

Maya 2016 Review

New in Modeling, Texturing & Sculpting (since Maya 2015 Extension)

1. Maya 2016 | Modeling & UV Workflow Improvements

- a. Landmark release for modeling, representing the culmination of a 3-year effort to refine and modernize subdivision modeling workflows in Maya. We also introduced a new toolset.

2. Overview

a. Subdivision Modeling Improvements

- i. Modeling Toolkit Integration
 - 1. Removed redundancies in tools/features
 - 2. Single context workflow
- ii. Usability Improvements
 - 1. Conducted several in-house user experience studies
 - 2. Closed 50+ Small Annoying Things & Ideas for Maya entries
 - 3. Revamped Maya's entire menu set
 - 4. Improved modeling technology
 - 5. Improved modeling & UV workflows

b. New Sculpting Workflow

- i. Mudbox brushes & brush engine in Maya
- ii. New features
- iii. New shape authoring workflow
- iv. New workflow opportunities not possible in dedicated sculpting apps

c. UV Creation & Editing Improvements

- i. Enhanced UV Viewport
- ii. New creation tools
- iii. New sculpting tool UV editing workflow

3. Subdivision Modeling

i. Modeling Toolkit Integration (completed)

1. New panel design (for improved usability)
 - a. Removed Power button
 - b. Removed Options menu
 - c. Removed Edit menu (Symmetrize & Shrinkwrap (renamed to Conform) moved to Mesh menu)
 - d. F7 assigned to Multi-Component selection mode (replacing Ctrl + Tab)
 - e. New Object button
 - i. Activates object selection mode
 - ii. Ctrl-click to convert selection to objects (and vice-versa by ctrl-clicking other buttons)
 - iii. Object count now displays in the UI
 - f. New UV button
 - i. Activates UV selection mode
 - ii. Ctrl-click to convert selection to UVs (and vice-versa by ctrl-clicking other buttons)
 - iii. UV count now displays in the UI
 - g. Removed MTK Select and Transform Tools
 - h. All Symmetry settings are now available in a single dropdown list (redesigned in both the Toolkit and Tool Settings window)
 - i. (Improved tooltips (ToolClips for Symmetry))
 - j. Soft Selection settings are now a subset of Maya's Soft Select settings and will now always show, whether the Selection Tool is active or not
 - k. Mesh (new section)
 - i. Combine
 - ii. Separate
 - iii. Smooth
 - iv. Boolean (this performs a Union Boolean that you can later switch to Difference or Intersection by using the In-View Editor)
 - l. Components (new section)
 - i. Extrude (we removed the MTK-based Extrude tool in favor of using Maya's Bridge Tool that now uses an in-view editor)
 - ii. Bevel (we removed the MTK-based Bevel tool in favor of using Maya's Bridge Tool that now uses an in-view editor)
 - iii. Bridge (we removed the MTK-based Bridge tool in favor of using Maya's Bridge Tool that now uses an in-view editor)
 - iv. Add Divisions (this was newly added to the panel)
 - m. Tools (revised section)
 - i. Multi-Cut
 - ii. Target Weld
 - iii. Connect
 - iv. Quad Draw
 - n. (Removed MTK Mesh Editing Tools (Extrude, Bridge, Bevel))
 - o. Keyboard/Mouse Shortcuts are now available for each of the Tools

- p. (Clicking active Tool buttons (Connect, Quad Draw, Multi-Cut and Target Weld) now deactivates the tool by switching to the Select Tool)
- q. (Removed Maya's Merge Edge and Merge Vertex Tools, since Target Weld does both)
- r. Tool Options are now also available in Tool Settings window (for Multi-Cut, Connect, Quad Draw and Target Weld)
- s. Revised Transform Options layout
 - i. (These settings have been redesigned and rewritten to work with Maya's Transform Tools)
 - ii. (Unique settings per transform tool (Move, Rotate, Scale))
 - iii. Move Settings
 - 1. All axis orientation options available
 - 2. MMB function (on menu) to toggle between the last two settings
 - 3. Edit Pivot button works the same as the one found in the Tool Settings window
 - 4. XYZ edit fields to input absolute values
 - iv. Rotate Settings
 - 1. All axis orientation options available
 - 2. MMB function (on menu) to toggle between the last two settings
 - 3. Edit Pivot button works the same as the one found in the Tool Settings window
 - 4. XYZ edit fields to input relative values (except when using Gimbal axis orientation)
 - v. Scale Settings
 - 1. All axis orientation options available
 - 2. MMB function (on menu) to toggle between the last two settings
 - 3. Edit Pivot button works the same as the one found in the Tool Settings window
 - 4. XYZ edit fields to input relative values (except when using Object axis orientation)
 - vi. Added "Step Snap"
 - 1. This exposes an often-overlooked feature in Maya, previously named "Discreet Move/Rotate/Scale"
 - 2. Tooltip gives users a heads-up that the J hotkey is assigned to this feature
 - 3. Options are presented in a more concise way

2. Integrated (and enhanced) Tool Constraints

- a. Available in Tool Settings window for all transform tools
- b. Works with Maya's Transform Tools
- c. Move single or multiple components using transform constraints
- d. All component types are supported
- e. Can be used with "Prevent negative scale" to straighten edges on a mesh

- f. Improved Edge Slide constraint
- g. MMB function (on menu) to toggle Transform Constraints on/off
- h. Sliding components along edges using the edge constraint won't affect the shape of the object, allowing you to easily edit the edge flow (i.e. edge loops) of your objects
- i. Compatible with Maya's Symmetry and Soft Select
- j. Integrated Selection Constraints
 - i. Works with Maya's Selection Tools
 - ii. MMB function (on menu) to toggle Selection Constraints on/off
 - iii. Selection Constraints: Shell now works with geometry shells (instead of UV shells)

3. Integrated MTK preferences (no more dedicated section)

- a. Manipulator Visibility: The Modeling Toolkit provides an option to hide the manipulator when modifier keys like Ctrl and Shift are pressed. This can improve component selection in cases where the manipulator gets in the way. We've integrated this feature in Maya's Preferences, in the Display > Manipulators category.
 - b. Caps Lock HUD option moved to Display menu (and now works across Maya)
 - c. Quad Draw preferences moved to Modeling preferences category
 - d. Pick Range preference integrated and moved to Manipulator category
 - e. Active Handle preferences integrated and moved to Manipulator category
4. **Integrated mouse cursors:** + and – signs indicate when selections are being added or subtracted with the select tool; when using a transform constraint, "Slide" appears next to the cursor to remind you the constraint is active

ii. Usability/Workflow Improvements

1. User-focused development

- a. 11 Improvements based on UX testing
- b. 50+ Small Annoying Things & Ideas for Maya posts closed
 - i. 750+ votes returned to users
 - ii. Tracking over 150 new ones for future releases
- c. Over 100 beta-reported defects fixed
- d. 100s of legacy issues fixed

2. Usability Improvements (learned from UX testing)

- a. Interactive Creation is now off by default for poly and NURBS primitive creation operations
- b. "Auto-Load New Objects" is now on by default
- c. Only one group of settings is expanded by default for Select and Transform tool settings (instead of complicating the look and feel of Maya by expanding all)
- d. Ctrl + 1 to enable/disable View Selected (Isolate Select)
- e. Ctrl + e to extrude
- f. Changed Mirror Geometry's Merge Threshold default value to 0.001 for better default results

- g. Raised Smooth and Smooth Mesh Preview Level limit beyond 4 divisions (be careful using high values though)
- h. In-View Message for Soft Select
- i. Extrude is now available in Poly Object marking menu
- j. Hard Edge Display mode returned back to Maya
- k. Interaction Shortcuts
 - i. Softimage-inspired
 - ii. In tool settings, middle clicking on the axis orientation menu button will toggle between the last two orientation modes.
 - iii. In tool settings, middle clicking on transform constraint, step snap, or symmetry menu buttons will toggle between the last used setting and off.
 - iv. In tool settings, middle clicking on custom axis menu button will activate the last "set to" option that was selected.
 - v. In the MTK panel, middle clicking on transform constraint, selection constraint, or symmetry or step snap menu buttons will toggle between the last used setting and off.
 - vi. In the MTK panel, middle clicking on the axis orientation menu button will toggle between the last two orientation modes.

3. Menu reorganization

- a. Reorganized menus; items are categorized and in certain cases alphabetized
- b. Combined Surfaces & Polygons menu set into a single "Modeling" Menu set
- c. Included XGen and Paint Effects menus in new Generate menu
- d. Moved polygon and NURBS selection items to a new (and general) Select menu
- e. Renamed Edit Curves menu to "Curves"
- f. Combined Surfaces & Edit NURBS menus into "Surfaces" menu
- g. Combined Create & Edit UV menus into "UV" menu
- h. Combined Normals and Color menus into "Mesh Display" menu
- i. Copied over the "Deform" menu
- j. All Mesh Tool menu items can now be shelved
- k. Improved Edit Mesh menu (removed redundancies); Running 'Detach' will now convert a selection of faces to its edge perimeter and then detach the faces using that border
- l. Added links to Cloud Services (ReCap and Character Generator) in the Generate menu

4. Revised Polygons shelf

- a. New icons
- b. Added dividers to separate primitives from modeling operations and UVs
- c. Replaced the "Chamfer Vertices" button with a more general "Bevel" button (works on vertices, edges and faces (converts to edge perimeter))

- d. Added “Target Weld” button
- 5. **New Curves/Surfaces shelf**
 - a. New icons
 - b. Combined Curves & Surfaces shelves into one
 - c. Added a divider to separate Curves from Surfaces
- 6. **In-View Editors**
 - a. In our aim to streamline the modeling workflow for the next release, we wanted to make node attributes more accessible while modeling than they currently are. This was already partially done for the Extrude command years ago, but we wanted to revamp that approach and apply it more generally to other modeling operations (and hopefully/eventually other parts of Maya outside of the modeling world). When executing a number of poly modeling operations, an In-View Editor will now appear in the viewport, giving you direct access to the most commonly modified attributes for each modeling operation.
 - b. 11 Poly Modeling operations supported & all poly primitive creation operations supported
 - c. Appear automatically for poly modeling operations (selecting the node also auto-displays them)
 - d. Inherit colors and behaviors from Channel Box
 - e. Press T (Show Manips) to show them for all 12 Poly creation operations (won’t show by default to avoid disrupting the creation workflow)
 - f. HUD option to disable the showing of these in the viewport
 - g. Can be moved anywhere within the Viewport – position is remembered for all other IVEs
 - h. Active in only one viewport at a time
 - i. Can be resized
 - j. Common attributes appear but can be further customized and reordered
 - k. Copy/Paste functionality
 - l. MMB-drag to adjust active (yellow) attribute
 - m. Edit the fields by clicking in them (Tab to cycle to the next)
 - n. Hover over all attributes to get descriptions for them
 - o. API to create your own
- 7. **Edit Pivot improvements**
 - a. “Center pivot” now works with shape selections (this allows you to center the pivot on an object in a hierarchy, without considering the hierarchy’s bounding box)
 - b. “Edit pivot” workflow now allows you to select objects without having to leave the workflow
 - c. Object pivots now display when in Edit Pivot mode while in Object selection mode

- d. Mouse cursor feedback (for example, the word “Pos Y” appears as a mouse cursor to let you know that you’re aligning the pivot to the Y position)
- e. Completely reorganized/streamlined tool settings window, adding a few new settings, to improve ease of use and conserve space;
 - i. Axis Orientation options have been combined into a single pop-up menu to conserve space
 - 1. MMB-clicking this menu switches between the last two active settings
 - ii. “Set Orientation to Component” button has been converted into a pop-up menu next to the custom axis orientation XYZ fields;
 - 1. You can now set to component (using Multi-Component selection mode) or Vertex, Edge or Face (automatically switching to the corresponding selection modes)
 - 2. Custom axis orientation fields are in degrees, not radians anymore
 - iii. Added two new options, “Pivot Position” and “Pivot Orientation” (also to the edit pivot marking menu) to allow users to choose whether or not LMB-clicking while editing the pivot affects the axis position, orientation or both
- f. Exit option in the Edit Pivot marking menu
- g. Transform Tool marking menus have been cleaned up
- h. Custom Pivot Cursor Feedback: The mouse cursor now updates with text to tell you more about what you're doing while holding down modifier keys and editing the pivot orientation, alignment and position.
- i. Edit Object Pivot now allows for object selection change
- j. A new "Bake Pivot Orientation" option in the Modify menu allows you to bake your custom pivot orientation to your object's pivot. The orientation needs to be set to "Custom" in order for this to work. Once the orientation is baked, the axis orientation setting is set to "Object". Also, if the object has children, its children will have an opposite transform applied to keep them in the same global position.
- k. Pin Component Pivot now stays pinned until user unpins manually (used to disable itself when a new object was selected)
- l. Center Pivot Per Shape: Based on feedback received from Softimage users, we now allow you to center the pivot for an object no matter where it is in the hierarchy. Previously, centering the pivot of a parent object with children would center the pivot to the bounding box of the entire lower hierarchy. That still happens in PR 46, but now you can select the shape node and use "Center Pivot" to center the pivot to only the selected shape node's bounding box.

8. Selection Tool improvements

- a. New Highlight Nearest Component option

- i. Allows you to turn on/off MTK/NEX (aka "Lazy") pre-selection highlighting (when off, Maya uses a 4 pixel radius for highlighting components)

9. Transform tool improvements

- a. Added a small dot to the center of the Move manipulator so that users can see the center point
- b. Ctrl + MMB to move components along normals
- c. Rotate Tool Improvements
 - i. Free Rotate: The "Center as virtual trackball" setting in the Rotate Tool has been renamed to "Free Rotate" (borrowing from the MTK's same-named feature). Also, when this is active (default), the center of the rotate manipulator is a light gray when hovering over it, to indicate that you will rotate in screen space when click-dragging in this area. Additionally, components will no longer pre-select highlight when hovering in this area and "Free Rotate" is enabled.
 - ii. Tweak Mode added to tool settings (and can now be activated when any tool is active)
- d. Scale Tool improvements
 - i. Tweak Mode added to tool settings (and can now be activated when any tool is active)
- e. Manipulator improvements
 - i. Move/Rotate/Scale and Edit Pivot Manipulator Handle Highlighting: A commonly ignored (but frustrating) issue in Maya is missing the manipulator handles when click-dragging them. When you activate a handle, it turns yellow, so previously, hovering over that handle wouldn't give you feedback that it's being hovered over, leading in some cases to selecting something else. Now, the highlighting color for manipulator handles is orange (while the active handle highlight color is still yellow), so you will know right away if you're successfully hovering over an active handle or not.
 - ii. Added preference to disable rotation handles on edit pivot manipulator, as well as controls to adjust their placement

10. Symmetry Improvements

- a. Partial Topological Symmetry support
 - i. Meshes no longer need to be 100% symmetrical in order to activate Topology as the symmetry option
 - ii. Option to turn off
- b. You can now activate topological symmetry when a mesh has multiple shells
- c. You can now activate topological symmetry on multiple shells to symmetrically edit multiple objects simultaneously
- d. New presentation saves space in the tool settings window

- e. There's no longer a requirement to pick an edge before activating Topological Symmetry; simply select Symmetry: Topology and then pick an edge

11. Bevel Improvements

- a. Created a new bevel node (3rd generation) using a revamped algorithm that works harder to maintain parallel edges during bevel operations while maintaining edge lengths
- b. Fixed issues brought up internally (QA and beta users) and externally (CG Talk, Small Annoying Things, etc.)
- c. Improved open edges support
- d. Improved corner support, avoiding overlapping edges with bevels containing more than 7 segments
- e. Added "Bevel Face" feature (this converts your face selection to its edge perimeter and then bevels only those edges)
- f. Improved UV preservation
- g. At the end of bevel code development this year, I compared hundreds of test cases in Maya 2014, 2015, 2016 and non-Autodesk apps, to ensure that we have the best algorithm possible. In all cases tested, results were at least equal to and sometimes better than non-Autodesk apps.

12. OpenSubdiv Improvements

- a. Performance improvements (multi-threaded, using new evaluation core for subdivision (2x improvement), OpenCL support)
- b. Stability improvements
- c. Rearranged/renamed some settings to improve usability
- d. Turned off Smooth Triangles by default

4. Sculpting

a. "Mudbox in Maya"

i. (For use in Viewport 2-only)

ii. New brush engine

1. High performance: All meshes are seamlessly (internally) converted to Mudbox meshes and all sculpting tools use the Mudbox brush engine inside Maya in order to sculpt at a high performance. Sculpt on 2-4 million polys at an average frame rate of 30-60fps. Large brush sizes, using different falloff methods and sculpting with smooth mesh preview active will impact performance.

iii. User-friendly workflow

1. A mesh needs to be activated in order to begin sculpting on it; after activating a sculpting tool, follow the onscreen instructions to select a mesh to activate – or first select one or multiple meshes to then activate a sculpting tool to use on it/them (note: meshes need to be manifold in order to sculpt on them)
2. Sculpt on either side of a mesh
3. A HUD indicates when you're sculpting and on which object(s)
4. **New Sculpting Shelf added;**
 - a. Presented in the same order as Mudbox (drop the shelf to the bottom for the same look/feel of Mudbox)
 - b. Double-click buttons to open Tool Settings window
 - c. All sculpting tools available to the left of the divider
 - d. ToolClips available for each sculpting tool
 - e. To the right of the divider are 4 new features;
 - i. Freeze Selection: Make a selection of poly components and click this button to enter the Freeze Tool and convert the selection to frozen parts of the mesh
 - ii. Visor: Click this to open the Visor to a new section where we added 68 base meshes that can be used for sculpting (all base meshes come from Mudbox but have been edited/updated for Maya)
 - iii. Blend Shape: Click this to create a blend shape node for the selected object
 - iv. Blend Shape Editor: Click this to open the Blend Shape Editor
5. Activating a sculpting tool will provide basic instructions in the Feedback Line with regards to how to use the selected tool
6. **User-friendly Interaction**
 - a. Brush ring color is black when normal, white when inverting the brush function (Invert or Twist) while holding Ctrl, blue when smoothing while holding Shift and orange when relaxing while holding Ctrl + Shift)
 - b. F to frame on hover point of cursor
 - c. Adjust brush size and strength with multiple hotkey choices:
 - i. LMB + B to resize brush
 - ii. LMB + M to adjust brush strength
 - iii. MMB + B to resize brush from zero
 - iv. MMB + M to adjust strength from zero
 - v. MMB-drag up/down to adjust strength

- vi. MMB-drag left/right to resize brush
 - d. Switch sculpting tools with hotkeys which only work when a sculpting tool is active; Ctrl + 0-9 (1 is Sculpt Tool and 0 is Freeze)
 - e. Adjust size and strength interactively anywhere in the viewport (not just on the mesh)
 - f. Brush Strength and Size values appear in feedback line
 - 7. Ability to sculpt on multiple meshes (combined or multi-selected)
 - 8. Ability to sculpt on instances
 - 9. Right-click (or Ctrl + Shift + RMB) marking menu for sculpting tool options
 - 10. Shift (or Ctrl) + RMB marking menu for switching between active sculpting tools
- iv. **18 new sculpting tools**
- 1. **Tools:**
 - a. Sculpt Tool (same as Mudbox)
 - b. Smooth Tool (same as Mudbox)
 - c. Relax Tool (new, not previously available in Mudbox – allows you to smooth a mesh surface without affecting too much of its shape, like “Average Vertices” or the Relax feature in Quad Draw)
 - d. Grab Tool (same as Mudbox)
 - e. Pinch Tool (same as Mudbox)
 - f. Flatten Tool (same as Mudbox)
 - g. Foamy Tool (same as Mudbox)
 - h. Spray Tool (same as Mudbox)
 - i. Repeat Tool (same as Mudbox)
 - j. Imprint Tool (same as Mudbox)
 - k. Wax Tool (same as Mudbox)
 - l. Scrape Tool (same as Mudbox)
 - m. Fill Tool (same as Mudbox)
 - n. Knife Tool (same as Mudbox)
 - o. Smear Tool (same as Mudbox)
 - p. Bulge Tool (same as Mudbox)
 - q. Amplify Tool (same as Mudbox)
 - r. Freeze Tool (same as Mudbox)
 - 2. **All Sculpting Tools are available in the Mesh Tools menu**
 - a. Tear-off menu
 - b. Option Boxes open Tool Settings window
 - c. Feedback line gives descriptions for each one
 - d. All items can be dropped to the shelf
 - e. Sculpt Geometry Tool was removed from this menu in order to promote the new Sculpting Tools (it can still be accessed via script or in the Surfaces menu and Curves/Surfaces shelf, since you’ll still need to use this tool to sculpt on NURBS geometry)
- v. **Comprehensive feature set**
- 1. All sculpting settings (available options and default settings) have been copied from Mudbox – see documentation for full details on all available tool options
 - a. Falloff Curve:

- i. Click anywhere in the graph to create new curve control points
- ii. Ctrl-click any control point to delete it
- iii. Enable “Snap” to automatically snap control points to the grid in the background of the graph
- iv. Setting the falloff curve is unique per brush tool
- v. You currently need to reset the entire brush tool in order to reset the falloff curve
- vi. Open a larger window to edit your curve shapes
- vii. All of Mudbox’ 8 falloff curve presets provided in the UI
- viii. Save your own custom falloff curve presets to reuse later or with other brush tools

b. Stamps:

- i. All Mudbox stamps included in Maya and available via the Visor
- ii. Right-click Image Thumbnail for options
- iii. Right-click Images in Visor for options
- iv. Thumbnail updates when flipping or rotating the image
- v. Double-click a thumbnail in the Visor to view the image file
- vi. Double-click a thumbnail in the Tool Settings window to choose a different stamp

vi. New-to-Mudbox features

1. Size Units: Choose between measuring the brush size (not strength) by world units or screen pixels. When World units is active as the brush size unit type, your brush size will be measured in world units and scale according to the distance from the camera view. When ‘Screen pixels’ is active, your brush size will be measured in pixels onscreen and remain a fixed diameter in the viewport, no matter where on a mesh you’re hovering over.
2. Falloff Type: Choose between Volume, Surface and Surface/Volume falloff types for all sculpting tools (default: Surface/Volume (like Mudbox / also the fastest method))
3. Ability to save custom falloff curves
4. New curve graph widget for adjusting falloff curves (based on Mudbox’ falloff curve graph widget, not Maya’s)
5. Draw Method: Choose between Continuous and Scale image from center or side to determine the drawing method for all sculpting tools (continuous is the default brush stroke behavior, whereas drawing from side/center is an imprint – essentially adding the imprint function to all sculpting tools)
6. Show frozen: Ability to show/hide frozen parts of a mesh in blue
7. Constrain to Surface: This option is available in 4 sculpting tools: Relax (on by default), Grab (off by default), Pinch (off by default) and Smear (off by default). This essentially allows you to use these 4 brushes without affecting the original shape/form; i.e. Grab will slide vertices along a mesh instead of pulling them out and sliding.

8. Unfreeze All: This option is available in the Freeze Tool Settings and allows you to unfreeze all parts of a mesh. Shift + U does this as well, while using any of the sculpting tools.
9. Invert Frozen: This option is available in the Freeze Tool Settings and allows you to invert the frozen parts of a mesh. Ctrl + Shift + I does this as well, while using any of the sculpting tools.
10. Twist: This option is available in the Grab Tool Settings and allows you to twist/rotate vertices on a mesh that fall within the falloff of the brush. Ctrl does this as well, while using the Grab Tool.
11. A Pin button allows you to make any of the brush's size settings unique (thereby locking its value so that it's not affected by any further adjustments made to other brush's size values)

vii. New Camera Pivot feature

1. A new setting has been added to the Tumble Tool, "Automatically set tumble pivot". This option is off by default, but you'll probably want to turn it on :) Set "Tumble Around" to "Tumble Pivot" and activate this new auto-set option to have a presumably better experience tumbling the camera while modeling and sculpting. When these options are set, the tumble pivot will automatically set itself once a new selection is made, while modeling poly objects. While sculpting, the tumble pivot will be set according to the first stamp of your most recent stroke. This feature is similar in behavior to Mudbox' "Local Focus" camera preference.

b. Shape Authoring

i. New blend shape (features &) workflow

1. New "Add New Target" feature: Click this to add a new blend shape target to the blend shape node without adding any extra geometry to the scene
2. Renamed "Add Base as Target" feature to be easier to understand
3. New "Edit" button for each blend shape target: Click this to edit the blend shape target using the base mesh, with sculpting tools and Maya's transform tools
 - a. Click Edit to start sculpting edits for the active blend shape target. An in-view message indicates that any edits on the base mesh that you do from here on in will be applied as deltas/edits to the active blend shape target. Click Edit again to stop committing base mesh sculpting edits to the target mesh. You now have a base mesh and a target shape with deltas that you can dial in and out using the blend shape target slider. Again, no extra meshes get added to the scene. Only one target mesh can be edited at a time. If a target's weighting is set to zero, the Edit button is disabled. If a target's weighting is set to anything between 0 and 1, the sculpted edits will always be made at 100%. For example, sculpt with 100% strength on a target set to 10% weighting (0.1): Your sculpted edits will be at 100% and they'll be amplified as you return the weighting to 1. The opposite is true for Transform tool edits.

4. New “Regenerate” button: Click this to generate a mesh in the scene based on the associated blend shape target (whether the object was originally in the scene, but deleted, or created without a mesh to begin with)
5. New “Delete” button: Click the trash can icon to quickly remove/delete the associated blend shape target from the blend shape node
6. New “Show Edit HUD” option in the Blend Shape Editor Options menu: Activate this to enable a heads-up display in the viewport that indicates when you’re editing a blend shape mesh

c. New Workflow Opportunities

(workflows unique to Maya and not to Mudbox and other dedicated sculpting apps)

- i. Sculpt relative to the limit surface with opensubdiv (Smooth Mesh Preview)
- ii. Use non-destructive deformers like shrink wrap while sculpting
- iii. Sculpt relative to the animated shot camera
- iv. Sculpt on animated characters in context of production camera shaders and lighting

5. Texturing

- a. (Renamed UV Texture Editor to UV Editor)
- b. (Hundreds of bug fixes)
- c. **UV Creation**
 - i. Improvements to the auto-project UV tool, based on Softimage code
 - ii. **Contour Stretch Projection** (an automated projection tool that creates normalized square projections on Non-linear forms, like roads) (Normalized square projection)
- d. **UV Editing**
 - i. OGS-based UV Editor
 - 1. **Pre-selection highlighting**
 - 2. **Selection Enhancements:** Continuing the work we did for Maya 2015 to improve component selection in the UV Editor, now all 3D view selection methods can be used in the UV Editor;
 - a. Double-clicking a border edge now only selects the associated border (as opposed to all connected border edges)
 - b. Select both full and partial vertex/edge/face/UV loops using Shift-click
 - c. Select both full and partial edge rings using Shift-click
 - d. Deselect both full and partial vertex/edge/face/UV loops using Ctrl-click
 - e. Deselect both full and partial edge rings using Ctrl-click
 - f. Double-click a single vertex, face or UV to select all connected components of that type
 - ii. **Multi-tile support for UV Layout**, plus options to layout to nearest tile
 - iii. **New brush-based workflow**
 - 1. API to create your own brush-based tools for the UV Editor
 - 2. **Unfold UV Tool** (locally unfold overlapping UVs)
 - 3. **Optimize UV Tool** (locally optimize UV texture spacing)
 - 4. **Cut UV Tool** (cut UV edges)
 - a. Cut edge loops or shortest edge loops
 - 5. **Sew UV Tool** (Sew UV edges)
 - 6. **Grab UV Tool** (Move UVs along a shell in any direction)
 - 7. **3D UV Grab Tool** (Adjust UVs in the 3D viewport, like pushing textures along a surface)
 - a. Option to lock shell borders
 - 8. **Pinch UV Tool** (Sharpen soft UV edges)
 - 9. **Smear UV Tool** (Pull the surface in the direction of your stroke)
 - 10. **Pin UV Tool** (Paint areas of a surface to prevent further modification); options to pin, unpin, invert pin, unpin all