



ChronoSculpt™

Manual
v 1.0



Contents

Introduction

Welcome to ChronoSculpt - Time is Finally Relative	1
ChronoSculpt Getting Started Tips	3
ChronoSculpt Navigation	3

Interface

Overview of Interface	4
Timeline.....	5

Project Menu Group

New Project	6
Load Project	6
Load Object	6
Load Cache.....	6
Save Project	6
Save Project As.....	6
Export MDD	6
Export Maya Cache	6
Export Frame to OBJ	6
Export to Endomorph.....	7
Export Alembic.....	7
About	7
Quit	7
Cut.....	8
Copy	8
Paste	8
Delete.....	8
Undo.....	8
Redo	8
Clear History.....	8

Tools Menu Group

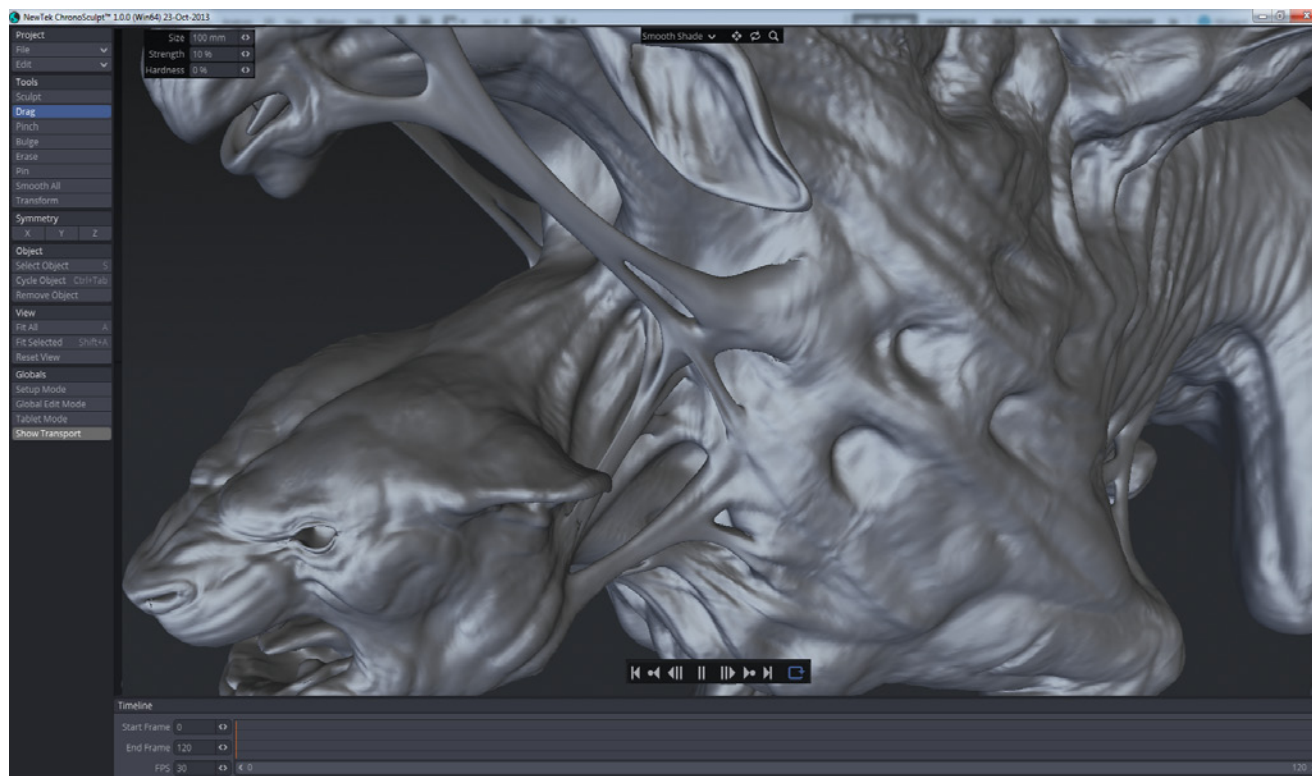
Sculpt.....	9
Drag	9
Pinch.....	9
Bulge.....	9
Erase	9
Pin	9
Smooth All	10
Transform	10
XYZ Symmetry.....	10

Object and View Menu Groups



Select Object	11
Cycle Object	11
Remove Object	11
Fit All	11
Fit Selected	11
Reset View	11
Globals	
Setup Mode	12
Global Editing Mode	12
Tablet Mode	12
Palette	12
Ease In/Ease Out	12
Examples	
I Love the Sound of Breaking Glass	13
Controlled Explosion	17
Cloth Penetration	19
III-Equipped Soldier	19
III-Proportioned Soldier	19

Introduction



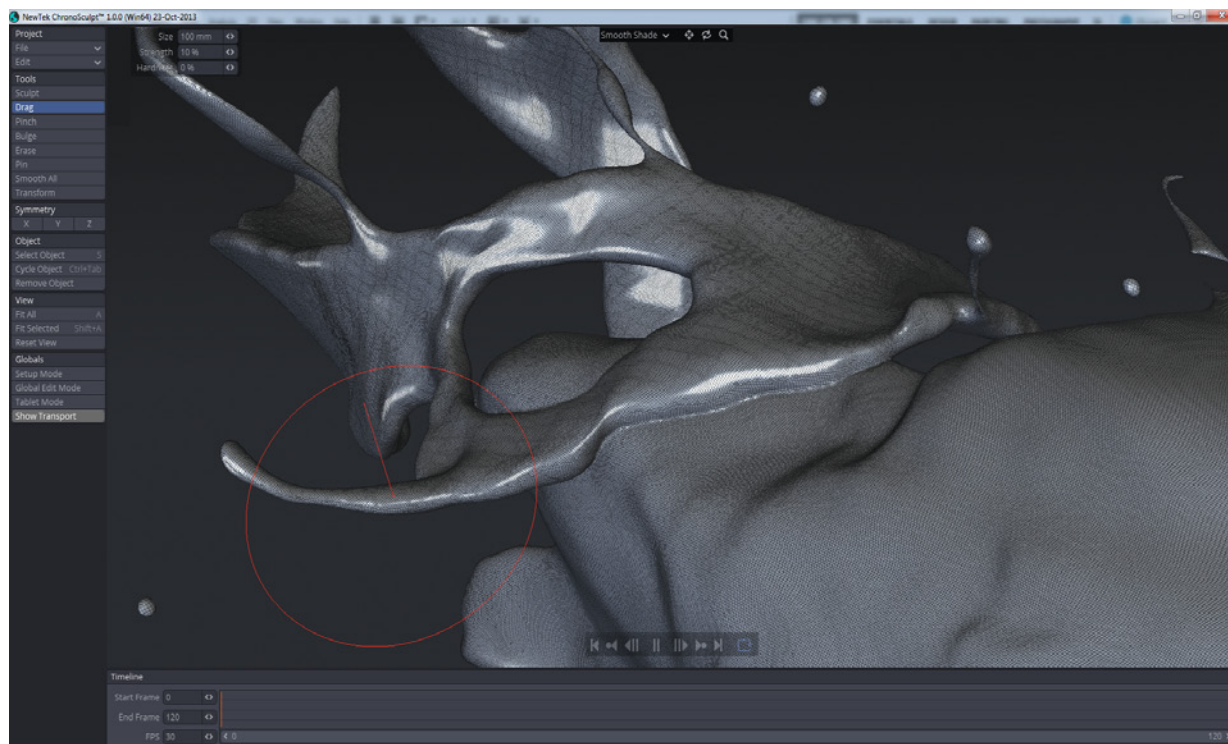
Welcome to ChronoSculpt - Time is Finally Relative

- **Revolutionary Time Sculpting** - quickly and easily removing dynamics simulation errors, jitters, or layer sculpted deformations on simulation cache files from most 3D software packages.
- **Sculpting Tools** - Use tools like *Sculpt*, *Pinch*, *Drag* and *Erase* to deform and manipulate your geometry over time.
- **Transform Tools** – Move individual geometry parts over time within a dynamics simulation cache using tools like *Transform*, *Pin*, and *Bulge* to help you complete your projects quickly.
- **Enhanced Geometry Engine** - Handle massive (8 - 10 million polygon objects) geometry files with ease.
- **Universal File Support** - ChronoSculpt supports LWO, OBJ, LightWave MDD, Autodesk Geometry Cache, and Alembic for easy integration into software pipelines.
- **OBJ Blend Shape and Endomorph Export** – Easily save any frame from the ChronoSculpt timeline as an OBJ for Maya blend shapes or as an Endomorph directly to your LightWave object files to create facial morph targets and deformation effects.
- **Clip Timeline** - Quickly reposition and adjust the length of your “sculpts” anywhere in the timeline to get the perfect effect on your cache animations or make global changes that apply to the whole animation.



Introduction

Introduction



ChronoSculpt is a powerful new stand-alone application that revolutionizes working with animation and dynamic simulation cache files from any application by allowing you to use sculpting and transformation tools over time. ChronoSculpt also introduces a radical new geometry engine based on our “Hydra” technology which allows the deformation and manipulation of 8-12 million polygon objects with ease.

Using industry standard vertex cache files in Alembic, LightWave MDD, or Autodesk Geometry Cache formats you can easily paint out errors on your dynamic simulations or completely change the look of a character either with layered sculpting “clips” in the timeline or globally to affect every frame in your cache animation.

ChronoSculpt could potentially save you hours of work by allowing you to quickly make changes to the baked dynamic simulation cache files to address simulation jitter, soft body penetrations, or to remove stray simulation pieces and get the shot out the door.

ChronoSculpt also allows you to export your sculpts and deformations as LightWave endomorphs or OBJ objects (for Maya blend shapes) on your character or object geometry for to allow unique character animation effects or visual effects deformations in your main application.



Introduction

ChronoSculpt Getting Started Tips

- Use **Ctrl+Tab** to cycle through your selected objects. ChronoSculpt supports multi-layered LWO objects and you can load multiple stand-alone OBJ or LWO objects as well. You can also click on the **Switch Object** button on the side menu as another option or use the **Select Object** tool (Keyboard shortcut: **Shift+s**).
- ChronoSculpt loads geometry cache data as a clip on the timeline. You can add as many as you want, drag them around, scale them, fade them out, etc.
- Select a clip in the timeline by clicking on the colored dot for that clip. The clip will expand and allow you to change the start and end frame.
- Drag a start or end frame by hovering your mouse over the first or last frame of the clip in the timeline. To move the entire clip in the timeline click and drag on the center colored dot.
- The three numeric fields to the left of the timeline are the start and end frame for the timeline and the bottom field (defaulting to 30) is the frame rate which is used only for playback speed.
- You can click anywhere in the timeline to set the current frame or use the left and right arrow keys on your keyboard to step through the timeline. Clicking with the mouse on the timeline will snap to integer values. **Shift+Click** will allow you to go to fractional frames. Transport controls can be hidden or revealed using the **Show Transport** toggle at the bottom of the tools list
- When you save a project it saves everything in the ChronoSculpt session. If you have 10 objects all animated and with their own sculpted clip modifiers on top of the cache files they will all get saved.
- You don't have to start with a cache file loaded in, you can just load an object and use the tools in ChronoSculpt to deform and manipulate it. Then you can save that file out to a cache file and in effect create a cache of your sculptures from scratch.
- The **Pin** tool allows you to pin an object or object part position for a length of time so that it does not move. This can be useful for correcting jitter on dynamics simulations for example. Just activate the **Pin** tool, go to a specific frame and click on the part that you want to pin. That will create a pin clip in the timeline whose **Ease Out** and length can be adjusted or moved in the timeline.

ChronoSculpt Navigation

Navigation uses **a** to Fit All, **Alt +LMB** for orbiting the view, **Alt+Shift+LMB** for panning the viewport and **Alt+Ctrl+LMB** for zooming. **Space** is used to drop the tool you are using and **Esc** is used to drop the clip you are working on.



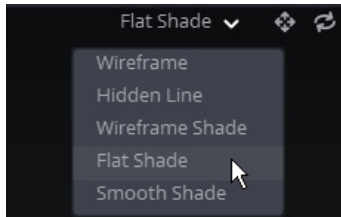
Advanced users of 3D software other than LightWave may want to change the config for the mouse navigation. The manual will continue to refer to the LightWave way of doing things, but if you wish you can edit the ChronoSculpt1.0\bin\cs\startup\CsShortcuts.lua file in a text editor.



Interface

Overview of Interface

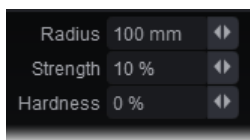
ChronoSculpt is a simple application that doesn't need a complex interface to have powerful results. Most things should be fairly intuitive. The main viewport is a Perspective view of your scene that can be navigated around using the three buttons at the top of the screen or their keyboard shortcut equivalents of *Alt+Shift+LMB* for panning the scene, *Alt+LMB* for orbiting the scene or *Alt+Ctrl+LMB* for zooming.



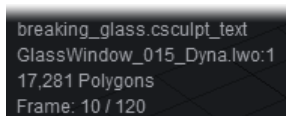
To the left of the navigation controls are the display modes:

- *Wireframe* - the basic wires for your scene;
- *Hidden Line* - only shows the wires for the front faces;
- *Wireframe Shade* - shows shaded polygons with a wireframe;
- *Flat Shade* - flat shaded polygons, best for mechanical models;
- *Smooth Shade* - smooth shaded polygons, best for organic models.

Tools that need additional settings present a HUD in the viewport. Values can be changed with the sliders or typed in. Alternatively, the *RMB* can be used directly in the viewport to set the radius for example.



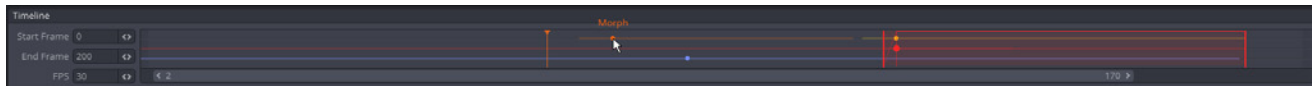
At the bottom of the viewport you will see the name of the project, the active object with its polygon count and a frame number.





Interface

Timeline



The timeline at the bottom of the screen can be navigated using the left and right cursor keys or the orange frame marker dragged through the scene. Keyframes can be moved in the timeline by clicking on their central dots and dragging them to where you want and the extents of the time taken can also be dragged to expand (and thus slow down the effect) or contract the time taken for a keyframe. Holding Shift will allow you to drag into fractional keyframes just as with navigation.

There are three lines to the timeline. The first shows keyframes for morphs in yellow, the second indicates pinning in red. The third line is for the geometry cache(s) loaded for an object in blue.

The three text boxes at the left end of the timeline are for:

- *Scene Start* - traditionally starting at 0.
- *Scene Length* - this automatically expands if you load a longer cache clip, but never contracts. It can also be set manually.
- *Framerate* - by default set to 30 fps. MDD files do not contain an FPS setting

The slider at the bottom can be resized to only view part of a longer scene by dragging on the arrows at either end. When smaller than the scene length it can be repositioned in the scene by dragging on the central portion of the slider.



Project Menu Group

The File dropdown, when clicked on reveals the following menu items:

New Project

Clears the scene and starts a new one. Keyboard shortcut: *Ctrl+N*

Load Project

This loads a CSculpt project file in *.csa, *.csb or *.csulpt_text formats. Keyboard shortcut: *Ctrl+O*

Load Object

Loads an LWO, OBJ or Alembic file.

Load Cache

Loads a geometry cache in MDD, Alembic or Autodesk Vertcache format.

Save Project

This saves a CSculpt project file. Keyboard shortcut: *Ctrl+S*

Save Project As...

This saves the current project under a new name.

Export MDD

Saves the currently selected object and its animation to an MDD geometry cache.

Export Maya Cache

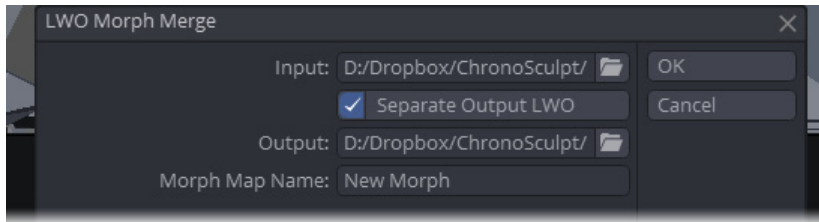
Saves a file in the Autodesk VertCache format.

Export Frame to OBJ

Saves the current animation frame as a separate OBJ file.



Project Menu Group



Export to Endomorph

Saves the current animation frame as a LightWave EndoMorph. Good for creating facial morphs for lipsync or adding a final finesse to a dynamics simulation.

Export Alembic

ChronoSculpt will save the object and cache files in one .abc file.

About

Shows the splash screen seen at startup of ChronoSculpt. It can be dismissed by clicking the close icon at the top right of the window.

Quit

Closes the program. Will give a warning if there are elements unsaved. Keyboard shortcut: *Ctrl+Q*



Project Menu Group

The Edit dropdown will present the following options. The amount of Undos and Redos is limited only by your system memory.

Cut

Cuts the currently selected clip (Morph, Pin or Cache). Keyboard shortcut: *Ctrl+X*

Copy

Copies the currently selected clip (Morph, Pin or Cache). Keyboard shortcut: *Ctrl+C*

Paste

Pastes the currently selected clip (Morph, Pin or Cache). Keyboard shortcut: *Ctrl+V*

Delete

Deletes the currently selected clip (Morph, Pin or Cache). Keyboard shortcut: *Del*

Undo

Undos the most recent action. Keyboard shortcut: *Ctrl+Z*

Redo

Redos the most recent undo. Keyboard shortcut: *Z*

Clear History

Resets the *Undo* count to 0 and clears the memory required for *Undos*.



Tools Menu Group

The tools in this group all have *Radius*, *Strength* and *Hardness* settings that can be changed using the HUD. The right mouse button can be used to change the *Radius* on the fly. *Ctrl* will do the opposite of the normal left mouse button action and *Shift* will smooth (where appropriate).

Sculpt

This is probably the tool you'll use most. Its equivalent in ZBrush is the Brush tool.

Drag

Like the Dragnet tool in LightWave this tool creates a smooth falloff to the vertices affected by the drag operation. In ChronoSculpt you will notice that the manipulation of massive geometry files is a breeze.

Pinch

This tool brings geometry together. You can expand the geometry using the *Ctrl* key modifier.



Bulge

Expands or contracts geometry with a falloff. Clicking on the gizmo moves the zone of influence which is represented by the orange sphere, clicking elsewhere performs the operation. This can create some very interesting inflate and compress effects on objects.

Bulge creates a *Morph* unless used in *Setup* or *Global Editing Mode*.

Erase

This uses a brush interface to erase back to the base object by removing deformations and animation applied by cache files.

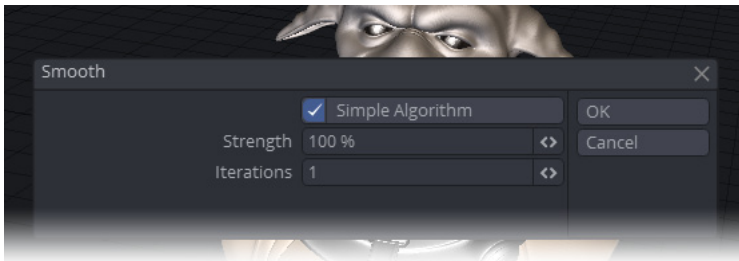
Pin

Pins a separate geometry part where it is. For example if you have a jitter on a group of dominoes after they fall to the ground due to the simulation having calculation errors you can use *Pin* to lock



Tools Menu Group

the dominoes to the table and remove the jitter quickly and easily and then resave your cache file out. You can also use [Transform](#) to move a stray object part out of the way and then use [Pin](#) to make sure that it doesn't go back to its original location. By default, [Pin](#) has a small [Ease In](#) and lasts for the rest of the scene. This can be changed and an [Ease Out](#) applied so that the items you pinned resume life with a delay. You paint the areas you wish to [Pin](#) and painting the same areas again with the Keyboard modifier [Shift](#) will deselect.



[Smooth All](#)

A smoothing algorithm that can be applied with multiple iterations. This deforms the object by smoothing out the position of its vertices. It is most useful with organic geometry. The more geometry you have the more interesting it is to use the [Simple Algorithm](#) switch. Turning it off will attempt to better preserve volume, but when the geometry gets heavily polygonized the difference becomes much subtler and the [Simple Algorithm](#) will give quicker results. [Smooth All](#) creates a [Morph](#) unless used in [Setup](#) or [Global Editing Mode](#).

[Transform](#)

Move separate geometry - for example in a LightWave .LWO you can save many different “parts” within one LWO object. Transform tools will allow you to transform those individual parts, for example a single shard of glass in a breaking window that hasn't quite gone where you want it. [Transform](#) creates a [Morph](#) unless used in [Setup](#) or [Global Editing Mode](#).

[XYZ Symmetry](#)

You can choose which axis you'd like symmetry on. Multiple axes can be chosen.



Object and View Menu Groups

The Object menu group presents three items:

Select Object

This allows you to click on a different object in your project, rather than just using the *Ctrl+Tab* shortcut or *Switch Object File Menu* option. Keyboard shortcut: *Shift+S*.

Cycle Object

Switches between objects in your project. Keyboard shortcut: *Ctrl+Tab*.

Remove Object

Deletes an object from your project.

The View menu group also presents three items:

Fit All

Fits the extents of your entire scene into the viewport. Keyboard shortcut: *A*.

Fit Selected

Fits the selected object into the viewport. Keyboard shortcut: *Shift+A*.

Reset View

Resets the viewport to its initial display.



Globals

Setup Mode

This is for modifying the base geometry throughout the animation, rather than just for a certain time. The object goes to its undeformed default state while you are in *Setup Mode*. For example, if this is a character it would be in the pose that it was modeled in before deformations are applied.

Global Editing Mode

Global Editing Mode is not available within *Setup Mode*, however if you are in *Global Editing Mode* you can also activate *Setup Mode* to show your geometry in its undeformed base state. *Global Editing Mode* is similar to *Setup Mode*, however you can edit at any point in the timeline and see how the deformation of your object will be affected by your modification, rather than only seeing the undeformed object.

Tablet Mode

Changes cursor positioning from relative to absolute for use with graphics tablets.

Palette



The Palette is available only when you create a clip or have a clip selected. The clips on the timeline are colored in a certain way by default - a morph is orange-yellow, a pin is red and a geometry cache is light blue, but if you have several it's good to color them differently to make the differences clear. The palette provides standard RGB values, but also an alpha to make differing transparencies.

Ease In/Ease Out

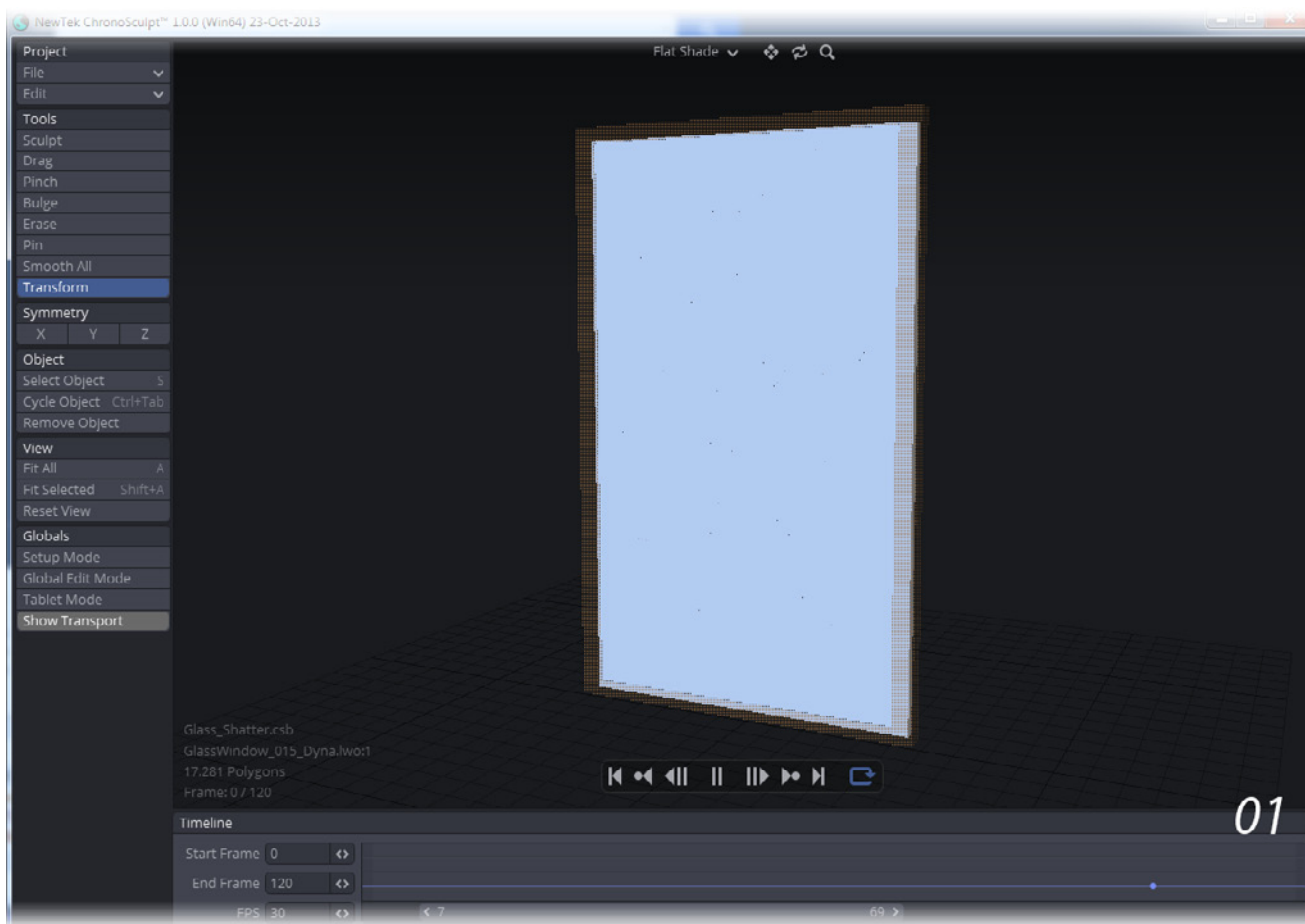
This toggle allows you to set the in and out of a clip. If for instance you'd like a change made to a scene element to become permanent, set the *Ease Out* to 100% by dragging the Control Point to the right and drag the end time for the clip to the end of the scene.



Examples

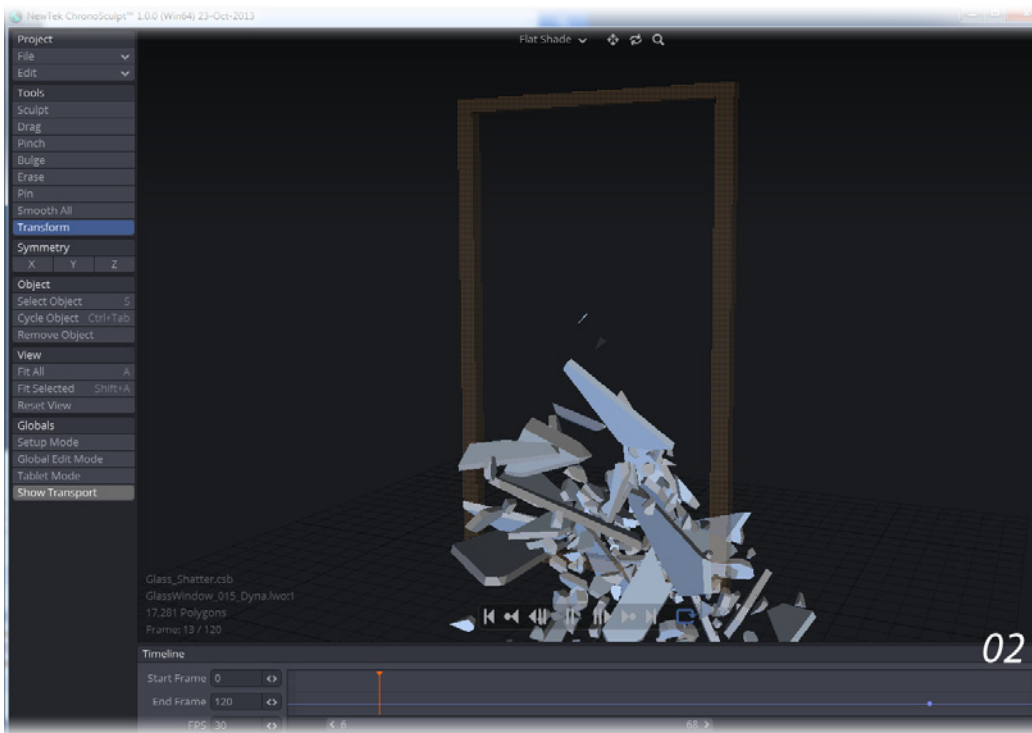
I Love the Sound of Breaking Glass

In this simple example we will show you how to quickly correct a dynamics simulation, rather than simulating again. In the ChronoSculpt content there is a project called [Glass Shatter](#). If you load it into ChronoSculpt and run through the frames using the right cursor key you will see that although the glass breaks beautifully, it leaves some shards behind that seem not to be affected by gravity.

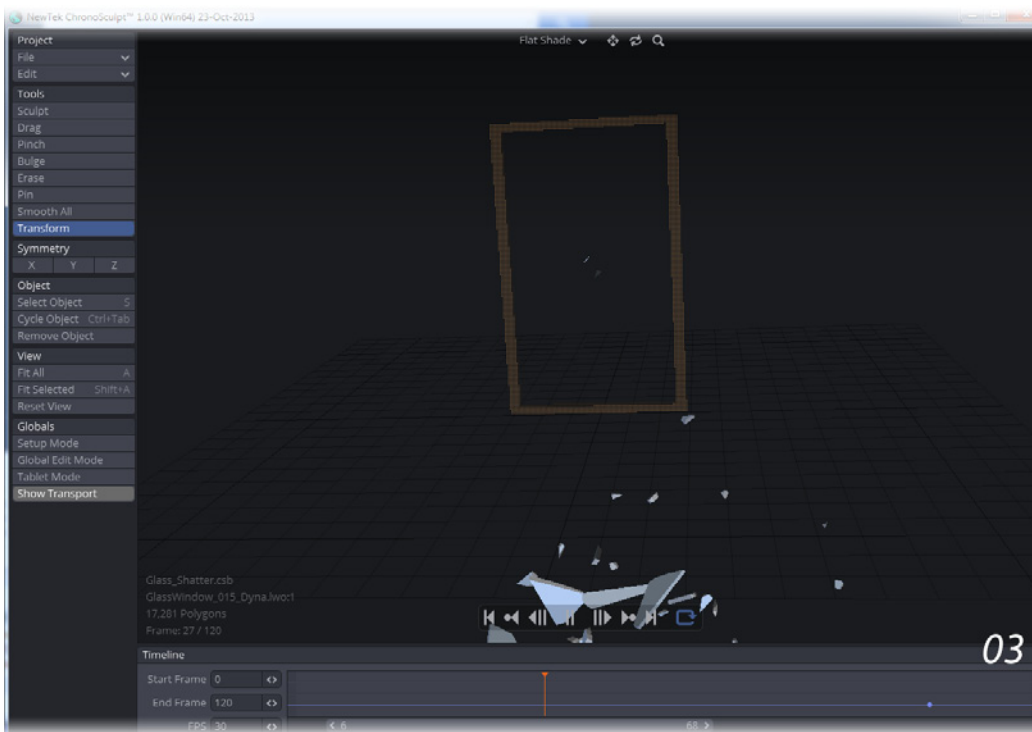


The scene as it initially loads in ChronoSculpt.

Examples

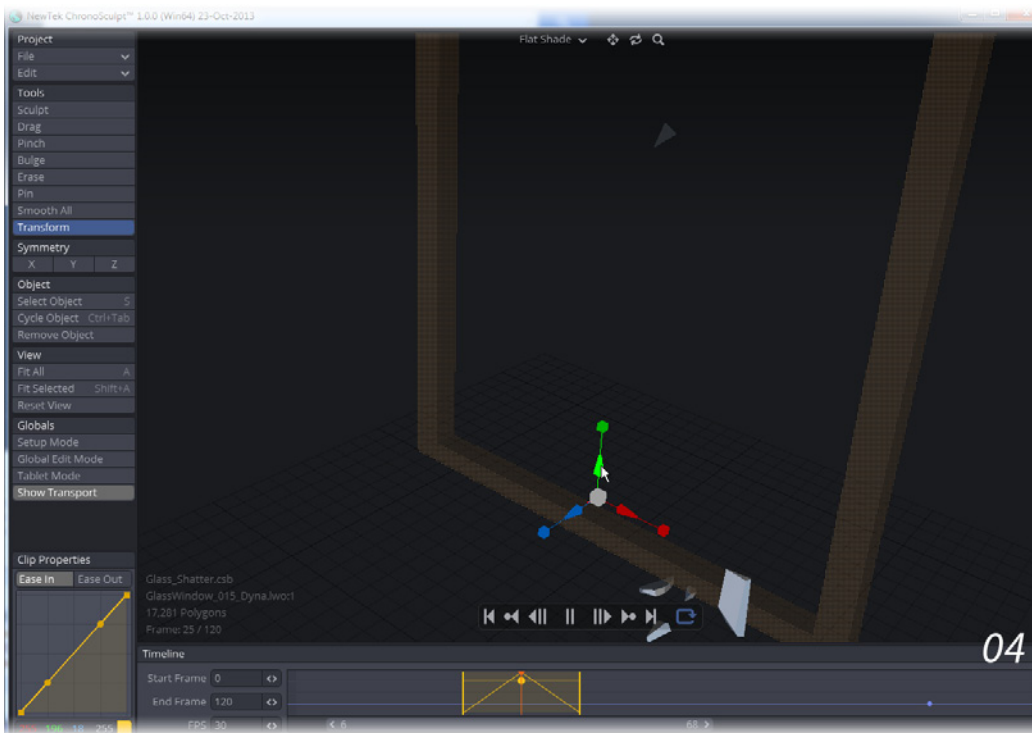


Those bits of glass in the center of the pane seem to be stuck.

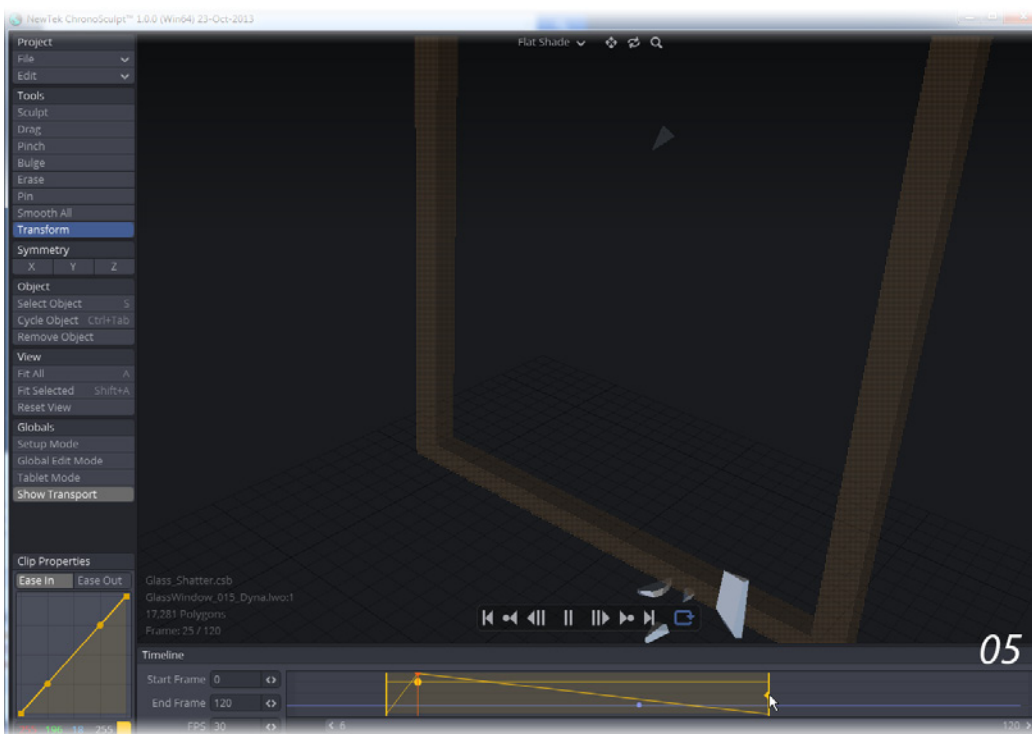


Yes, they are indeed. Do we need to go back and resimulate?

Examples



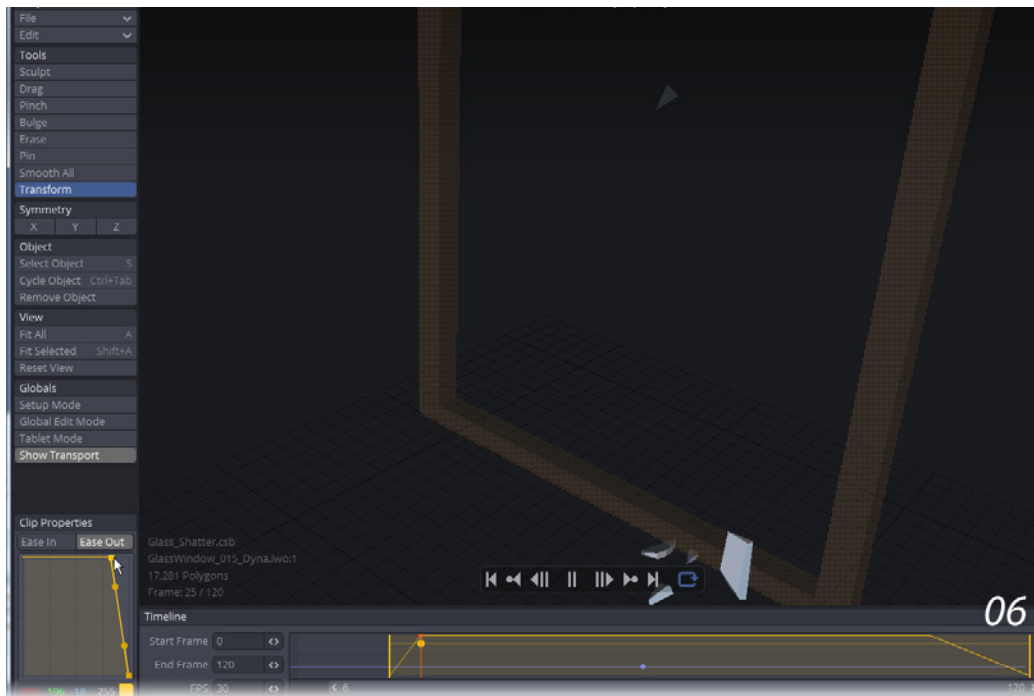
Not with *ChronoSculpt* to hand! Use the *Transform* tool and grab the offending shards of glass, there should be four in total.



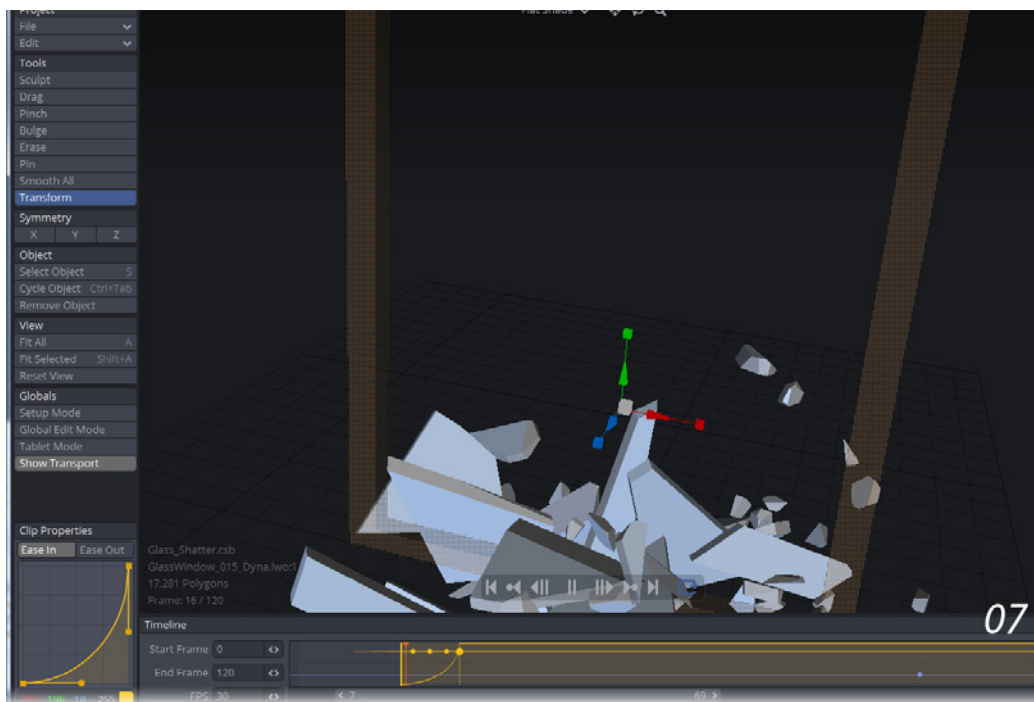
Move each piece down in the Y so it's under the frame and then stretch the end out to reach the end of the scene.



Examples



Now click on the **Ease Out** button and move the yellow dot all the way to the right. You should see that the initial pyramid shape has changed to give an incoming slope, but the pose is held until the end of the scene.



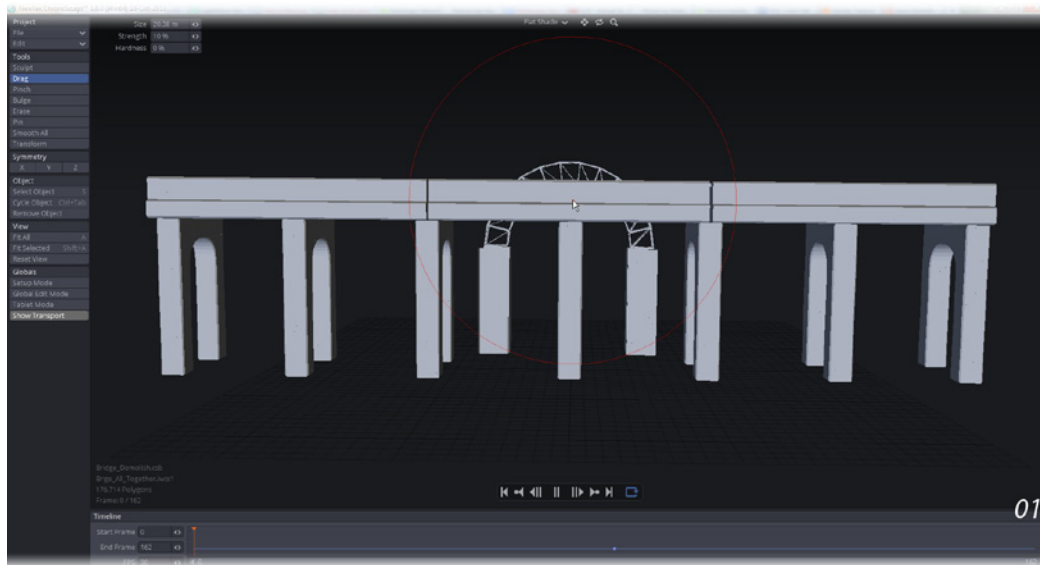
Now you have moved one piece, do the other three. You morphed the object's vertices and can move the morphs nearer the start of the scene by dragging on each of the four yellow circles in the timeline. By changing the Ease In curve you can dictate how the shards all fall.



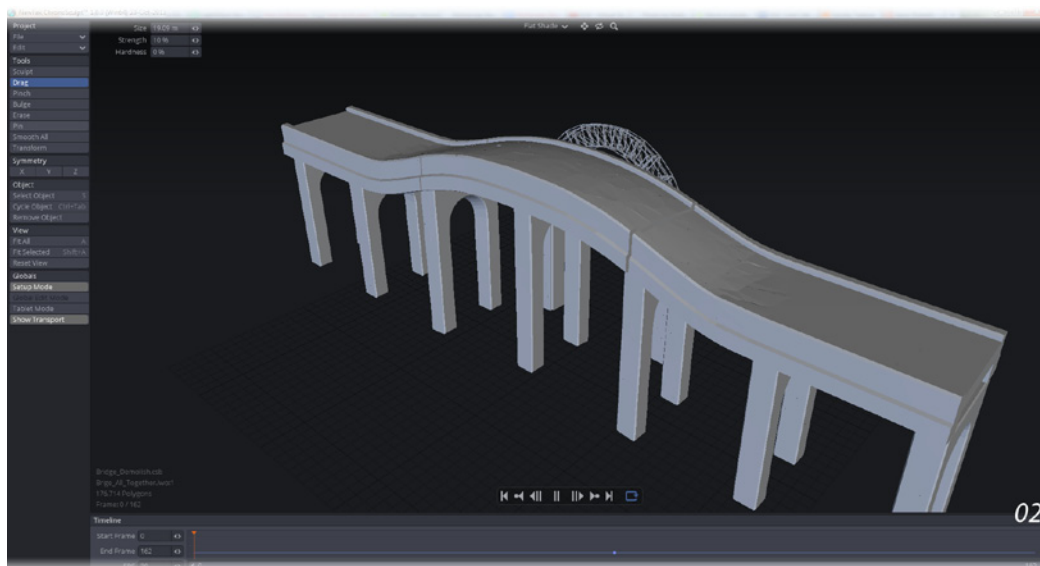
Examples

Controlled Explosion

In a similar vein to the previous example, your director suddenly decides that the bridge you've slaved over getting the dynamics just right needed to be arched. There isn't the time to rebuild the bridge, it's going to be in the distance, so you can get away with stuff. Here's how ChronoSculpt can help save the day.



Here's the bridge. It has an MDD file of the explosion already loaded, but we're going to go into Setup mode to alter the base geometry before it gets destroyed.

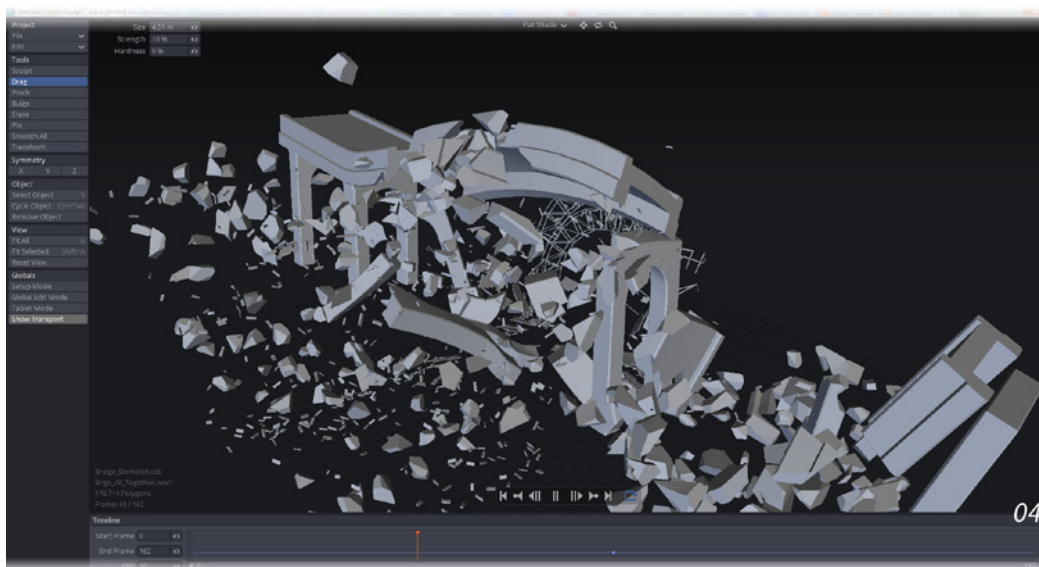


In Setup Mode we have used the Drag tool to change the shape of the bridge, to give the hump the director wants.

Examples



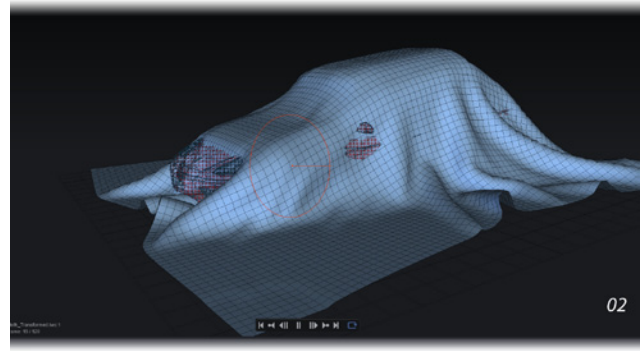
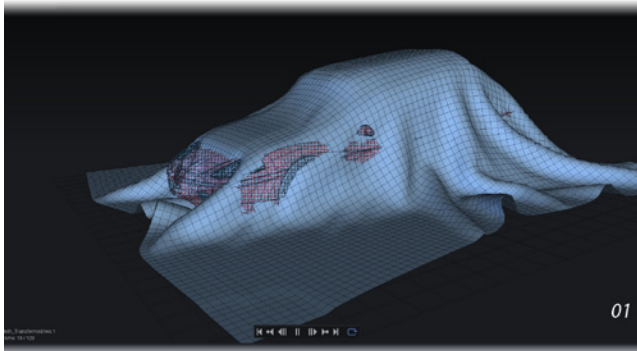
The bridge's center legs have been stretched down a little to keep them on the ground.



The deformed bridge is destroyed for the 3-second shot at no additional cost for remodeling or redoing the dynamics. Job done.

Examples

Cloth Penetration



The *Sculpt* tool can be used to solve those tricky cloth penetration issues swiftly, even if the car geometry is changed.

Ill-Equipped Soldier



Using *Transform* in *Setup* mode to remove items. The third shot is what we want to achieve without the additional military gear. Go into *Setup* mode (01), select the gear you want to remove and move it offscreen one-by-one (02). Exit *Setup* mode (03).

Ill-Proportioned Soldier

You can of course create some variation if you need several soldier objects, to keep them looking different. This is all the same object and the MDD cache plays back no matter how the soldier looks.

