

communityviz®

Exploring Your
CommunityViz
Version 4.4 Upgrade



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Introduction to CommunityViz Version 4.4

CommunityViz® Version 4.4, including Scenario 360™ and Scenario 3D™, is the newest edition of CommunityViz software for planners. This update of the award-winning software features exciting improvements that include

- **Suitability Wizard** upgrade
- Speed improvements from a new **Performance Package**
- 5 new **proximity-based formula functions**
- 2 new **utility formula functions**
- A new **Saved View Browser** for Saved Views
- **Improved Installer** with simpler update patches
- Plus, **improvements and updates** to a number of existing CommunityViz capabilities


This short guide, intended for people who are already using CommunityViz 4.3, provides a tour of the major new features available in Version 4.4. As always, detailed, context-sensitive help is available within the software itself to answer specific questions.

Suitability Wizard Upgrade

Powerful and practical new additions to a favorite tool

The ever-useful **Suitability Wizard** is a CommunityViz community favorite, providing a handy way to score features in a layer based on their suitability for a particular purpose. Now in Version 4.4 it gets a package of user-inspired upgrades.

The color-ramped multifactor weighted overlay maps made possible by the Suitability Wizard are frequently featured in decision-making meetings, discussions, and reports all over the planning world. And they're not confined to suitability *per se*: we've seen them used for risk assessment, desirability, cost estimating, and much more. The Suitability Wizard creates variable assumptions for factor weightings, so during analysis you can quickly vary the importance of difference factors and see the results. And because the factors are based on Scenario 360 dynamic spatial formulas, moving or editing features on the map updates results too.

The new  **Suitability Wizard** is backward compatible with earlier versions. You can still find it from the Scenario 360 toolbar dropdown menu | Tools | Suitability, or on the Decision Tools toolbar. Here's what new:

- **Requirement factors** are criteria that must be met for a feature to be suitable, regardless of its score on other factors. This makes them different from and complementary to *consideration* factors, the only kind available in earlier versions. Now, features that fail to meet a requirement are said to be *excluded* from consideration and receive a suitability score of -1, making them easy to distinguish from the other scores that range from 0 to 100.
- **Five new proximity functions** are available to use if you want them. Choose from a drop-down box of options with plain English names like "Count of Nearby Features" that match the formula functions names you can read about in the Proximity Functions article in this guide.
- **Include/Exclude** assumptions can be created automatically in addition to weighting assumptions. They are simple Yes/No assumptions that let you decide during analysis which of many factors you want to use at any given time.
- **Faster** updates when working with a suitability analysis once it's set up. You'll notice these most on big analyses, and they'll be especially impressive if you have been using earlier versions to do geodesign activities like moving proximity targets or affecting overlap calculations.
- **Streamlined formulas** are now created for suitability attributes. If you are in the habit of looking at the formulas the wizard has created, you'll notice the new ones are shorter and easier to read, partly because they use the new IfError and Norm functions, and partly because fewer new attributes are created in some cases.

Screenshot of the Suitability Wizard dialog box. The title bar reads "Suitability Wizard - 'School Sites' in layer 'Buildings'". The main heading is "Set up Suitability Factor" with the subtitle "Create or change a suitability factor." Below this, there's a section for "New Suitability Factor" where a name "Example" is entered. Two radio buttons allow selecting "This factor is a consideration" (unselected) or "This factor is a requirement" (selected). Under "How the value of this factor is determined:", four radio buttons are shown: "Proximity to other features." (selected), "Amount of overlap with another layer.", "Average value of underlying grid.", and "From an existing numeric attribute.". To the right, five numbered steps are listed: (1) Proximity Type (Distance to Nearest Feature), (2) Target Layer (Buildable Area), (3) Target Attribute (Buildings Difference), (4) Include features within this distance: (with a text input and "map units" label), and (5) Exclude features with distance: (with a dropdown arrow). At the bottom, there's a "Where Condition (Optional)" section with "No condition exists" and an "Add" button. Navigation buttons "< Back", "Next >", and "Cancel" are at the bottom right.

Proximity-Based Formula Functions

Scenario 360 learns the beauty of being “nearby”

If you use the Scenario 360 Formula Editor, we predict that at least one or two of these new Scenario 360 attribute formula functions will soon join your short list of favorites. They are the **Proximity** functions: functions that operate on all the features in a target layer that are “near” the current feature. In that way they are akin to buffer/overlap or buffer/intersect models you might create in ArcGIS, but with the Scenario 360 advantages of being *easy* and *dynamic*. The distance that determines “near,” for example, can be a variable assumption.

Here they are:

- **ProximityCount** finds out how many features in the target layer are near each feature in the host (also known as current) layer.
 - Example: Number of transit stops (target layer) near each parcel (host layer).
- **ProximitySum** finds all features in the target layer that are near each feature in the host layer. Then it adds up the values of a specified attribute in the nearby target features.
 - Example: Total number of jobs (target attribute) in all census blocks (target layer) that are near each parcel (host layer).
- **ProximityAvg** first it finds all features in the target layer that are near each feature in the host layer. Then it averages the values of a specified attribute in the nearby target features.
 - Example: Average property value (target attribute) of buildings (target layer) that are near each parcel (host layer).
- **ProximityWeightedSum** is similar to `ProximitySum`, except that target attribute values count less if they are far away. Specifically, target attribute values are divided by $(1+r)$, where r is the distance away.
 - Example: Park access measured by the weighted number of acres (target attribute) of parks (target layer) near each parcel (host layer).
- **ProximityWeightedAvg** is similar to `ProximityAvg`, except that target attribute values count less if they are far away. Specifically, target attribute values are divided by $(1+r)$, where r is the distance away. Note that the weighted average drops quickly as the maximum distance (“nearby” distance) increases.
 - Example: Crime hotspot analysis based on the weighted average of crime events (target attribute) in neighborhoods (target layer) near each parcel (host layer).

For reference and perspective, you may also want to review the existing functions `MinDistance`, `AvgDistance`, `OverlapArea`, `OverlapSum`, `OverlapWeightedAvg`, and `GetFromClosest`.

You can try out the new functions by creating a new attribute and setting up its formula using the Formula Editor. Type “proximity” in the search box at the top and the proximity functions will appear in the box below. The Help articles provide illustrative diagrams and other information.

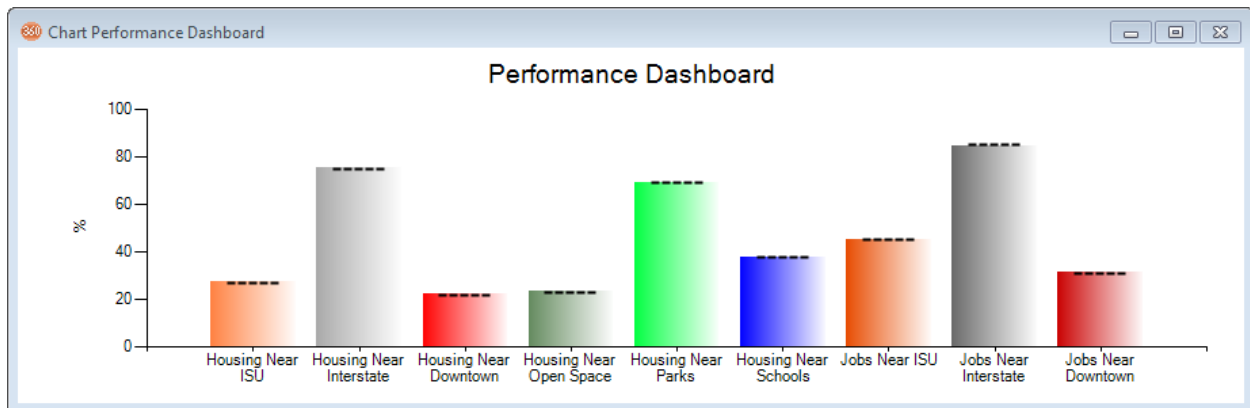
Utility Formula Functions

Two extremely handy new functions

In addition to the new Proximity functions, CommunityViz Version 4.4 comes with two handy new formula functions to save you time and effort. You'll find them in the function list when using the Formula Editor.

IfError returns a number you specify if it encounters an invalid result such as "infinity" or "null." It's perfect for defending against divide-by-zero or log of zero, but it works for other invalid results as well. It's much easier than writing out careful but tedious formulas like `If([Denominator]=0, Then(1), Else([Numerator]/[Denominator]))`, and it executes faster as well.

Norm (Normalize) performs a linear normalization on a set of attribute values, rescaling them so they range from 0 to 100, or some other range you specify. The new Suitability Wizard uses `Norm` instead of the more complicated `Min` and `Max` formulas it created in the past, and you may find it useful for creating **dashboards**. "Dashboards" is a name some people use for bar charts with 5 or 10 indicators that have all been rescaled so they use the same y-axis. They're an elegant way to display a spectrum of performance results, and `Norm` now makes the rescaling process easy.



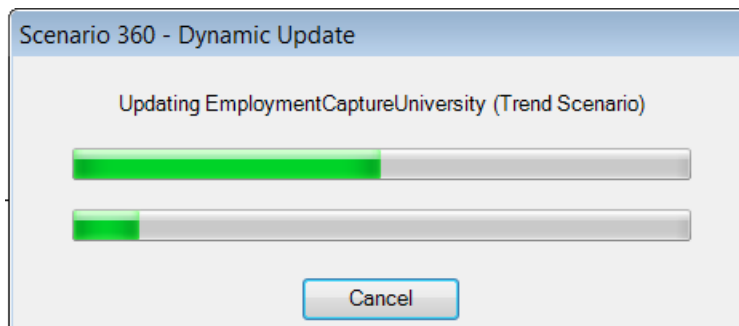
Performance Package

Architectural improvements mean faster updates throughout

Modern computers are a marvel—one that you experience every time you use CommunityViz. Those update progress bars are telling you that thousands of operations are happening every second. Thanks to ever-growing power like that, we've seen the typical CommunityViz project expand from hundreds of features to tens and *hundreds of thousands* of features.

Yet we know you can never have enough speed, and Placeways is always on the lookout for new discoveries to rev up CommunityViz even further. Scenario 360 Version 4.4 takes advantage of new breakthroughs that are showing impressive performance improvements at multiple levels of the code, including some parts you can see from the outside (e.g., functions used by the Suitability Wizard) and some you can't (dynamic update engine design).

The overall effect is noticeably faster, more responsive updates for almost every dynamic operation you perform.



Faster updates during geodesign

If you use CommunityViz sketch tools to edit features while working on large datasets, there are additional, specific Version 4.4 performance improvements that are just for you. When used properly, these improvements can make incremental analysis updates run far faster than in earlier versions. Read on for advice on creating the right conditions for this kind of speed.


The time savings come primarily when you edit features in a target layer referred to by the functions **Min**, **MinDistance**, **OverlapArea**, or **Sum**. A typical example is placing a new transit stop in an analysis where parcels are measuring their distance to the nearest transit stop using the `MinDistance` function. In the new architecture, updates to the `MinDistance` formula in the parcels layer will be much faster if you follow these guidelines:

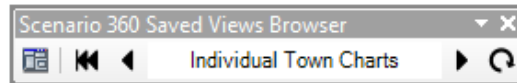
- Edit only one target feature at a time in a single edit *operation* (the number moved during a single edit *session* doesn't matter). In other words, avoid moving, deleting, or using Apply Style on a selection with multiple features in it.
- Use simple formulas that contain only one of these functions at a time.
- Be careful of turning off or suspending updates on any attributes or indicators referenced by these formulas. If you do, run a full update on these formulas after you resume updates on the referenced components.

More details appear in the Help article called Incremental Updates.





Saved View Browser


Use Saved Views like a slide show

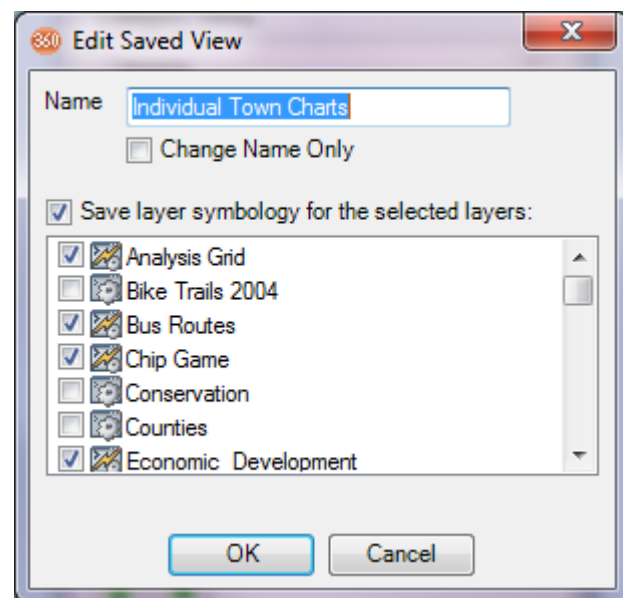
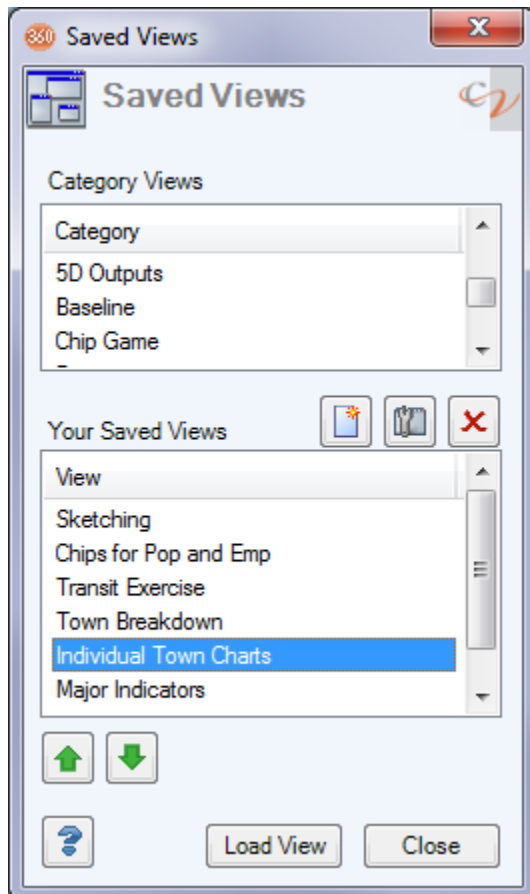
If you've ever presented your CommunityViz work to a large audience, you've probably used  **Saved Views**. They let you record particular screen layouts including map extent and symbology, which scenario and which windows are showing, and other details that make for smoother presentations.



The new **Saved Views Browser** toolbar now makes Saved Views easier to use. You can step forward and back through your views with a single, unobtrusive click. To use it, just arrange your Saved Views in order in the list of Your Saved Views. Then use new toolbar buttons to move forward, back, or back to the beginning. A handy window displays the name of the current view, and hovering over the buttons shows the name of the next and previous views.

You can also step through Saved Views with handy keyboard shortcuts:  +  for back and  +  for forward.

Need to modify or rename an existing Saved View? Great news for those who have patiently deleted, resaved, and reordered Saved Views in earlier versions: you can now setup and manage Saved Views just like other components. To edit an existing view, select its name in the list and click the  **Properties** button. Click **OK** to apply your current display to the current name, and/or check the **Change Name Only** box to change just the name and leave the display settings as they are.



Improved Installer

Faster and easier updates over the web

Version 4.4 uses a new, improved software installer. It's more robust across the increasingly diverse computer environments we are encountering as the CommunityViz user community continues to grow. That means there's a better chance that installations will go smoothly even in older or unusual systems environments.

And regardless of your environment, you'll find that future patches and upgrades will be a snap: no more uninstalling, reinstalling, and relicensing; just an easy upgrade.

Plus...

In addition, look for these upgrades and improvements:

- Fixes for External Table Links
- Fixes for behavior of update check boxes
- General updates for wizards, functions, and interface

As always, **up-to-date Help documentation** can be found online and throughout the CommunityViz 4.4 interface.

We hope you enjoy the new CommunityViz Version 4.4!