PAINT-THE-REGION AND LONG-RANGE REGIONAL TRANSPORTATION/LAND USE PLANNING

A Visualization Experience of Northeastern Illinois Planning Commission

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ABSTRACT

Northeastern Illinois, with 272 municipalities, more than 1,200 units of government, and 8 million people, requires effective and extensive collaboration on its regional planning process. In 2001, Northeastern Illinois Planning Commission (NIPC) initiated *Common Ground*, as a *Blue Print for Regional Action* to address a new standard for public planning. In 2005, this comprehensive planning effort led to the 2040 Regional Framework Plan that provides a set of guidelines for an interactive public planning process aided by the application of state-of-art technology. This paper describes the procedure that was developed to support the visualization of alternative feature in the public participation process.

Utilizing internet based customized GIS software, participants are able to "paint the region" on the screen presenting their own desired future in terms of the region's transportation, land use and the environment. User-friendly multiple digital layers of the existing infrastructure are provided to the participants to enable them to make choices and understand the full complexity of the region's systems. The painted features are further explained and supported by both general statistics on quantifiable decisions made by each workshop group through innovative keypad technology, and the comprehensive synthesizing process done back at the agency. The final synthesized regional transportation and land use map (in the form of centers, corridors and green areas) is referred to as the Common Ground scenario. Compared with the traditional forecast scenario generated by population forecast and transportation modeling, the Common Ground scenario fills the gap between the qualitative public inputs and rigid transportation planning models through interactive visualization technology, where the geo-database is used as a bridging tool.

KEY WORDS

Public Planning, Paint the Region, GIS, Visualization, Transportation and Land Use

Developed by the Northeastern Illinois Planning Commission (NIPC), the 2040 Regional Framework Plan was awarded as the American Planning Association's 2006 national plan of the year (1). The Plan covers the six counties that make up the Chicago metropolitan area. The commission instituted a program in 2001 called "Common Ground" to pursue a community-based approach to regional planning. In order to effectively engage the region in seeking solutions to current and emerging challenges, the state-of-art technology was used in each of Common Ground's 200 workshops and meetings to involve participants in meaningful decisions and to support consensus-based decision making. Building upon its existing geographic information system, NIPC and consultants at Criterion developed Paint-the-Region (PTR) – an innovative planning tool that allowed participants to map their desired future for the region. After summarizing, synthesizing, and finalizing the public input using PTR, this innovative visualized public planning process was proved to be very successful by the final Plan.

REGIONAL PLANNING ORGANIZATIONS IN NORTHEASTERN ILLINOIS

Founded in 1957, NIPC has long collaborated with local governments to evaluate growth trends and complete population and employment forecasts. In order to produce the 2040 regional land use and transportation plan, NIPC engaged the region in a "bottom up" planning effort that respects the authority of local communities to plan for their futures and recognizes the need for communities to work together to address these issues. Common Ground is a blueprint program launched by NIPC in 2001. Supported with about ten staff members, Common Ground's mission is to design and initiate a new type of inclusive planning process as a precursor to the 2040 plan. Ultimately, the 2040 plan details the ideas of thousands of northeastern Illinois residents who participated in the Common Ground process, and through their participation, the residents of the region voiced their strong desire to create a region that will be a far superior place to live than the region that would evolve if they simply allowed current trends to continue (1).

The Chicago Area Transportation Study (CATS) was founded in 1955 as the regional transportation planning agency for the northeastern Illinois region. CATS is charged with planning and developing a safe, efficient, and an affordable transportation system for the region. Technically, the 2040 Framework Plan has two bases: one is the broad public inputs and another one is the typical transportation and land use forecast results. The integration of these two bases was one of the unique features of the final 2040 framework plan success. CATS 2040 transportation forecast and its 2030 Regional Transportation Plan (the 2030 RTP, which was produced in 2003) acted as one the primary technical inputs, and was developed as one of the major scenarios for implementation (3).

The plan was a success because of the cooperative efforts of both agencies. Because of the extensive amount of cooperation during the past decade, especially during the four-year regional framework planning process, in the Spring of 2005, local government, business, and community leaders recommended to the Governor and the General Assembly the creation of a new public agency to coordinate comprehensive planning in northeastern Illinois. The legislation, signed into law in August 2005, created the Regional Planning Board – now known as the Board of the Chicago Metropolitan Agency for Planning (CMAP), which merged the two major regional planning agencies NICP and CATS together.

In short, the 2040 Framework Plan was a collaborative effort of the two major regional planning agencies: NIPC and CATS, and a broad cross-section of residents, planners and politicians across the region. The plan is an adventure in bringing everyone together to vision their own future. And this planning experience also showed us the necessity of active and effective cooperation between local planning agencies.

THE NORTHEASTERN ILLINOIS REGION

A regional map and regional profile is shown in figure 1.

Figure 1: Northeastern Illinois Regional Profile 2000

Regional Profile

- Six Counties
- 272 Municipalities
- 8.1 million residents
- 4.3 million jobs
- 3,749 sq. miles of area
- 85 sq. miles of water
- 2,769 miles of bus & rail transit
- 54,600 miles of road network
- 768,000 acres of agriculture land
- 200,000 acres of protected open space and forest preserves
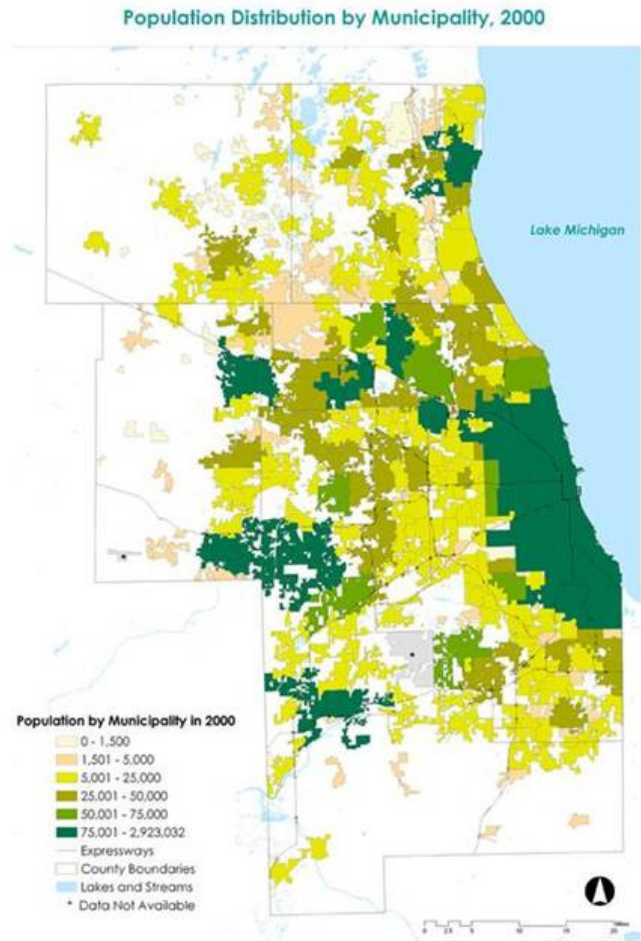
By 2040, the region's population will approach 11 million, and the tri-state area (Milwaukee, Wisconsin, to east of Indiana), with the global city of Chicago as its hub, may well include more than 15 million people. At the same time, the region's residents will be much more diverse racially and ethnically. Between 1990 and 2000, new foreign-born residents accounted for 65 percent of the region's total population growth. In the next ten years, there will be no majority population in the region. At present, the six counties of northeastern Illinois include about 1.16 million acres of incorporated land. To accommodate the projected population growth while maintaining the current propensity to decentralized low density growth, the incorporated areas would have to expand by 337,000 acres, an area the size of Kane County (2). If municipalities within the region do not want to consume land at this rate, accommodating growth requires a dramatic rethinking of current development patterns. The 2040 Framework Plan was designed under these situations, and is meant to be very broad in scope.

CONTEXT AND PROCESS OF THE 2040 FRAMEWORK PLAN

I.   Planning Context

Common Ground recognizes the planning and implementation efforts of local jurisdictions. The

municipalities plan, build, and maintain the local roadways, purchase and improvement green areas, manage water supply, and regulate building and growth. In this way, Common Ground reflects an emerging idea called "community-based regionalism" where individual communities maintain their traditional authority but commit to work collaboratively with one another (2). The participants included in the Common Ground Process are a cross-section: residents, community leaders, public officials, business owners, and planners at all levels. Their efforts, coupled with planning at other local levels of government, serve as building blocks in the implementation of the 2040 plan.

Common Ground first defined four inter-related objectives as listed below (2). By achieving these objectives, Common Ground has been one of the most ambitious planning processes in the nation, with extraordinarily diverse and open participation, extensive facilitated dialogue, civic engagement, and consensus building:

1. Prepare and adopt the 2040 Plan based on a publicly created, comprehensive vision for the region's 35-year future.
2. Use the best available technology to support a new approach to community-driven regional planning in northeastern Illinois.
3. Assist local planning efforts by researching and disseminating best practices, utilizing new technology and facilitating intergovernmental cooperation.
4. Strengthen the link between land-use planning and transportation infrastructure investment across the region.

In order to achieve these objectives, a creative effective involvement process needs to be designed, a series of creative planning concepts need to be developed, and a set of innovative technology based tools need to be identified and utilized.

II. Planning Process

i. Three-Phase Design and Center-Corridor-Green Area Concept

The four-year Common Ground planning efforts were divided into three phases (2):

- Phase 1: Issues Identification and Goals Drafting
- Phase 2: Vision Mapping Using Paint-the-Region
  - Involved community members, planners & decision makers
  - Identified regional patterns of change
  - Identified Centers, Transportation Corridors and Green Areas for 2040
- Phase 3: Plan Writing, Modeling, Public Hearings, Visualized Presentation

In the first phase, participants created a diverse set of 52 goals to define the region's future in 2040, and these goals address issues ranging from education to water supply, transportation to taxation. These goals further developed into 5 regional themes as illustrated in Figure 2.

Phase 2 is the emphasis of this paper. During this phase, the state-of-art visualization tools are used under the creative planning concept of Centers, Corridors, and Green Areas. To achieve the Common Ground regional goals, the vision of the 2040 Framework Plan identifies centers for development, corridors for connections and green

areas for open space. The 2040 Regional Framework Map in Figure 3 illustrates the defined hierarchy of centers, corridors and green areas that can be implemented at the facility level through CATS's Regional Transportation Plan and at the community level through the measures identified in the Plan itself.

Figure 2: How Goals Led to Strategies
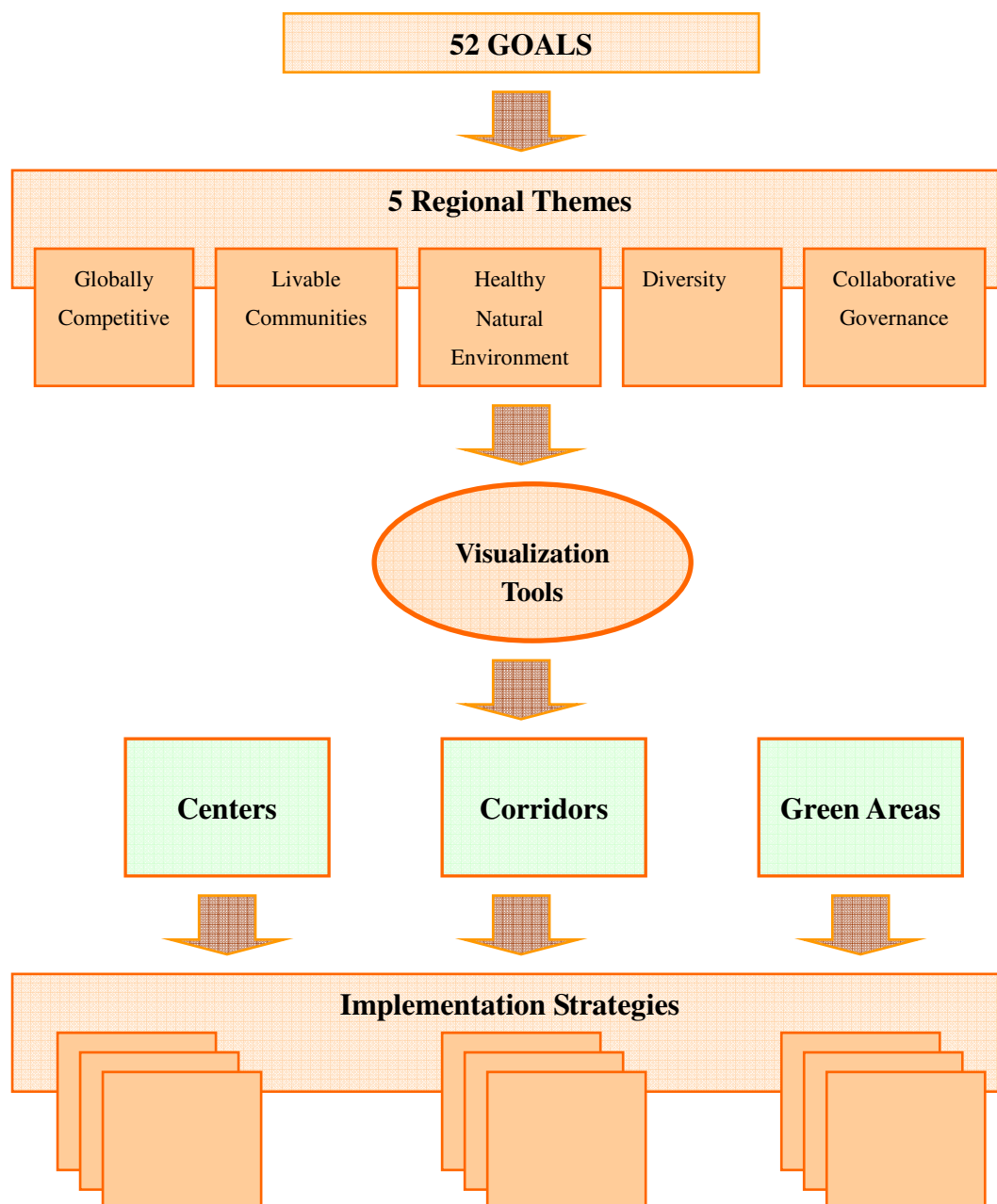
Because its broad in scope, the 2040 Regional Framework Map shows how major corridors will connect the centers of regional significance and how these centers and corridors can be surrounded by an integrated network of green areas. In this way, the 2040 Regional Framework Map sets the frame for future planning in the region. Many of these centers, corridors and green areas exist in some form today, while others must be created.

**Figure 3: 2040 Regional Framework Plan: Centers, Corridors, and Green Areas**
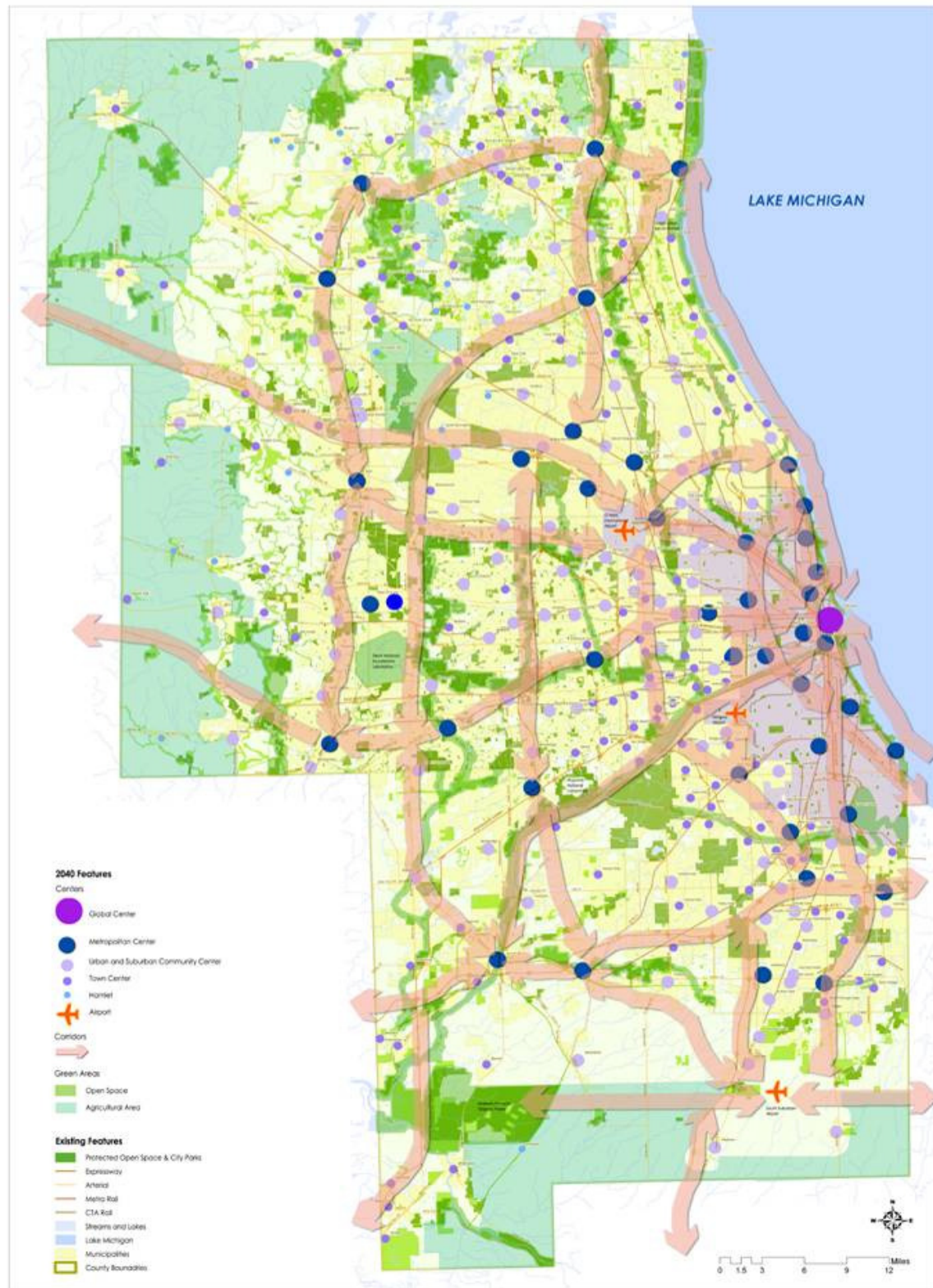
COMMON GROUND: A BLUEPRINT FOR REGIONAL ACTION
A PROJECT OF THE northeastern illinois planning commission

PAINT-THE-REGION (PTR)

Technically, the PTR was created as an extension of ArcGIS (ArcView). Via a web browser, the site allows users to explore land use and transportation planning by "painting" their vision on the map "canvas." A snapshot of the PTR user interface is shown in Figure 4, which was available to any resident who has an internet access during the planning period. NIPC has used GIS to manage their geodata base for over a decade, so this tool as an extension is a natural fit with its GIS activities. The customized ArcMap contains front and back reference layers (on the right hand side of the screen) that give context to actual land use and transportation data. Paint the Town is designed as an interactive tool (on the left hand side of the screen) allows users to draw growth boundaries and a paint land-uses and transportation corridors on-the-fly during public meetings. These new features are instantly viewable by other website users. As areas are painted, the tool simultaneously calculates new households and jobs that are being added to a community. Painting is accomplished with a palette that offers different choices of development style and intensity.

Figure 4: Paint-the-Region Internet Based User Interface
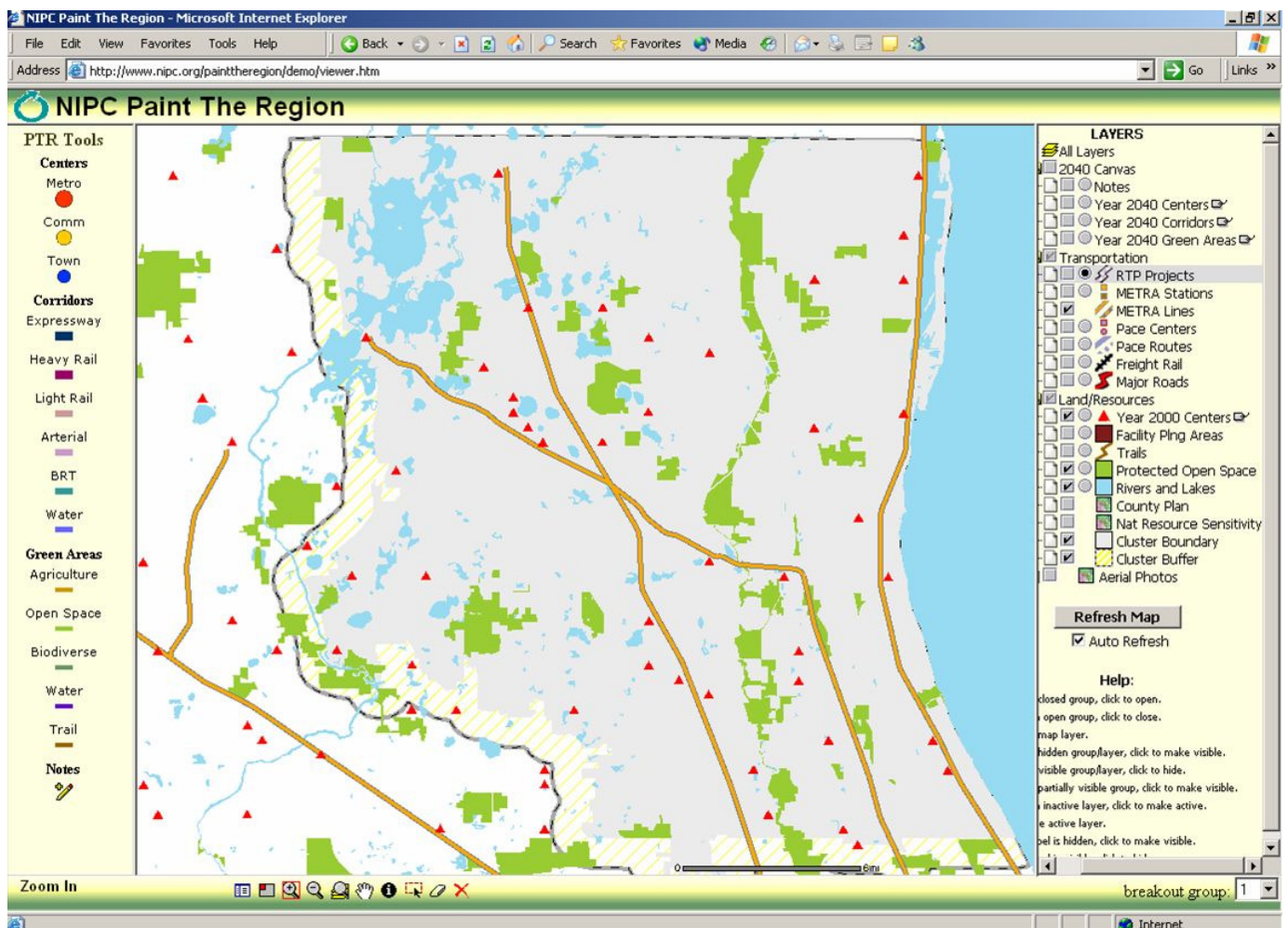
In order to inform, communicate, and collect all the local inputs via the PTR tool, NIPC held nearly 200 public workshops and public hearing at different communities and over 2000 people were involved from the beginning to the end. Figure 5 is an onsite picture of one of the local workshops, and Figure 6 visually illustrates the typical room setup. Figure 7 and Figure 8 explicitly illustrate the roles of people and essential tools on each table.

Figure 5: Sample On-Site Workshop Picture

Figure 6: Typical Workshop Room Setup

On a table:

- 9-10 participants
- A Table Facilitator
- A Computer Facilitator
- A Networked Computer with PTR
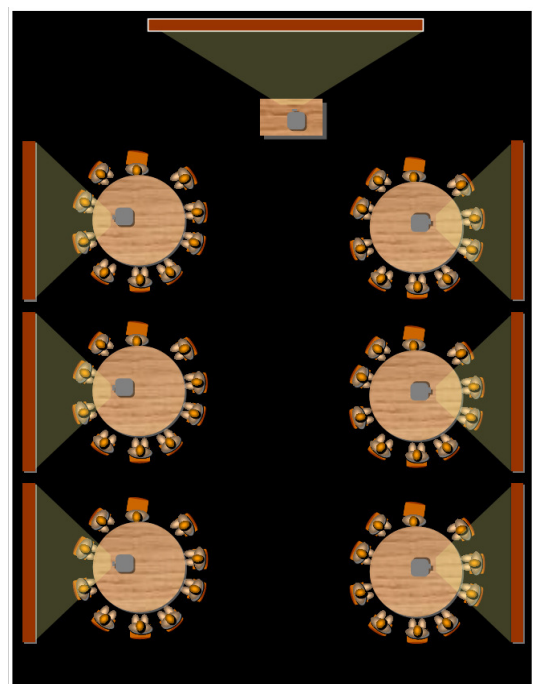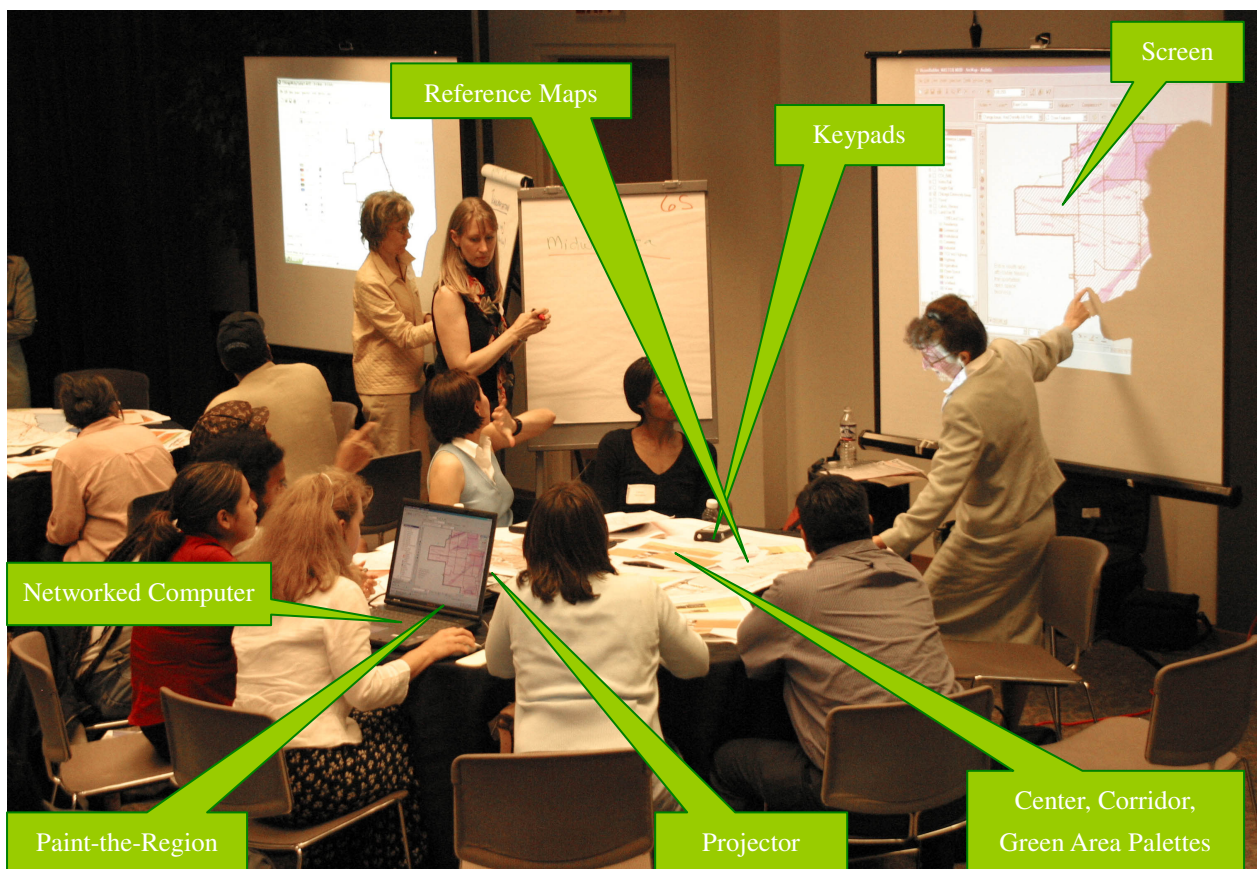- A projector
- Maps
- Palettes
- Reference material

Figure 7 Who are on the Table?

Figure 8: What are on the Table?

With the aid of the all the given materials and the instructions provided by the facilitators, each table would then generate a PTR scenario. Figure 9 shows an example of hundreds of such scenarios.
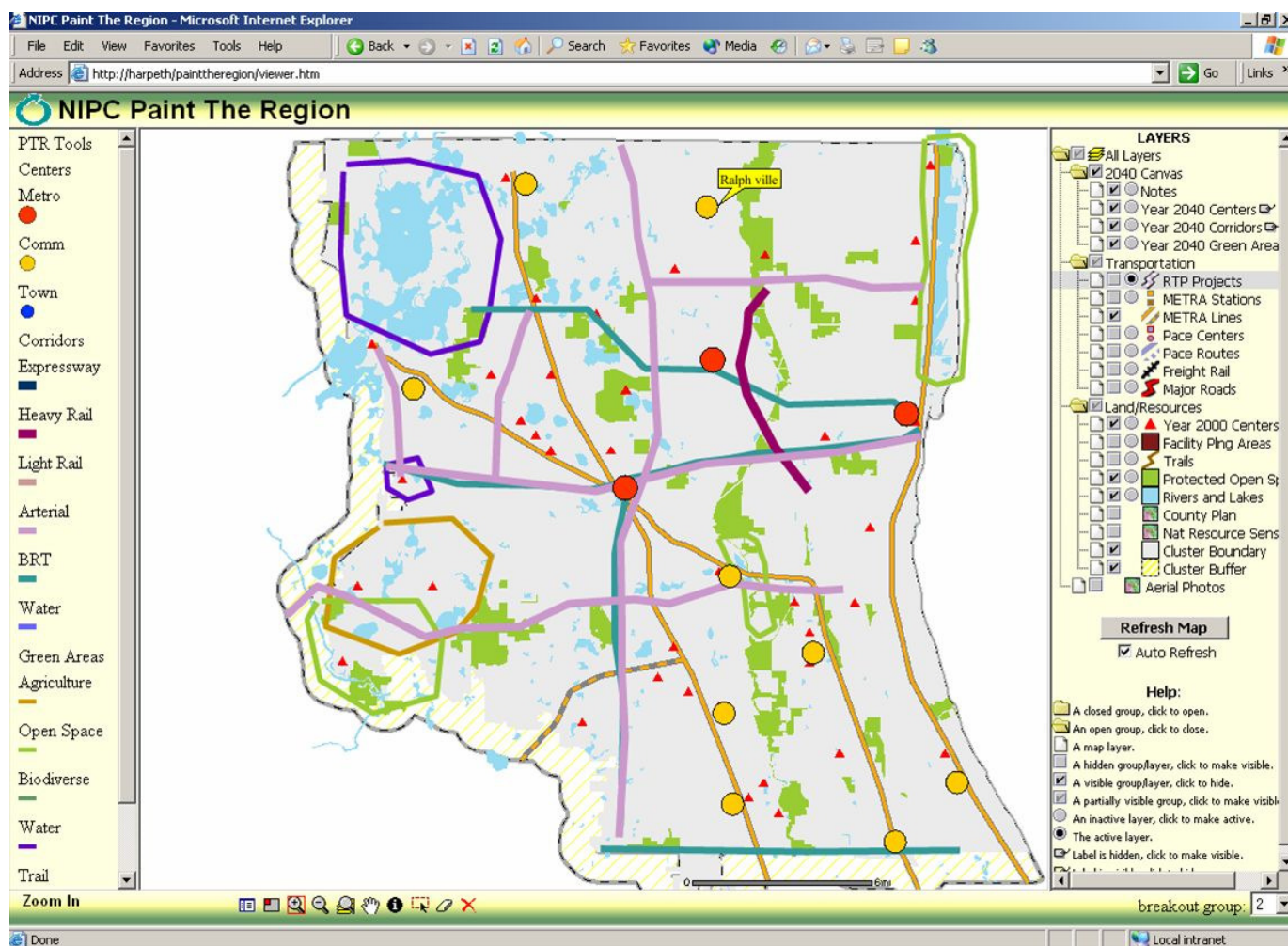
Figure 9: Sample PTR Scenario from Individual Table

Figure 10 and Figure 11 illustrate how the PTR results communicate between the each of the workshop locations and NIPC sever, and among all the workshops held in individual communities. As shown in Figure 12, by utilizing ArcIMS (ESRI software that allows for centrally hosting and serving GIS maps, data, and applications for use on the Internet) and ArcSDE (an advanced spatial data server for managing geographic information in numerous relational database management systems), PTR input data was collected and backed-upped into NIPC's database management systems. At the conclusion of the outreach meetings, NIPC staff had a comprehensive digital record that can be left with local officials and analyzed further at NIPC. Ultimately, individual community scenarios are aggregated into the multi-county growth forecast.

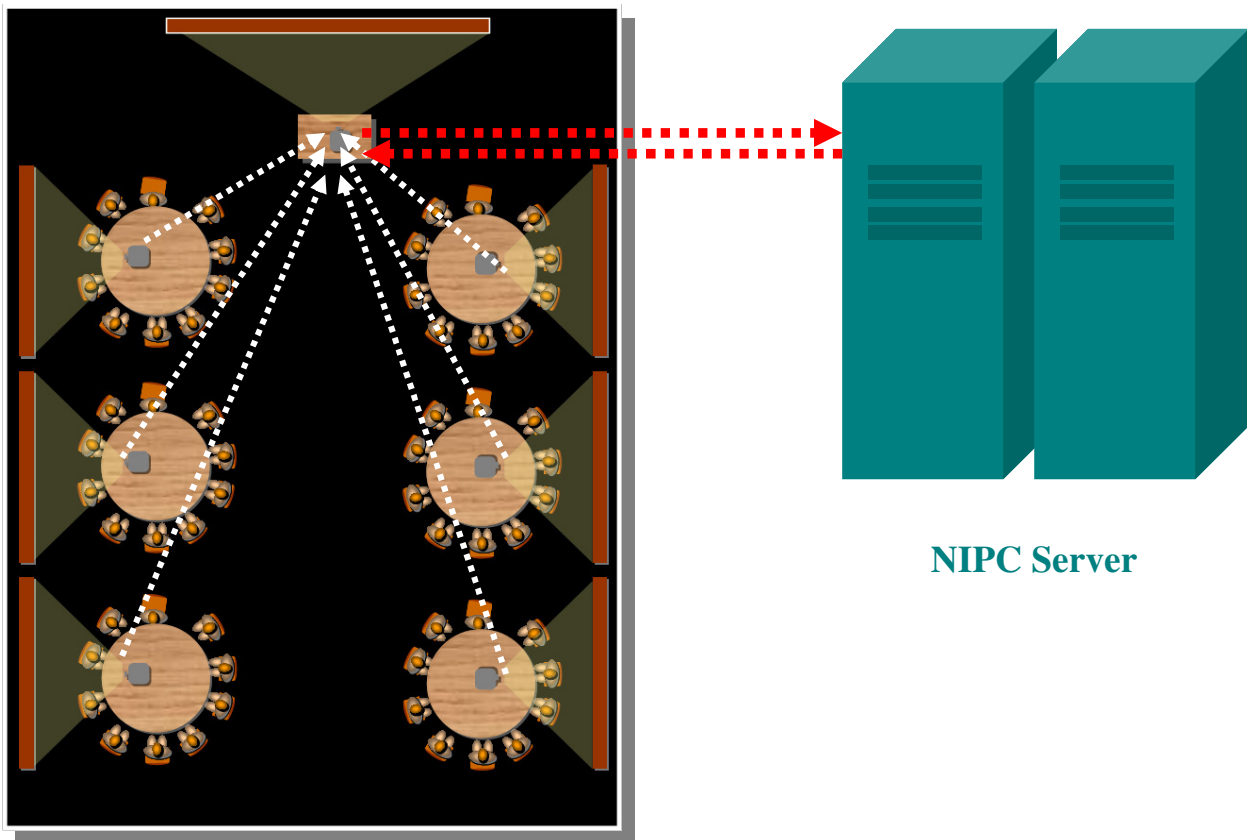**Figure 10: Communication between Community Workshop and NIPC Server**

NIPC Server

Figure 11: Communication Among all the Communities and NIPC Server
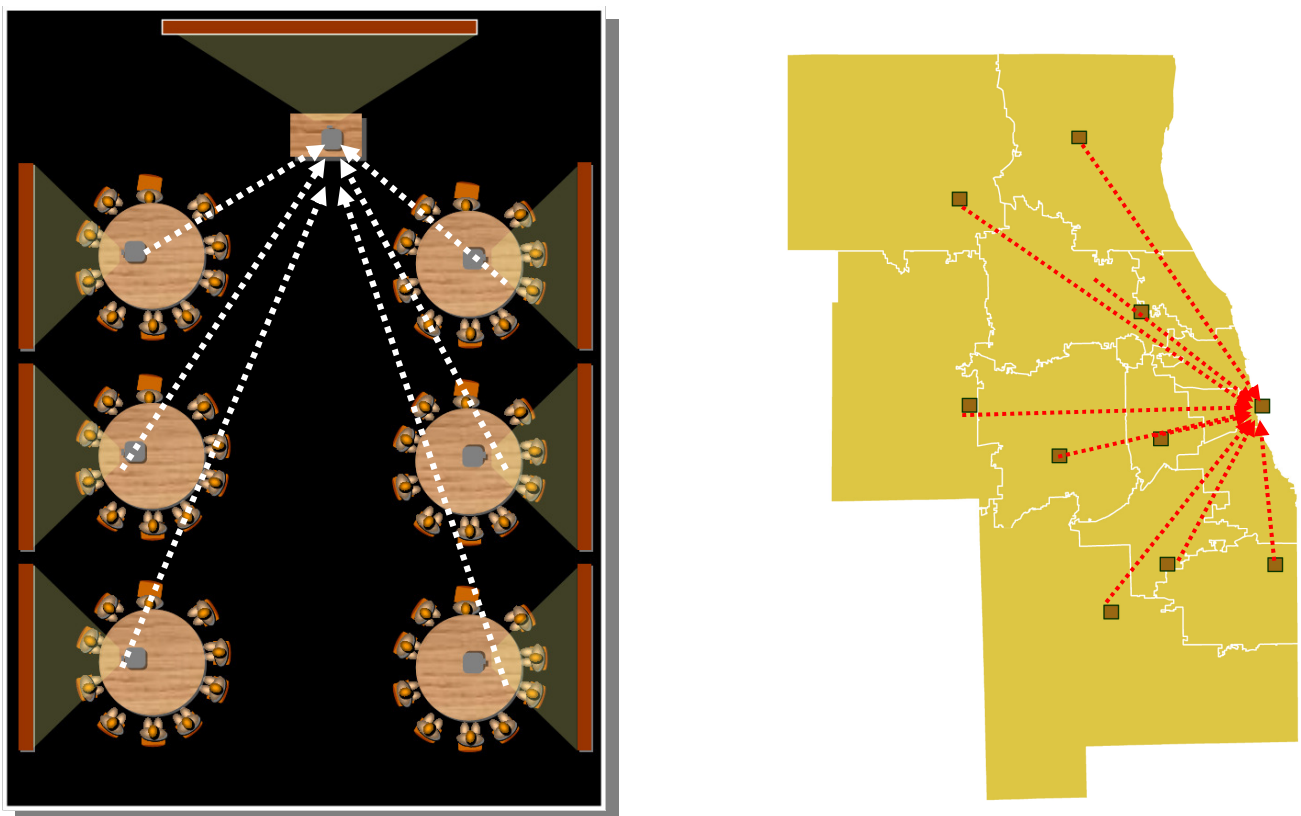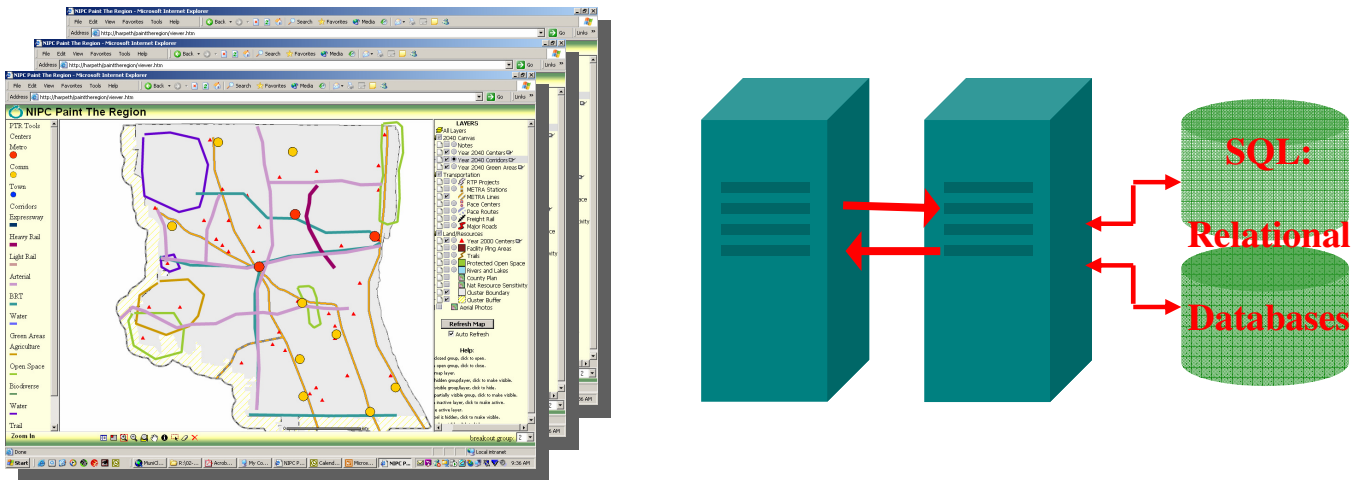
Figure 12: Paint-the-Region Working Mechanism

In conclusion, the visualization tools employed by Common Ground served two primary purposes. First, participants use the tool in a visioning process to create a land-use map that reflects their desires. Second, the tool provides indicators to help people understand the impact their decisions would have on quality of life (2). So how do these tools fit into the regional planning and forecasting work? During past planning efforts, NIPC used versions of these tools in building its regional database. Another INDEX-based tool created by Criterion called Plan Builder was used to gather input from individual community plans and combined them with US census data as well as NIPC and CATS forecast data. Plan Builder intended to set up a regional transportation and land use database at the community and neighborhood level, while PTR provides the region with a visualized map of desired transportation corridors and land use. The compatibility of these tools make it possible to vision and further realize the region's future based on both typical forecast procedure and the bottom-up visioning procedure.

These tools create new opportunities for citizens to be more directly involved in the planning process. However, these tools are not a cure all and should not dictate the planning process. They can be fun and meaningful, but they cannot replace professional planning expertise and a good planning process. It is also emphasized by NIPC that a community should not design a process entirely around what any given tool or set of tools has to offer. Instead, that community should determine what it needs to be doing and then look for tools to support that process. New state-of-art technologies are creating many new opportunities in planning. These tools focus on bringing the public closer to the planning process by helping them collaborate with each other and giving people without a technical planning background the ability to see the impacts of decision about growth in their communities (2).

SYNTHESIZING THE MAP

NIPC staff analyzed the results from these workshops through a series of cluster synthesis meetings and a regional synthesis meeting, created the regional map of centers, corridors, and green areas that is an integral part of the 2040 Plan. The process began by synthesizing the multiple maps for a single cluster that were produced at each workshop. The proposals for centers were compared with information available in municipal and county plans and other relevant data, such as population growth, job growth, and transportation forecast. The maps representing each

community cluster were then quilted together to form a single map for the region. Figure 13 shows the quilting process for corridor system. The final quilted map was shared with land-use, transportation, and environmental planning vision across the region (2040 Framework Plan).

Figure 13: Quilting the Regional Corridors
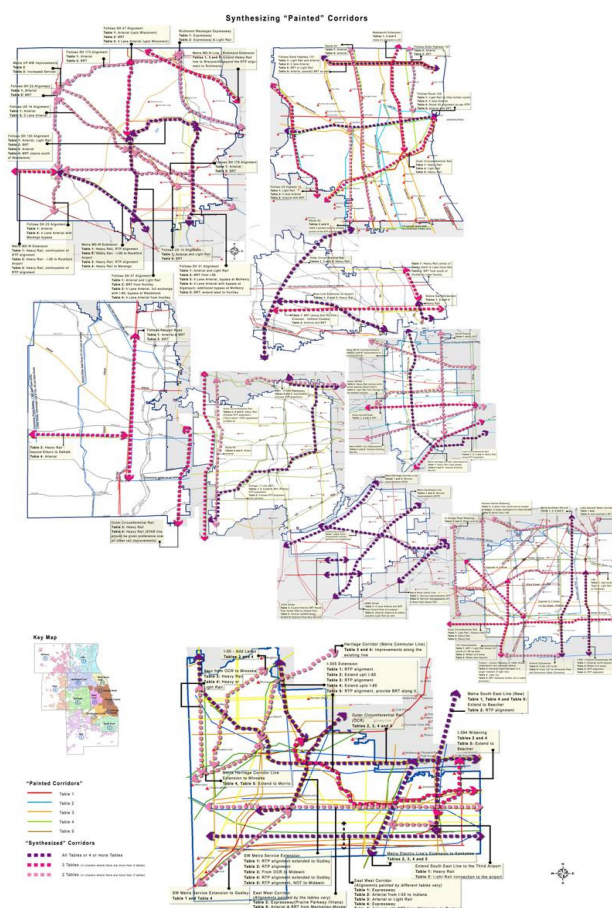
REALIZING THE VISION

NIPC has historically developed and maintained the official population and employment forecasts for the metropolitan region. CATS then models the transportation network against the forecasted distribution of population and jobs. The opportunity for new and more effective land-use and transportation planning between NIPC and CATS has been created by Common Ground. New modeling tools are being developed to increase the effectiveness of land-use and transportation planning. The benefit of such tools is to model or "test" alternative futures suggested by local community planning preferences. Such testing can help identify consistency with Common Ground, or identify any unintended impacts from transportation and land use decisions (2).

Through computer simulation, modeling tools can also be used to "test" alternative scenarios and assumptions regarding future land-use and transportation decisions. The tool can measure elements such as roadway congestion, level of infrastructure investment, jobs/housing balance, air and water quality, fiscal and economic impacts, and other measured outcomes. Common Ground goals can be tested by the model. Setting basic parameters for constructing scenarios, the results of this process can help determine whether current policies support desired outcomes (2).

Considered broadly, the region's ability to implement the 2040 Plan will depend largely on creating mechanisms to facilitate effective planning at the local and regional levels. These mechanisms will need continually renewed commitments to cooperation among municipalities, developers, planners, and many other interests across the region to be successful.

ACKNOWLEDGMENT

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