Hyun-Sun Choi·Simon Choi, 2010. Climate Change and Regional Land Use Planning : The Formulation of California Senate Bill No. 375, 환경정책연구 9(1) : 3~29

리뷰논문

Climate Change and Regional Land Use Planning : The Formulation of California Senate Bill No. 375

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기후변화와 광역토지사용계획: 캘리포니아의 Senate Bill No. 375의 사례

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제 출 : 2009년 10월 7일　　승 인 : 2010년 3월 8일

국 문 요 약

기후변화에 따른 광역적 토지사용 정책의 중요성에 대해 미국 캘리포니아 사례를 분석하여 제시하였다. 미국 연방제 하에서 각 주정부의 고유한 환경정책은 온실가스를 줄이는 데 주요한 역할을 하고 있다. 미국 캘리포니아주의 SB 375 입법 사례와 법안에 포함된 인센티브 제도는 실제적으로 토지사용, 교통, 주택 등에 어떠한 정책적 영향을 끼칠 수 있는지 모델을 제시하고 있다. 또한 한국에서의 녹생성장의 논의에 있어서 기후변화에 대처한 환경정책과 광역개발정책의 적절한 통합에 대한 정책적 시사점을 제시하고 있다. 캘리포니아 주정부의 SB 375는 캘리포니아 기후변화 정책의 실제적 집행전략으로서: 1) 교통계획 시 지속 가능한 커뮤니티 전략 도입 2) 광역계획과 주택정책의 통합 3) 구체적인 인센티브 도입 4) 온실가스를 줄이는 전략 도입 5) 캘리포니아 대기관리국의 역할 등을 제시하고 있다.

주제어 기후변화, 광역지역, 토지사용, 인센티브, 환경정책

Abstract

This paper explores how effectively the newly introduced planning process – California Senate Bill No. 375 will achieve the regional GHG emissions target under the California policy and planning

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framework and how well incentive based environmental policy might perform. The new legislation creates a future growth scenario to reduce greenhouse gas (GHG) emissions with incentives as means of implementation of AB 32 – the Global Warming Solution Act of 2006 and includes five important policy and planning aspects: 1) the role of sustainable communities strategies (SCS) as one of the key elements in their regional transportation plans; 2) planning for transportation and housing; 3) specified incentives for the implementation of SCS; 4) the regional planning approach toward reducing GHG emissions; and the role of the California Air Resources Board to establish the regional GHG emissions target. This has significant implications for regional and environmental planning with incentives - resources allocation and approval process.

Keywords Climate Change, Region, Land Use, Incentive, Environmental Policy

Ⅰ. Introduction

Climate change presents significant challenges to governments and public policy makers due to its wide and comprehensive impact on all constituents and indeed all people(Byrne et al., 2007; Freeman, 2006). Each of the major climate change assessments by the Intergovernmental Panel on Climate Change has concluded that global warming was occurring more rapidly than expected (IPCC, 2001; IPCC 2007). While former president George W. Bush opposed putting mandatory limits and regulation on greenhouse gas (GHG) emissions, the Obama administration has confirmed the danger of GHG to public health[1] and welfare and has pledged to limit GHG. However, the U.S.federal government has been lagging behind in terms of climate change and environmental policy because of heated bipartisan politics. Among the leading state and local governments, California ambitiously launched Senate Bill 375 (SB 375) in October 2008.

There has been a series of discussions to prevent climate change or to prepare new environmental risks. While many countries have tried to formulate and implement public policy for climate change, they first need to list priorities and areas with appropriate policy tools. One of the more important priorities may be

1) EPA administrator Lisa P. Jackson of the Obama administration said, "This finding confirms that greenhouse gas pollution is a serious problem now and for future generations (Eilperin, 2009)."

regional land use planning, including transportation, housing, and sustainable communities. In addition, it is important to discuss what kind of policy approach is more appropriate in climate change and environmental policy. This work paper explores two main questions: First, what is the environmental policy framework for regional land use planning in the United States? What are its implications for other countries? This paper mainly focuses on the case of the newly introduced SB 375 in California in the context of US environmental policy history. Second, how can incentive work for environmental policy and urban planning? Can incentive based environmental policy perform better in urban and regional planning than traditional regulation policy?

This paper assesses the existing and planned regional planning and coordination efforts associated with the introduction of SB 375 that was enacted in 2008. SB 375 is a means or implementation plan of AB 32 – the Global Warming Solution Act of 2006. While the U.S. federal government has not been productive in environmental policy in serious bipartisan policy environments, the State of California ambitiously took a leading role for the global warming issue. AB 32 aims at reducing greenhouse gas (GHG) emissions to 1990 levels no later than 2020. How can California achieve this? One of the important means is SB 375. The major change in the existing regional planning process is to create a future growth scenario that will reduce GHG emissions with incentives, including transportation funding and exemptions/streamlining under the California Environmental Quality Act (CEQA).

Ⅱ. Climate Change and Urban Development

U.S. President Barack Obama has assembled a team of climate experts to propose legislation and broker international agreements. The team consists of experts from Congress, states, and foreign governments. Although the Obama administration is committed to addressing climate change, the necessary level of public engagement with the issue still appears inadequate in the United States (Nisbet, 2009, p. 14).

Climate change is present, and has become an important part of environmental and energy policy. As environmental policy has been refined and climate change has become a present risk, public policy focuses on urban areas, where more GHG and pollutants are generated. More of the world population is living in cities. According to World Urbanization Prospects (UNPD, 2009), 48.6% of the world total population in 2005 (6.5 billion) is concentrated in urban areas, and 69.6% of the world population will be in 2050 (9.2 billion). Thus, in terms of policy, urban and regional planning and development may be a key issue to reduce GHG and climate change impact in the next decades.

1. Theoretical Background: Climate Change and Environmental Policy

Humans are intimately dependent on environmental systems to meet their essential needs regardless of their socioeconomic status and residential area, but they often fail to recognize the importance and value of natural system (Daily, 1997). Climate change affects the whole world with long-term implications, and potential climate changes may be irreversible (Marechal, 2007, p. 5182). In terms of climate change and environmental impact, governments provide action or inaction as policy. Environmental policy can be defined as all government actions that affect or attempt to affect environmental quality and the use of natural resources. As public policy is action or inaction about citizens'welfare issues, environmental policy actions may take place at the local, state, regional, national, or international level. The term has been expanded to governments'environmental protection efforts that are motivated by public health concerns. Thus, environmental policy is "government action affecting human health and safety, energy use, transportation and urban design, agriculture and food production, population growth, and the protection of vital global ecological, chemical, and geophysical systems (Brown, 2006; Speth, 2004; Vig and Kraft, 2006)." It also deals with climate change as a present risk against human welfare, and it cooperates with energy, health, urban planning, and transportation policies.

Traditional public policy uses regulation or a "command-and-control" approach

for policy goals. Regulation includes placing limits on the allowable discharges of polluting substances from each source. Thus, government needs to provide an administrative system to monitor compliance with limits and to impose sanctions or penalties for violations. Environmental regulations may have four steps: 1) determine the rules and regulations to achieve the given pollution control targets; 2) establish penalties or sanctions for noncompliance; 3) monitor sources so that incidents of noncompliance can be detected; and 4) punish violations (Freeman, 2006). However, the traditional regulation approach faced serious criticism for two reasons: 1) regulation may be excessively costly, and not cost-effective; and 2) any incentive structure embedded in regulation systems may be inappropriate, because compliance can be so costly. Thus, critics of regulation frequently mention the greater use of market incentives or market-based approaches (Kraft&Furlong, 2007). With this incentive, environmental policy can be more relianct on public information disclosure, more flexible and cooperative approaches to regulation, and further decentralization of power to the states (Davies and Mazurek, 1998; Dietz and Stern, 2003; Durant, Fiorino, and O'Leary, 2004; National Academy of Public Administration, 2000). Economists or "New Public Management" (NPM) theorists clain that more incentives can be a better means for environmental policy instead of direct regulation.

2. Environmental Policy in the United States

There have been internationally organized scientific and cooperative efforts to address global climate change since the late 1980s. In 1988, the Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP). The IPCC intends to assess the latest scientific, technical and socio-economic literature relevant to the understanding of human-induced climate change. IPCC and the U.S. National Academy of Science both have confirmed a link between anthropogenic gases and climate change, which will affect disadvantaged populations and future

generations the most due to industrialized nation's emissions (Byrne et al., 2007). At the 1992 Earth Summit, delegates from 179 nations developed an elaborate agenda of action for the twenty-first century called Agenda 21 (United Nations, 1993). The Kyoto Protocol (1992) is intended to alleviate GHG concentrations in the atmosphere at a more acceptable level. According to the Kyoto Protocol, countries are mandated to reduce major GHG. For example, the Kyoto Protocol suggests the United States reduce 7% of its GHG emissions. The Clinton Administration of the United States once adopted the 1993 Climate Change Action Plan, which intended to bring GHG emissions to 1990 levels by the year 2000.

Modern environmental policy was developed during the 1960s, and it has been located in the center of the policy field since the 1970s in the most developed countries including the Untied States. The first generation environmental policy of the United States was general and too broad. It was ambitious, but did not have a policy focus and instruments. Congress enacted major environmental actions (Chasek, Downie, & Brown, 2006; Kraft, 2007). The enactment of the six-page "National Environmental Policy Act of 1969"(NEPA) opened the modern era in environmental policy. NEPA acknowledged the "profound impact of man's activities on the interrelations of all components of the natural environment" and the "critical importance of restoring and maintaining environmental quality"for human welfare. The main instrument of the goal is the preparation of environmental impact statements (EIS). NEPA also created a presidential advisory body of environmental issues called the Council on Environmental Quality (CEQ). The CEQ is charged with supervising the EIS process, and it works with executive agencies to define their responsibilities under the act. After NEPA, a series of environmental laws followed, including the Clean Air Act Amendments (1970, 1990); Clean Water Act (1972); Safe Drinking Water Act (1974); Resource Conservation and Recovery Act (1976); Toxic Substances Control Act (1976); Federal Insecticide, Fungicide, and Rodenticide Act (1972); and Comprehensive Environmental Response Compensation, and Liability Act (1980). These acts were ambitious, but limited. Since these only used a command-and-control system or direct regulation in implementation, those

acts could not have effectiveness and efficiency due to severe resistance from private companies. The Environmental Protection Agency (EPA) was established in 1970 to organize and implement these seven major policies.

However, there were political conflicts about environmental policy in the 1980s because of the conservatives'concern about the strong role of government and its implications for the private sector, increasing doubts among policy analysts about the effectiveness and efficiency of the dominant command-and-control regulation, and the business community's resentment over the burdens and costs of the new policies. The Reagan administration (1981-1989) demonstrated little sustained interest in environmental programs (Vig & Kraft, 1984). However, the Congress blocked the president's efforts in response to public opinion that favored strong environmental protection. Ironically, more non-profit environmental organizations emerged in this period, and more citizens participated in the environmental movement. This pattern continued through 1990, as George H. W. Bush worked closely with Congress to enact the Clean Air Act Amendments of 1990 (CAAA). This CAAA also brought all urban areas into compliance with national air quality standards over a twenty-year period. However, bipartisan politics become more serious under the Clinton Administration, and there were no major reforms for environmental policy. During the 1990s, President Clinton's Environmental Projection Agency (EPA) tried to "reinvent"environmental regulation to make it more efficient and more acceptable to the business community. The reinvention included more collaborative decision making, in which industry and other stakeholders worked cooperatively with government officials.

3. Urban and Regional Development: Governance and Sustainability

Since the U.S. federal government refused to enact more environmental policies to reduce GHG and prepare for climate change due to heated bipartisan debates, states and local governments needed to pursue climate policy changes (Byrne et. al., 2007; Lutsey & Sperling, 2008). Cities and states both have also been able to diminish the

influence of interest groups because the public desires green energy development that may lead to job creation, and better health standards, land use to planning, disaster management, and utilities regulation. In addition, it is important to apply the concept of governance to urban and regional planning. American regional governance works "voluntarily" because of their rational choice to avoid transaction cost (Feiock, 2007). Regional governance involves cooperation and partnership among governments and diverse stakeholders. It generally has multiple stakeholders, rules, vertical and horizontal networks, and social interactions (Governance International, 1999). For environmental and urban issues, state and local governments need regional governance.

U.S. States are big economic powers in the world. Eighteen states would rank among the top 50 nations in the world (Rabe, 2006, p. 41). For example, Texas exceeds the United Kingdom in emissions, and Ohio exceeds Turkey. In response to climate change, more than half of the states have enacted at least one piece of climate legislation or issued at least one executive order. Among those states, California has been active in this arena. In 2002, California enacted legislation that established the first carbon dioxide emissions standards for motor vehicles in North America or Europe. Once California has taken higher standards for climate change, it created potential for a competitive "race to the top" among states (Rabe, 2006, p. 42). There are nine government partnerships that in total consist of 94% of the American population and 89% of emissions through September 2007. Although the reductions are not close to what is truly needed these sub-national efforts by cities and states could stabilize U.S. GHG emissions to 2010 levels by 2020 especially because diverse regulations for industry are avoided (Lutsey & Sperling, 2008, p. 682). States and cities both realize that climate mitigation efforts are better with coordinated research into mitigation technologies, consistent emissions inventories procedures, and integration of these emissions-reduction sub-markets. There have also been partnerships between the states and foreign governments (mostly the EU)[2].

2) U.S. states that engage in climate change policy generally follow these steps: "…inventorying GHG emissions within the state; establishing a GHG registry; formulating a GHG mitigation action plan; and initiating programs and regulations to bring about

Ⅲ. California Model

To anticipate future challenges, many U.S. states are responsible for substantial amounts of greenhouse gas reduction. States may need to fill the "policy gap" created by federal inaction upon climate change and environmental policy (Rabe, 2006). California is a leading state, and enacted some important legislation that is further ahead than any other state.

1. Leading State in the United States

As a leading state in environmental protection, the State of California has introduced the Global Warming Solutions Act (a.k.a. AB32), which was signed into law by the Governor of California Arnold Schwarzenegger on September 27, 2006. The bill establishes a timetable to bring California into near compliance with the provisions of the Kyoto Protocol. AB32 mandates that the State of California reduce GHG emissions to 1990 levels by the year 2020. The California Air Resources Board (CARB) estimates that 2004 GHG emissions from automobiles and light trucks reached 135 million metric tons. Automobiles and light trucks account for almost 30 percent of the GHG emissions throughout California. Given the significant contribution of the transportation sector in producing GHG emissions, SB375 was passed by the State legislature and signed by Governor Schwarzenegger on September 2008 to provide a means for achieving AB 32 goals from cars and light trucks. This bill shows the significant effort of the State of California to implement the global warming goals of AB 32.

As an implementation bill of AB 32, SB375 is intended to achieve emission targets

GHG reductions in future years". During the year 2007, 96% of states wereGHG inventoried, 64% of the states had climate change action plans, 45% of states have GHG emission-reduction target goals, and seventeen states including 284 cities not within that 45% have city or state GHG emission-reduction target goals (Lutsey & Sperling, 2008, p. 675). The target-setting ensures that policy-makers deliver considerable emission reductions and provide a thorough framework rather than plans and mitigation studies. The U.S. Dept. of Energy Annual Energy Outlook 2007 is used as a baseline for emission-reduction characteristics concerning the states with GHG reduction goals for 1990 levels by 2020. Fortunately if the cities' and states' goals are met then a 13% reduction is equivalent to 47% of the total U.S. emission reduction needed for the 1990 benchmark U.S. emission level (Lutsey & Sperling, 2008, p. 677).

through enhanced coordination of four major planning elements: land use, housing, transportation, and the environment. Land use was promoted to one of the key planning elements through SB375, while three other planning elements have received attention from state and federal governments over the decades. Land use regulation has been understood as local police power since the court case of the Village of Euclid, Ohio, et al. v. Ambler Realty Company in 1926. California realized the importance of growth and development in the early 1900s, and has adopted many growth- related planning requirements and policies: zoning and general plan. Zoning regulations specify the use of buildings, structures and land for different uses, including the location, height, lot sizes, and bulk. Thereof Land use is also regulated through general plans. A general plan is required by state law and should be adopted by city and county. A general plan is composed of seven mandatory elements (e.g., land use, circulation, housing, conservation, open space, noise, and safety) and additional optional elements important to their communities. A general plan should be comprehensive and long-term (15-20 years).

In contrast to the land use element, three other elements (e.g., housing, transportation, and environment) have been understood as regional issues, at minimum by the federal and state governments. These three functional plan elements among others are very difficult for local governments to deal with due to the region-wide coverage of the issues. These elements became more serious regional matters across the region or the metropolitan area due to the rapid increase in automobile ownership and expanding suburbs. Both federal and state governments have developed many planning requirements to deal with regional housing, transportation, and environmental issues, which are mainly caused by region wide growth and development patterns.

2. Coordination of Planning Efforts for Regional Issues

1) Growth and Development - Regional Blueprint Planning Program

Federal and state governments do not directly handle urban growth allocation

and development patterns. In California, the Regional Blueprint Planning Program was introduced to help Metropolitan Planning Organizations (MPOs) develop alternative planning scenarios. The program would be used to utilize previously unallocated federal funding, as well as improving the comprehensive level of transportation/land use planning. The Regional Blueprint Planning Program is a voluntary, discretionary grant program that provides seed funding to MPOs to conduct regional blueprint planning. The program contributes to the vision of improved quality of life within California by addressing future growth on a twenty-year horizon through the integration of transportation, housing, land use, environmental resources, other infrastructure, and services. The program requires enhanced public engagement and is currently underway in most urbanized areas of the state, including several rural counties (Joan Sollenberger & Lisa Klein, Regional Transportation Plan Guidelines Work Group Meeting, June 28, 2007).

2) Housing - Regional Housing Needs Allocation (RHNA) and Local Housing Element

The Regional Housing Needs Allocation (RHNA) process establishes minimum housing development capacity that cities and counties are to make available via their land use powers to accommodate growth within a short-term planning period. RHNA numbers are assigned by four income categories as guideposts for each community to develop a mix of housing types for all economic segments of the population. The process is also known as "fair share" planning. The RHNA results should be consistent with other goals of State Law: increasing the housing supply and the mix of housing types, tenure, and affordability in an equitable manner; promoting infill development and socioeconomic equity; promoting an improved intraregional relationship between jobs and housing and allocating a lower proportion of housing need to an income category when a jurisdiction already has a disproportionately high share compared to the countywide distribution (California Senate Bill No. 12 65584 (d)).

Every city and county in California must adopt a comprehensive "general plan" to govern its land use and planning decisions. All planning and development

actions must be consistent with the general plan. The general plan housing element must be periodically updated using the latest RHNA allocation plan. A housing element must first include an assessment of the locality's existing and future housing needs. This assessment must include the community's "fair share" RHNA for all income groups (very low, low, moderate and above moderate) as determined by the regional Council of Governments (COG).

3) Transportation

Since the Federal-Aid Highway Act (1962) and Urban Mass Transportation Act (1964), federal transportation funds were distributed with participation of cities or regions. The Federal-Aid Highway Act of 1962 required, as a condition attached to federal transportation financial assistance, that transportation projects in urbanized areas of 50,000 people or more be based on a continuing, comprehensive, urban transportation planning process undertaken cooperatively by the states and local governments (U.S DOT, 1988). The "3Cs"("continuing", "comprehensive", and "cooperative") planning process is the result of this law.

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) was enacted to effectively deal with transportation planning and policy. It was followed by the Transportation Equity Act for the 21st Century (TEA-21) and most recently in 2005, the "Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users" (SAFETEA-LU). The key elements of ISTEA are as follows: First, COGs or MPOs can have stronger roles and responsibilities than before. ISTEA requires strong working relationships between MPOs and other agencies. Second, long-range plans must evaluate a variety of scenarios. In this scenario building, public participation will be very important. ISTEA requires long-range planning to define and evaluate several distinct alternatives in terms of broad costs and benefits and the ability to accomplish clearly stated area wide goals. Third, the Regional Transportation Plan (RTP) and Regional Transportation Improvement Programs (RTIP) should be clearly related, and these two RTP and RTIP initigtives must be financially constrained. Fourth, ISTEA requires TIP to conform to air quality goals

and places restrictions on the kind of programs they can fund if regions are in non-attainment of Clean Air Act standards. Fifth, as an important political and governing change, significant public participation is required. ISTEA requires a proactive public involvement process, including access to compete technical and policy information, timely notices, full access to key decisions, and support for early and continuing involvement in planning and TIP development.

4) Environment

The 1990 Clean Air Act (CAA) intends to reduce smog and air pollution by establishing air quality standards and planning requirements for various air pollutants. The CAA requires federally supported highway and transit project activities to meet federal air quality requirements. Under the U.S. Department of Transportation (DOT) Metropolitan Planning Regulations and U.S. Environmental Protection Agency's (EPA) Transportation Conformity Rule requirements, the MPO's Regional Transportation Plan (RTP) needs to pass regional emission analysis tests. The analysis should demonstrate a positive compliance finding.

CEQA, or the California Environmental Quality Act, is a statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. CEQA was enacted in response to the NEPA. CEQA applies to certain activities of state and local public agencies. A public agency must comply with CEQA when it undertakes an activity defined by CEQA as a "project." A project is an activity undertaken by a public agency or a private activity which must receive some discretionary approval (meaning that the agency has the authority to deny the requested permit or approval) from a government agency which may cause either a direct physical change in the environment or a reasonably foreseeable indirect change in the environment.

3. SB 375: Five Important Policy and Planning Aspects

SB375 includes five important policy and planning aspects for achieving the regional GHG emissions reductions target for years 2020 and 2035. First, SB 375

emphasizes the role of sustainable communities strategies (SCS) as one of the key elements in their RTPs in reducing GHG emissions.

Table 1 Change Before and After SB375

	Before SB375	After SB375
RTP	• MPOs are mandated to develop RTP according to federal law. • Long term planning horizons (minimum 20 years) • Transportation Analysis Zone (TAZ) • Air quality conformity analysis • Federal transportation funding is arranged consistent with future growth allocation, which is based on the current general plan and local participation.	• MPOs are mandated to develop RTP according to federal law. • Long term planning horizons (minimum 20 years) • Transportation Analysis Zone (TAZ) • Air quality conformity analysis. GHG emissions target • Federal transportation funding is arranged consistent with future growth allocation, which is based on the Sustainable Communities Strategy (SCS)/Alternative Planning Strategy (APS) and local participation. • Local governments' land use regulations do not need to be consistent with SCS/APS
COMPASS BLUEPRINT	• MPOs voluntarily participate in the state program as part of RTP development. • Long term planning horizons (20 years). • Transportation Analysis Zone (TAZ), Grid Cell, Parcel. • Disseminates the General Plan and provides a suite of services and technical assistance to promote achievement of localt goals consistent with the collective regional blueprint for future growth.	• MPOs voluntarily participate in the state program as part of RTP development. • Long term planning horizons (20 years). • Transportation Analysis Zone (TAZ), Grid cell, or Parcel. • Disseminates the General Plan and provides a suite of services and technical assistance to promote achievement of localt goals consistent with the collective regional blueprint for future growth. • Helps MPOs to develop SCS/APS as required in RTP
CEQA	• State and local agencies are mandated to identify the significant environmental impact of their actions (e.g., approval of land use development), and avoid or mitigate those impacts, if feasible.	• State and local agencies are mandated to identify the significant environmental impact of their actions (e.g., approval of land use development), and avoid or mitigate those impacts, if feasible. • An exemption from CEQA is provided for qualified transit priority projects, as defined by SB 375, which must be consistent with the applicable SCS. • Streamlined environmental review process is provided for transit priority projects that do not entirely qualify for a full exemption.
RHNA	• COGs are mandated to develop RHNA by the state law. • Short term (6 years) RHNA should be consistent with the long term RTP growth forecasts (SB12). • Housing needs are allocated at the city/unincorporated county level. • The general plan housing element is legally required and must be updated every 5 years. • Local governments must rezone land to accommodate designated housing allocations.	• COGs are mandated to develop RHNA by the state law. • Short term (8 years) RHNA should be consistent with the long term RTP growth forecasts and SCS. • Housing needs are allocated at the city/unincorporated county level, consistent with SCS. • The general plan housing element is legally required and must be updated every 8 years. • Local governments must rezone land to accommodate designated housing allocations. SCS identifies developable sites for potential development.

It has brought attention to future growth allocation and development as part of the integrated planning framework to achieve the "regional emissions target". The future growth allocation is made available through sustainable communities strategy (SCS)[3], which identifies the general location of land uses, residential densities and building intensities within the region. SCS is understood as a regional version of the local general plan land use element.

The SCS is expected to limit the frequency of driving by car and encourage more transit use or walking by promoting "smart growth principles" such as: development near public transit;mixed use development, provision of housing opportunities near job centers, and job opportunities, and (when appropriate), in housing-rich communities; development of workable communities; in-fill development (where appropriate) to revitalize underutilized sites; and focused growth along transit corridors and nodes to utilize available capacity; i. e. transit-oriented development.

The development pattern in an SCS must comply with federal law, which requires that any pattern be based upon "current planning assumptions"that includes the information in local general plans and sphere of influence boundaries. The SCS will not directly affect local land use decisions. The SCS does not in any way supersede a local general plan, local specific plan, or local zoning. SB 375 does not require that a local general plan, local specific plan, or local zoning be consistent with the SCS. An SCS would be understood as a regional version of the land use element in the local general plan

Second, SB 375 integrates three key planning elements: SCS, RTP, and RHNA to

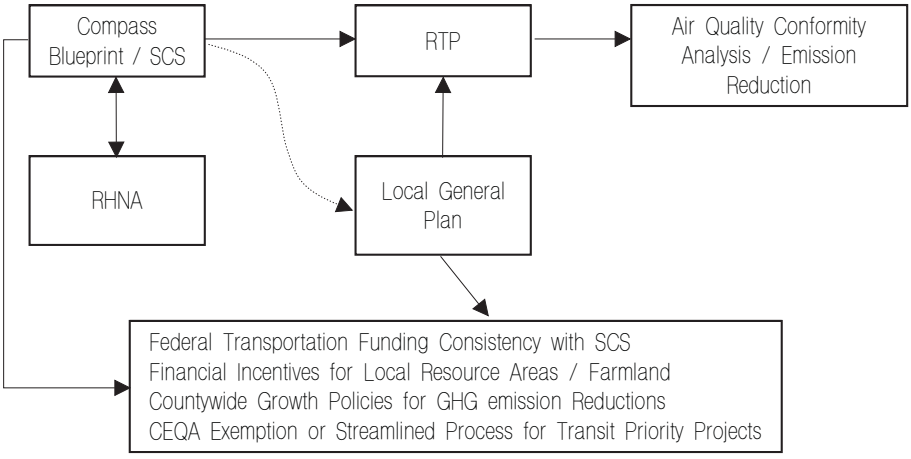
3) An SCS will: 1) identify the general location of uses, residential densities, and building intensities within the region; 2) identify areas within the region sufficient to house allthe population of the region, including all economic segments of the population, over the course of the planning period of the regional transportation plan;3) identify areas within theregion sufficient to house an eight-year projection of the regional housing need for the region; 4) identify a transportation network to service the transportation needs of the region; 5) gather and consider the best practically available scientific information regarding resource areas and farmland in the region; 6) set forth a forecasted development pattern for the region, which, when integrated with the transportation network, and other transportation measures and policies, will reduce GHG emissions fromautomobiles and light trucks to achieve, if there is a feasible way to do so, the GHG emissions reductions target approved by the state board; and 7) quantify the reduction in GHG emissions projected to be achieved by the SCS and, if the SCS does not achieve the targeted reductions in GHG emissions, set forth the difference between the amount that the SCS would reduce GHG emissions and the target for the region.

achieve the regional GHG emissions target. The long-term transportation plan (planning horizon of minimum 20 years) and the short term housing needs allocation plan (8 year planning horizon) are linked to each other through SCS and prepared on the same planning cycle. The RHNA has implications for future affordable housing needs and additional housing supply for local jurisdictions, while the RTP is assumed to bring additional financial resources to communities. Local jurisdictions tend to underestimate affordable housing needs because of social costs, while they tend to overestimate transportation needs due to financial packages. Once these two different perspectives can be discussed together on the same planning cycle, the growth issues might be better sorted out in more balanced way.

Third, SB 375 provides financial and regulatory incentives for the effective implementation of land development through SCS. The financial incentive is available through the consistency requirement of the financial element of the RTP (e.g., allocation of transportation funds) with the SCS, its land use planning, and transportation policies, targeting GHG emissions reductions. Since the land use plan (growth allocation) of the SCS must be based upon the most current planning assumptions, it is generally taken from local city and county general plans. If SCS cannot achieve the GHG emission reductions target, an Alternative Planning Strategy (APS) should be prepared. The financial incentives are also provided to cities and counties that have resource areas or farmland, for the purposes of, for example, transportation investments for the preservation and safety of the city street or county road system, and farm to market, and interconnectivity transportation needs. An MPO or county transportation agency shall also consider financial assistance for counties to address countywide service responsibilities in counties that contribute towards the GHG emissions reductions targets by implementing policies for growth to occur within their cities. The regulatory incentives such as CEQA exemptions and streamlining are also available for certain projects achieving the goals of reducing GHG emissions by their proximity to transit or by their consistency with the SCS. As cities and counties use the CEQA exemption/streamlining in SB 375, their

assumptions of future growth and land use will tend to be more consistent with those in the SCS.

Figure 1 Relationship of Major Plans and Programs: Before and after SB375



Fourth, SB 375 adopts the regional planning approach toward reducing GHG emissions. Eighteen MPOs in California are expected to play a key role in integrating three key planning elements: SCS, RTP, and RHNA to achieve the regional GHG emissions target. MPOs are also expected to participate in the process of establishing the regional GHG emissions target by CARB. MPOs ultimately develop the overall guideline of implementing SB 375 to ensure coordination among stakeholders, to resolve conflicts, and to comply with applicable legal requirements. The role of MPOs is important in the planning process and consistent with the federal efforts (e.g., the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991 and the Clean Air Act Amendments (CAAA) in 1990) of enhancing the role of MPOs in allocating federal transportation funds.

CARB, among other agencies, is responsible for developing the GHG emissions reductions targets for each region (as opposed to individual local governments or households). CARB must take certain factors into account before setting the targets, such as considering the likely reductions that will result from actions to improve

the fuel efficiency of the statewide fleet and regulations related to the carbon content of fuels (low carbon fuels). CARB must also convene a Regional Targets Advisory Committee (RTAC), which includes representation from the League of California Cities (League), California State Association of Counties (CSAC), metropolitan planning organizations, developers, planning organizations and other stakeholder groups. Furthermore, before setting the targets for each region, CARB is required to exchange technical information with the MPO for that region and with the affected air district. SB 375 provides that the MPO may recommend a target for its region. CARB also approves emission estimation methodologies, and reviews and accepts/rejects the regional SCS/APS.

Subregion, local jurisdictions, and LAFCO, also play an important role in implementing SB 375. First, subregions collaborate with SCAG on regional SCS. Subregions have an option to propose sub-regional SCS: 1) to work together with county transportation commissions; or 2) to develop sub-regional APS, if necessary. Second, local jurisdictions provide input to SCAG on growth forecast as part of the integrated process; collaborate with respective sub-regions & CTCs on sub-regional SCS, if necessary, identify sufficient sites in the Housing Element, and rezone certain sites if necessary, to accommodate the RHNA allocation for the local jurisdictions, ensure a sub-regional SCS or the regional SCS is supported by the existing general plan, or built upon with the envisioned changes in the general plan, conduct public hearings, and declare that transit priority projects are a sustainable communities project and are exempt from CEQA review, conduct streamlined CEQA review for transit priority projects that do not qualify as SCS projects, and may adopt traffic mitigation measures for transit priority projects. Third, Local Agency Formation Commissions (LAFCOs), operating in each county, review proposals for the formation of new local governmental agencies and for changes in the organization of existing agencies. LAFCO decisions intend to balance the competing needs in California for efficient services, affordable housing, economic opportunity, and conserve natural resources. LAFCO also makes an effort to preserve agricultural land resources by considering the effect of any proposal on existing agricultural

lands. LAFCO wants to discourage urban sprawl by promoting the efficient delivery of urban services (police, fire, water, and sanitation) and avoiding the unnecessary loss of agricultural resources and open space lands. As one of its responsibilities, LAFCO determines spheres of influence for all local governmental agencies. A sphere of influence is a planning boundary outside of an agency's legal boundary (such as the city limit line) that designates the agency's probable future boundary and service area. The purpose of the sphere of influence is to ensure the provision of efficient services while discouraging urban sprawl and the premature conversion of agricultural and open space lands by preventing overlapping jurisdictions and duplication of services.

Fifth and last, SB 375 requires establishing a regional GHG emissions target by September 2010. The targets may be expressed in gross tons, tons per capita, tons per household, etc. The process of determining the regional (or subregional) target would be the combination of a top-down/bottom up process or the technical/political process. The technical process of determining the GHG emissions reductions is not purely technical due to the technical limitations and uncertain nature of the currently available modeling capabilities. The "business as usual" land use scenario is used as a reference to determine the regional GHG emissions target and to develop the regional SCS. In summary, SB375 shall have significant implications on the existing planning process for producing affordable housing through the RHNA, allocating the federal transportation funds through the RTP, and approving development projects through the CEQA process.

Ⅳ. Conclusion: Implications and Challenges

The paper discusses how SB 375 changes the existing way of developing regional plans and approving local development projects to achieve the regional GHG emissions target. This legislation is based on incentives to guide local and regional land use, transportation, and housing for sustainable development. Even though the

goal of SB 375 is revolutionary, the means are incremental in terms of using incentives such as public funding and the approval process. SB 375 may reflect all implications from concerns on direct regulations in 1980s and NPM in 1990s. Clearly, it applies incentive based policy to regional policy and planning to reduce GHG. In addition, the California model can be applicable to other countries where there is a need to implement a mean between central and local governments for regional and urban development. However, it is still unclear as to how to prepare a 90 million dollar budget for monetary incentives. Thus, there are still many issues to be resolved. This paper points out incentives, regional approaches, and technical issues as lessons and challenges of SB 375.

1. Incentives

SB 375 successfully aligns three major state programs (Blueprint, RHNA, and CEQA) with a Federal program (RTP) to effectively deal with the greenhouse gas emissions. While RTP, RHNA, and CEQA are mandated by either Federal or State governments, the Compass Blueprint is voluntary program. The financial and regulatory incentives are key planning and implementation tools and are available for projects consistent with the sustainable communities strategy. This reform is not completely new, but it contains revolutionary elements. The basic idea of linking growth with transportation funds was already included in the "original" smart growth policy of Maryland in 1997. The policy contained in SB 375 is already implemented in Contra Costa County in California. SB 375 is simply one of several state laws and policies dealing with growth (Bill Fulton, August 2008). The question is whether the financial and regulatory incentives will stop sprawl and work toward reinvestment and increased development near public transit, along corridors and in mixed-use urban centers. The past urban and regional growth has occurred in suburban areas at a massive scale and is projected to continue in the future. We are not sure if the incentives are significant enough to stop people from moving to suburban areas or bring more people into inner city areas from suburban areas.

2. Regional Approach

The region's MPO and CTC sometimes notice that local zoning regulations and land use plans do not properly conform to their local and regional transportation projects requiring tremendous amounts of federal and local funds. The transportation project might not be justified due to the limited travel demand associated with restricted land use plans and their growth allocations in the future. CTC has tried to establish a proper channel of interactive communication and potential adjustment of local general plans, but has frequently failed. The reason is simple. Land use is regulated by local jurisdictions and land use regulation is understood as the police power of the local jurisdiction to protect the public health, safety and welfare of its residents (Curtin, Jr., 1993, p1.). However, transportation is a regional issue, where local boundaries have no meaning. Regional transportation usually assumes local land use as a given. Since the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, the regional movement toward more coordination of urban use and transportation has made some progress to some extent.

With the introduction of SB 375, the regional MPO, in particular, the CTC will have an increased role in determining the future growth patterns of the region. More coordinated and extensive efforts to align transportation fund allocation in the RTP with the preferred growth scenario (SCS), which is hopefully consistent with the local general plan reflecting smart growth strategy, will enhance the regional capability of achieving the regional GHG emissions target. SB 375 relies on the existing regional planning and governance framework/approach to achieve the regional GHG emissions target. SB 375 added a few more planning elements, such as the internal consistency requirement between a newly created SCS and transportation funding decisions, and financial and regulatory incentives, to the existing planning and governance framework. MPOs are generally expected to perform a function as a consensus builder during the long-term plan preparation process, to serve as a middleman to broker disagreements and to ensure consistency among the short term plans and programs.

Although MPOs play an important role in the planning process and allocation of federal transportation funds, the major issue with MPOs, in particular, large MPOs, in California would be the limited role in allocating transportation funds based on region wide priorities. SCAG, for example, delegated its short term and long term programming and planning functions to subregions, counties, and transportation implementation agencies. The fund allocation by the transportation implementation agencies, other than a regional MPO, would reduce the likelihood that transportation resources will be allocated on the basis of area wide priorities, including improved air quality and system-wide efficiency (Lyons, 1994, 26). The major function of some MPO processes was reduced to combining, rather than integrating, program documents to reflect system-wide objectives (Lyons, 1994; Innes & Gruber, 2001). The MPO decision making body is basically composed of local elected officials and is expected to make policy and planning decisions based on the existing framework SB 375 does not alter the current regional planning structure, which delegates decision-making authority to local officials sitting as MPO board members (Fulton, December 2008).

3. Technical Uncertainty and Fair Share

1) Planning Assumptions of APS: Realistic

Bishop (January 2009) promptly raises the question of the reasonableness of planning assumptions underlying APS. It might be said that the SCS, a required element of the RTP, might not achieve the assigned GHG emissions reductions. If the SCS is unable to reduce GHG to achieve CARB's assigned emissions target, the MPO is required to develop an APS to achieve the GHG emissions reduction target. APS will not be a required element of an RTP and can be based on any "unrealistic" assumptions.

2) Regional/Subregional Target

There are three ways of reducing emissions from cars and light trucks: greater fuel efficiency, reducing the carbon content of fuels, and the changes in growth

patterns that reduce overall driving (Fulton, October 2008). SB 375 requires CARB to develop greenhouse-gas emissions reduction targets for cars and light trucks for California's MPOs by September 30, 2010. According to a scoping plan adopted by CARB on…, the recommended regional transportation-related GHG target (measure No. T-3) is to reduce GHG emissions statewide by 5 MMTCO2E in 2020. The potential benefits of this measure that can be realized by 2020 as shown above were estimated after accounting for the benefits of overall fuel efficiency improvements from improved emission standards and low carbon fuels from changes in fuel composition in the plan. A regional GHG reduction target to each of the State's 18 MPOs throughout California will be used as the benchmark for development of the SCS. Once assigned, MPOs will need to assign the subregional GHG reduction target for subregions, which volunteer to prepare the SCS/APS. The spatial fair share allocation of GHG emission is difficult because of the complicated dynamics of development patterns and GHG emissions.

3) Definition of "Business as Usual Scenario"

There must be a baseline land use scenario to be compared against the SCS. What would be a baseline land use scenario? SCAG once developed three baseline projections for developing the 2004 RTP growth forecast. They are the trend projection, the local input projection, and the baseline (no project) projection. The trend projection was developed in June 2002 and is a technical projection that provides a best estimate for future growth based on past trends. The methodologies and assumptions underlying the projection were exhaustively reviewed and approved by a joint committee consisting of the regional Forecasting Technical Task Force (FTTF) members, representatives from the subregions and local jurisdictions, and a panel of demographic and economic experts. Second, local input projection was developed in November 2002 and is based on input from counties, subregions, and local jurisdictions between September 2002 and November 2002. The trend projection along with methodologies for both demographic and economic projections

at the city level and other necessary documents was provided for local review. Third, the baseline (no project) projection was developed in July 2003 and reconciles the local input with the trend projection based on evaluation criteria at both the regional and local levels. The input received from local jurisdictions provides data on future growth based on local land availability and local policies such as general plans. Then, the local input is merged with the trend projection to form the baseline projection based on a detailed evaluation process. A review committee reviews the local input and reconciles them utilizing the established criteria.

4) Measurement and Modeling: Travel Demand Models and Land Use Models

SB 375 requires diverse and complex modeling capabilities to measure and monitor the impact of land use on transportation and GHG emissions. The major question is whether these models are reasonably sensitive to key factors and policy variables which are potentially of great interest for implementation of SB375. As the RTAC requested information on modeling capabilities and data collection programs currently in use by MPO's around the state, the SACOG staff processed the survey and reported its survey results (RTAC, March 2009). First, large MPOs have travel demand models with reasonable sensitivity to more key factors, as well as more plans for model improvements and active development work, than do small MPOs. Small MPOs have simple travel demand models, without sensitivity to many key factors. Most MPOs have no capacity, untested capacity, or insensitivity to the policy/key factors, such as micro-level land use factors (including many of the "Ds"), ITS and traffic management, intercity transit, pricing policies, especially those for toll roads and HOT lanes. Second, land use models are used to forecast or project future land use quantities and spatial distributions within a region. The simplest models allocate future growth to areas based on available capacity and forecaster judgment. The most advanced models are based on analysis of economic activities within a region, and include feedback to travel demand models. Large MPOs have land use models with reasonable sensitivity to key factors, as well as more plans for model improvements

than do small MPOs. Very few MPOs have land use models with known sensitivity or capacity to capture key economic factors like housing affordability, factors which influence land development (e.g. land costs, returns-on-investment, etc.) or basic economic production within the region. Third, data collection and monitoring programs are intended to gather, organize, and report observed land uses, demographics, characteristics of the transportation system, and utilization of that system in a region. The data are used for evaluating trends and changes over time, updating the base year datasets for forecasting models, and validating the models themselves. According to the survey results, many data are oftentimes collected but not on a regular schedule or in a consistent way. Housing and employment data are regularly collected and their trends are regularly monitored.

4. Implications for Korea Environmental Planning

California's SB 375 gives some lessons to other countries. Since Korea is pursuing a green growth model, it is also critical to apply environmental policy in conjunction with growth, land use, housing, and transportation. First, Korea needs to establish a governance structure for growth and the environment. Korea may have a centralized environmental policy model at the national and regional levels, but this centralized approach needs to be decentralized according to local autonomy system. The California model provides strong implications for a highly decentralized governance structure. Second, this paper can provide linkages between land use and environmental policy. As climate change environmental policy develops, there are increasing concerns about practical implementation tools in land use and housing. SB 375 is an exact case that other countries use as a reference. This model provides cases of land use powers to accommodate growth, such as "fair share" planning in regional governance. Third, transportation is also an important field for climate change issues. SB 375 also includes transportation as a part of climate change policy, which may provide lessons for Korean transportation policy in conjunction with GHG emissions regulation.

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