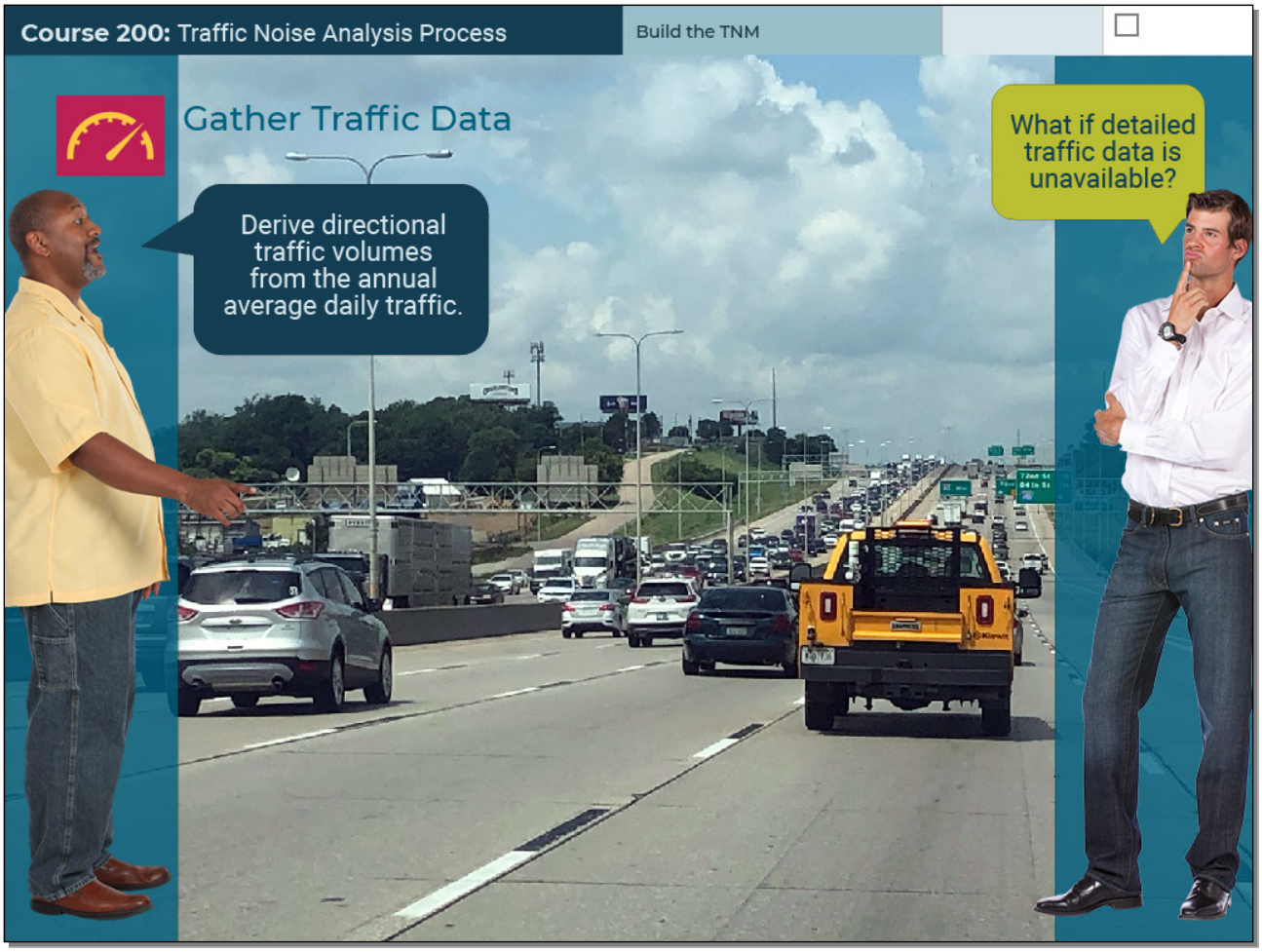
Slide 7 - Slide 7



Audio Script and Notes to Reviewers
In that case, you can use the level of service, such as “C”, where traffic operates with free-flow conditions. If there is some question as to the worst noise hour, it may be necessary to conduct twenty-four-hour monitoring to determine the worst noise hour. However, twenty-four-hour monitoring is typically not necessary, and requires coordination with N-dot to develop a monitoring plan.

Text Captions
Gather Traffic Data
Include Worst-Case Scenario
In that case, you can use the Level of Service that operates with free-flow conditions.
It may be necessary to conduct 24-hour monitoring to determine the worst noise hour.

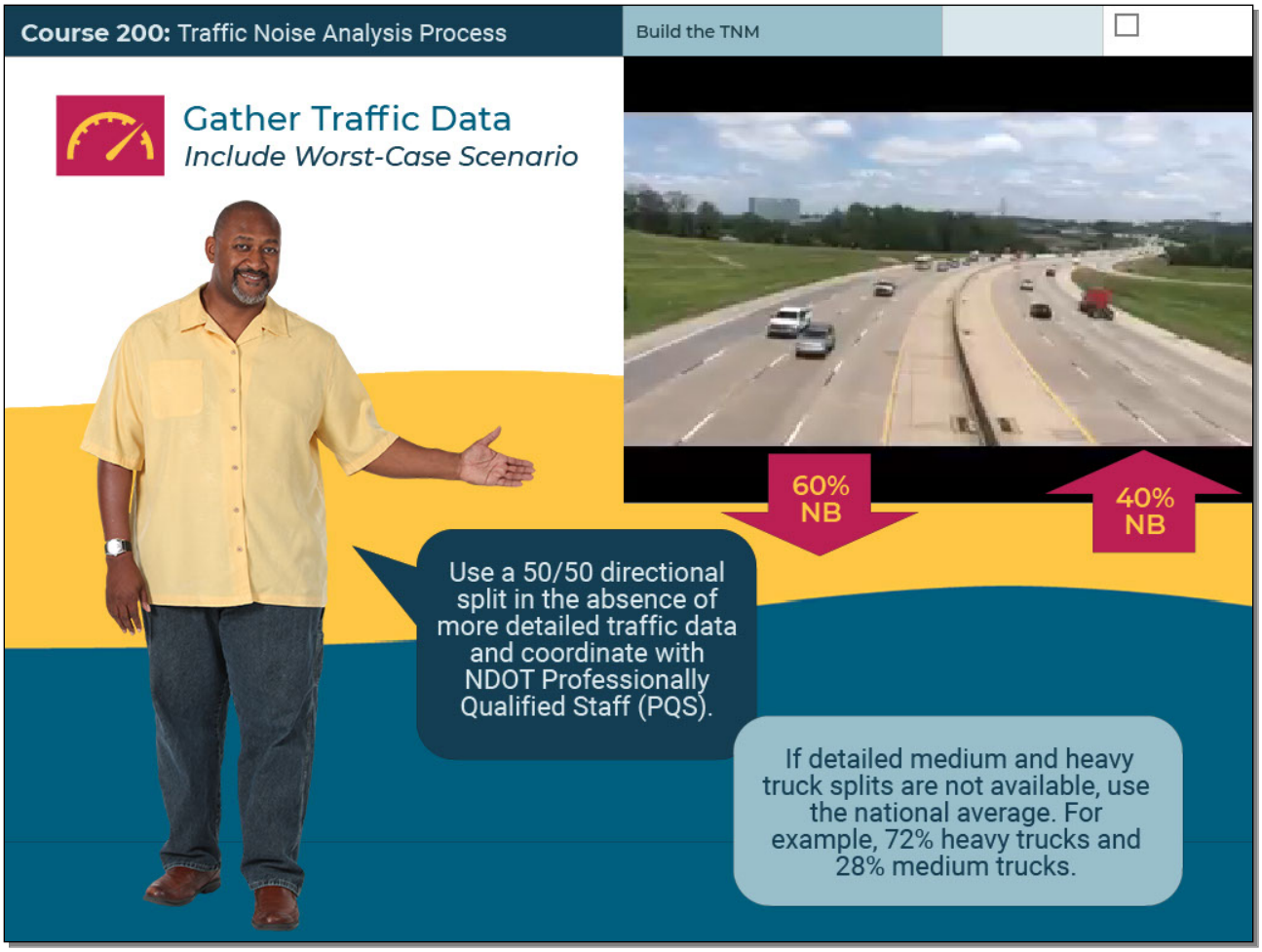
Slide 8 - Slide 8



Audio Script and Notes to Reviewers
Derive directional traffic volumes from the annual average daily traffic.
What if detailed traffic data is unavailable?

Text Captions
Gather Traffic Data
What if detailed traffic data is unavailable?
Derive directional traffic volumes from the annual average daily traffic.

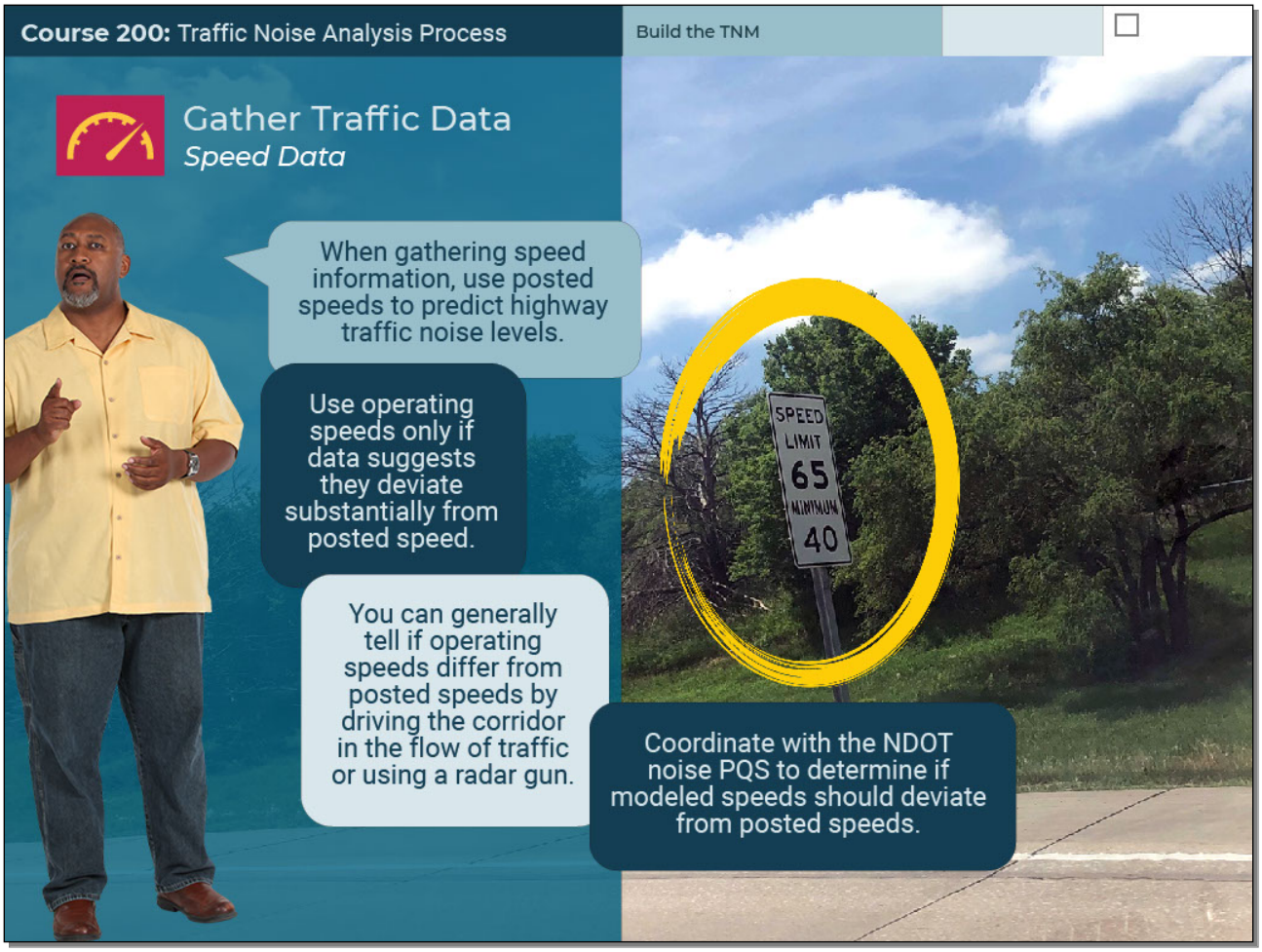
Slide 9 - Slide 9



Audio Script and Notes to Reviewers
Use a fifty-fifty directional split in the absence of more detailed traffic data and coordinate with N-dot Professionally Qualified Staff. Similarly, if detailed medium and heavy truck splits are not available, the national average can be used. For example, seventy-two percent heavy trucks and twenty-eight percent medium trucks. Again, coordinate with N-Dot Noise P-Q-S.

Text Captions
Gather Traffic Data
Include Worst-Case Scenario
Use a 50/50 directional split in the absence of more detailed traffic data and coordinate with NDOT Professionally Qualified Staff (PQS).
If detailed medium and heavy truck splits are not available, use the national average. For example, 72% heavy trucks and 28% medium trucks.

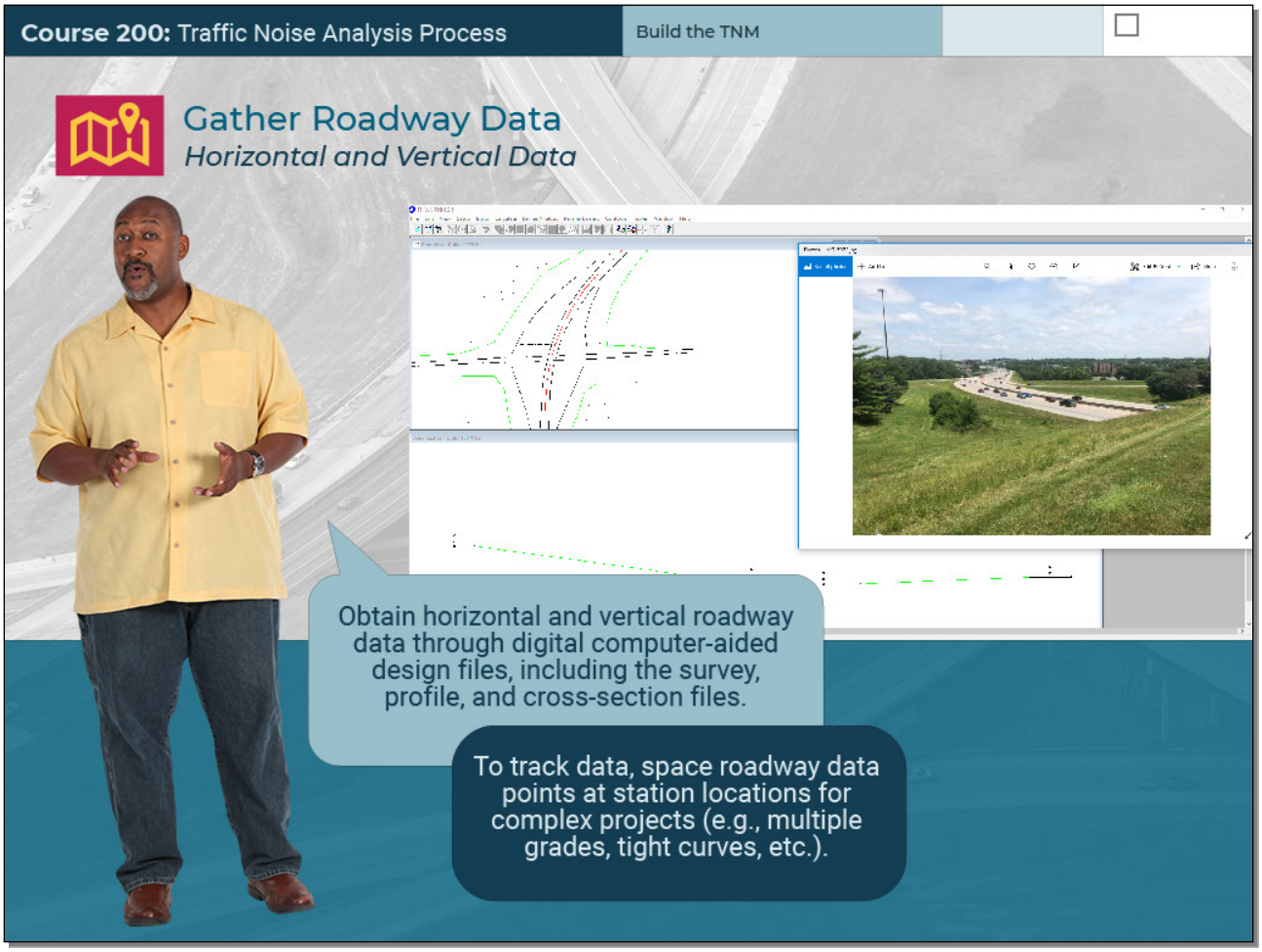
Slide 10 - Slide 10



Audio Script and Notes to Reviewers
When gathering speed information, use posted speeds to predict highway traffic noise levels. Use operating speeds only if data suggests they deviate substantially from posted speed. You can generally tell if operating speeds differ from posted speeds by driving the corridor in the flow of traffic or using a radar gun. Coordinate with the N-dot noise P-Q-S to determine if modeled speeds should deviate from posted speeds.
Reviewer: Added last sentence to tell them how they will know if operating speeds deviate from posted. OK?

Text Captions
Gather Traffic Data
Speed Data
When gathering speed information, use posted speeds to predict highway traffic noise levels.
Use operating speeds only if data suggests they deviate substantially from posted speed.
You can generally tell if operating speeds differ from posted speeds by driving the corridor in the flow of traffic or using a radar gun.
Coordinate with the NDOT noise PQS to determine if modeled speeds should deviate from posted speeds.

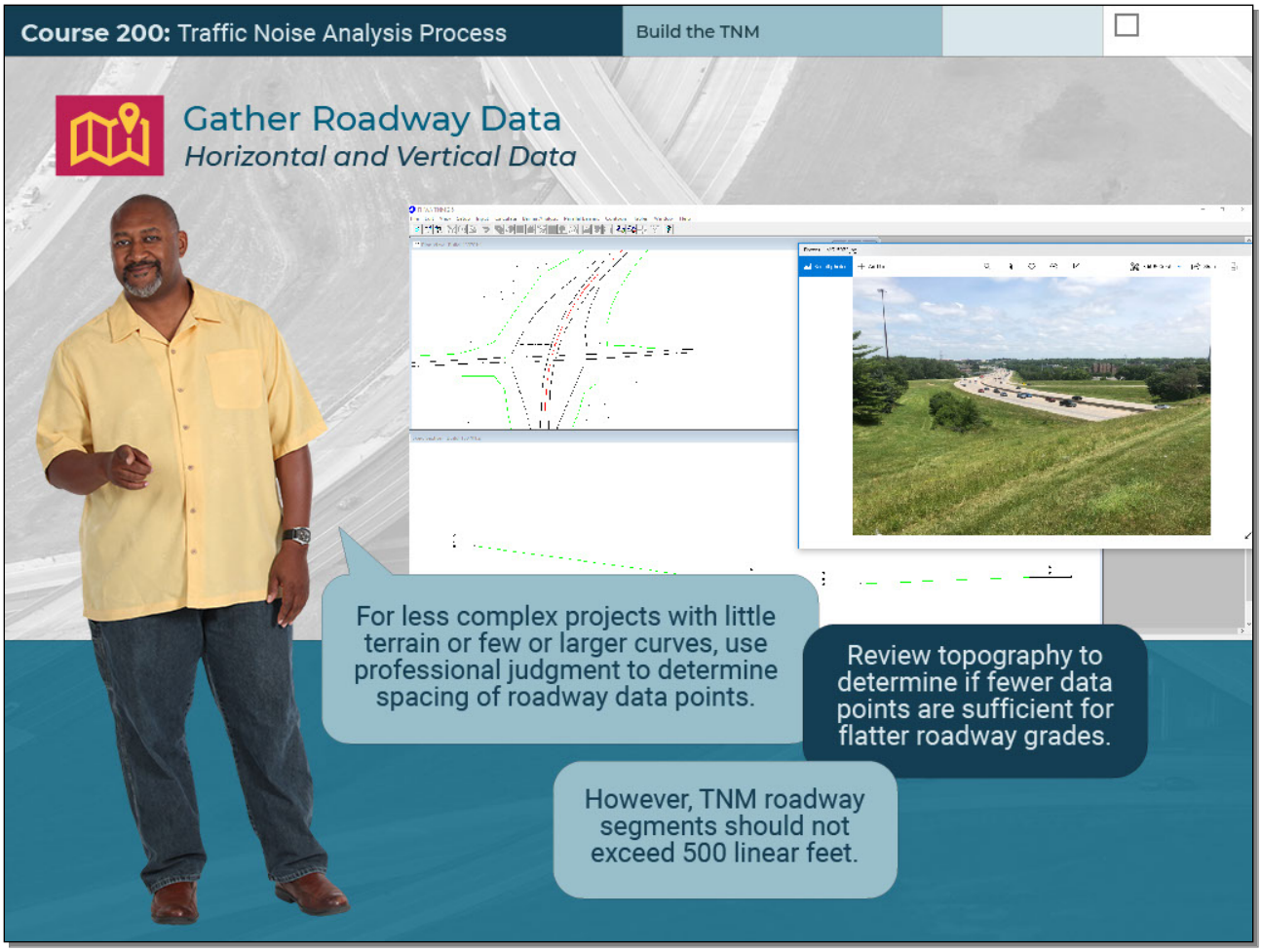
Slide 11 - Slide 11



Audio Script and Notes to Reviewers
Your next step is to gather roadway data. Obtain horizontal and vertical roadway data through digital computer-aided design files, including the survey, profile, and cross-section files. To track data, space roadway data points at station locations for complex projects, for example, multiple grades, tight curves, etcetera.

Text Captions
Gather Roadway Data
Horizontal and Vertical Data
Obtain horizontal and vertical roadway data through digital computer-aided design files, including the survey, profile, and cross-section files.
To track data, space roadway data points at station locations for complex projects (e.g., multiple grades, tight curves, etc.).

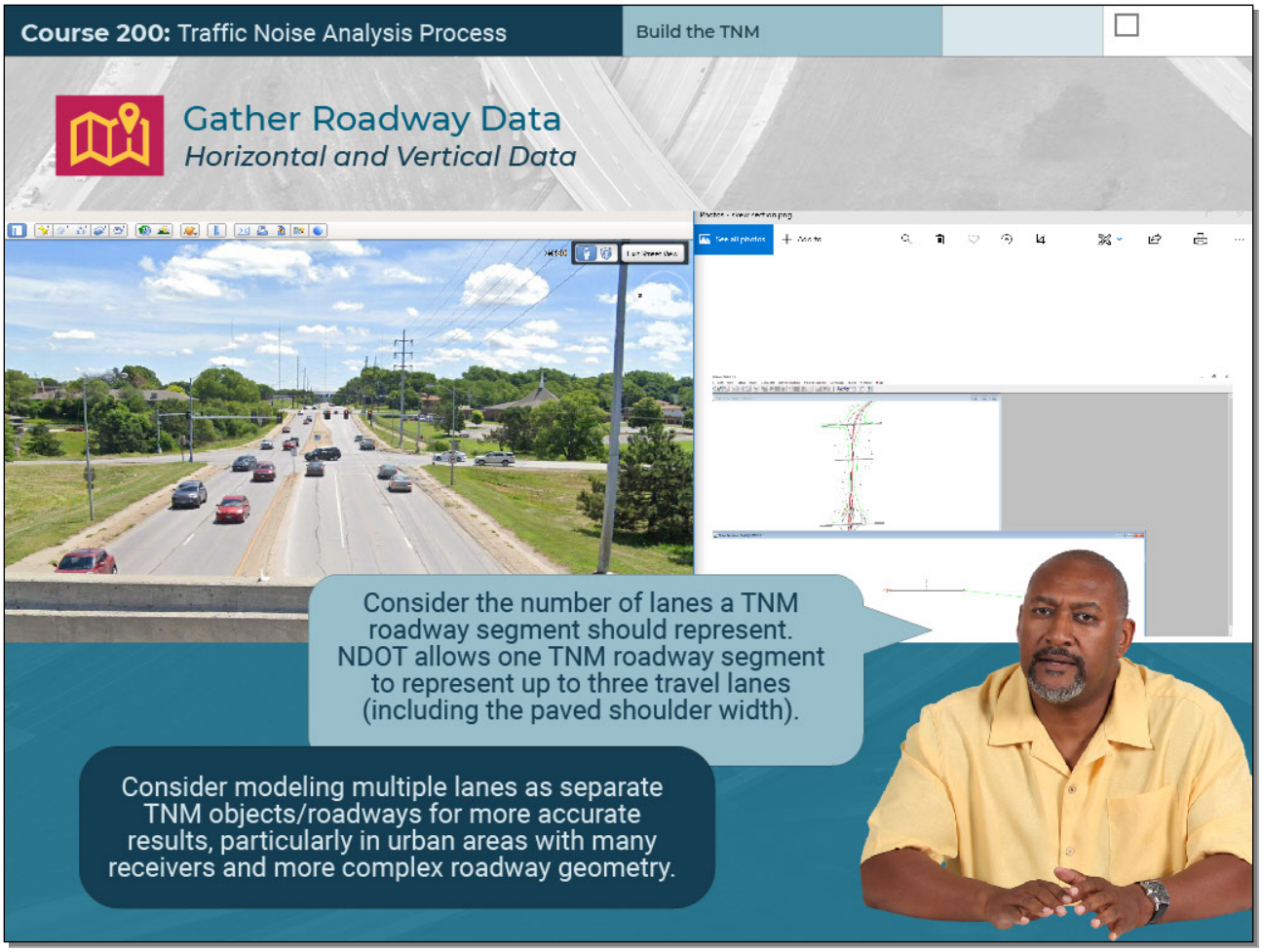
Slide 12 - Slide 12



Audio Script and Notes to Reviewers
For less complex projects with little terrain or few or larger curves, use professional judgment to determine spacing of roadway data points. Review topography to determine if fewer data points are sufficient for flatter roadway grades. However, T-N-M roadway segments should not exceed five-hundred linear feet.

Text Captions
Gather Roadway Data
Horizontal and Vertical Data
For less complex projects with little terrain or few or larger curves, use professional judgment to determine spacing of roadway data points.
Review topography to determine if fewer data points are sufficient for flatter roadway grades.
However, TNM roadway segments should not exceed 500 linear feet.

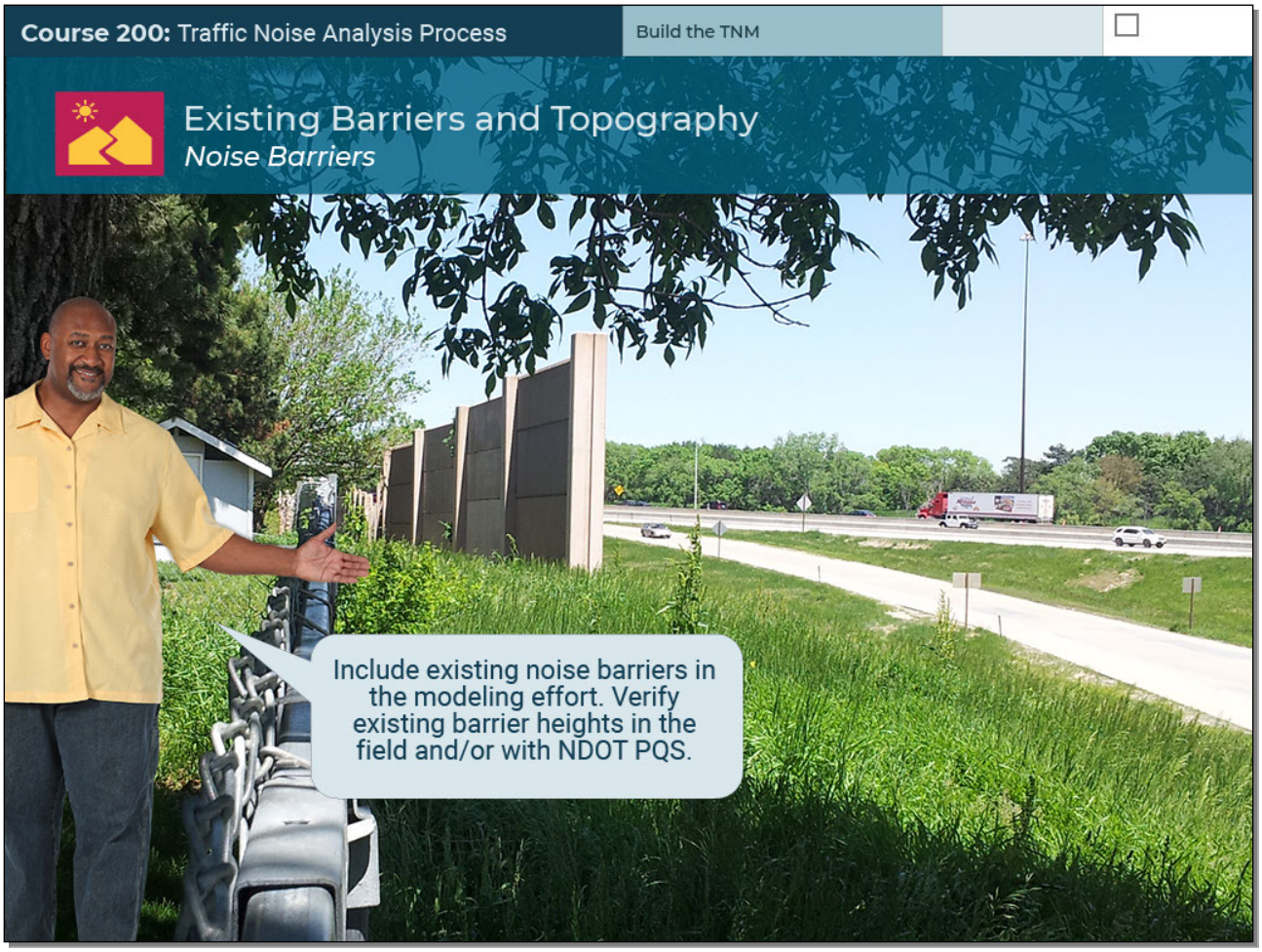
Slide 13 - Slide 13



Audio Script and Notes to Reviewers
Consider the number of lanes a T-N-M roadway segment should represent. N-dot allows one T-N-M roadway segment to represent up to three travel lanes, including the paved shoulder width. Consider modeling multiple lanes as separate T-N-M objects or roadways for more accurate results, particularly in urban areas with many receivers and more complex roadway geometry.

Text Captions
Gather Roadway Data
Horizontal and Vertical Data
Consider the number of lanes a TNM roadway segment should represent. NDOT allows one TNM roadway segment to represent up to three travel lanes (including the paved shoulder width).
Consider modeling multiple lanes as separate TNM objects/roadways for more accurate results, particularly in urban areas with many receivers and more complex roadway geometry.

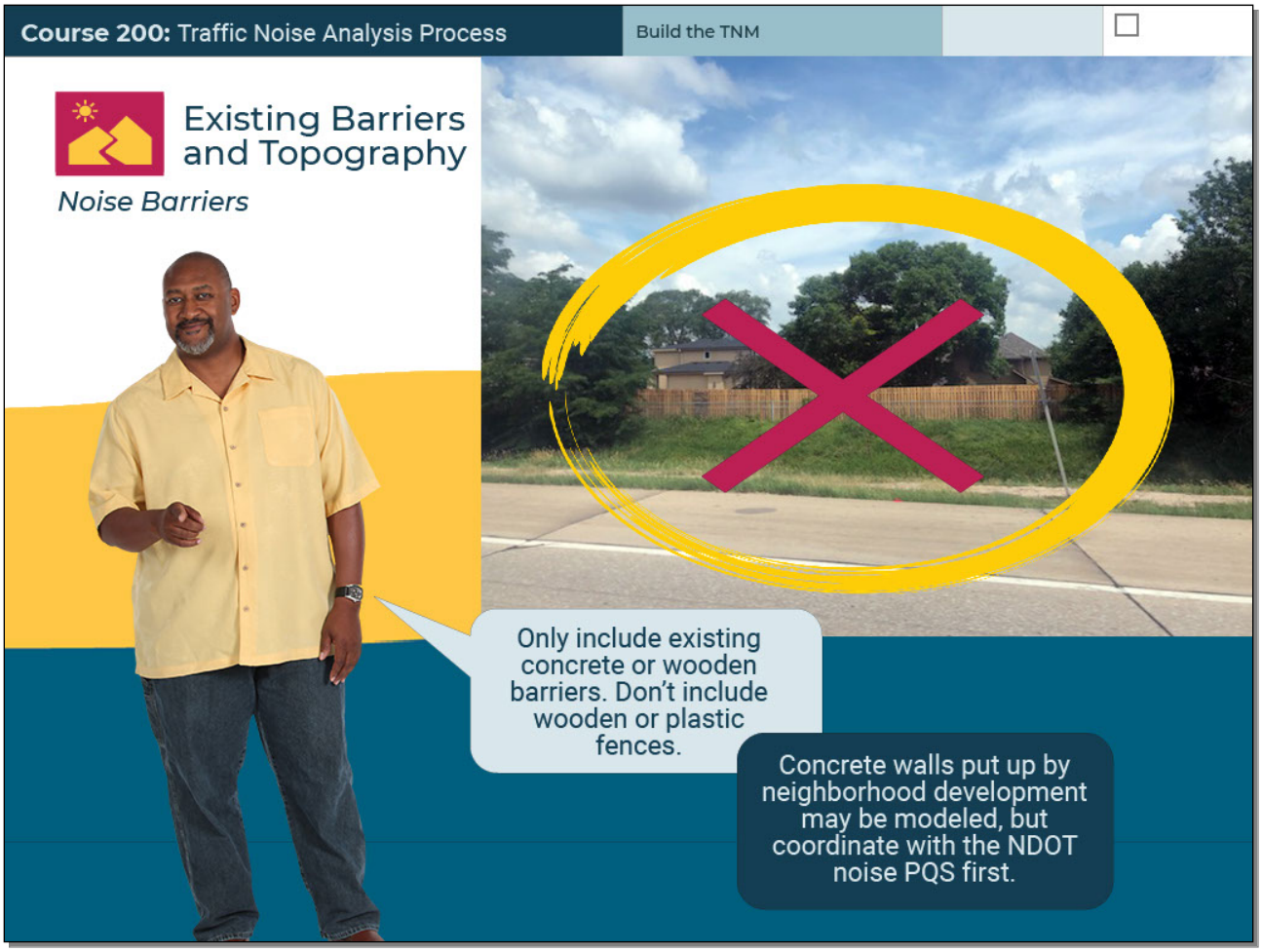
Slide 14 - Slide 14



Audio Script and Notes to Reviewers
Now gather information about existing barriers and topography. Include existing noise barriers in the modeling effort. Verify existing barrier heights in the field and-or with N-dot P-Q-S.

Text Captions
Existing Barriers and Topography
Noise Barriers
Include existing noise barriers in the modeling effort. Verify existing barrier heights in the field and/or with NDOT PQS.

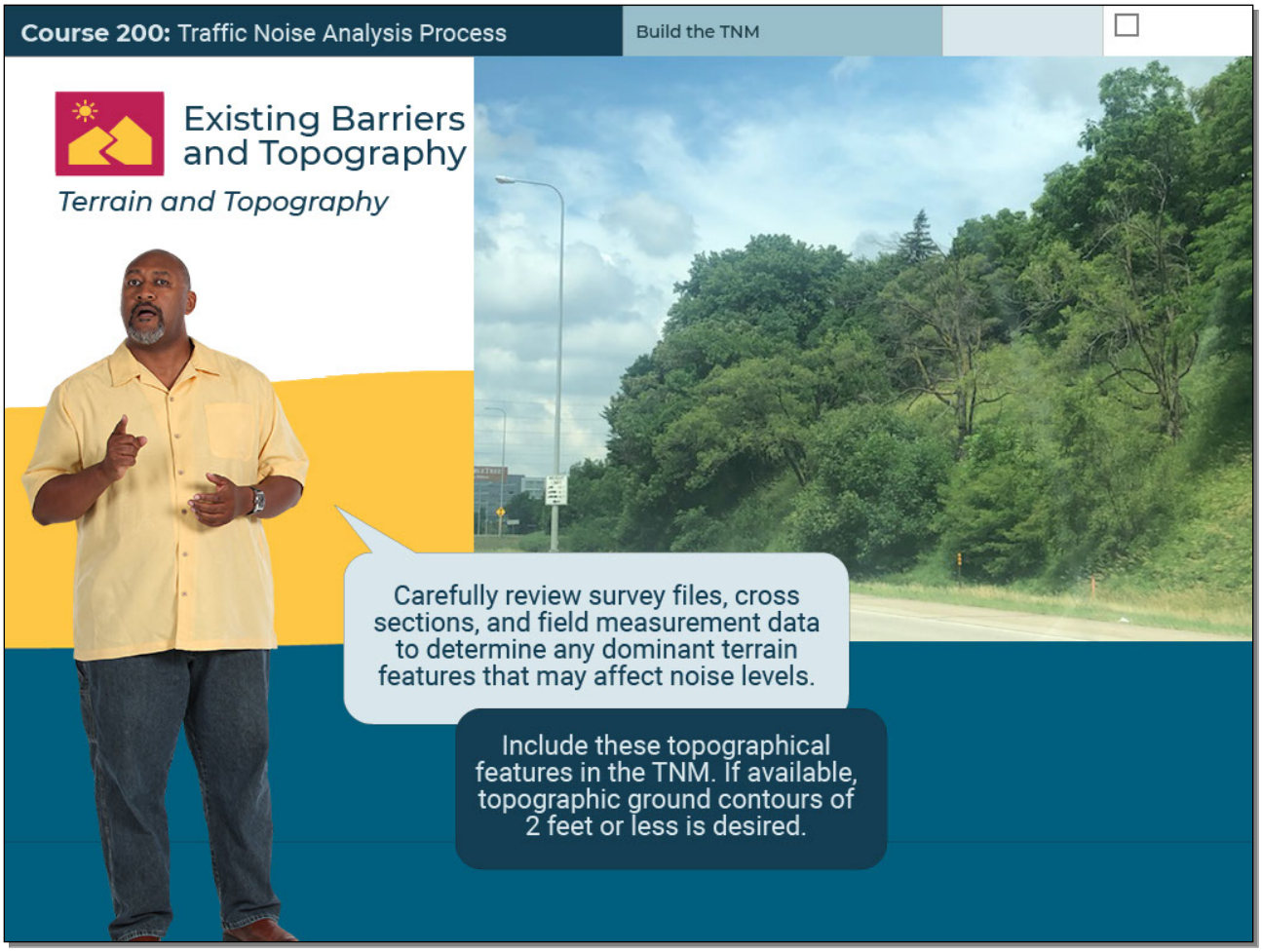
Slide 15 - Slide 15



Audio Script and Notes to Reviewers
Only include existing concrete or wooden barriers, but don't include wooden or plastic fences, such as back yard fences.
Concrete walls put up by neighborhood development may be modeled, but coordinate with the N-dot noise P-Q-S first.
Reviewer: Example project did include jersey median barrier. Need clarification.

Text Captions
Existing Barriers and Topography
Noise Barriers
Only include existing concrete or wooden barriers. Don't include wooden or plastic fences.
Concrete walls put up by neighborhood development may be modeled, but coordinate with the NDOT noise PQS first.

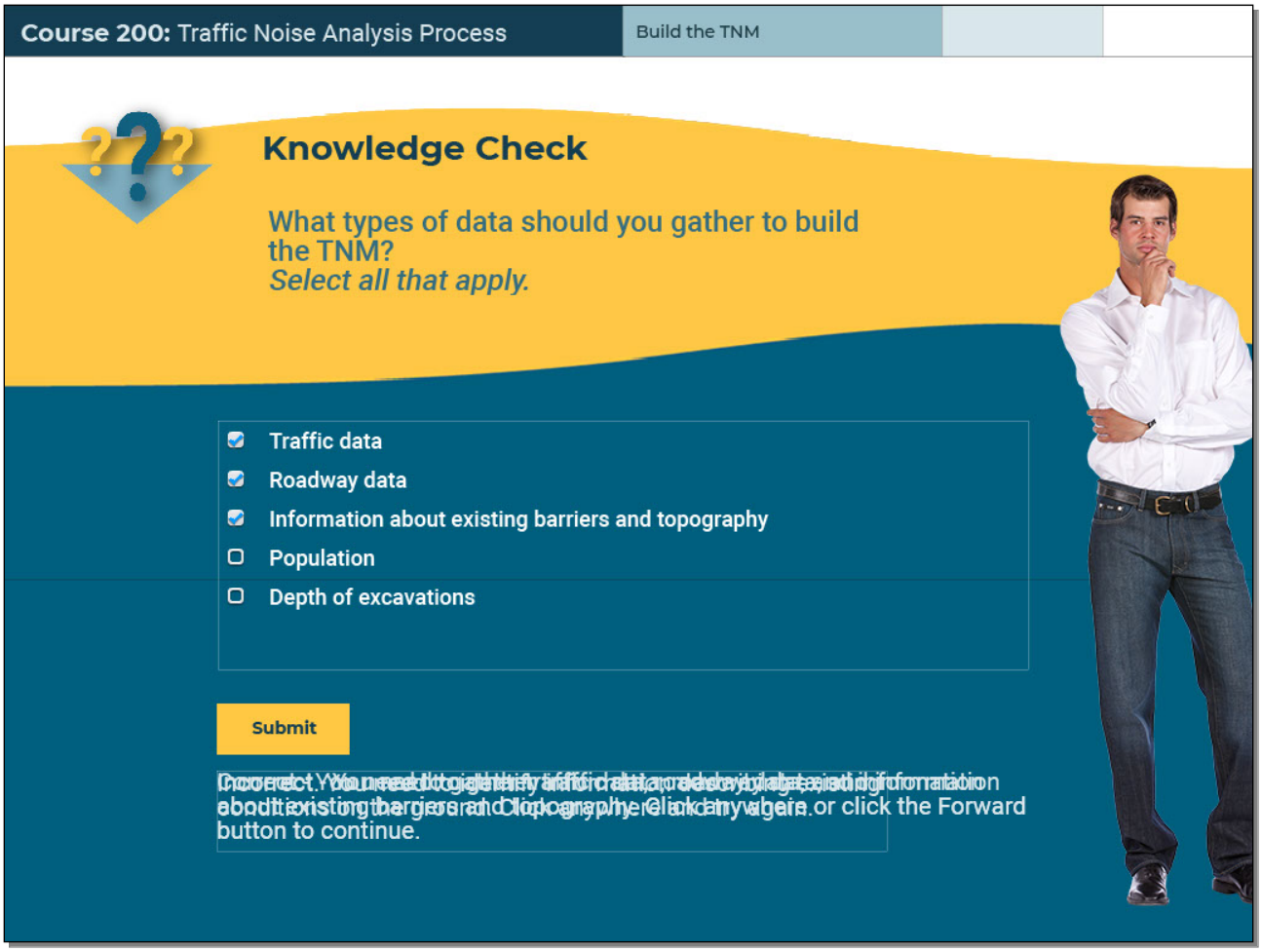
Slide 16 - Slide 16



Audio Script and Notes to Reviewers
Carefully review survey files, cross sections, and field measurement data to determine any dominant terrain features that may affect noise levels. Include these topographical features in the T-N-M. If available, topographic ground contours of two feet or less is desirable.
Reviewer: Example project did include jersey median barrier. Need clarification. Also, how do they find out what the fences are made of?

Text Captions
Existing Barriers and Topography
Terrain and Topography
Carefully review survey files, cross sections, and field measurement data to determine any dominant terrain features that may affect noise levels.
Include these topographical features in the TNM. If available, topographic ground contours of 2 feet or less is desired.

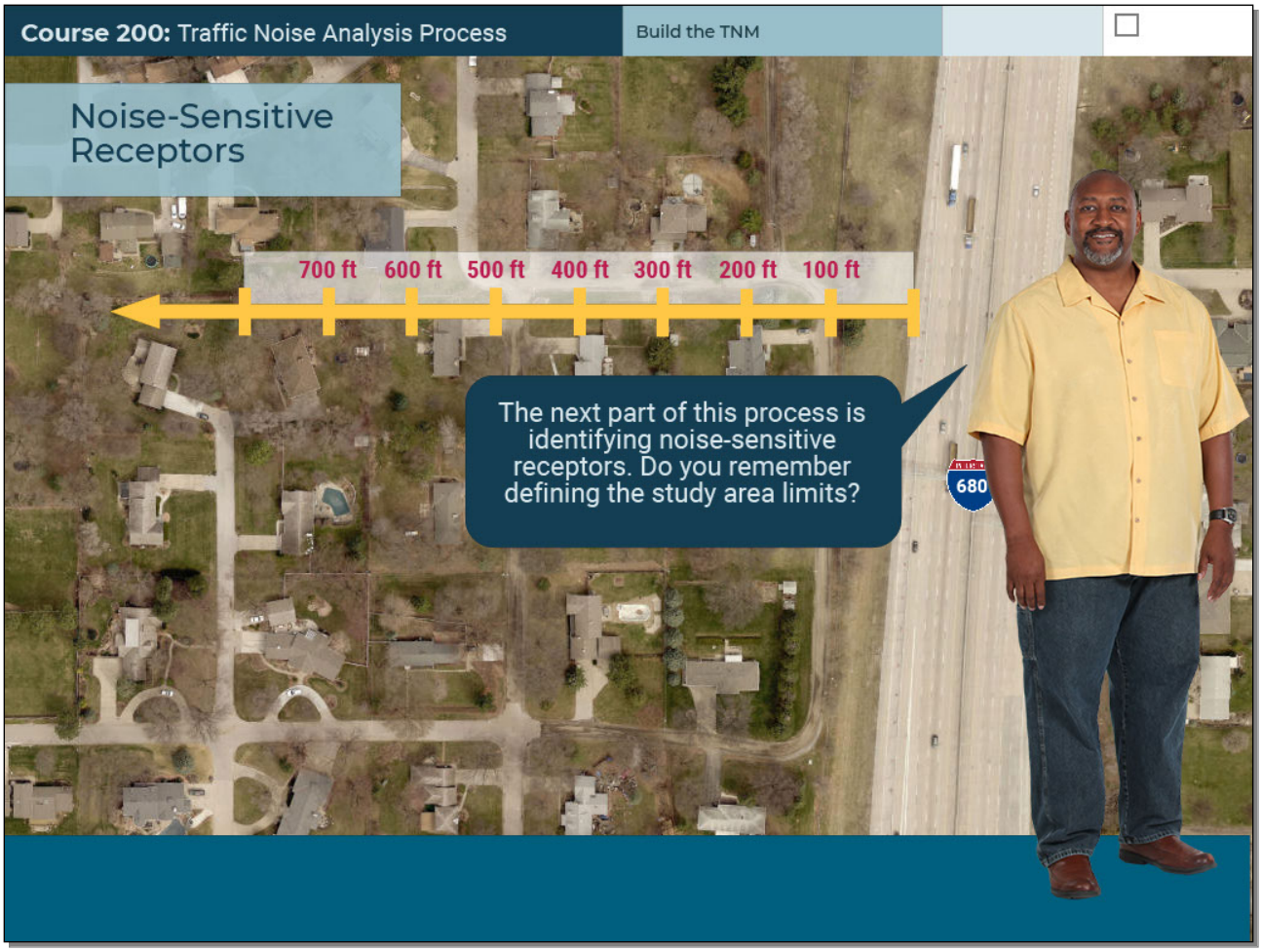
Slide 17 - Slide 17



Audio Script and Notes to Reviewers
What types of data should you gather to build the T-N-M?

Text Captions
Knowledge Check
What types of data should you gather to build the TNM?
Select all that apply.
Correct - You need to gather traffic data, roadway data, and information about existing barriers and topography. Click anywhere or click the Forward button to continue.
1st incorrect feedback: Incorrect. You need to identify information describing existing conditions on the ground. Click anywhere and try again.
2nd incorrect feedback: Incorrect - You need to gather traffic data, roadway data, and information about existing barriers and topography. Click anywhere or click the Forward button to continue.

Slide 18 - Slide 18



Audio Script and Notes to Reviewers
The next part of this process is identifying noise-sensitive receptors. Do you remember defining the study area limits?

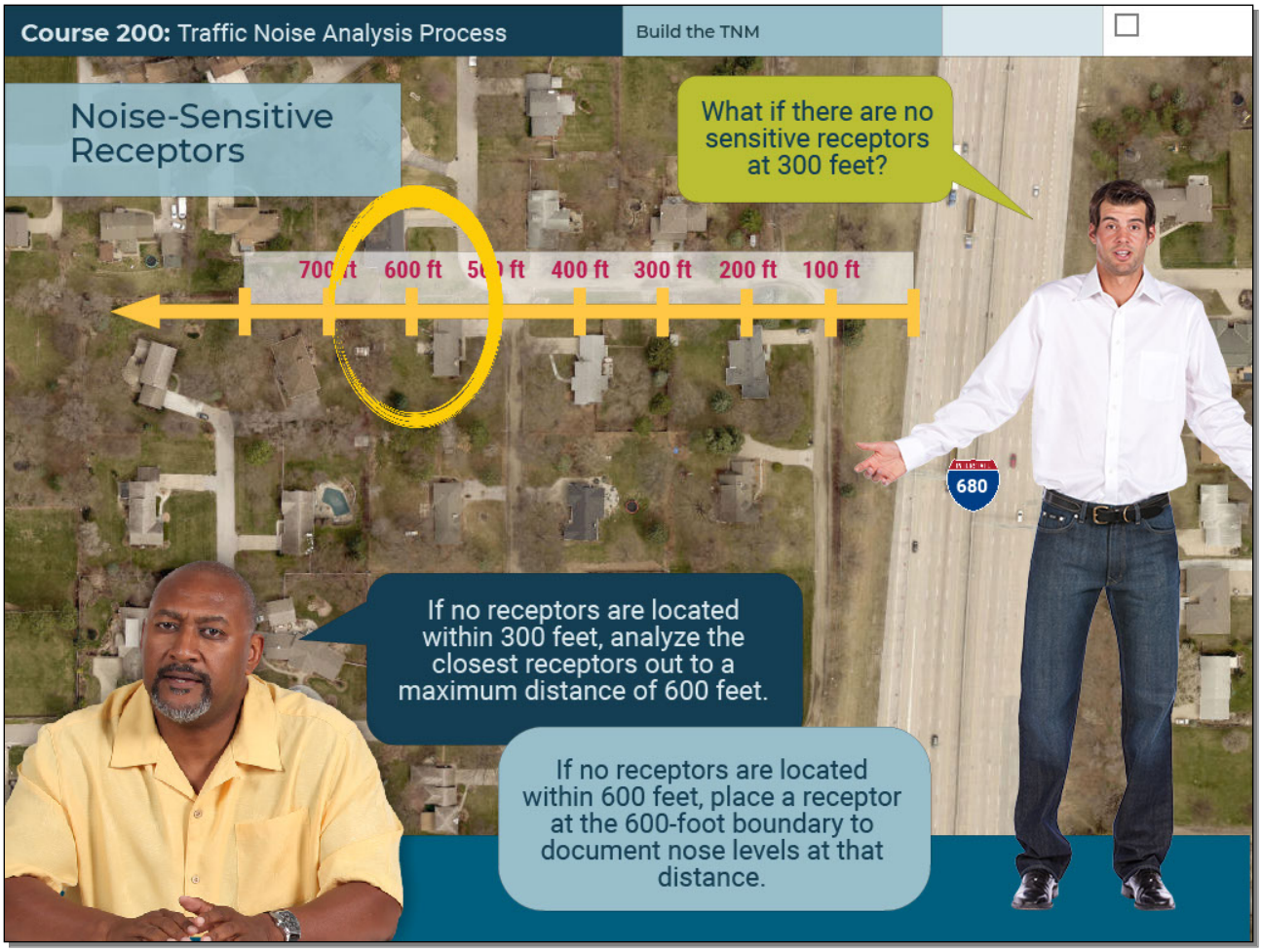
Text Captions
Noise-Sensitive Receptors
The next part of this process is identifying noise-sensitive receptors. Do you remember defining the study area limits?

Slide 19 - Slide 19

Audio Script and Notes to Reviewers
Complete the sentence below by filling in the blank.

Text Captions
Knowledge Check
Do you recall from Module 1?
Complete the sentence below by filling in the blank.
The noise study area should be widened a minimum of 300 feet from the edge of pavement.
Correct - The study area width should extend a minimum of 300 feet from the edge of pavement. Click anywhere or click the Forward button to continue.
1st incorrect feedback: Incorrect - The minimum distance is less than 400 feet and more than 200 feet. Click anywhere and try again.
2nd incorrect feedback: Incorrect. The study area width should extend a minimum of 300 feet from the edge of pavement. Click anywhere or click the Forward button to continue.

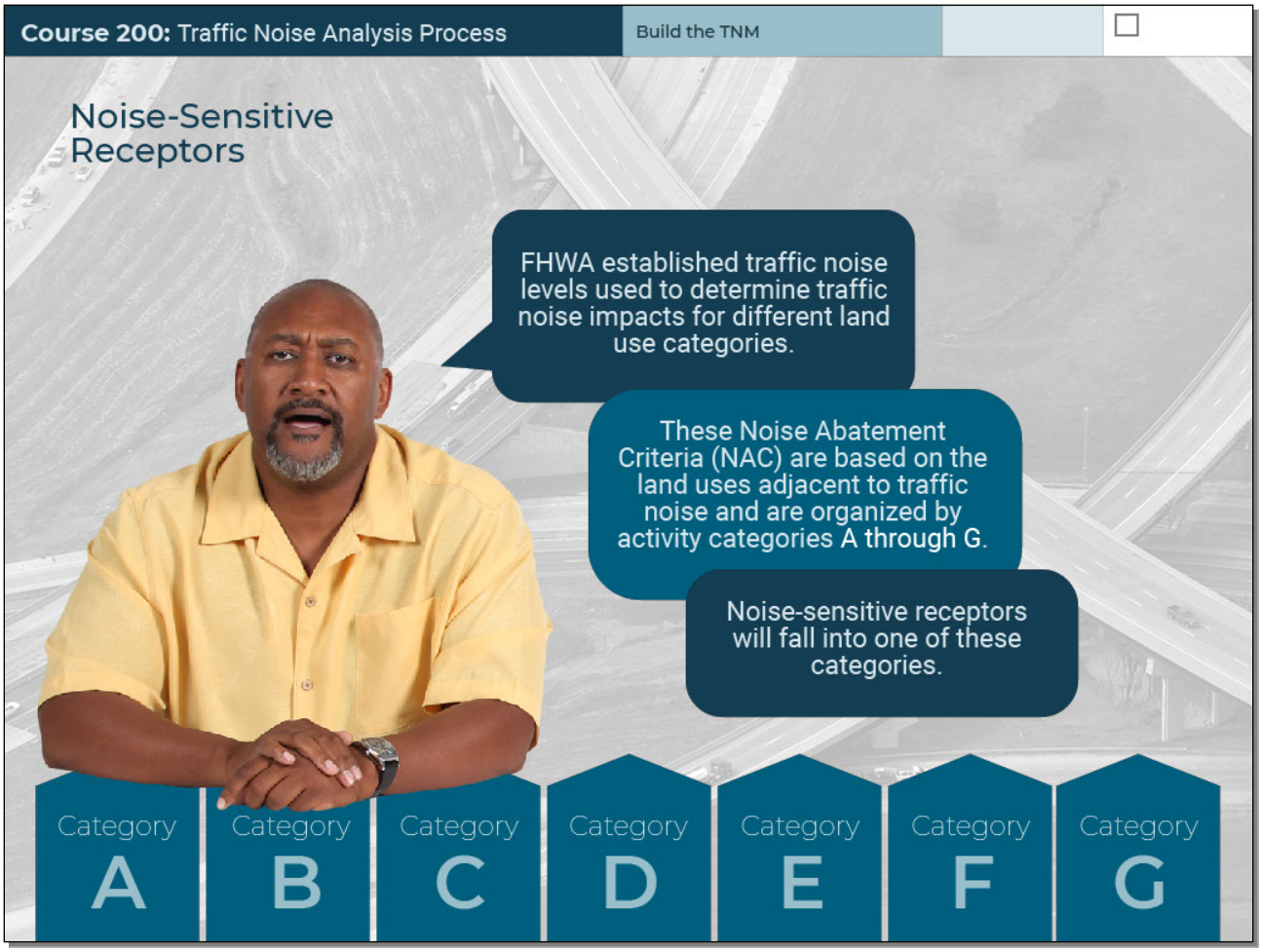
Slide 20 - Slide 20



Audio Script and Notes to Reviewers
What if there are no sensitive receptors at three-hundred feet?
If no receptors are located within three-hundred feet, analyze the closest receptors out to a maximum distance of six-hundred feet. If no receptors are located within six-hundred feet, a receptor will be placed at the six-hundred-foot boundary to document nose levels at that distance.

Text Captions
Noise-Sensitive Receptors
What if there are no sensitive receptors at 300 feet?
If no receptors are located within 300 feet, analyze the closest receptors out to a maximum distance of 600 feet.
If no receptors are located within 600 feet, place a receptor at the 600-foot boundary to document nose levels at that distance.

Slide 21 - Slide 21



Audio Script and Notes to Reviewers
Recall from the Introductory course that F-H-W-A established traffic noise levels used to determine traffic noise impacts and absolute levels for noise abatement. These Noise Abatement Criteria are based on the land uses adjacent to traffic noise and are organized by activity categories A through G, each with a specific noise level that determines an impact. Noise-sensitive receptors will fall into one of these categories. However, some of these categories you will rarely analyze for N-dot noise impacts.

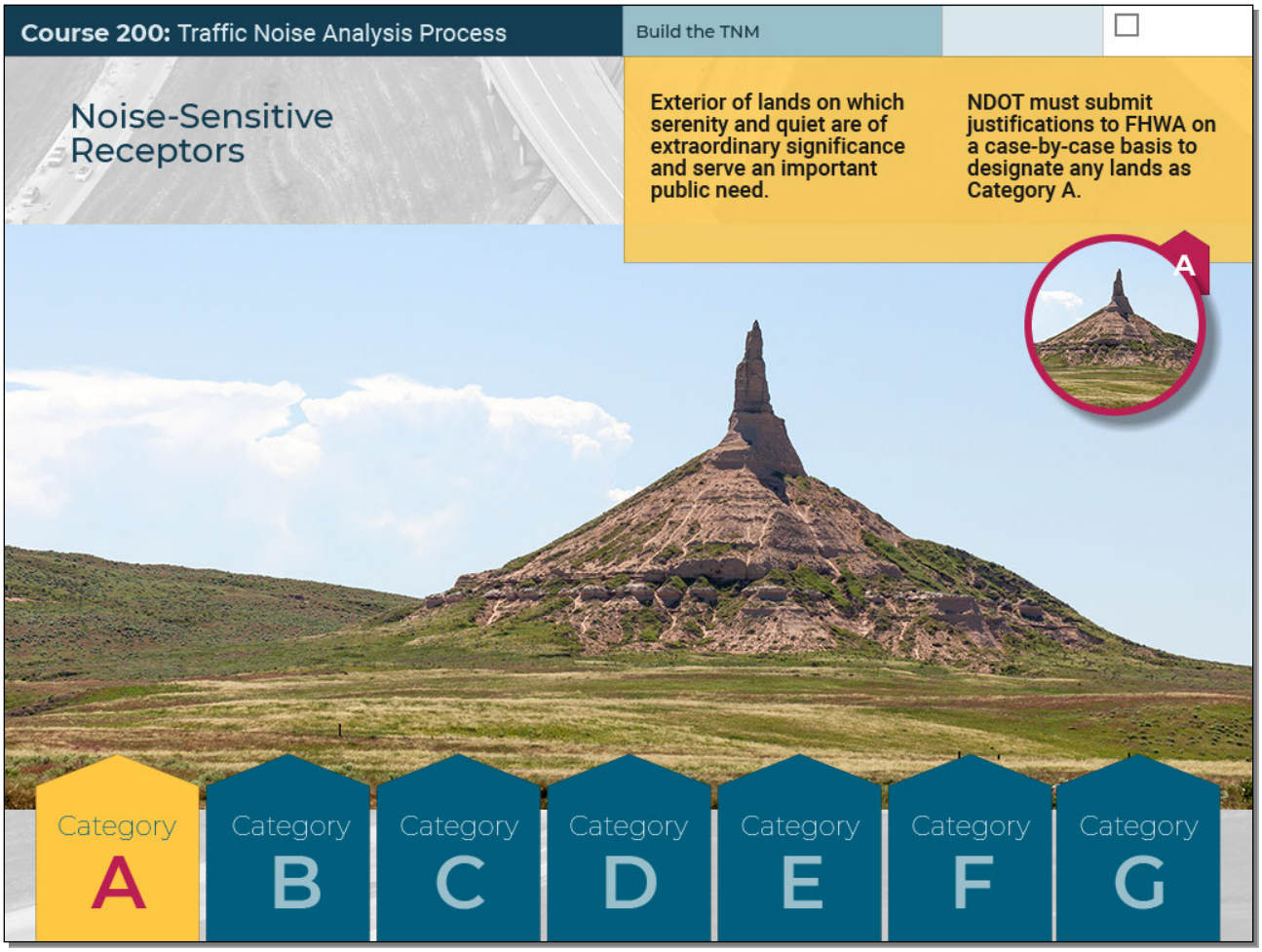
Text Captions
Noise-Sensitive Receptors
FHWA established traffic noise levels used to determine traffic noise impacts for different land use categories.
These Noise Abatement Criteria (NAC) are based on the land uses adjacent to traffic noise and are organized by activity categories A through G.
Noise-sensitive receptors will fall into one of these categories.

Slide 22 - Slide 22

Audio Script and Notes to Reviewers
Click on each category tab to learn more about each one.
Reviewer: Moved this from the 100 level.

Text Captions
Noise-Sensitive Receptors
Click on each category tab to learn more about each one.

Slide 23 - Slide 23



Audio Script and Notes to Reviewers
Activity Category “A” consists of the exterior of lands on which serenity and quiet are of extraordinary significance and serve an important public need. N-dot must submit justifications to FHWA on a case-by-case basis to designate any lands as Category “A”.
NOTE: This will be a click interaction. However, the information that will be displayed for each tab is presented on following slides to enable review and revision.

Text Captions
Noise-Sensitive Receptors
Category A
Exterior of lands on which serenity and quiet are of extraordinary significance and serve an important public need.
NDOT must submit justifications to FHWA on a case-by-case basis to designate any lands as Category A.

Slide 24 - Slide 24

Audio Script and Notes to Reviewers
Activity Category “B” lands are the exterior areas of single-family and multi-family dwellings; includes apartment buildings, mobile home parks, etcetera.
NOTE: This will be a click interaction. However, the information that will be displayed for each tab is presented on following slides to enable review and revision.

Text Captions
Noise-Sensitive Receptors
Category B
Exterior areas of single-family and multi-family dwellings; includes apartment buildings, mobile home parks, etc.

Slide 25 - Slide 25

Audio Script and Notes to Reviewers

Activity Category "C" lands are exterior areas of non-residential lands. This includes places where people REC-reate, such as active sport areas, parks, picnic areas, campgrounds, playgrounds, recreation areas, trails, and trail crossings. It also includes places where sound is recorded or projected, such as radio stations, recording studios, television studios, amphitheaters, and auditoriums. In addition, Category "C" includes areas where quiet is expected, such as cemeteries, schools, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, Section four-F sites.

NOTE: This will be a click interaction. However, the information that will be displayed for each tab is presented on following slides to enable review and revision.

NOTE: I had to break down the list so that the reader recording the audio can catch his/her breath, which is why I categorized them the way I did. Hopefully that's not a problem. OR the text could just state that it's non-residential lands.

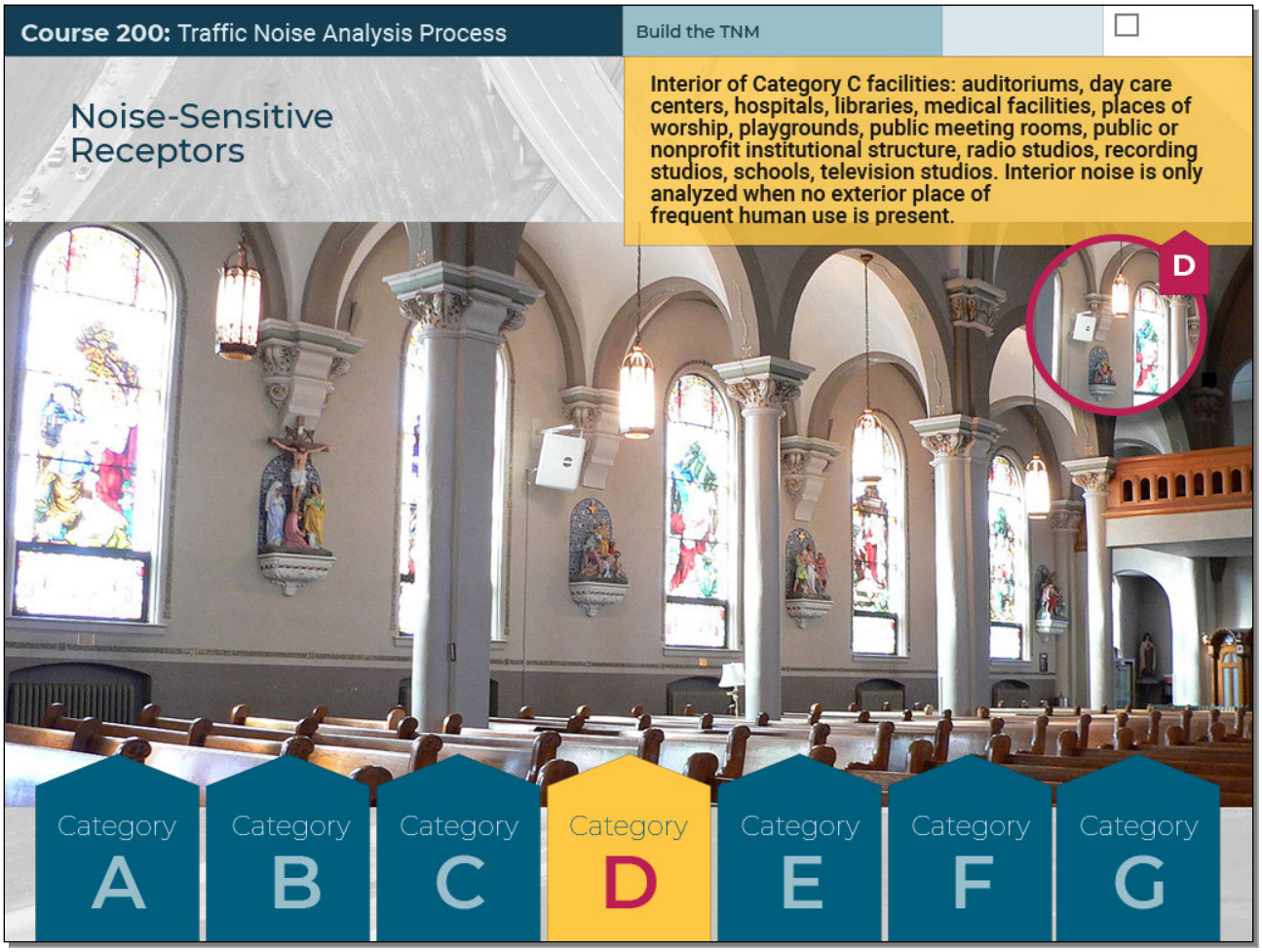
Text Captions

Noise-Sensitive Receptors

Category C

Exterior areas of non-residential lands: active sport areas, parks, picnic areas, campgrounds, playgrounds, recreation areas, trails, trail crossings, radio stations, recording studios, television studios, amphitheaters, auditoriums, cemeteries, schools, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, and Section 4(f) sites.

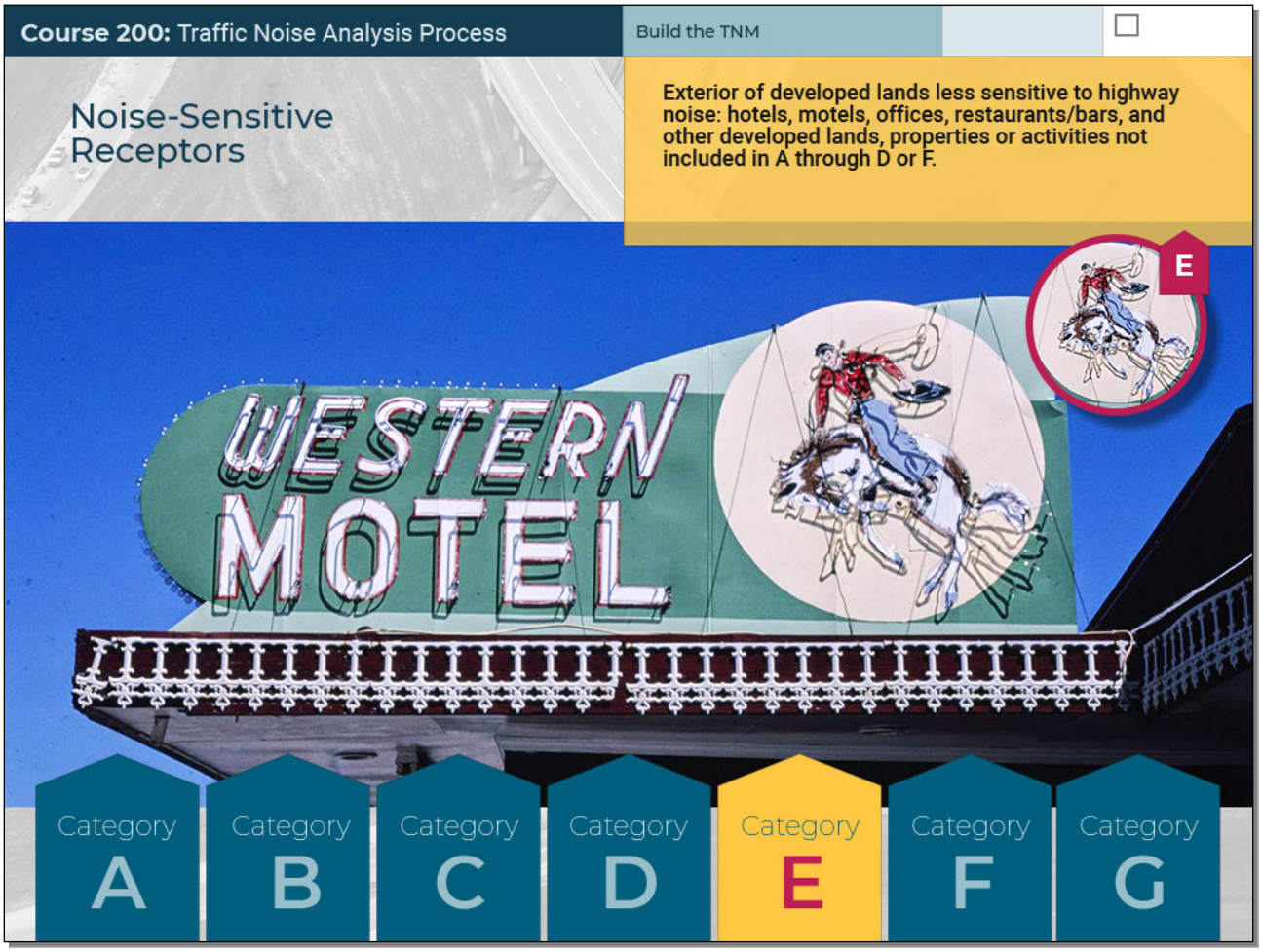
Slide 26 - Slide 26



Audio Script and Notes to Reviewers
Activity Category "D" includes the interiors of Category "C" facilities. This includes auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structure, radio studios, recording studios, schools, and television studios. Interior noise is only analyzed when no exterior place of frequent human use is present.
NOTE: This will be a click interaction. However, the information that will be displayed for each tab is presented on following slides to enable review and revision.

Text Captions
Noise-Sensitive Receptors
Category D
Interior of Category C facilities: auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structure, radio studios, recording studios, schools, television studios. Interior noise is only analyzed when no exterior place of
frequent human use is present.

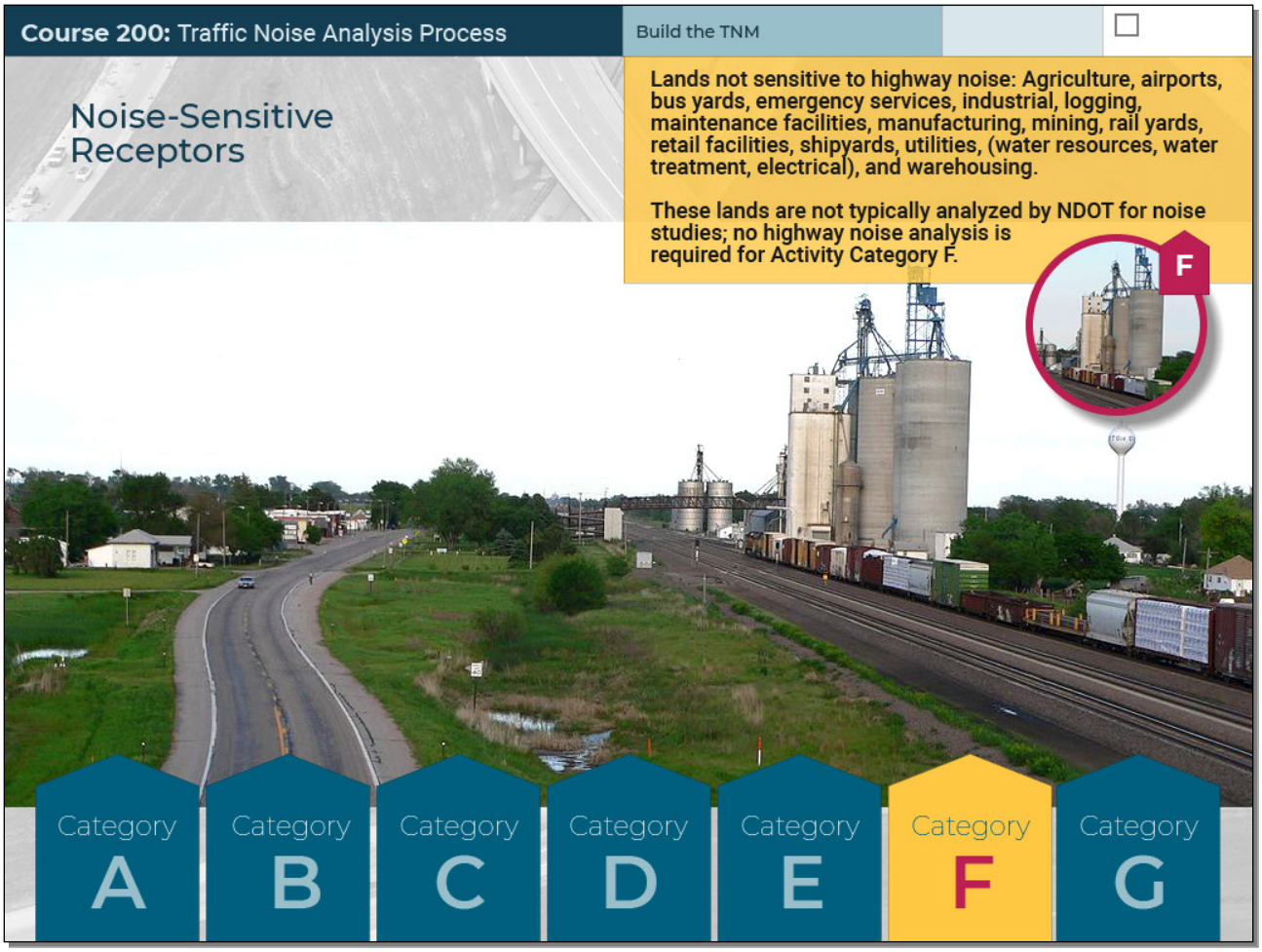
Slide 27 - Slide 27



Audio Script and Notes to Reviewers
Activity Category “E” is the exterior of developed lands less sensitive to highway noise. This includes hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in “A” through “D” or “F”.
NOTE: This will be a click interaction. However, the information that will be displayed for each tab is presented on following slides to enable review and revision.

Text Captions
Noise-Sensitive Receptors
Category E
Exterior of developed lands less sensitive to highway noise: hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A through D or F.

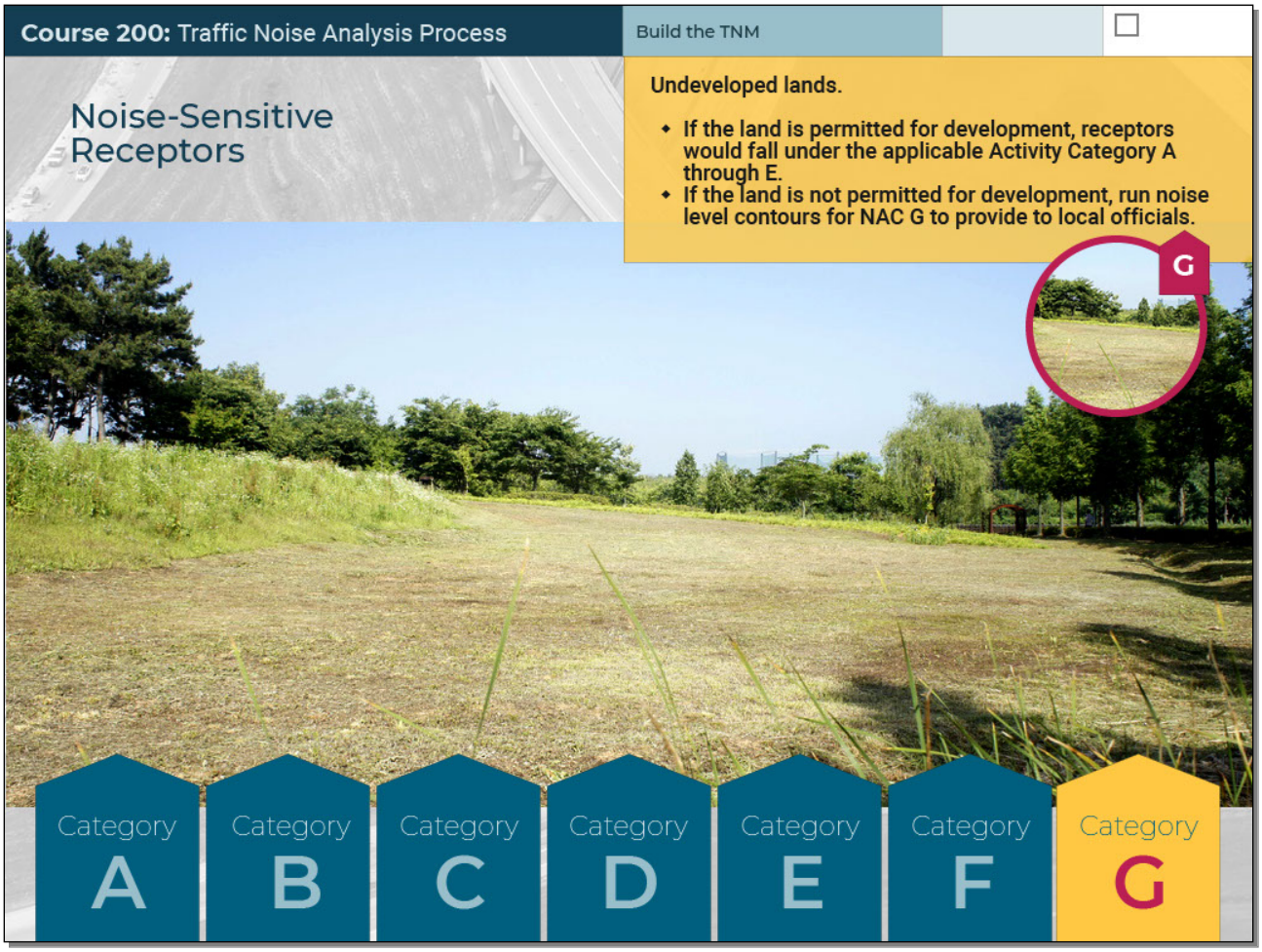
Slide 28 - Slide 28



Audio Script and Notes to Reviewers
Activity Category "F" lands are not sensitive to highway noise. These include lands used for agriculture, airports, bus yards, emergency services, industrial, logging, maintenance, manufacturing, mining, rail yards, retail facilities, shipyards, utilities, and warehousing. These lands are not typically analyzed by N-Dot for noise studies. Therefore, no highway noise analysis is required for Activity Category F.

Text Captions
Noise-Sensitive Receptors
Category F
Lands not sensitive to highway noise: Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities, (water resources, water treatment, electrical), and warehousing.
These lands are not typically analyzed by NDOT for noise studies; no highway noise analysis is required for Activity Category F.

Slide 29 - Slide 29

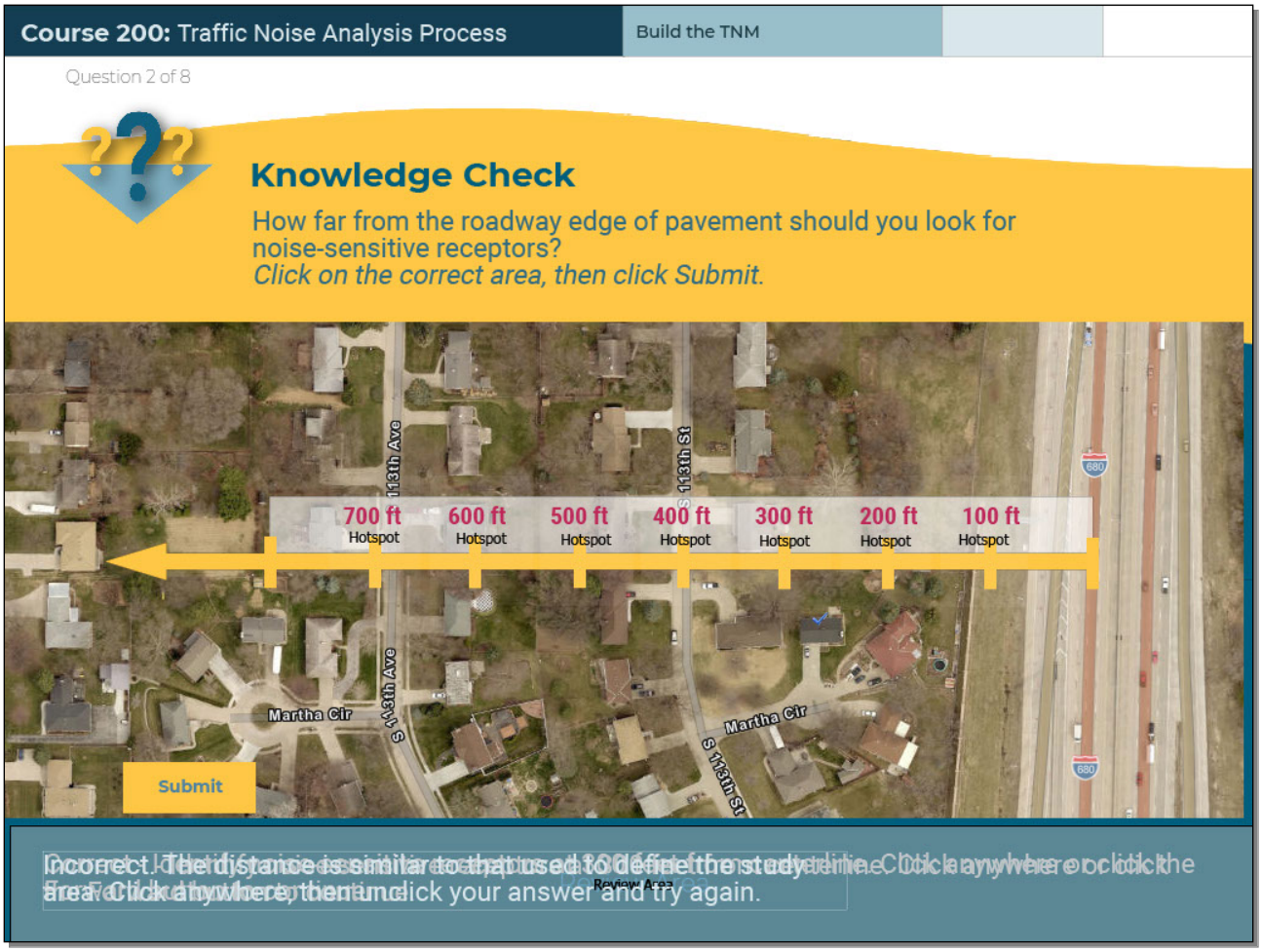


Audio Script and Notes to Reviewers
Activity Category "G" is used for undeveloped lands. If the land is permitted for development, receptors would fall the Activity Category that applies, "A" through "E". If the land is not permitted for development, run noise level contours for Activity Category "G" to provide to local officials, described in more detail in Step Seven.
NOTE: This will be a click interaction. However, the information that will be displayed for each tab is presented on following slides to enable review and revision.

Text Captions
Noise-Sensitive Receptors
Category G
Undeveloped lands.

- If the land is permitted for development, receptors would fall under the applicable Activity Category A through E.
- If the land is not permitted for development, run noise level contours for NAC G to provide to local officials.

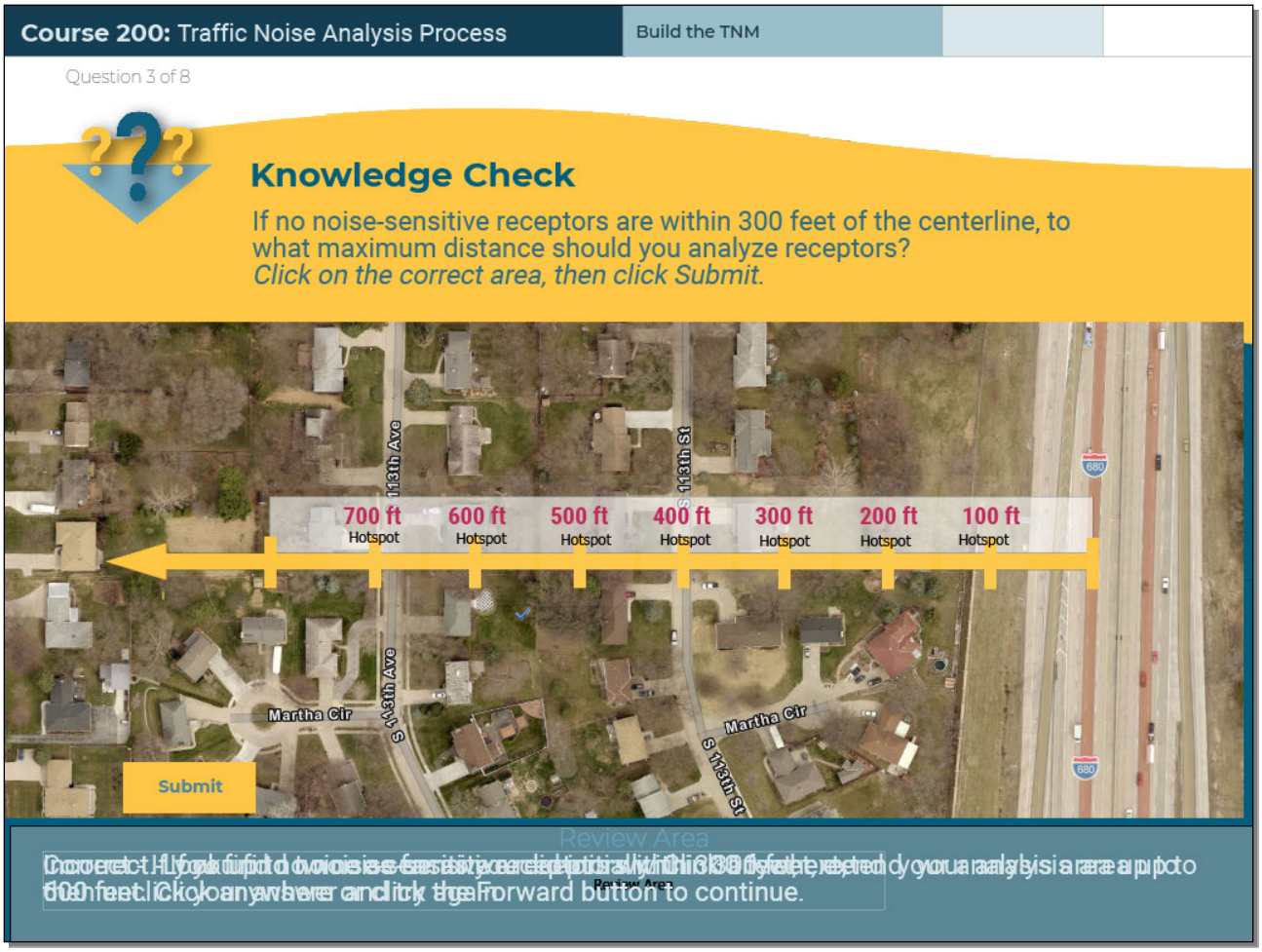
Slide 30 - Slide 30



Audio Script and Notes to Reviewers
How far from the roadway edge of pavement should you look for noise-sensitive receptors?

Text Captions
Knowledge Check
How far from the roadway edge of pavement should you look for noise-sensitive receptors?
Click on the correct area, then click Submit.
Correct - Identify noise-sensitive receptors at 300 feet from centerline. Click anywhere or click the Forward button to continue.
1st incorrect feedback: Incorrect. The distance is similar to that used to define the study area. Click anywhere, then unclick your answer and try again.
2nd incorrect feedback: Incorrect - Identify noise-sensitive receptors at 300 feet from centerline. Click anywhere or click the Forward button to continue.

Slide 31 - Slide 31



Audio Script and Notes to Reviewers
If no noise-sensitive receptors are within three-hundred feet of the centerline, to what maximum distance should you analyze receptors?

Text Captions
Knowledge Check
If no noise-sensitive receptors are within 300 feet of the centerline, to what maximum distance should you analyze receptors?
Click on the correct area, then click Submit.
Correct - If you find no noise-sensitive receptors within 300 feet, extend your analysis area up to 600 feet. Click anywhere or click the Forward button to continue.
1st incorrect feedback: Incorrect. Look up to twice as far as you did initially. Click anywhere, then unclick your answer and try again.
2nd incorrect feedback: Incorrect - If you find no noise-sensitive receptors within 300 feet, extend your analysis area up to 600 feet. Click anywhere or click the Forward button to continue.

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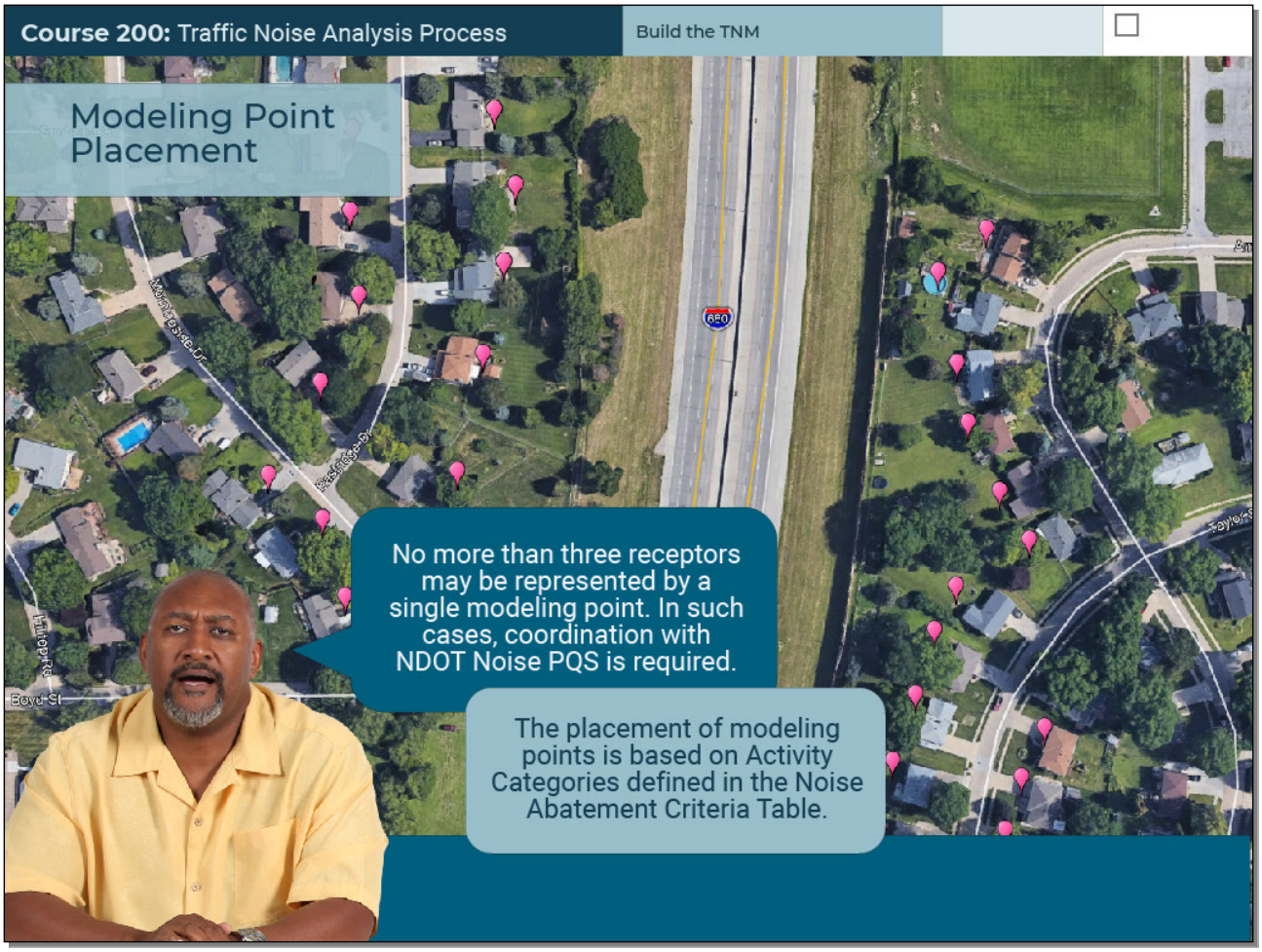
Audio Script and Notes to Reviewers
You can now use that information to identify modeling points. A modeling point is an area where noise analysts measure and/or model highway traffic noise levels. A modeling point may represent one or more receptors.

Text Captions
Modeling Point Placement
You can now use that information to identify modeling points.
A modeling point is an area where noise analysts measure and/or model highway traffic noise levels. A modeling point may represent one or more receptors.

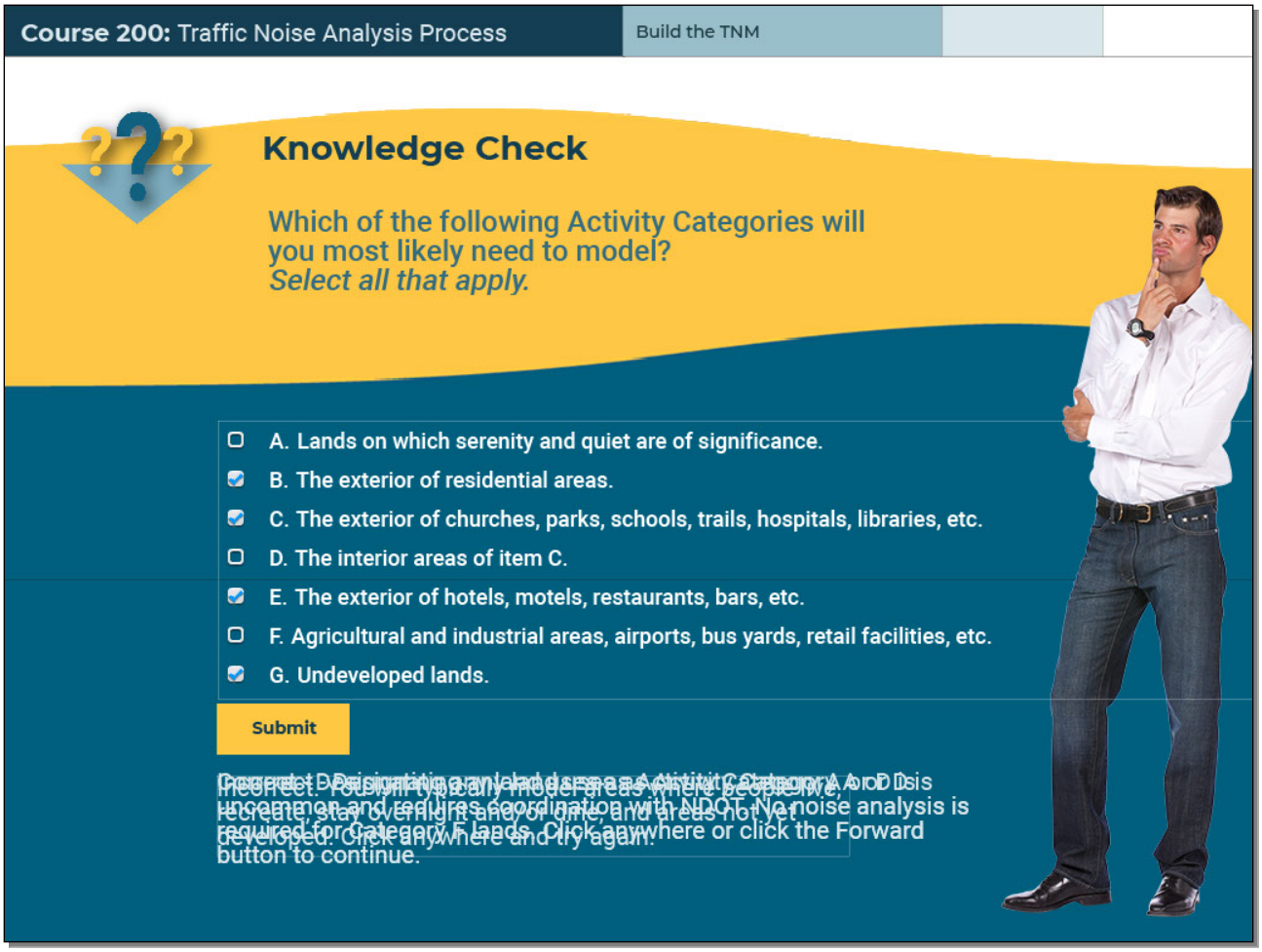
Slide 33 - Slide 33



Audio Script and Notes to Reviewers
No more than three receptors may be represented by a single modeling point. In such cases, coordination with N-dot Noise P-Q-S is required. The placement of modeling points is based on Activity Categories defined in the Noise Abatement Criteria Table.

Text Captions
Modeling Point Placement
No more than three receptors may be represented by a single modeling point. In such cases, coordination with NDOT Noise PQS is required.
The placement of modeling points is based on Activity Categories defined in the Noise Abatement Criteria Table.

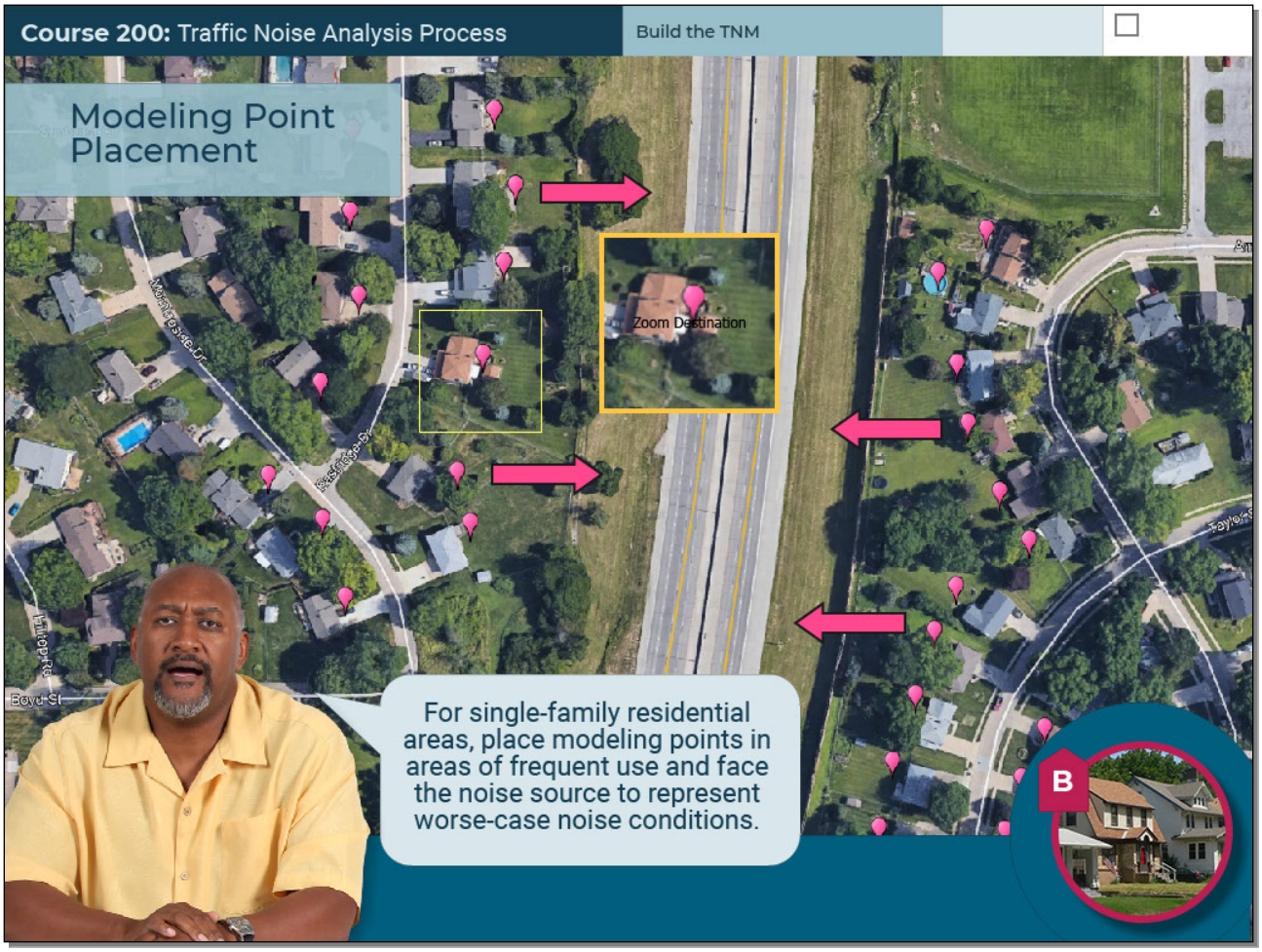
Slide 34 - Slide 34



Audio Script and Notes to Reviewers
Which of the following Activity Categories will you most likely need to model?

Text Captions
Knowledge Check
Which of the following Activity Categories will you most likely need to model?
Select all that apply.
A. Lands on which serenity and quiet are of significance.
B. The exterior of residential areas.
C. The exterior of churches, parks, schools, trails, hospitals, libraries, etc.
D. The interior areas of item C.
E. The exterior of hotels, motels, restaurants, bars, etc.
F. Agricultural and industrial areas, airports, bus yards, retail facilities, etc.
G. Undeveloped lands.
Correct - Designating any land uses as Activity Category A or D is uncommon and requires coordination with NDOT. No noise analysis is required for Category F lands. Click anywhere or click the Forward button to continue.
1st incorrect feedback: Incorrect. You will typically model areas where people live, recreate, stay overnight and/or dine, and areas not yet developed. Click anywhere and try again.
2nd incorrect feedback: Incorrect - Designating any land uses as Activity Category A or D is uncommon and requires coordination with NDOT. No noise analysis is required for Category F lands. Click anywhere or click the Forward button to continue.

Slide 35 - Slide 35



Audio Script and Notes to Reviewers
For single-family residential areas, place modeling points in areas of frequent use and face the noise source to represent worse-case noise conditions. For example, modeling points were placed in the back yards of these homes.

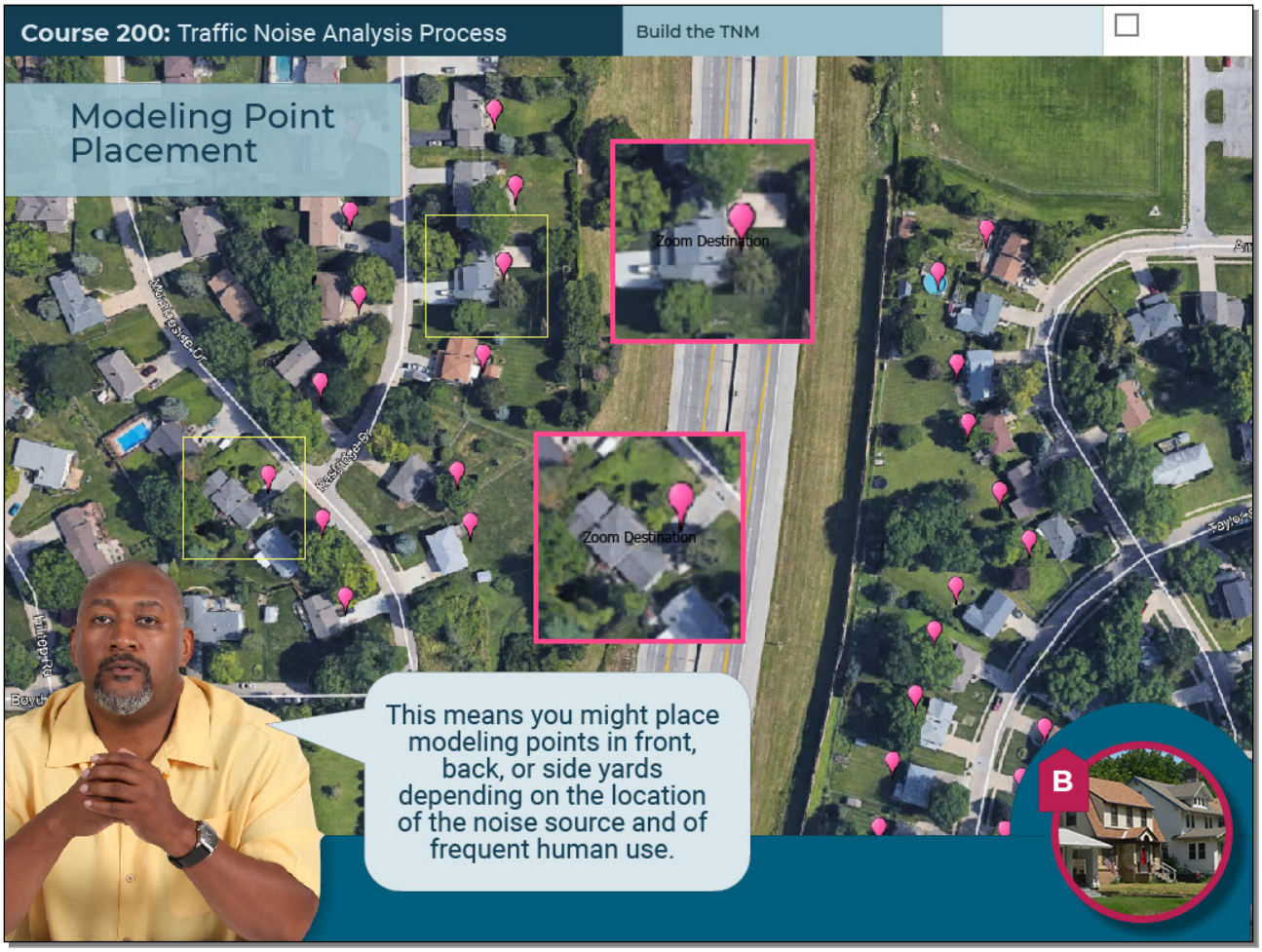
Text Captions
Modeling Point Placement
For single-family residential areas, place modeling points in areas of frequent use and face the noise source to represent worse-case noise conditions.

Slide 36 - Slide 36

Audio Script and Notes to Reviewers
Modeling points must be within twenty feet of the dwelling unit, regardless of whether other structures, such as swimming pools, swing sets, etcetera, are located in the yard that may be closer to the noise source.

Text Captions
Modeling Point Placement
Modeling points must be within 20 feet of the dwelling unit, regardless of whether other structures, such as swimming pools, swing sets, etc. are located in the yard that may be closer to the noise source.

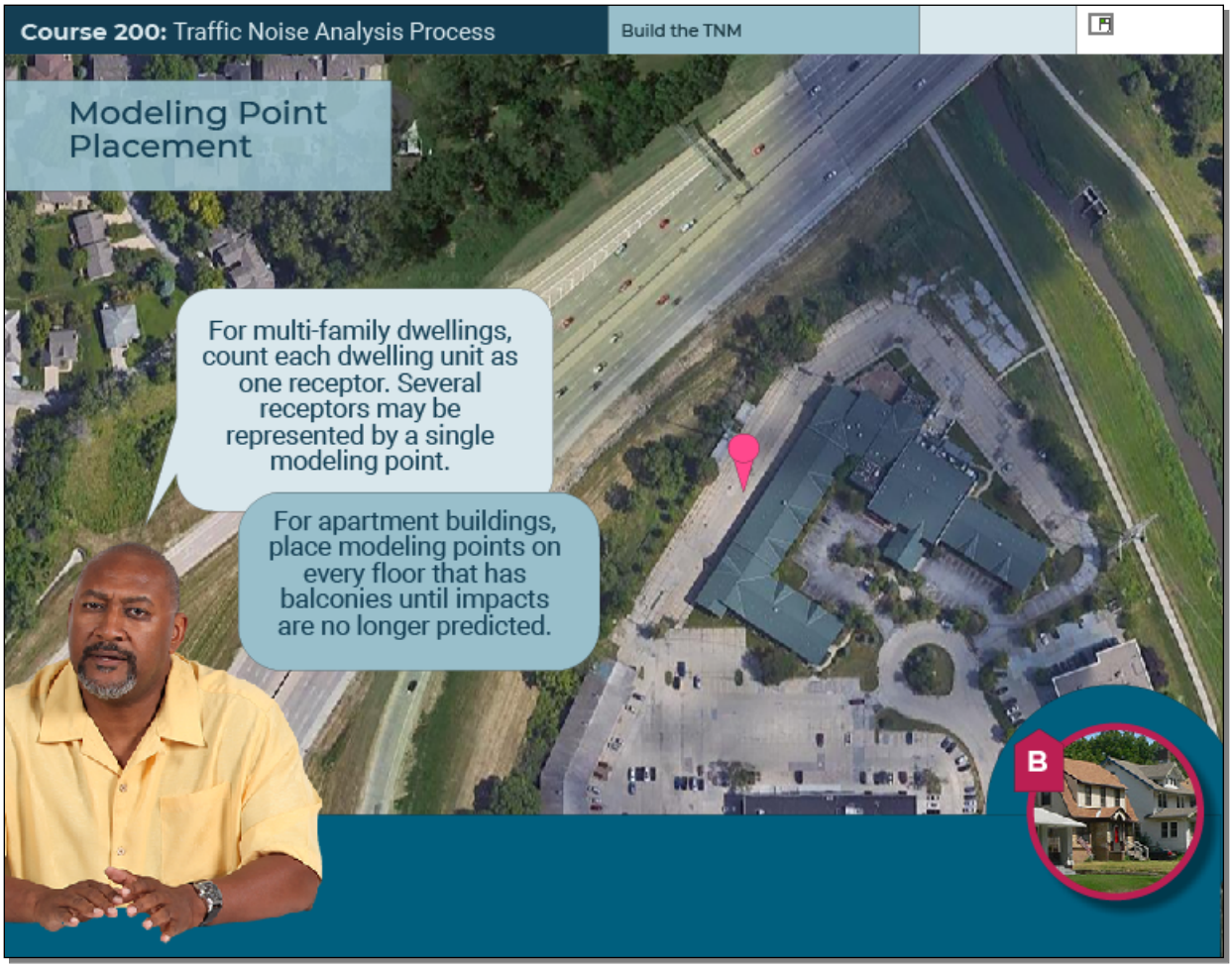
Slide 37 - Slide 37



Audio Script and Notes to Reviewers
This means you might place modeling points in front, back, or side yards depending on the location of the noise source and of frequent human use.

Text Captions
Modeling Point Placement
This means you might place modeling points in front, back, or side yards depending on the location of the noise source and of frequent human use.

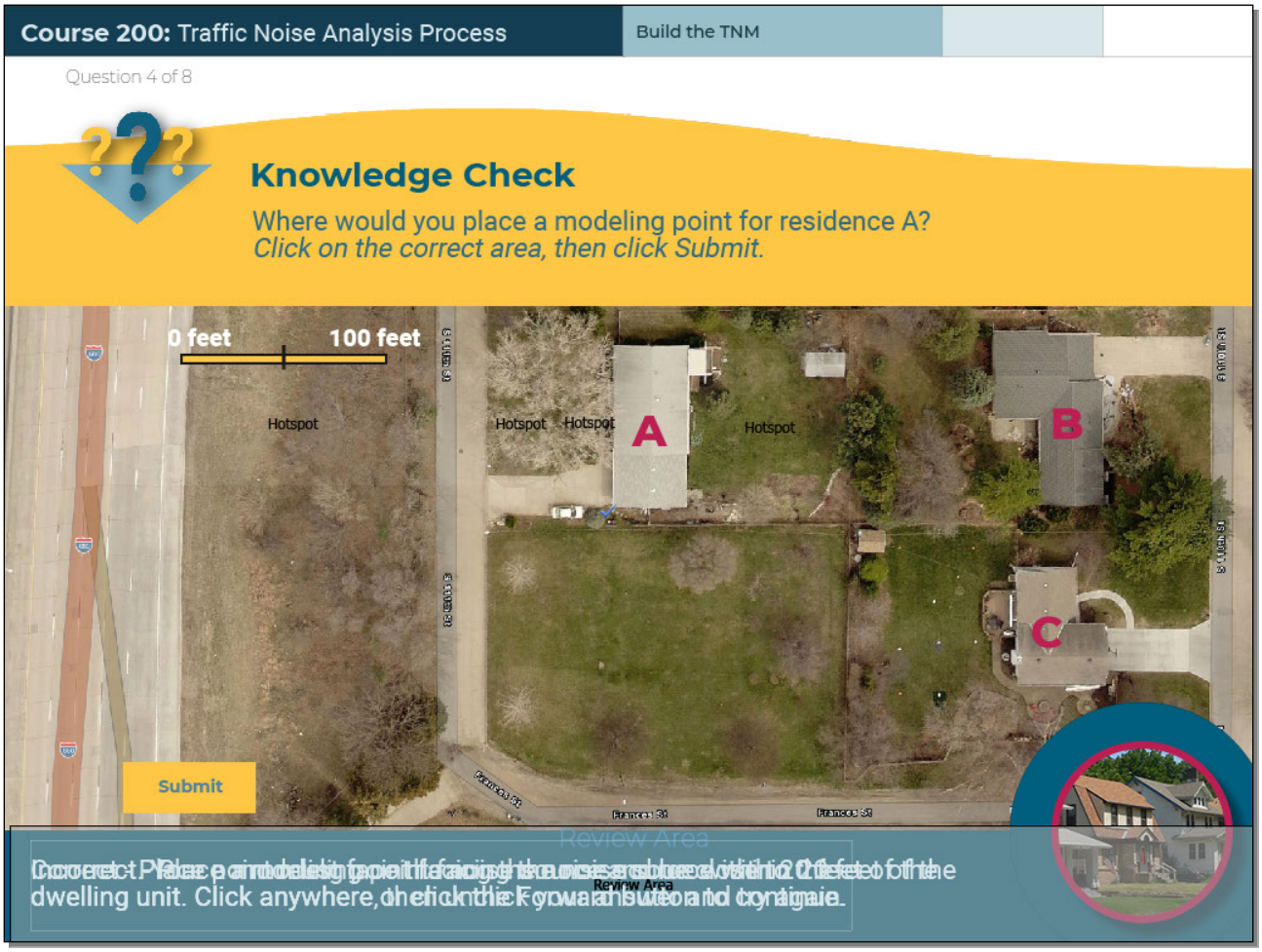
Slide 38 - Slide 38



Audio Script and Notes to Reviewers
For multi-family dwellings, count each dwelling unit as one receptor. Several receptors may be represented by a single modeling point consistent with the approach for single-family residences. For apartment buildings, place modeling points on every floor that has balconies until impacts are no longer predicted. Coordinate with the NDOT Noise P-Q-S in unique situations.

Text Captions
Modeling Point Placement
For multi-family dwellings, count each dwelling unit as one receptor. Several receptors may be represented by a single modeling point.
For apartment buildings, place modeling points on every floor that has balconies until impacts are no longer predicted.

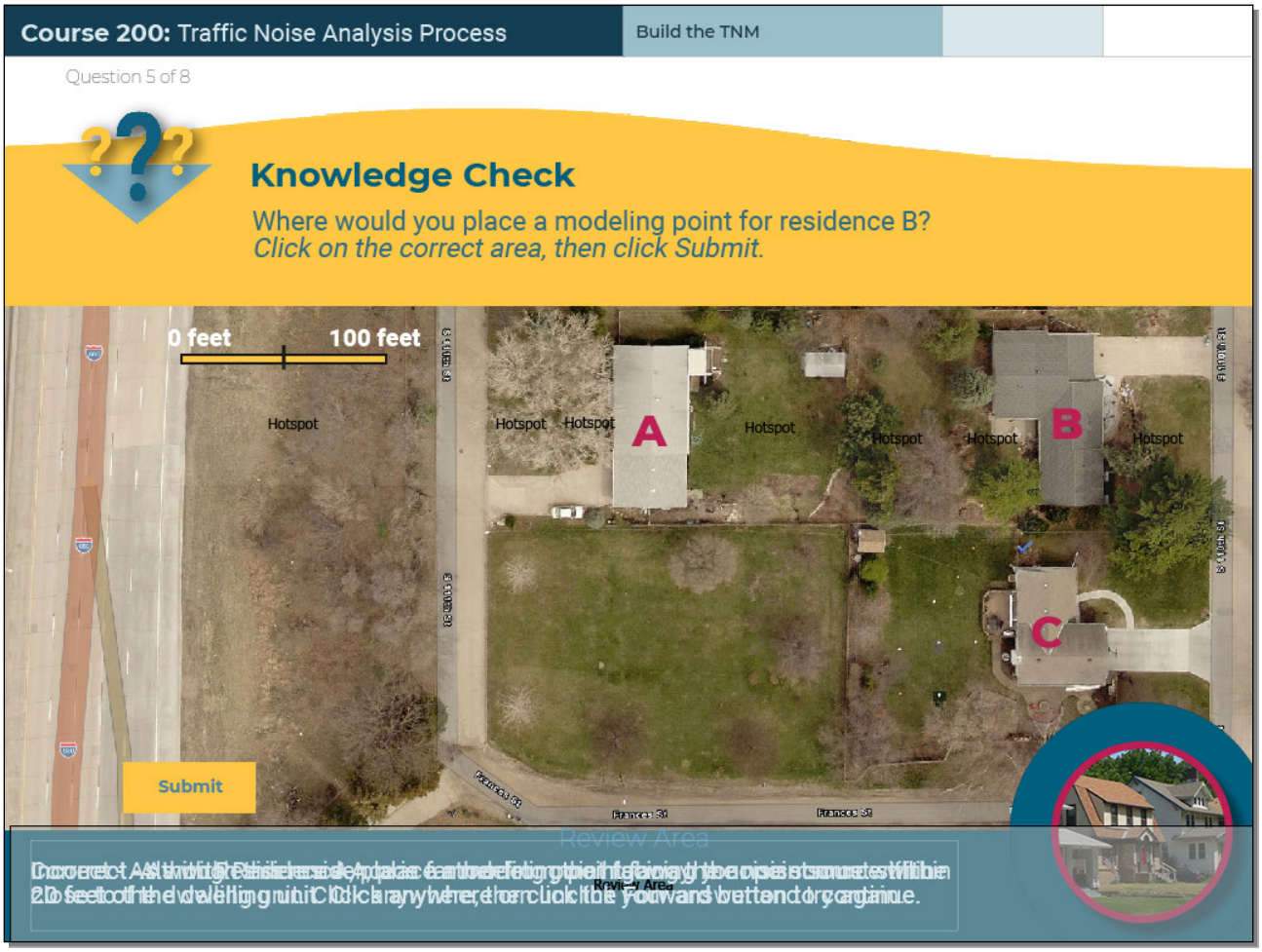
Slide 39 - Slide 39



Audio Script and Notes to Reviewers
Where would you place a modeling point for residence A?

Text Captions
Knowledge Check
Where would you place a modeling point for residence A?
Click on the correct area, then click Submit.
Correct - Place a modeling point facing the noise source within 20 feet of the dwelling unit. Click anywhere or click the Forward button to continue.
1st incorrect feedback: Incorrect. Your point must face the noise source and be close to the dwelling unit. Click anywhere, then unclick your answer and try again.
2nd incorrect feedback: Incorrect - Place a modeling point facing the noise source within 20 feet of the dwelling unit. Click anywhere or click the Forward button to continue.

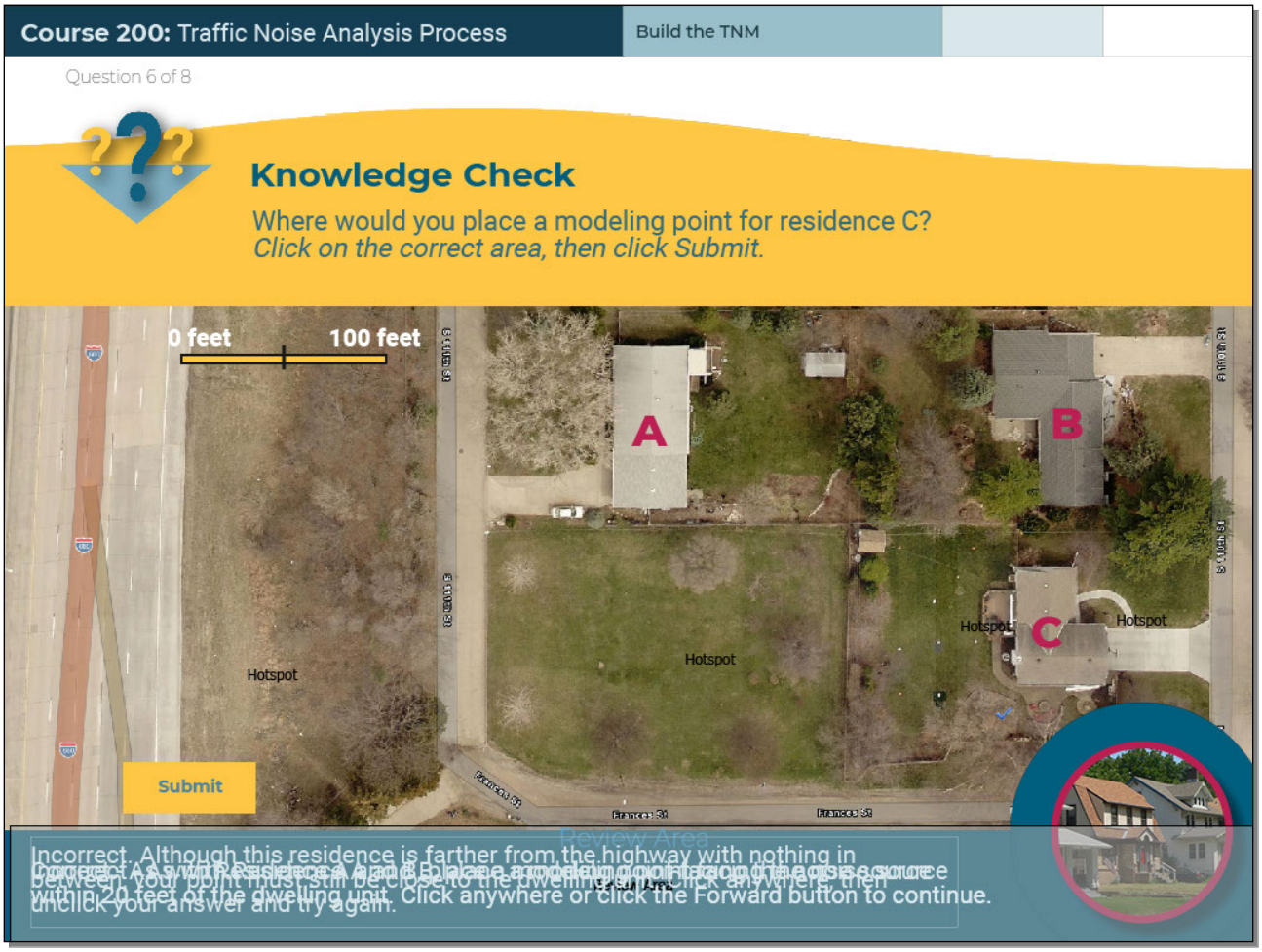
Slide 40 - Slide 40



Audio Script and Notes to Reviewers
Where would you place a modeling point for residence B?

Text Captions
Knowledge Check
Where would you place a modeling point for residence B?
Click on the correct area, then click Submit.
Correct - As with Residence A, place a modeling point facing the noise source within 20 feet of the dwelling unit. Click anywhere or click the Forward button to continue.
1st incorrect feedback: 2nd incorrect feedback: Incorrect - As with Residence A, place a modeling point facing the noise source within 20 feet of the dwelling unit. Click anywhere or click the Forward button to continue.
2nd incorrect feedback: Incorrect. Although this residence is farther from the highway, your point must still be close to the dwelling unit. Click anywhere, then unclick your answer and try again.

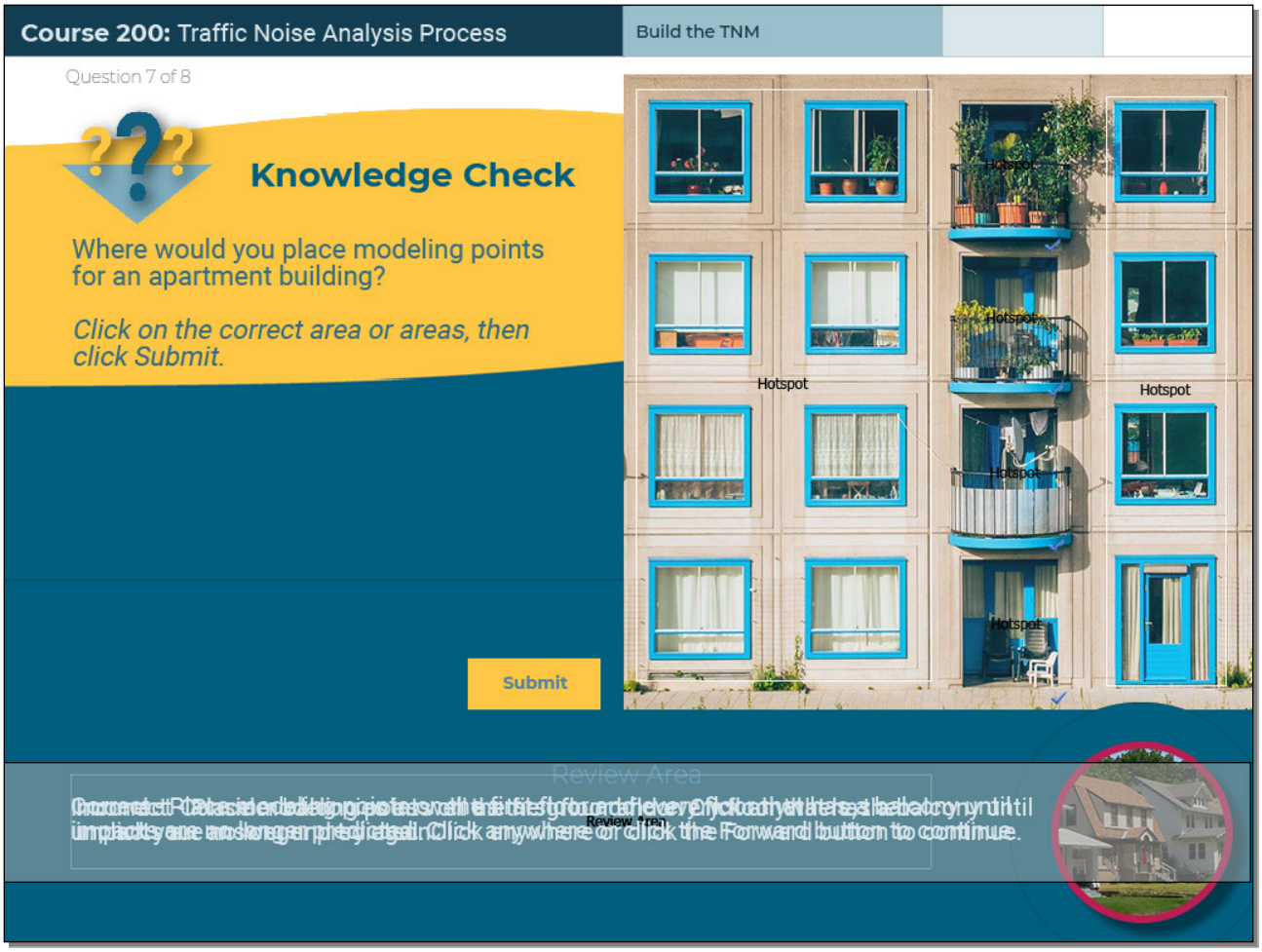
Slide 41 - Slide 41



Audio Script and Notes to Reviewers
Where would you place a modeling point for residence C?

Text Captions
Knowledge Check
Where would you place a modeling point for residence C?
Click on the correct area, then click Submit.
Correct - As with Residence A and B, place a modeling point facing the noise source within 20 feet of the dwelling unit. Click anywhere or click the Forward button to continue.
1st incorrect feedback: Incorrect. Although this residence is farther from the highway with nothing in between, your point must still be close to the dwelling unit. Click anywhere, then unclick your answer and try again.
2nd incorrect feedback: Incorrect - As with Residence A and B, place a modeling point facing the noise source within 20 feet of the dwelling unit. Click anywhere or click the Forward button to continue.

Slide 42 - Slide 42



Audio Script and Notes to Reviewers
Where would you place modeling points for an apartment building?

Text Captions
Knowledge Check
Where would you place modeling points for an apartment building?
Click on the correct area or areas, then click Submit.
Correct - Place modeling points on the first floor and every floor that has a balcony until impacts are no longer predicted. Click anywhere or click the Forward button to continue.
1st incorrect feedback: Incorrect. Consider balconies as well as the ground floor. Click anywhere, then unclick your answer and try again.
2nd incorrect feedback: Incorrect - Place modeling points on the first floor and every floor that has a balcony until impacts are no longer predicted. Click anywhere or click the Forward button to continue.

Slide 43 - Slide 43

Audio Script and Notes to Reviewers
When building the TNM, place modeling points at areas of frequent human use, such as picnic tables, for Activity Category C.

Text Captions
Modeling Point Placement
When building the TNM, place modeling points at areas of frequent human use, such as picnic tables.

Slide 44 - Slide 44

Audio Script and Notes to Reviewers
Take the same approach for cemeteries. Place modeling points are areas of frequent human use, such as benches or memorials. If your noise study area includes a cemetery, consult with N-dot for details on how to proceed.

Text Captions
Modeling Point Placement
Take the same approach for cemeteries. Place modeling points are areas of frequent human use, such as benches or memorials.
If your noise study area includes a cemetery, consult with NDOT.

Slide 45 - Slide 45

Audio Script and Notes to Reviewers
For Activity Category E, place receptors at areas of frequent human that are near the roadway, for example, a restaurant patio or a hotel balcony or pool.
NOTE TO REVIEWER: Does the length of frontage matter if they use 200 feet regardless??

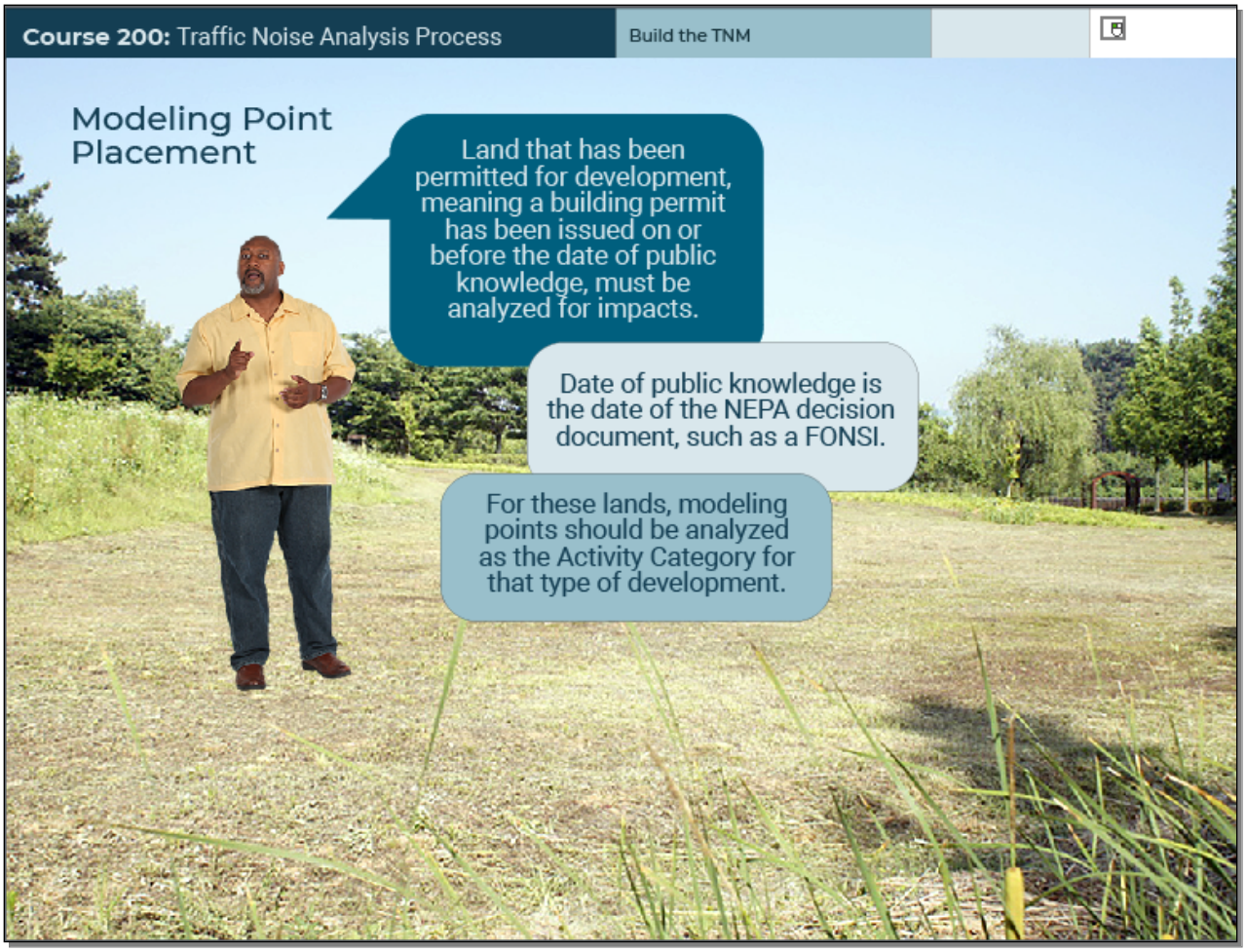
Text Captions
Modeling Point Placement
For Activity Category E, place receptors at areas of frequent human that are near the roadway, for example, a restaurant patio or a hotel balcony or pool.

Slide 46 - Slide 46

Audio Script and Notes to Reviewers
Activity Category G is land that is permitted for development, meaning a building permit has been issued on or before the date of public knowledge. Date of public knowledge is the date of the Neepa decision document, such as a fonzee. For these lands, modeling point placement should be consistent with the Activity Category for that type of development.
WILL: I can't remember what we decided about how to provide info to the local officials. I think you said they note it in the report but it's up to the NEPA PM to make sure it gets into the NEPA doc, is that right?

Text Captions
Modeling Point Placement
Activity Category G is land that is undeveloped. Place receptors to estimate setbacks for local officials to avoid impacts to future development.

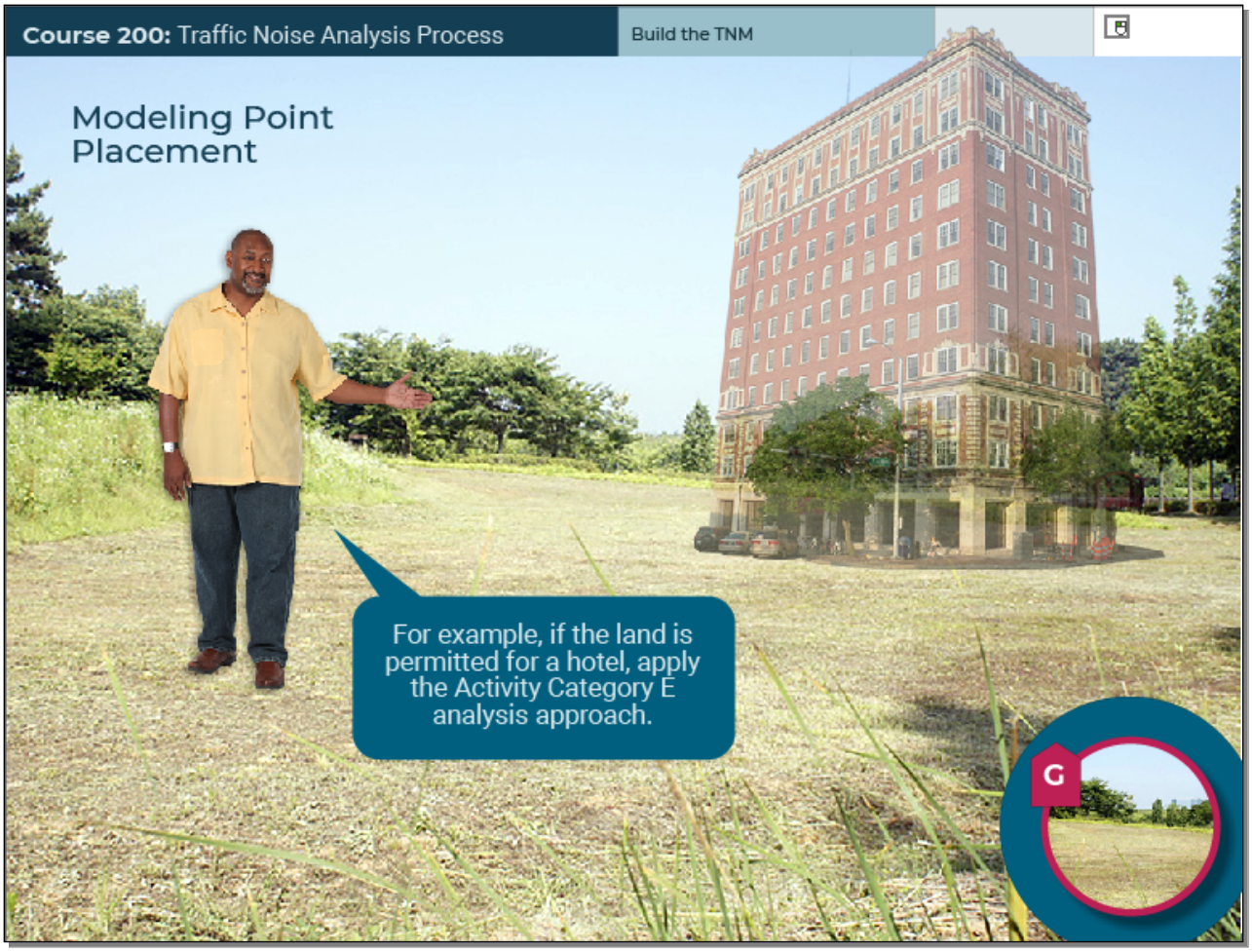
Slide 47 - Slide 47



Audio Script and Notes to Reviewers
Undeveloped land that is permitted for development, meaning a building permit has been issued on or before the date of public knowledge, must be analyzed for impacts. Date of public knowledge is the date of the Neepa decision document, such as a fonzee. For these lands, modeling points should be analyzed as the Activity Category for that type of development.

Text Captions
Modeling Point Placement
Land that has been permitted for development, meaning a building permit has been issued on or before the date of public knowledge, must be analyzed for impacts.
Date of public knowledge is the date of the NEPA decision document, such as a FONSI.
For these lands, modeling point placement should be consistent with the Activity Category for that type of development.

Slide 48 - Slide 48



Audio Script and Notes to Reviewers
For example, if the land is permitted for a hotel, apply the Activity Category E analysis approach. You'll learn more about this in Module Four.

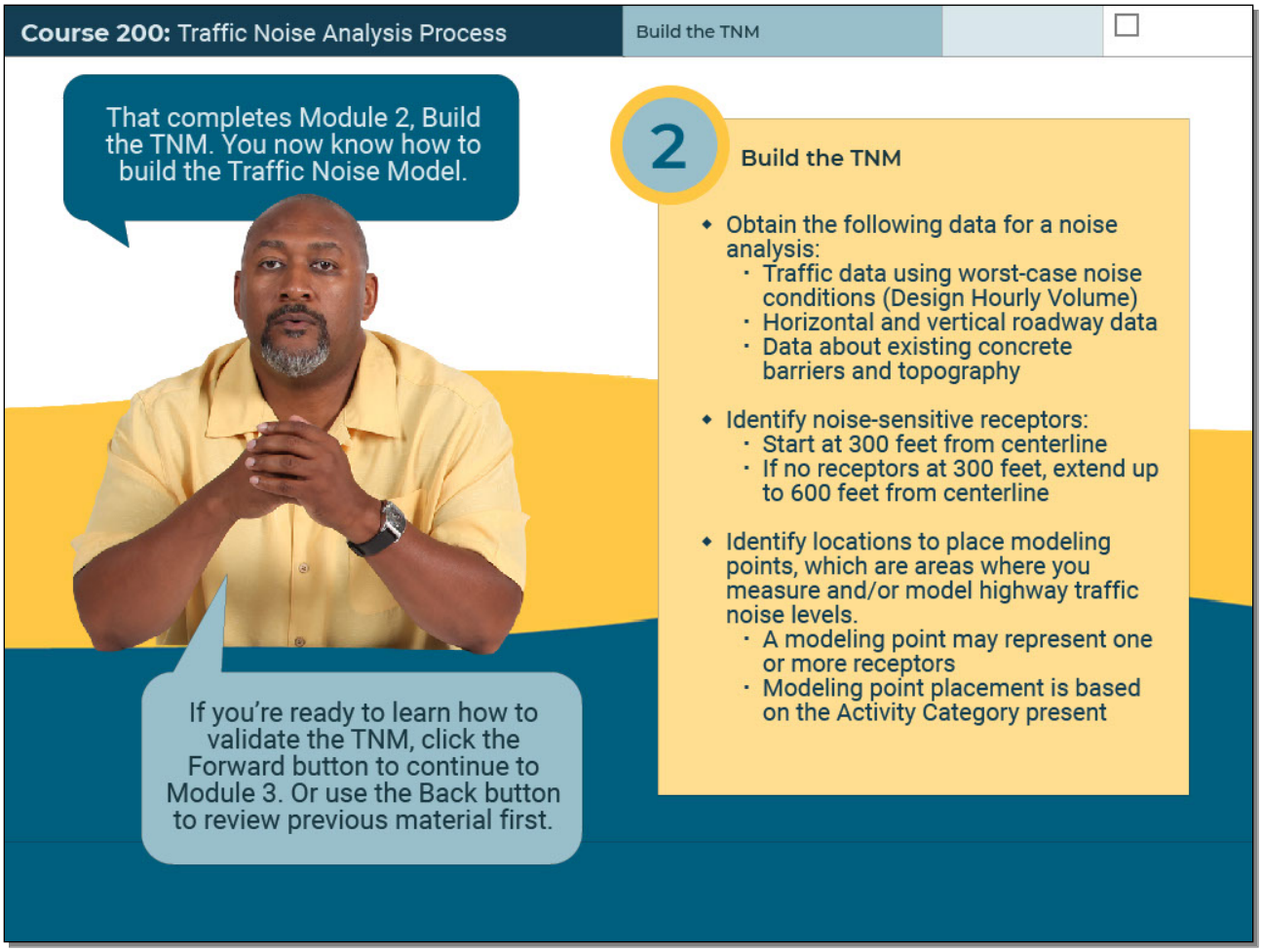
Text Captions
Modeling Point Placement
For example, if the land is permitted for a hotel, apply the Activity Category E modeling approach.

Slide 49 - Slide 49

Audio Script and Notes to Reviewers
Your project includes undeveloped land that is permitted to be developed as a townhouse. Where would you place modeling points?

Text Captions
Knowledge Check
Your project includes undeveloped land that is permitted to be developed as a townhouse. Where would you place modeling points?
Correct - Because a townhouse falls under Activity Category B, place modeling points consistent with that category. Click anywhere or click the Forward button to continue.
1st incorrect feedback: Incorrect - Think about the type of development that will be constructed. Click anywhere and try again.
2nd incorrect feedback: Incorrect - Because a townhouse falls under Activity Category B, place modeling points consistent with that category. Click anywhere or click the Forward button to continue.

Slide 50 - Slide 50



Audio Script and Notes to Reviewers

That completes Module Two, Build the T-N-M. In this module, you learned how to build the T-N-M by obtaining data for a noise analysis, identifying noise-sensitive receptors, and placing modeling points. Here's a quick summary. If you're ready to learn how to validate the T-N-M, click the Forward button to continue to Module Three. Or use the Back button to review previous material first.

Text Captions

That completes Module 2, Build the TNM. You now know how to build the Traffic Noise Model.
2 Build the TNM

- Obtain the following data for a noise analysis:
  - Traffic data using worst-case noise conditions (Design Hourly Volume)
  - Horizontal and vertical roadway data
  - Data about existing concrete barriers and topography
- Identify noise-sensitive receptors:
  - Start at 300 feet from centerline
  - If no receptors at 300 feet, extend up to 600 feet from centerline
- Identify locations to place modeling points, which are areas where you measure and/or model highway traffic noise levels.
  - A modeling point may represent one or more receptors
  - Modeling point placement is based on the Activity Category present

If you're ready to learn how to validate the TNM, click the Forward button to continue to Module 3. Or use the Back button to review previous material first.