Summary and Recommendations

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In March 1994 a conference was held at the Beckman Center of the National Academy of Sciences to review the status of products from the 1990 decennial census developed to date and to address the plans for the 2000 census as then perceived by the Bureau of the Census. The proceedings of the 1994 meeting have been published as Transportation Research Board *Conference Proceedings 4: Decennial Census Data for Transportation Planning* (1995).

History and Context

The 1994 and 1996 conferences followed a pattern that has evolved since the 1970 census of reviewing the preceding census and planning for the next. Never in that series of conferences on the decennial census has there been such uncertainty about a prospective census. As the year 2000 approached, it appeared that the United States would greet the new millenium without a national census or without one that did more than make a simple count of the populace. Rather than the usual lack of interest in Congress for the upcoming census that was 6 years away, there appeared to be much concern about the high costs and lack of timeliness of the 1990 census and a sense of substantial weaknesses in the census products and their timely delivery.

In response to congressional criticism and financial constraints, the Bureau of the Census has developed a series of alternative approaches to the traditional census. The one most favored, and that causes the greatest alarm in the transportation community, is an approach called *continuous measurement*, which effectively reduces the long-form census to a very large, continuing monthly survey, with results detailed enough to equal those obtained with the long form when cumulated over a period of 3 to 5 years. The short-form census, the basic count of the population used for congressional redistricting, was to be unchanged.

Using continuous measurement, the decennial census would still collect a 100 percent population and housing unit count with basic demographics, such as age, race, ethnicity, sex, and household relationships. But the traditional sampling conducted with the 100 per-

cent count and covering about one-sixth of the population, in which the transportation items and the whole range of social, economic, and housing statistics were obtained, would not be collected by means of a one-time census but by using the continuous measurement system.

This approach, untested and vague in its characteristics, was perceived as a serious threat to the critical materials from the census on which transportation planners depend. In the view of transportation planners and analysts at that time, the census was not perceived as "broken"; rather it was a critical component in the planning data set of states, local governments, and metropolitan planning organizations that produced very valuable—in fact irreplaceable—data. Certainly there was a sense that substantial improvements to the traditional approach were both necessary and possible but that the techniques existed to effect these improvements. Many of these techniques were discussed within the framework of the 1994 conference.

Reflecting these concerns, the 1994 conference participants called on the Bureau of the Census to critically evaluate its plans for the year 2000 census. The recommendations restated strong support for the long-form questionnaire used with the decennial census. The potentially attractive attributes of continuous measurement were recognized, and to better evaluate the proposal, an extensive program parallel to the census was called for. Essentially, the key view of the conference attendees was that the census was too important—too critical to the nation, particularly at the start of a new millenium—to be entrusted to a new and untested procedure.

Given the strong uncertainties during that conference, the participants believed that preparation for the next census should be closely monitored during the next two years and that another meeting be held then if events suggested the utility of such a meeting.

In response to the recommendation from the 1994 conference, the Bureau of Transportation Statistics (BTS) sponsored a study of continuous measurement. The 1996 conference participants thank BTS and endorse the findings of that study and incorporate them by reference in the findings of this meeting.

The overall objectives of the current conference were to

1. Assess the uses of the 1990 census data, including case studies of applications by large metropolitan planning organizations (MPOs), small MPOs, state departments of transportation, transit operators, and the private sector;
2. Review the current plans for Census 2000 and assess the impacts on the transportation program;
3. Review and assess data needs of the future and recommend methods and products to improve Census 2000;
4. Assess data collection options if Census 2000 does not include items needed by transportation planners; and
5. Develop an action agenda for federal, state, and regional agencies.

The discussions of the 1996 conference are summarized in the accompanying box, sharply punctuating the value of and context for the meeting.

SUMMARY

From the foregoing synopsis of the last 2 years, a number of conclusions can be elicited about the context of the present meeting. Additional, detailed recommendations regarding other agencies are provided in the next section.

- **The central role of census journey-to-work data is unchanged.** The participants reiterated their strong support for the Bureau of the Census and its decennial program. They emphasized the strong dependence of their planning programs on the decennial census long-form data products.

SUMMARY OF MEETING CONTEXT

After two years, what is unchanged? What is different or new? What can we conclude now?

What is unchanged?

Support for continuing needs of states and MPOs:

- –For the census generally
- –For the 2000 decennial census
- –For the long-form census
- –For the Census Transportation Planning Package (CTPP)

Interest in expansion of the decennial census:

- –Access data
- –Multimodal journey-to-work data
- –Multiple-job data
- –Variability of work trip data
- –Non-work-related travel data

Need for greater quality:

- –Small-area geographic identification
- –Small-area allocation

Need for greater timeliness:

- –Speedier delivery of all census products
- –Speedier delivery of CTPP

What is new or changed?

Some planning needs have changed—focus is on small-area data

Funding context has evolved in

- –Bureau of the Census
- –U.S. Department of Transportation

There is new information:

- –BTS/TRB continuous measurement study
- –Census content tests
- –Census Bureau strategic plan
- –Continuous measurement now parallel with the decennial long-form survey

- **A key factor is small-area data.** It is at the local level that data needs are most critical to meet the requirements of the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) and the Clean Air Act Amendments (CAAA). These data must be available for very small areas of geography such as census tracts, block groups, and even blocks and block faces for aggregation to traffic analysis zones. Sampling densities must be sufficient to meet these needs.
- **Prospective changes to the census are a serious threat.** Participants saw the prospect of attempts to substitute continuous measurement for the long-form approach to the decennial census as a serious threat to planning capabilities at all levels of government.
- **There was strong support for a plan to use the long-form data collection method in parallel with a continuous measurement pilot program.** The participants recognized the potential value of continuous measurement, but they could not support an untested approach as a replacement for such a critical element in their planning programs.

- **The U.S. Department of Transportation (DOT) and the transportation community still need to work in close coordination with the Census Bureau.** The Bureau should recognize the need for a real partnership among its various constituents. The census depends on the transportation community, particularly the MPOs and the DOT agencies that fund the review and revision of census geographic materials; this process requires closer coordination between the MPOs and the DOT agencies.
- **Full funding of the decennial census is crucial to state and MPO planning processes.** The value of the decennial census for the nation's economic and social health in general and for support of the nation's transportation planning process in particular was reemphasized. To be sure, there is room for greater efficiency and cost improvement in the present census process, but ultimately the cost of the census is minor considering the critical questions relating to public investment and public policy that the census data support and the responses to which the nation has depended on for a decade.
- **Continuous measurement is not a viable alternative to the long-form census at this time.** At this critical stage, particularly at the beginning of a new millenium, it is essential that the census be sound and accurate. The promise of continuous measurement is still uncertain. Its alleged cost savings are unsubstantiated and appear particularly fragile when considered in the light of the total costs that users will have to absorb to adjust to the new system. Far greater experience is needed, with detailed parallel comparisons between the traditional and the proposed approaches, before conversion to the new method can be supported. Continuous measurement should replace the traditional census when it has been shown to produce a better product, not because it is asserted to be a cheaper approach. If an equal product could be obtained for less through an alternative procedure, certainly that would be acceptable.
- **Development of the continuous measurement system is encouraged and supported.** The participants see great promise in the continuous measurement process in the future after pilot testing against the traditional census. Implementation at the transportation planning level would require extensive research, restructuring of programs, and changed modeling and analysis procedures. Training costs would be substantial. The need for transportation agencies to maintain continuing geographic systems updates for the census alone would be a major cost increase, which would generate great expense to the transportation process that can be borne in a properly structured program.

The structure of the 1996 meeting on the 2000 census took a different tack than in past meetings, in which the group was divided into separate clusters that followed different tracks, utilizing workshops oriented around the issues of interest to the participants, such as the states, large metropolitan areas, small metropolitan areas, transit agencies, the private sector, and so on.

This second meeting on the 2000 census, because it had had the benefit of the earlier meeting's conclusions, was able to spend less time on fact finding and focus more on key areas: updating experience with the 1990 census, refining quality improvements needed, and then focusing strongly on alternatives facing the transportation profession for the year 2000.

Findings and Recommendations

General Findings

- *The Bureau of the Census should conduct a year 2000 census with a strong long-form component.*

The current Census Strategic Plan for 2000 cites this intent, and the agency must adhere to that strategy.

- *The decennial census long-form data are the statistical centerpiece of the metropolitan planning process.*

Both the general socioeconomic data and the specific transportation journey-to-work data contained in the long form are key.

- *It is critical that the decennial census process be adequately funded to ensure a quality, full-scale undertaking.*

Relative to the scale of the decisions to be made based on these data and the immense public investment involved, census costs are at an appropriate level.

- *The Bureau of the Census should enact its strategy for 2000 and adopt all other appropriate procedures to ensure efficient, low-cost, cost-effective, timely products that act as a force for national unity.*

The Bureau has identified key improvements and changes that can be made to the traditional process using statistical techniques, new technologies, and other tools to improve the cost, speed, and quality of the decennial products. That strategy is endorsed, and the Bureau must be permitted to implement that strategy.

- *Small-area data form the main element of the census that is crucial to transportation.*

These data, available in sample sizes adequate for small units of geography, permit transportation planning that is responsive to the congressional mandates of ISTEA and CAAA.

- *All elements of transportation at all levels benefit from the census products.*

National policy is strengthened, states benefit from commonly defined and collected data, large metropolitan areas are capable of using these highly complex data to meet their challenges, but perhaps the greatest beneficiaries are small metropolitan areas that do not have the sophistication or resources to collect such essential statistics on their own. Functionally, the less heavily used modes of transportation benefit most from the extensive sample sizes; these are the modes that are most often the object of public policy decisions: carpooling, public transit, walking, bicycling, telecommuting, and so forth.

- *Continuous measurement should be supported as an experimental, pilot program with potential for the future, but in no way should it impede the 2000 decennial census activity.*

There is real concern that on the basis of the untested promise of potential cost savings, the continuous measurement system might be seen as a potential substitute for full-scale census activity in 2000. It would be irresponsible to replace so important an activity with an untested process. If funding constraints dictate that cuts are to be made, continuous measurement should be delayed.

- *A research effort should parallel the 2000 census keyed to potential implementation of continuous measurement in the first decade of the new century and for the 2010 census.*

A carefully constructed set of representative sample areas can be developed to test the new approach against the 2000 long-form census. This research effort can be less extensive than that now envisioned by Bureau personnel and less expensive. Parallel research will need to begin in the transportation sector to make the changes to planning tools, investment models, forecasting systems, and so on, that will need to be made responsive to the new data structure.

- *A Memorandum of Understanding should be drawn up between the Bureau of the Census and DOT.*

This understanding would specify the interests, responsibilities, and obligations of both agencies in the upcoming decennial census, incorporating the concerns of the states, MPOs, and other local entities.

• *The transportation community should consider the creation of a Census Technology Center to monitor events.*

The transportation community needs to closely track events in the census planning and development process. It needs to understand the implications of these plans and keep practitioners and affected institutions informed of key developments, research needs, and other implications.

Specific Findings

The following findings focus on detailed aspects of the activities surrounding the census—its planning, development, tabulation, use, and follow-on activities.

• *The Census Bureau is currently field testing a number of changes in the transportation area that are under consideration for implementation in 2000.*

These changes need careful evaluation. Field tests should be closely monitored, and changes that reduce detail, particularly aggregation in the transit modes, need careful scrutiny and discussion before implementation.

• *As the journey to work evolves, the census should consider the broader needs of transportation.*

The identification of trip itineraries using multiple modes, multiple jobs, and occasionally used modes has been cited elsewhere and is a valuable potential addition to the census data.

• *The decision in the Census Strategic Plan that there will be no telephone or field follow-up activities for the long form needs to be evaluated.*

This cost-saving measure needs careful consideration and review by transportation authorities to assess the impacts on prospective planning data products in terms of reliability and other factors.

• *The implications of the Data Access and Dissemination System (DADS) program for timely, effective, and comparable products to transportation authorities need close scrutiny.*

The Bureau intends the DADS program to create on-call data tabulations from the next census, substituting electronic media for paper. The delays and high costs of similar tailor-made systems forced transportation agencies to establish the standardized Census Transportation Planning Package (CTPP) files. The transportation community needs to reconsider the entire CTPP strategy in the light of changing technologies, changing Census Bureau procedures, and changing transportation needs.

• *Census transportation data from 1970 on should be structured in data files using media that will ensure their permanence and utility for trend analyses.*

The census data have great value for historical applications and trend analyses. Their use should not be impeded by failure to properly preserve files and enhance their potential use.

• *Extensive research needs are associated with new census procedures.*

These research needs include (*a*) the reliability implications of sampling and other procedural changes, (*b*) the impacts of the use of administrative records such as drivers'license files and vehicle registrations as census tools, and (*c*) establishment of research designs for comparison of the transportation census long form and continuous measurement.

• *The transportation community needs definitive yearly cost and planning information on the continuous measurement process.*

The transportation planning profession intends to closely monitor the pilot continuous measurement program to better understand the kinds of changes that will be required in professional practice.

• *Plans by the Census Bureau to implement continuous measurement generate an additional series of longer-term but still critical research needs.*

These research needs include studies of (*a*) the geography of continuous measurement sampling plans and their impacts on transportation, (*b*) the specific implications for transportation of the multiyear averaging approaches of continuous measurement, (*c*) the changes needed in the state metropolitan and local planning processes to accommodate continuous measurement, and (*d*) the cost consequences for transportation of changes required in the modeling, forecasting, and training programs of states and MPOs.

• *Study is needed of the implications for local agencies of the new Census Bureau authorization (Public Law 103-430) to better use local capability for updating census geography.*

The Census Bureau will make substantial demands on MPOs and their federal sponsors to meet the needs for geographic updating with local expertise. This area needs clarification. States will need to play a role in defining state-related geography, dealing with such issues as "rest-of-county areas." Part of this problem is the delineation of the boundaries of the Public Use Microdata Sample (PUMS). The continuous measurement system will require continuous updating of geographic information. The technical, institutional, and cost implications for transportation need identification and explication.

Recommendations

The Bureau of the Census should

- Conduct a full census in the year 2000 including the long form with comprehensive transportation elements.
- Incorporate the best technological, statistical, and institutional modifications to ensure a reliable, rapid, cost-effective census consistent with its year 2000 strategy.
- Share its pretest experiences with the transportation community and consult them regarding prospective modifications.
- Plan for a dual activity in which a continuous measurement pilot program would be tested in parallel with the traditional decennial process.
- Continuously provide the user community with greater details on development aspects, research, and costs of the continuous measurement process.
- Ensure that the concept of the Data Access and Dissemination System (DADS) is better developed and realized as a substantial resource.

The U.S. Department of Transportation should

- Develop and coordinate a memorandum of understanding (MOU) with the Bureau of the Census spelling out reciprocal responsibilities and actions to be taken, specifically focusing on geographic systems developments.
- Produce a model MPO–Census Bureau arrangement as part of the MOU.
- Develop contingency plans to respond to various census development scenarios. The costs and other implications of these alternatives need to be fully defined.
- Plan for and support MPO and state geographic systems development for census use.

- Begin to plan for a new Census Transportation Planning Package for the 2000 census.
- Develop training materials for the better understanding and use of Census 2000 materials.
- Closely monitor and report on development of the census 2000 program on a continuing basis.
- Begin planning for development of skills and methods for use of continuous measurement.
- Transmit these recommendations to the Bureau of the Census.
- Consider funding a TRB-based Census Technology Center similar to the one developed for the Strategic Highway Research Program to monitor, evaluate, and develop responsive tools for census-based products.

States and MPOs should

- Be prepared to cooperate in sharing needs and capabilities regarding the census.
- Organize to articulate their respective data needs.
- Consider producing and using tutorial devices such as videos to inform upper management of census data issues and their implications.

States should

- Produce a better definition of state traffic and planning zones for census summary use.
- Produce their views on appropriate state PUMS boundaries.
- Assist smaller MPOs with data needs and development.
- Consider producing statewide commuting summaries.

MPOs should

- Articulate the extensive costs and other implications generated by the loss of census data and identify and quantify new tools that will need to be developed and procedures that will need to be revised.
- Be prepared to be the center of geographic review of census coding tools.

The Transportation Research Board data committees should

- Remain informed of census developments. As the nexus of information and communication on census developments, these committees bring together federal, state, local, and private-sector players.
- Monitor, review, report on, and discuss the nature of changes in census programs and their implications for other professional sectors of transportation—planning, policy, investment—as well as for the transportation data sector.

The private sector should

- Inform others via data-related associations, professional societies, consulting firms, and other groups of the consequences of this public change, both for others in the private sector and for other government entities.
- Ensure that others in the private sector are kept informed of the consequences of decisions regarding the census transportation data.

Congress should

- As the ultimate location where census and transportation needs are synthesized, be aware of the implicit trade-offs for transportation involved in decisions about the census.
- Hold hearings focusing on future transportation planning needs at the national, state, and local levels.
- Be aware of the cost implications for states, MPOs, and DOT of census budget cuts.
- Be better informed regarding transportation data needs and the census role in meeting those needs.