Generalization of Multiple Scale Maps from a Single Master Database

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This paper describes some of the work being done on map generalization at the American Automobile Association (AAA).   AAA produces various map products at different scales for our members, including detailed city maps, vicinity maps, regional maps, and atlases.   Our goal is to maintain all of the required   geographic data in a single master database and to generate all of our map products from this one database.   A closely related goal is make updates only once, directly to the master database, and to have those changes automatically appear in all derived maps the next time they are produced.

We have found that is possible to derive maps from a common database, but that it is more of a challenge to create maps out of a single database without duplicating data.   It is fairly easy to generalize a map if you can create subsets of data, and use these subsets to create the map.   It is much more of a challenge to create a map without creating any duplicate data.   One of the most obvious obstacles to this goal is the processing time that is required to generalize.   As the difference between the source and target scales increases, so does the time required to process the data.   At a certain point, the processing required becomes so great that it is no longer possible to compose a map and generalize on the fly, while working with the 'live' database.

Each map scale and product has unique challenges.   We are developing generalization rules that not only satisfy each map scale, but also address the unique nature of each product type. For city maps the main challenge is text placement and indexing.   For smaller scale vicinity maps, the main challenge is creating automated routines to preselect the features that should appear on the map.   For all map scales, the challenge is to automate procedures that are based on the decision making process of the cartographer.