

Creating a Crash Animation

The Exercise

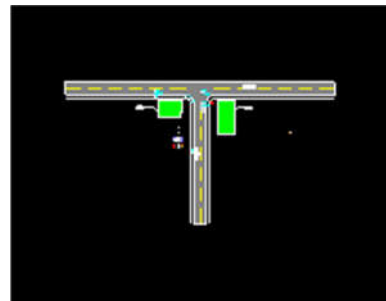
An animation showing two symbols following a path to a point of impact can be created in the IMS Animation module. The drawing you work with requires the following elements:

- The Drawing or Pointcloud with the elements you need to see.
- Measurements that can be used to create 3D polylines that define the paths of the symbols
- Symbols should be inserted into the scene

Opening the drawing

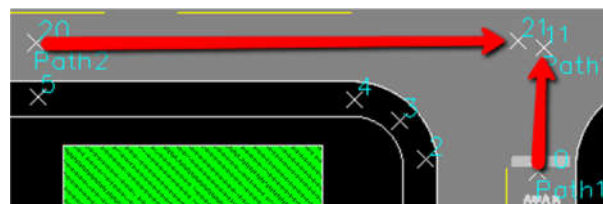
A drawing containing the needed elements can now be opened. We'll use it to create a path and then create a fly through animation.

1. Start IMS
2. Pick "Open Scene"
3. Navigate to the location "Intersection" is stored and open the drawing.



Drawing the Paths

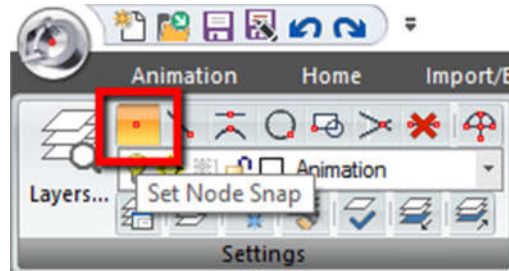
Your drawing has points stored that we can use to guide drawing a path. Points 10 and 11 define the first path. Points 20 and 21 define the second path.



Entity Snaps

Entity snaps are activated before you start a drawing command. They ensure that an entity that you are drawing adopts the exact X,Y,Z coordinates of the entity you are using as a guide.

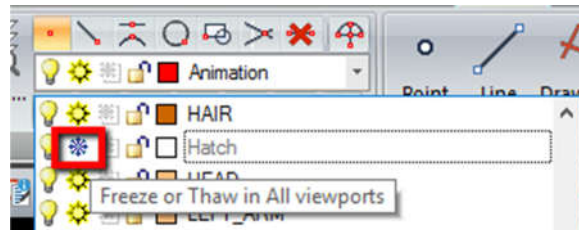
- Find the Settings group in your Draw Ribbon
- Clear all active entity snaps ("Active" snaps are indicated by the orange highlight)
- Set the "Node Snap" active



Configuring your Layers

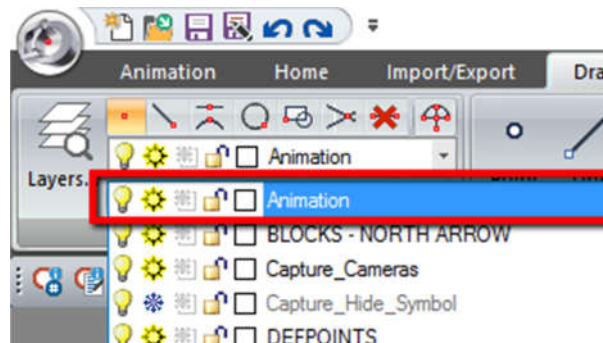
Let's freeze the hatch layer, it can sometimes cause visibility issues:

- Select the pulldown to the right of the layers dialog.
- Find the Hatch layer
- Pick on the freeze/thaw icon
- Any hatches in the drawing are now hidden



Let's set "Animation" as the current layer:

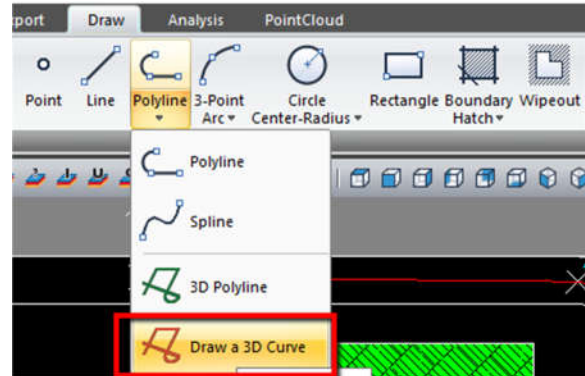
- Select the pulldown to the right of the layers dialog.
- Move your mouse so that "Animation" is highlighted
- Left click so that "Animation" now shows in the current layer display.



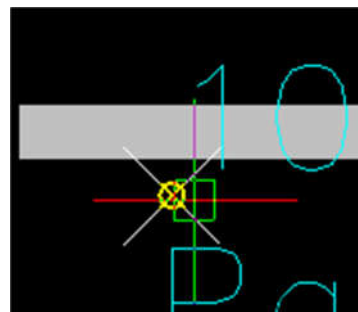
Drawing Path 1

"Draw a 3D Curve" is a command that is ideal for creating animation paths, both 2 Dimensional and 3 Dimensional.

- Look for “Polyline” in the “Draw” section of the “Draw” menu
- Select polyline and find “Draw a 3D Curve” in the extended options.
- Now watch the command bar for instructions while creating this path:



- **Pick first point:**
- When you see this prompt, mouse over point 10
- Note the Node snap icon. This indicates the node has been recognized and will ensure your path begins at these exact coordinates.



- **Options: Redraw/Undo, or select segment type: Line/<Spline>/Arc**
- Now we are seeing options for creating a 3D curve.
- Type “L” and enter to indicate we are drawing a line segment
- Then snap to “11”



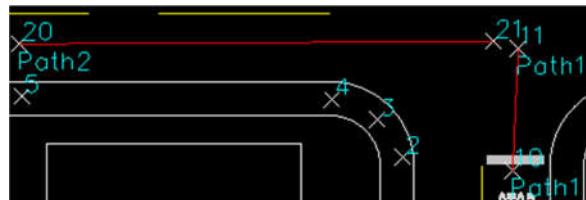
- **Options:**
Draw/Redraw/Undo/Close/Wrap/COarseness/Tension, or select segment type: <Line>/Spline/Arc, or pick next point:
- Now we're at the end of our path, but we have not yet created it.
- Note how when you zoom the red preview line vanishes.
- Type "R" and enter to turn the preview on.
- When you are satisfied with your work, complete the operation by typing "D" and enter.
- The path is complete



Drawing Path 2

Path 2 connects points 20 and 21. Use the same steps as before to create this path on the "Animation" Layer.

- Start at 20
- Ensure node snaps are on
- Remember to type "D" to draw the line when you are finished



Save your work.



This drawing already has two vehicle Symbols inserted so you can focus on learning the steps in an animation. This can be accomplished by opening the Symbol Librarian on the "Draw" ribbon:

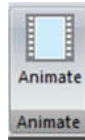


Symbols can also be imported from Google Sketchup Warehouse by using the Collada Import tool.

Creating the Animation

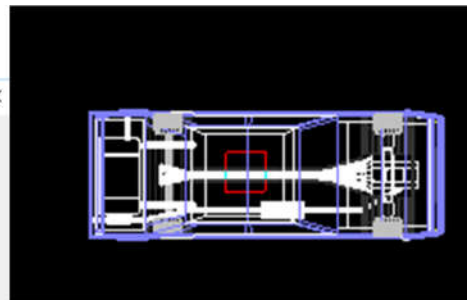
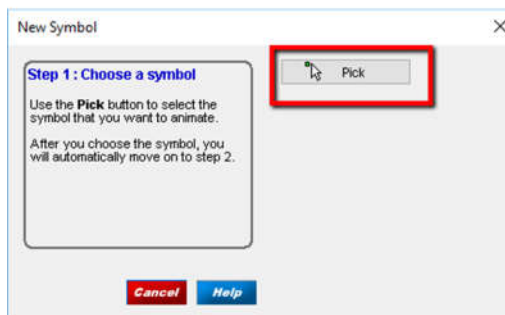
We are now moving on to the next critical step, creating an animation file and assigning two symbols to their paths.

- Find “Animate” on the Animate Ribbon
- Select “Symbol” and “Add Symbol.”

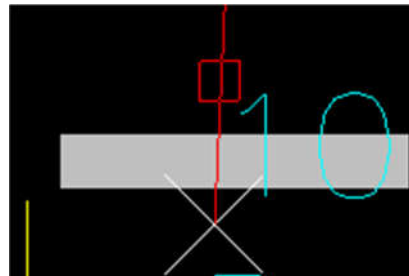
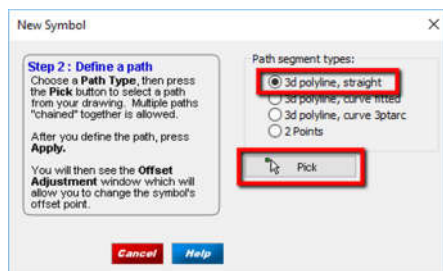


Inserting Symbol 1

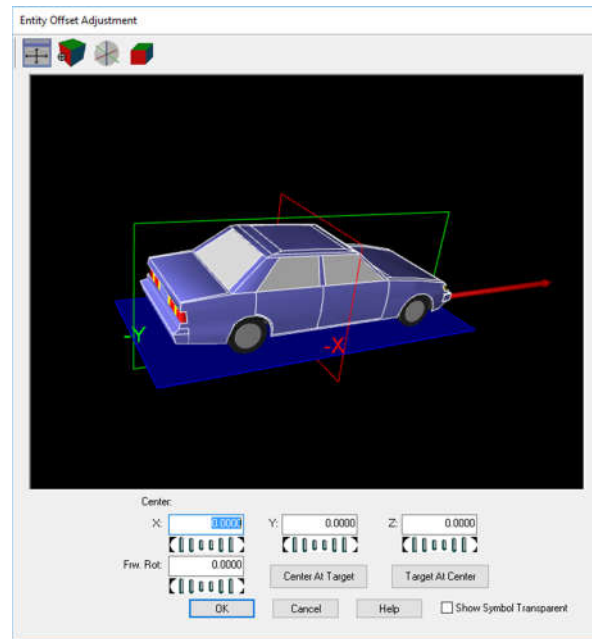
- Select “Pick” and then select the blue sedan symbol that is positioned to the left of the road



- Select “3D Polyline, Straight” and then “Pick.”
- Select the 3d polyline between 10 and 11



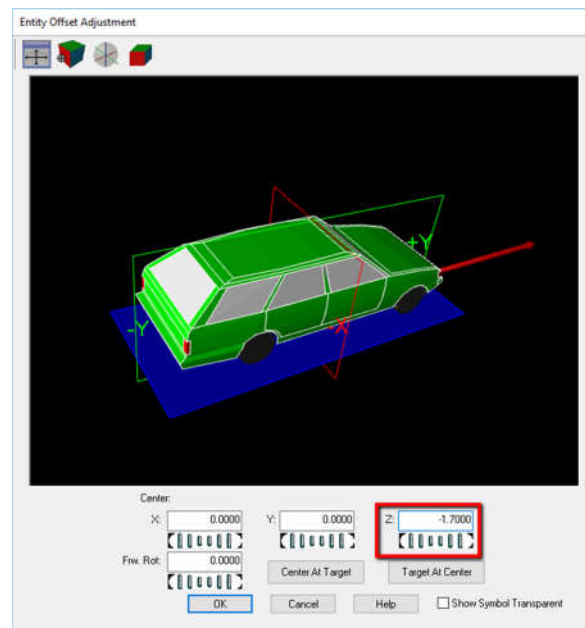
- Pick “Apply” and now you can configure your Symbol Offsets.
- We want this symbol to move along the ground as a rolling vehicle would. Use the “Jogger” buttons to adjust the Z offset so that the blue plane representing the ground is at the symbol’s wheels.
- There is no need to adjust the rotation value as the red arrow is showing that the forward direction on the symbol is correct.
- Select “OK” to complete the operation.



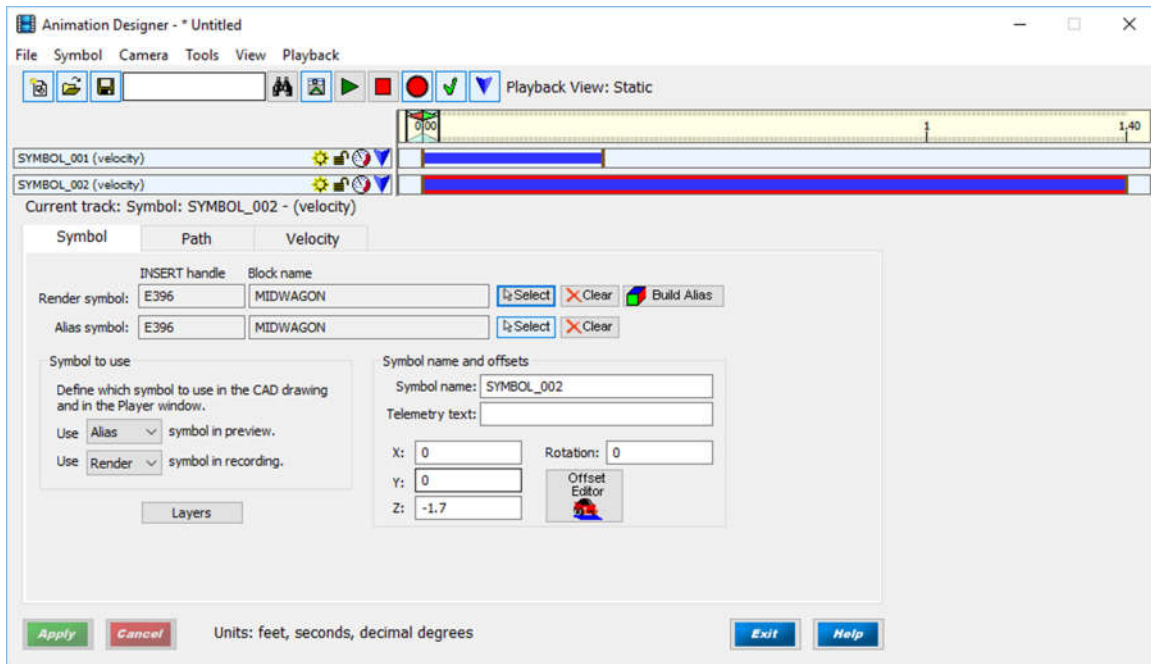
Inserting Symbol 2

Repeat the steps to insert the Green Wagon Symbol and link it to the path that connects 20 and 21.

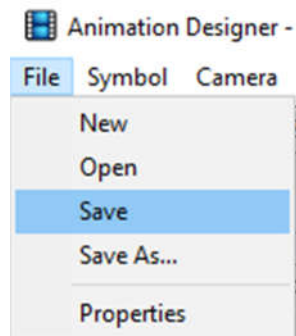
- Notes:
- The path is between 20 and 21
- This symbol requires that you adjust the “Z” offset slightly so that the blue plane is even with the bottoms of the tires.



The Result:



- File | Save as...
- Save your file as "Anim1"



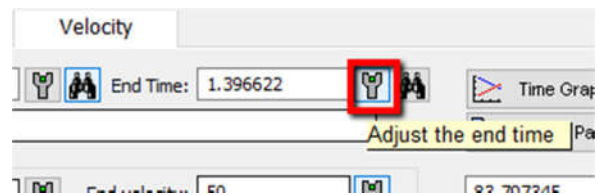
Adjusting the Tracks so they end at the time of Impact

We have inserted two tracks, but they are now configured with a default velocity and time. Next we need to configure the tracks to reproduce the events leading to a collision.

Adjusting the Velocity of Symbol 2

Airbag data was able to show us that the green wagon travelled at a constant velocity of 50 feet/sec. Let's configure the track to show that and calculate a time from the known distance and speed:

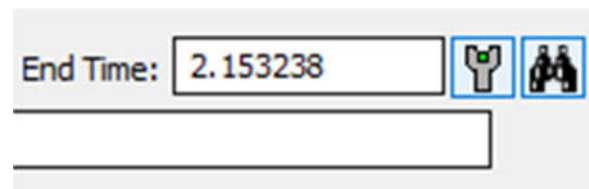
- Highlight the track for Symbol 2
- Enter 50 for the Start and End velocities
- Pick the tuning fork icon to calculate a new end time
- Pick “Apply”
- Note that the end time is now 1.675947



Adjusting the Velocity of Symbol 1

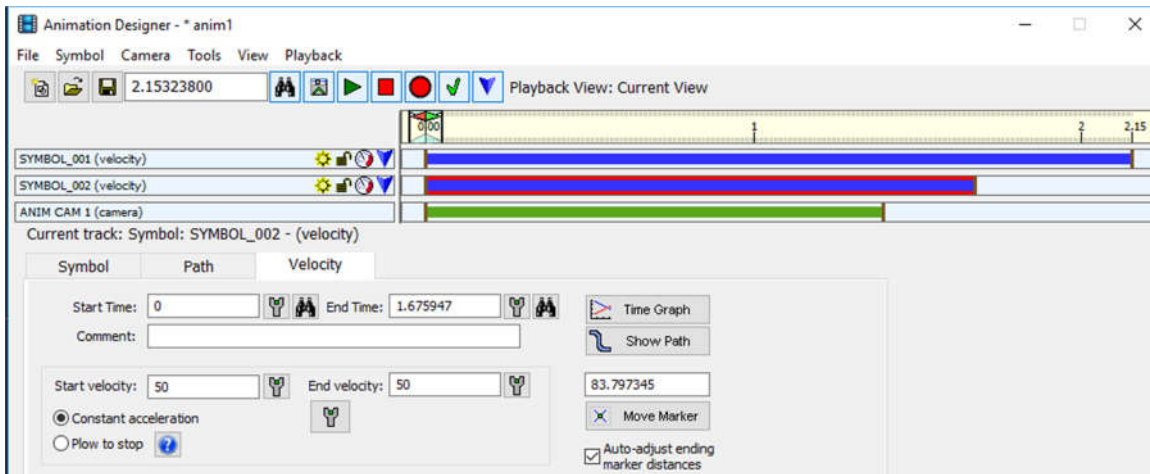
Witnesses tell us that the blue sedan accelerated from zero until it was impacted by the green wagon. We will approximate a velocity of 20 feet/second at that point.

- Highlight the track for Symbol 1
- Enter 0 for the Start velocity
- Enter 20 for the End
- Pick the tuning fork icon to calculate a new end time
- Pick “Apply”
- Note that the end time is now 2.153238



Adjusting the Start Time for Symbol 1

Now we need to do some arithmetic. We must use the longest track as the overall length of the animation, and adjust the shorter symbol track so it ends at exactly the same time.



Solving for start time of Symbol 2:

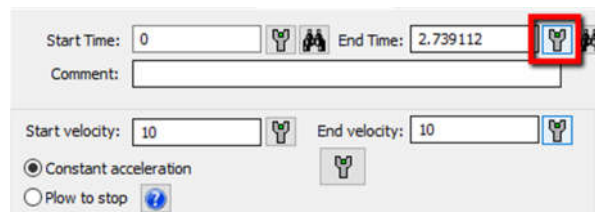
Start Time Symbol 2 = End Time Symbol 1 - End Time Symbol 2

Start Time Symbol 2 = 2.153238 – 1.675947

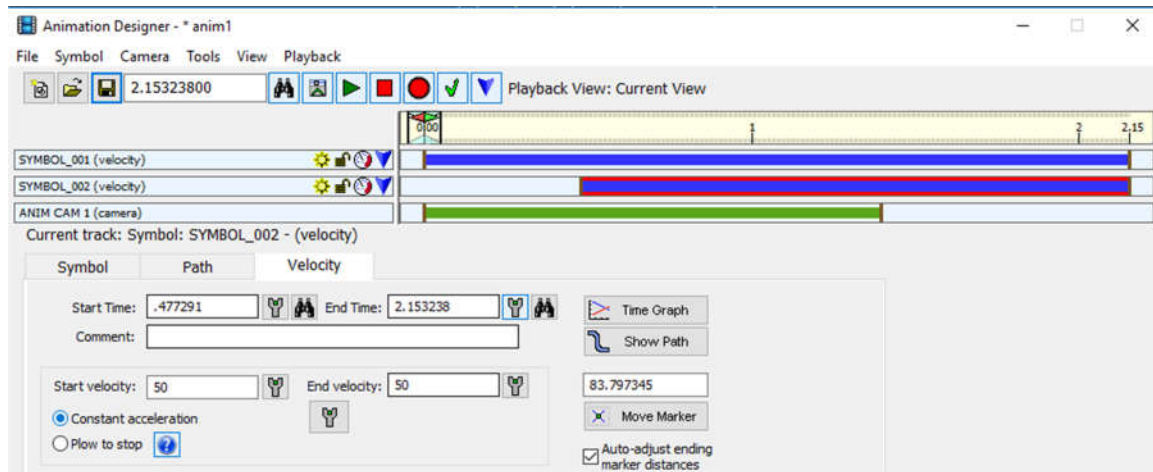
Start Time Symbol 2 = .477291

Adjusting the Time on the Symbol Track

- Highlight the Symbol 1 Track
- Edit the start time for symbol 2 to be .477291
- Pick “Apply”
- Pick the tuning fork icon next to the “End Time” field to trigger an adjustment of the track to match the velocities.
- Note how a new time value of 2.630529 has been calculated.
- Pick “Apply”



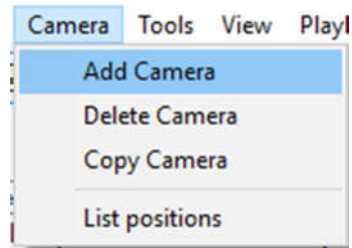
The Result

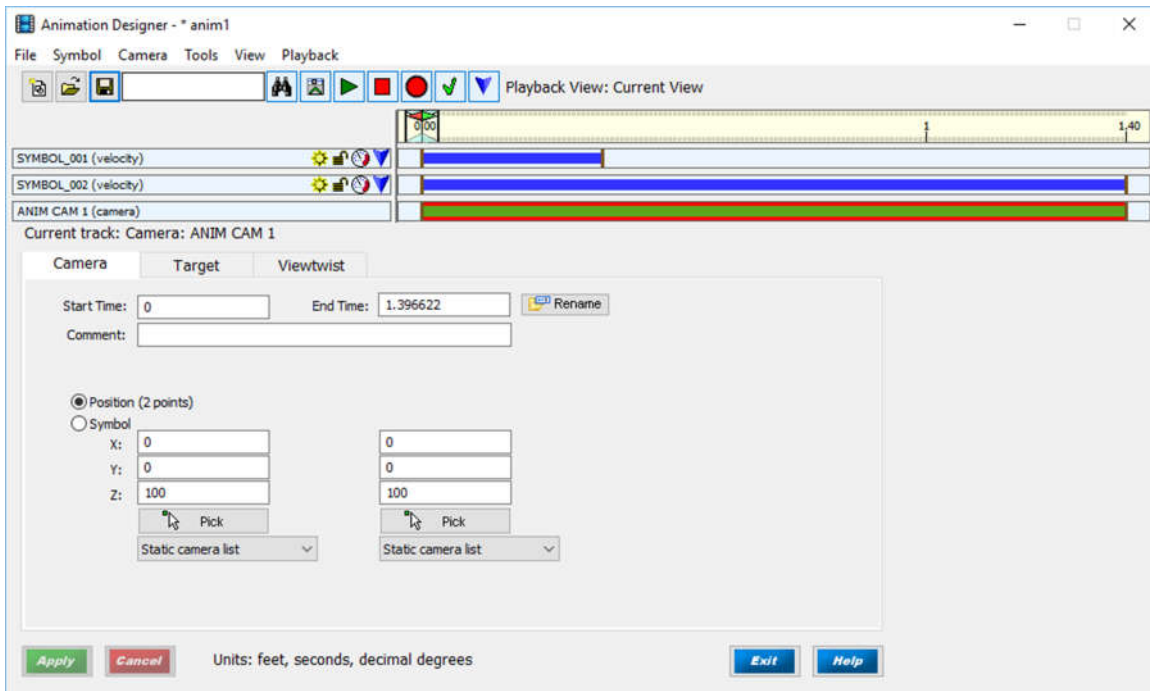


Inserting a Camera

Next we're going to insert a camera for an aerial view and record an animation.

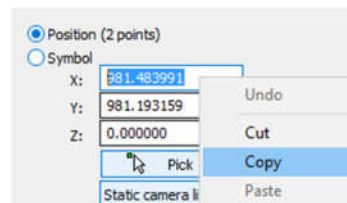
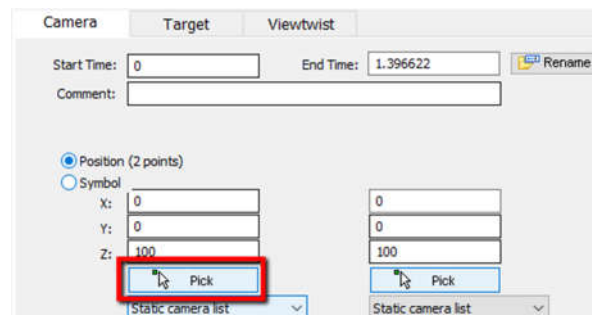
- Go to "Camera" and "Add Camera"
- Note in the image below that a new track has been added to your animation designer.
- Highlight the track by left clicking with your mouse so you can configure it.

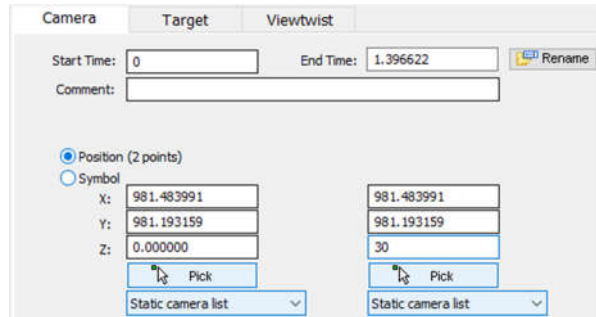




Configuring Camera Position

- Select the "Camera" tab
- Select the "Position (2 points)" radio button
- Select "Pick"
- Snap to point 3
- Next, Copy and paste the X and Y coordinates from the first position dialog to the second one
- Finally, set a Z value of 30 in the second position dialog. This will have the effect of causing our camera to rise during the animation to give a better perspective.
- Pick "Apply"





Camera Target Viewtwist

Start Time: 0 End Time: 1.396622 [Rename](#)

Comment:

☒ Position (2 points)

☐ Symbol

X: 981.483991 981.483991

Y: 981.193159 981.193159

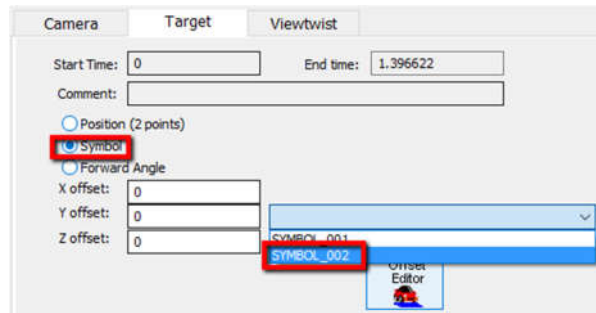
Z: 0.000000 30

[Pick](#) [Pick](#)

Static camera list Static camera list

Configuring Camera Target

- Select the “Target” tab
- Select the “Symbol” radio button
- Select “Symbol_002” from the pulldown
- Pick “Apply”



Camera Target Viewtwist

Start Time: 0 End Time: 1.396622

Comment:

☐ Position (2 points)

☒ Symbol

☐ Forward Angle

X offset: 0

Y offset: 0

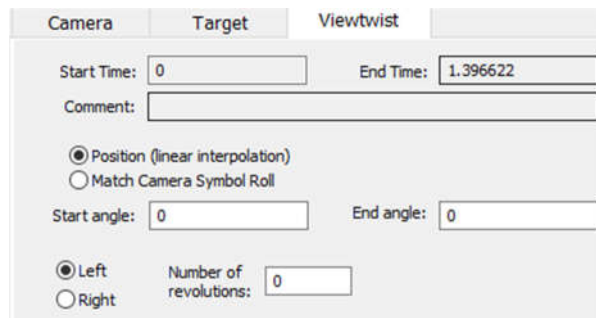
Z offset: 0

Symbol_002

[Apply](#)

Configuring Viewtwist

- Select the “Viewtwist” tab
- There is nothing to change here.
- Pick “Apply”



Camera Target Viewtwist

Start Time: 0 End Time: 1.396622

Comment:

☒ Position (linear interpolation)

☐ Match Camera Symbol Roll

Start angle: 0 End angle: 0

☒ Left Number of revolutions: 0

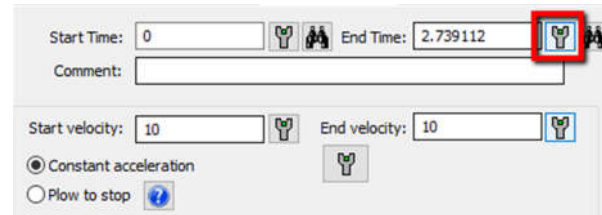
☐ Right



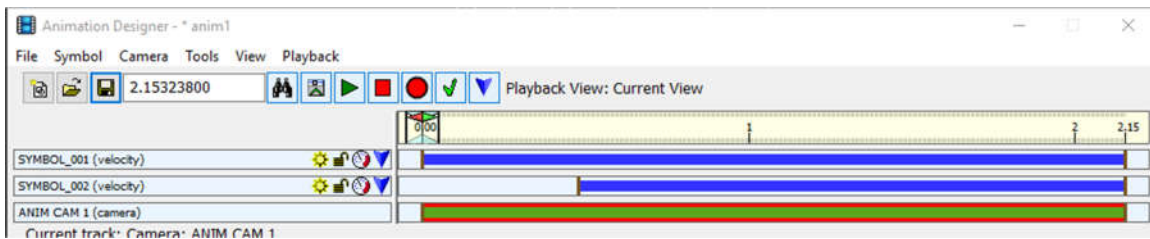
Viewtwist is used to adjust camera “roll” or twisting about the longitudinal axis.

Adjusting the Time on the Camera Track

- Highlight the Camera 1 Track
- Edit the start time for Camera to be 0
- Pick “Apply”
- Edit the “End Time” field to equal 2.153238
- Pick “Apply”



The Result:

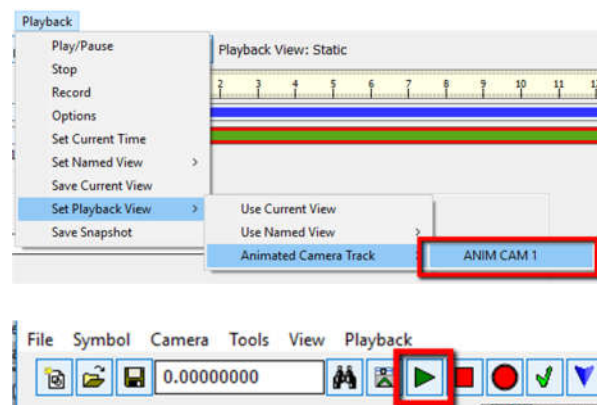


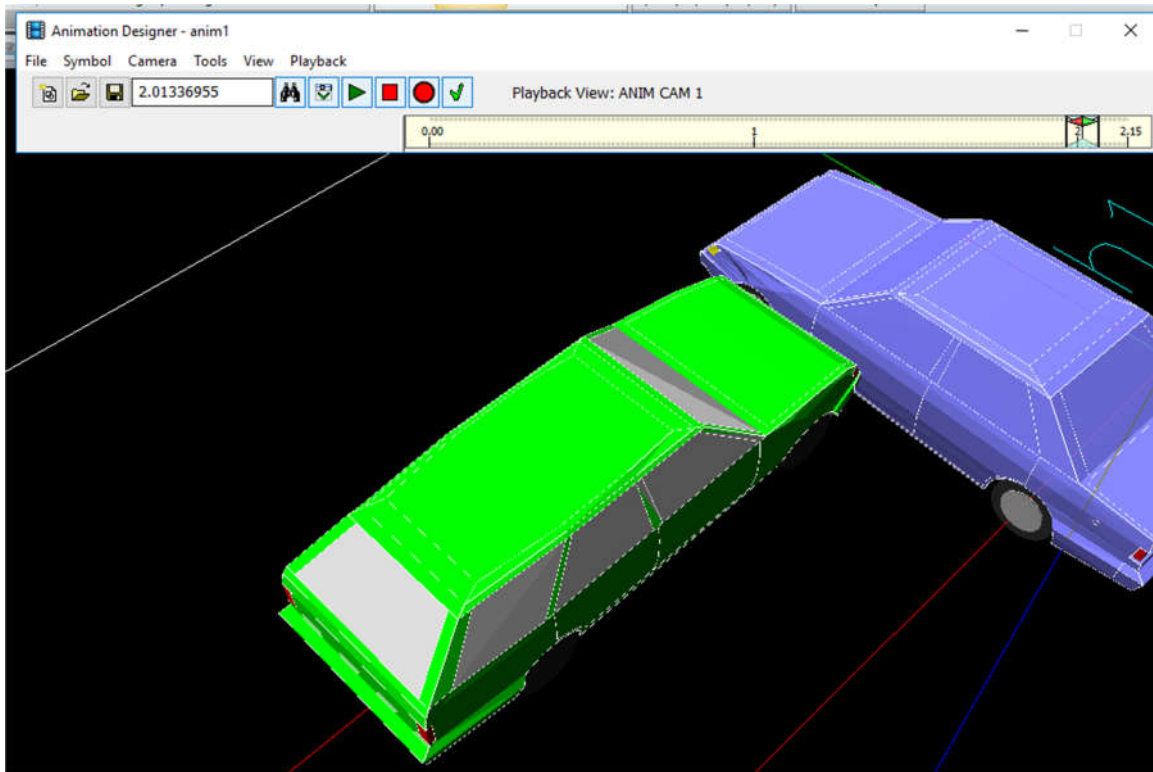
Setting the Playback View

Now we are ready to play back and record our animation. We have many options for positioning and targeting of the camera, but in this example we'll play the whole animation from a single camera position, targeting the green wagon.

Setting the Playback View and Previewing the Animation

- Open Playback | Set Playback view | Animated Camera Track
- Select ANIM CAM 1
- Now pick the “Play” button
- Pick the Stop button at any time to stop and reset the playback
- You can also use the Binocular icon or slider widget to move to different segments of your animation
- Try these options to preview your animation from the assigned camera.





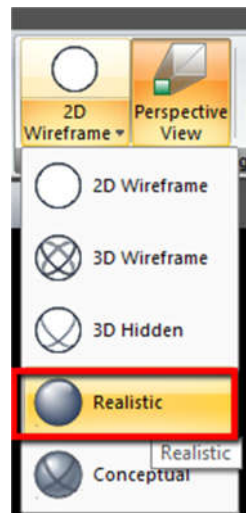
Record your animation

Once all the details are in place, we can record an animation.

Setting the Visual Style

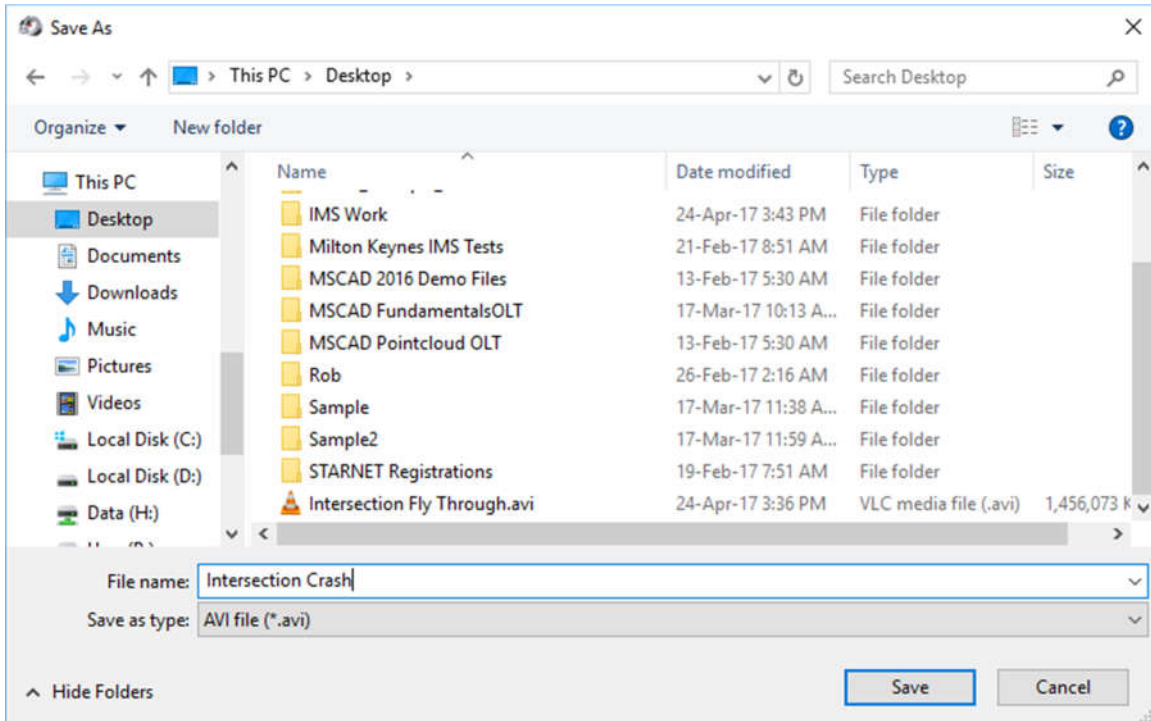
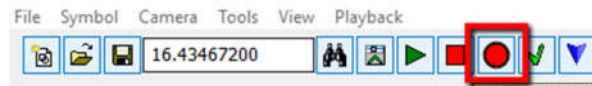
This drawing contains a limited number of 3D elements. By default they are rendered as Wireframe entities as this is more efficient. But now that we are recording we should change to “Realistic” view:

- Switch to the “Home” ribbon
- Find the “Rendering” group
- Your current visual style is displayed. (Usually it is 2D wireframe)
- Pick on the pulldown and select “Realistic.”

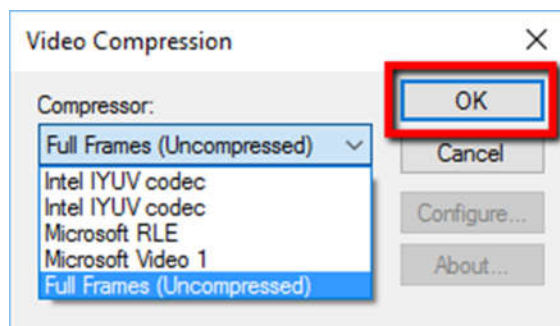


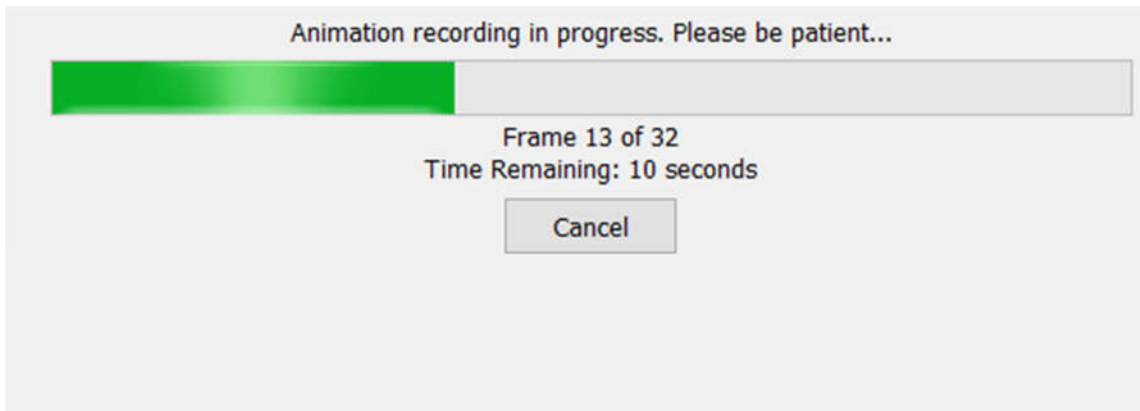
Recording

- Pick the “Record” button:
- Navigate to the folder you need to save your media file
- Enter a name for the media file
- Save



- Select a Video Compression Option
- (NOTE: your options may vary from this image)
- “OK”





The Result:

The animation will play back in your default media viewer software:

