About COLLABLOCATION
https://collablocation.shinyapps.io/home

COLLABLOCATION is a collaborative laboratory for location analysis and planning. This online mapping platform is designed for use in hands-on interactive workshops where stakeholders break up into small groups to propose and analyze a system of locations, and then come together to compare and discuss each group's design, and repeat through several rounds of improvement. This GIS-facilitated process, known as "geodesign," succeeds by tapping into and channeling the collective intelligence of a group of stakeholders and experts.

What is Geodesign? Geodesign is an emerging field within the general category of participatory planning and GIS. For our purposes, we define geodesign as:

> *Geodesign is a collaborative design and planning method for stakeholders that tightly couples creation of design proposals with impact simulations informed by the geographic context and systems thinking, normally facilitated by GIS.* (This definition of geodesign is modified from Flaxman (2010) as amended by Stephen Ervin, see www.spatial.redlands.edu/geodesign/ for other definitions).

A history of geodesign as a concept and term can be found at www.esri.com/library/whitepapers/pdfs/introducing-geodesign.pdf. Two other well-know software packages for geodesign are www.geodesignhub.com/ and blogs.esri.com/esri/arcgis/2014/06/02/introducing-geoplanner-for-arcgis/.

Geodesign for points. Geodesign has been mainly applied to land-use planning, and most geodesign software has been created with polygons (land parcels) in mind as the primary decision units. In contrast, COLLABLOCATION has been created with point facilities in mind. While it is true that every point facility—a school, fire station, shopping mall, hospital, or fuel station—has an areal extent if you zoom in enough, COLLABLOCATION was created specifically to be able to treat facilities as points in GIS, and to evaluate a set of existing and new facilities as a *system* of point facilities. Users can visualize all kinds of GIS data including points, lines, and polygons, but the decisions COLLABLOCATION users make are where to locate a set of points. Clicking on the map drops a "point" marker at that location, and clicking on Evaluate and Save analyzes the performance of a proposed set of new facilities in conjunction with the existing facilities.

Multi-group, multi-stage workflow. For a collaborative, workshop-based design process, geodesign software must not only provide GIS tools and scientific submodels that an individual analyst might employ, but must also facilitate a collaborative, multi-group, multi-stage workflow. Thus, COLLABLOCATION keeps track of every tested map, the individual locations chosen, and the system's performance by each group at every stage. It includes features and tabs specifically for graphical and spatial comparison of multiple plans. At each stage of the workshop (or evolution of the planning), each group can design, analyze, and save multiple iterations.

In addition, at any iteration of any stage, a group can import a previous solution designed by themselves or another group and use that as the basis for further modifications.
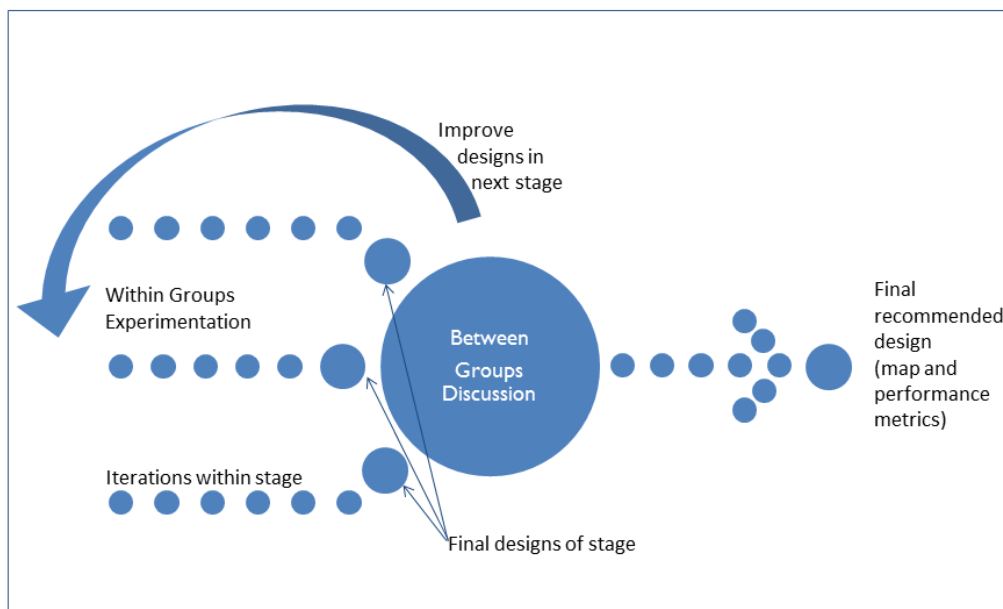
Potential applications. The initial funding to develop COLLABLOCATION was for collaborative design of a network of compressed natural gas (CNG) fuel stations for long-haul, heavy-duty trucking. The GIS layers and evaluation submodels were therefore designed specifically for this purpose, but can be readily adapted to:

- electric vehicles, fuel-cell vehicles, or other alt-fuel vehicles
- consumers and/or fleets
- any geographic scale from local to international

In addition, we hope that analysts will adapt this open-source software to other facility location problems where multiple stakeholders are involved, such as schools, fire stations, medical facilities, retail centers, waste facilities, industrial facilities, parks, transit stations, libraries, and other public or private facilities that are best analyzed at the scale where they can be treated as points on a map or transport network.