Radical Railbanking

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GEODEMOGRAPHY

Over the past several decades, the use of geodemographic data has become ubiquitous in the regulation of urban land use and development.[1] City planning commissions use geodemography to aid in the implementation of policy, and private corporations reference geodemographic data when purchasing, selling, or developing real-estate.[2] The histories of these datasets have been well documented by scholars in geography and the social sciences.[3] In the United States, the emergence of contemporary geodemography began in the 1960s with the governmental subdivision of geography for the purpose of bureaucratic control—first for the assignment of Zip codes, then census data collection territories, and finally 911 responder zones. By the 1970s, these regions were drawn and computerized in the form of Census TIGER files, and data collected through the census was assigned to these computerized drawings in an early GIS platform. Soon, companies like Claritas and CACI began using census geodemography to develop and retail designed subdivisions of consumer identities, called market segmentation sets, which could be linked to their geographic locations through GIS. These commercial datasets were used for targeted mass marketing and presorted mailing campaigns, as well as the selection of sites for commercial construction. Thus, critically, with the latter development the effect of geodemography began to imprint itself on the built environment. By the 1990s, census geodemography was being combined with other information such as consumer spending data and television viewing habits to produce consumer identities of increasing specificity. Meanwhile, the geographic size of data sampling was decreasing—shrinking from the Zip code or census block down to the household or individual. And in the 2000s, producers of market segmentation data-sets began to account for increasingly mobile consumers whose location differed throughout the day, revising methods of marketing to a consumer in a fixed position or locating commercial buildings based on residential populations alone.[4]

Today, the demand for geodemographics has created a surging industry of data providers of uber-corporate nomenclature, such as Claritas, Axciom and ESRI. These companies provide increasingly baroque data

assemblages—algorithmic cocktails of census data, consumer spending information, figures scraped from Internet usage, and other sources through which consumers unconsciously provide daily information about themselves.[5] Thus, today's market-segmentation sets include information about race, ethnicity, sexuality, income, consumer tastes, hobbies, net worth, real estate value, and countless other characteristics. These data sets describe increasing idiosyncratic and highly synthesized consumer identities, linking these groups to their spatial locations in our cities or urbanized areas. According to ESRI's recent "Tapestry" segmentation set, for example, one might be labeled a "Rustbelt Retiree," a member of the "Industrious Urban Fringe," or a "Southern Satellite," among sixty-eight other highly customized identity groups.[6]

The rise of market segmentation geodemographic data has not been met without skepticism. Some question its fundamental effectiveness, while others assert that the underlying assumption that "you are where you live" is reductive at best.[7] Countering that sentiment, a review of trade journals will reveal a wealth of success stories from the geodemographic industry.[8] This debate is unresolved. However, a third position renders the difference of opinion moot. Perhaps more important than the ability of market segmentation data sets to accurately describe existing consumer groups is their ability to *make real* the identities they describe. Speaking aptly to this effect, the geographer Jon Goss writes:

> My concern over this technology is not whether geodemographics really can accurately predict profitable marketing strategies, but rather that geodemographics displays a strategic intent to control social life and that the ideological conception of identity and social space within the model may become real—in other words, that the assumptions will be validated as the strategies take effect.[9]

Significantly, Goss indicates that the underlying assumptions about identity within geodemographics are ideological. The geographer is not alone in this opinion. Joining him are scholars in his own discipline and others that deride geodemography, and the GIS platforms that enable its use, for their unchecked *positivism*. Many scholars note that geodemography and GIS, in their attempt to make geographic space scientifically knowable and enable bureaucratic control, imposes a narrow epistemological regime—privileging extant quantitative variation over latent qualitative difference. Further, the categories of data collection within geodemography, which may include constructed distinctions about race, gender, and ethnicity, are accepted as scientific fact. These fundamentally questionable distinctions of identity and subjectivity are then made even more complex and contentious when used as ingredients in the synthesis of today's commercially available market segmentation sets. While one would be hard-pressed to find an individual who would self-identify as a "Rustbelt Retiree," a member of the "Industrious Urban Fringe," or a "Southern Satellite," the marketing strategies that result from the instrumentalization of these identity categories might impose their definitions on an unknowing public.

Revelation of the ideological nature of geodemography has motivated some geographers to mount counter-projects. Most notably, one academic subconcentration now identifies under the label "critical GIS."[10] These geographers attempt to resist the hegemony of scientific control latent within geodemography and GIS though projects and papers that alternately attempt to demystify, profane, or reveal the biases of the mainstream application of geodemography. Others attempt to forward systems of demography that are more rooted in local knowledge and therefore do not impose identities from an exterior power.[11] Many of these tactics will sound familiar to an architectural audience, as they mirror some practices forwarded in the name of a critical architecture. However, as in architecture, recent thought in geography calls into question the efficacy of resistance. To this effect, Jon Goss writes:

> There is literally no point of or to resistance, no stable position from which to oppose the strategy; it is always expanding, and as surveillance intensifies, as models increase in complexity, and as commodified meanings proliferate, any resistance is analyzed, rapidly incorporated into the model, packaged convincingly, and returned as part of the strategy. The consumer, whether naïve or sophisticated, is thus bound up within this dialectic of control.[12]

Thus, the discourse around geodemography remains at an impasse, with near unanimity among academics as to its ideological effects, but without a clear trajectory toward a less contentious future.

Despite this impasse, the project described below attempts to locate a constructive position relative to the hegemony of geodemography from which the architect can tactically operate. Architecture plays a critical role in the way geodemography is instrumentalized. To be sure, more often than not development guided by geodemography serves to limit design decisions, recommending the repetition of conventional commercial building types, and removing the opportunity for what most in our discipline would properly identify as architecture. However, the resultant buildings can be understood to exercise tremendous agency. When commercial real-estate developers use geodemography to choose a site for development, their buildings deeply implicate the synthetic identities described by geodemography in space. The shopping malls, big-box outlets or fields of coffee houses that result become territorial beacons for the collection of a specific combination of consumers. United in space, this combination of consumers, in effect, *becomes* the synthesized consumer identity described in the operative geodemography. In this scenario buildings become material locales for the synthesis of the groups identified in market segmentation sets—points of condensation for the creation of hybridized consumer groups. Moving outward from these structures, urbanized space becomes an assemblage of overlapping spatio-statistical territories, measured as a function of the entrapment radius of commercial buildings and the range of mobility of specific consumer types.

The contention here is that as the instrumentalization of geodemography infringes upon the disciplinary terrain of architecture more and more, architects must find ways to address its onslaught. And, as architects, we might find reason in our disciplinary history for optimism. The ability of development guided by geodemography to reify synthetic consumer identity groups is hauntingly reminiscent of the architectural ambition to design the *social condenser*, an object of fascination for architecture that traces a historical arc from Russian Constructivism, through European Modernism and the later work of OMA, up to current theoretical posturing about architectures that "make new publics," or "condense hybrid collectives."[13] To be sure, these projects are usually forwarded in the interest of situating architecture as a social actor in a redemptive, revelatory, or projective manner. To extend this ambition to encompass the development recommended by geodemography cynically equates "publics" with "consumer groups." Noting this, the project below willingly risks cynicism. This leap is taken in the hope that the rewards may outweigh the risks. If the commercial success of development guided by geodemography is any indicator, the real-estate industry has succeeded where architecture often has not in establishing methods through which latent collectives may galvanize in urban space, or around architectural insertions.

The following project is also forwarded with measured caution. Keeping in mind Jon Goss's warning that there is simply "no stable position from which to oppose" the hegemony of geodemography on urbanized space, it is equally important not to embrace this hegemony directly. If architects simply accept the protocols that geodemography imposes, uncritically using this data as yet another design tool, we risk becoming technocrats whose labors reproduce the malignant ideologies latent in our technologies. Hence, the project below attempts to locate a third position. The goal here is to begin speculation about how designers may game with geodemography. Neither a stance of resistance nor one of complicity, gaming with the system has the ambition of simply trying to produce something *other* from within hegemony. The hope is that this *other* might point to a different future, or at least unlock the possibility that such a future is possible. To do this, the architect must assume the role of the technocrat, even amplifying and exacerbating technocratic methods. But the goal is not to implement scientific control. The goal is to unlock latent and imaginative scenarios. The project may smack of scientism to many, but aspires to forward science fictions.

RAILBANKING

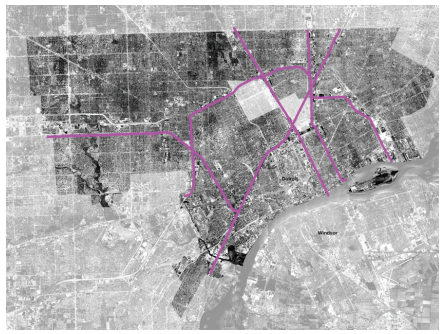
Railbanking is a process through which unused railways and easements may be turned over for development as public space. Historically, railways have been assembled from land parcels with varied and discrete ownership types. Some parcels are owned out-right by the rail company, while others are regulated by complex ownership agreements, limited rights of use, or temporary government land grants. When a rail company abandons a railway, property rights for the land parcels composing the rail default to differing beneficiaries depending on their original ownership type. Railbanking provides an omnibus legal proceeding through which the complex patterns

of ownership around an unused railway may be consolidated and a new public realm may emerge.[14]

This project hijacks and radicalizes the tactics of railbanking by manipulating geodemography through the productive misuse of conventional GIS software. The project is sited along lengths of active railway in Detroit that currently negotiate abrupt formal and demographic division (Figure 1). Historic neighborhoods often self-identify their borders at Detroit's railways, concentrations of ethnic groups are located in enclaves sequestered by the rails, and the industrial building stock that once lined the railways often creates discontinuity between the urban fabric on either side. Just as conventional railbanking using a legal proceeding to consolidate land rights in yield of public space, Radical Railbanking uses GIS to analyze and recombine development potentials that are latent in the spatial and statistical relationships between the land parcels along Detroit's rails. In doing so, the process makes visible potentials for urban development that would not register within the episteme of conventional applied geodemography.

Key to the Radical Railbanking process is a modeling technique called TIN modeling. Common to many GIS platforms, TIN is an acronym for Triangular Interpolated Network. The modeling technique creates complex 3-dimensional surfaces from an aggregation of triangular planes with height values at all three points. TINs are typically used in GIS to model topography and enable subsequent ecological analyses. But Radical Railbanking misuses TIN models to eschew and hybridize the categories of conventional geodemography. Thus, while most applications of GIS are fundamentally positivist and limited by the categories of data collection within their applied geodemographics, this project is fundamentally relational and reformulates data as a function of statistical and spatial relationships.

An initial TIN model is created by offsetting the profile of the selected railways one half mile to each if its sides and interpolating population density values as they register at the offset lines across the resultant corridor. This offset distance is intended to capture population density values at the approximate point where the historical industrial development lining the rail transitions to residential fabric, while defining a corridor between that would be considered walkable. This interpolation creates a model with an abruptly serrated profile, imaging differing intensities in population density, in relation to the geometric offset of the selected railways. Thus, statistical certainty is reformulated as a spatial and statistical relationship. The serrated model is analyzed and the ridges with the highest values are isolated. These ridges indicate relatively high population density values where they intersect with either one, or both, railway-offset lines. Lines at the locations of these ridges are projected back onto the city and combined with the railways to create a "Connective Armature Diagram" across the railway's dormant proximity (Figure 2). This is a projective diagram for new development along the railways that, critically, is based on a fundamental *reformulation* of conventional geodemography. The diagram is meant to locate trajectories for development that might stitch together unusually vital neighborhoods, channel one zone of higher density into another of lower density,



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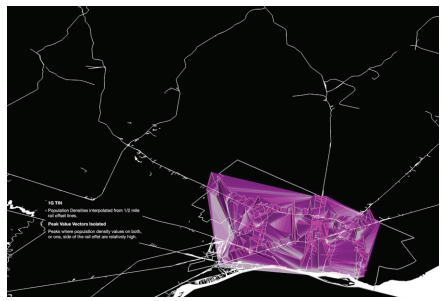

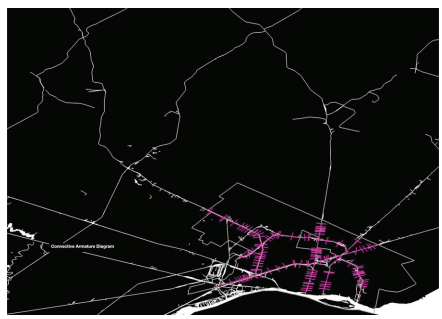

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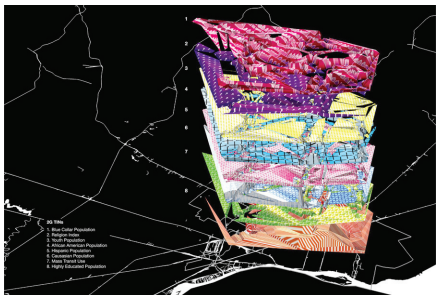
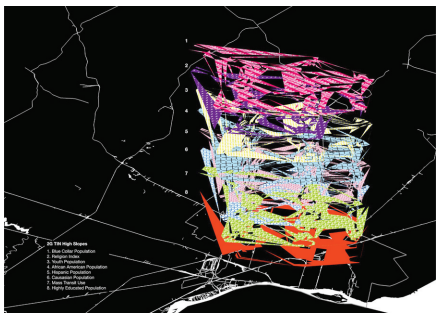
Figure 1: Selected railways in Detroit





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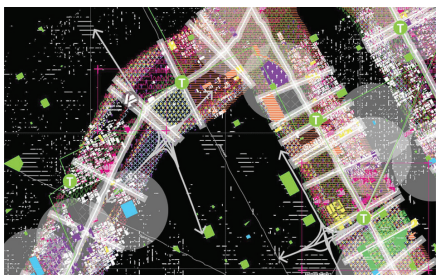

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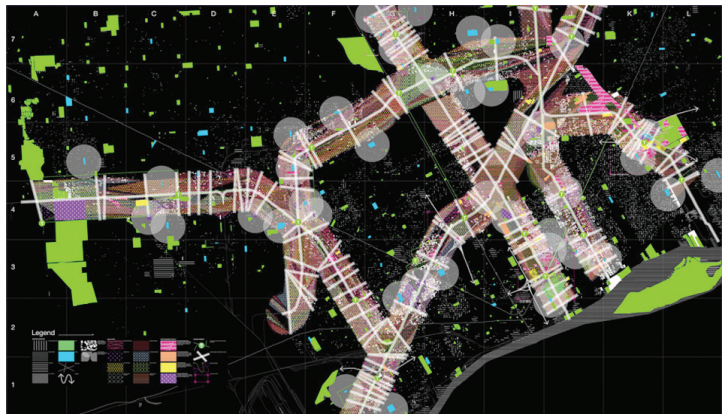

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and organize the aggregation of further spatio-statistical relationships in a second round of analysis.

The geometry of the Connective Armature diagram is then used as a basis for a series of second-generation TINs. Datasets for these TINs are chosen for one of two reasons. The first category of data sets relate to conventional demographic categories that seek to define a "community" such as the African American "community" or the Hispanic "community." Under this category, demographics are used for the total African American, Hispanic, Caucasian, and youth populations. The second category of data sets is chosen because it relates to programmatic elements that have been historically conceptualized as structural elements within urbanism, such as schools, churches or transit stations. Under this category, demographic figures such as the blue-collar worker population, the highly educated population, the religion index, and mass transit ridership are used. This step in the Radical Railbanking process images relationships between data values as they register on the connective armature diagram, and projects those relationships across the space between. Hence, standard geodemography, with all of its positivist biases, is again reformulated and made increasingly spatially and statistically relational. No longer representing a singular statement of statistical "fact," the second generation TINs reformulate and hybridize datasets in relation to the Connective Armature Diagram and the dataset used in its initial creation. The result is a set of TIN models of complex pseudo-topographic triangulation. These models are then analyzed using a standard topographic analysis function to isolate only those faces of their triangulated surfaces with the most intense slope values. Under the assumption that the territories with the highest gradient of difference are those most potentially mercurial, these high-slope faces are interpreted as regions in the compound spatio-statistical relationships imaged where the values are indicate volatility, or where the most possibility for change exists (Figure 3). In each of these steps described herein the intended uses of conventional GIS are co-opted, and geodemographic classifications are hybridized.

The high-slope regions are then projected back onto the city. The resultant drawing is conceptualized as a kind of re-imagined zoning map (Figures

Figure 4: Final zoning map

Figure 5: Detail of final zoning map

4 and 5). Added to the map are fields of very low value, land-banked, or city-owned properties. These are thought of as parcels immediately available for use in any future redevelopment strategy. Also added are schools, parks, and major roads, all of which are thought of as existing entities that may inform decision making in future strategies. Within the high-slope areas from the TIN model analyses, incentives are sometimes stipulated for urban programs that directly solicit a demographic or market group such as an incentive for new green-industry development where an intense relationship between blue collar worker populations occurs. Elsewhere, in zones where several intense spatio-demographic relationships overlap, urban programs that cut across or hybridize the conventional categories of geodemography are encouraged, like megachurches, sports complexes, and education facilities. The Connective Armature Diagram, which is latently present as the geometric base of the spatio-demographic relationships modeled in the TINs, is concretized as incentives for the development of a continuous network of public spaces that stitch neighborhoods together. The map strategically encourages a series of contemporary "best-practice" urban programs—like urban farming and community centers—but deploys them in a way that is meant to intensify the relationship *between* urban programs and events, elevating latent urban volatility. The map is sometimes blatantly prescriptive, but these prescriptions are intended to be catalytic of playful and unpredictable urban development.

Most zoning maps simply segregate occupancy and regulate development density, and could thus easily sit within the positivist episteme of conventional geodemography. Counter to this, the Radical Railbanking zoning map displays a rich density of pattern reading against pattern; relationships compounding and inflecting each other. Using the map to develop strategies for urban development requires a process of pattern recognition: deciphering, designing, and making rules for operating within the relationships that the map makes visible. Hence, it becomes a sort of medium for the projection of architectural and urban imagination, but one that is yielded through a co-opting of, or gaming with, techniques of scientific control. Unlike the commercial or mainstream applications of geodemography, the map never reiterates or reifies conventional or constructed identity categories, nor would development guided by the map solicit newly synthesized consumer groups. Instead, Radical Railbanking attempts to recollect for the discipline of architecture the agency of social condensation by manipulating the tools of the bureaucrat. Buildings and urban designs guided by the Radical Railbanking process incentivize the emergence of creative urban identities and hybrid urban collectives, describing a city that is solicitous of imaginative architectural interventions. ◆

ENDNOTES

1. For the purposes of this paper, the author defines geodemography as the study of the geographic distribution of demographic types, especially as this data is used for marketing research.

2. "GIS" is an acronym for "Geographic Information Systems." GIS is commonly understood to be any computer-based mapping systems in which geographic features are organized in mapping layers, and attributes within the layers are linked to statistical databases. For one detailed history and definition of GIS, see: Kang-tsung Chang, *Introduction to Geographic Information Systems*. (New York: McGraw Hill, 2002).

3. See, for example, D. Phillips and M. Curry (2002) Privacy and the phenetic urge: Geodemographics and the changing spatiality of local practice. In D. Lyon (ed) *Surveillance and Social Sorting:Privacy, Risk and Digital Discrimination*. New York: Routledge, 137-152.

4. Ibid, 145.

5. ESRI, "2010 Methodology Statement: Esri Data—Tapestry Segmentation for Block Groups and ZIP+4s," 2010.

6. ESRI's "Tapestry Segmentation" consumer database. http://www.esri.com/data/esri_data/tapestry.html

7. Jon Goss, '"We Know Who You Are and We Know Where You Live": The Instrumental Rationality of Geodemographic Systems," *Economic Geography*, Vol. 71, No. 2, April 1995, p.172

8. See, for example, "Case Study: PETCO Improves Location Selection," *Integrated Solutions for Retailers*, May 2010 For a review of successful uses of geodemography, see also D.J. Curry, *The new marketing research systems: How to use strategic database information for better marketing decisions*, New York: Wiley, 1993

9. Goss, 172

10. For a comprehensive review of the "critical GIS" discourse see, Matthew W. Wilson and Barbara S. Pore, "Theory, Practice and History in Critical GIS: Reports on an AAG Panel Session," Cartographica 44/1.

11. See, for example, Rina Ghose, R. 2001. "Use of Information Technology for Community Empowerment: Transforming Geographic Information Systems into Community Information Systems," *Transactions in GIS*, 5(2), pp.141-163

12. Goss, 193

13. For one discussion of the social condenser in Russian Constructivist architecture see: Victor Buchli, "Moisei Ginzburg's Narkomfin Communal House in Moscow: Contesting the Social and Material World," *Journal of the Society of Architectural Historians*, Vol. 57, No. 2 June, 1998, pp. 160-181

. For a recapitulation of the social condenser as the capitalist skyscraper: Rem Koolhaas, *Delirious New York*, New York: Monacelli Press, 1978, p.152

. For one contemporary theorist discussing the ability of architecture to condense new collectives: Robert Somol, "Green Dots 101" in *Hunch 11*, 2007

14. http://www.railstotrails.org/ourwork/trailbuilding/toolbox/informationsummaries/railbanking_whatandwhy.html