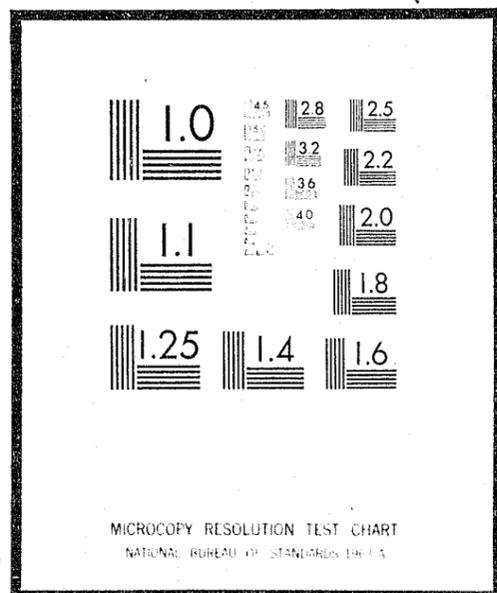


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6/24/77

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THE DEVELOPMENT OF A STREET LIGHTING PHOTOGRAPH DISPLAY FOR OBTAINING MEASURES OF CITIZENS' PERCEPTIONS AND PREFERENCES

by

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NCJRS
JUL 5 1978

This is Research Report Number 4 for the project entitled "Measures of Municipal Services: Multi-Mode Approaches" funded by the Research Applied to National Needs Division of the National Science Foundation (Grant Number GI 38535).

WORKSHOP
in
Political Theory and Policy Analysis

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THE DEVELOPMENT OF A STREET LIGHTING PHOTOGRAPH DISPLAY FOR
OBTAINING MEASURES OF CITIZENS' PERCEPTIONS AND PREFERENCES

Among the principal objects of the Measures project was the development of instruments for the objective measurement of citizens' perceptions of and preferences for various levels of street lighting. A significant problem encountered in the development of such instruments was that of establishing a common point of reference for all citizen reports; a single standard against which respondents could make judgments. This problem was especially acute in dealing with levels of street lighting (as opposed to dimensions of street lighting such as "type of fixture") because of the highly subjective nature of terms relating to brightness levels.

The objective was to devise a means of comparing citizens' reports with regard to lighting levels. If two citizens report a preference for "brighter" street lights, or say that their current lights are "dim," how can an investigator make a judgment as to how bright they do want their lights, or how dim they perceive their current light to be? One way of making such judgments is to present citizens with common stimuli against which to report their preferences and perceptions.

The Street Lighting Simulator was one means of providing such common stimuli. (See Report Number 2 in this series.) Early in its development, when the idea of the simulator was still novel and its practicality in doubt, the Workshop team also began to investigate the possibility of using a series of photographs for the same purpose. By showing respondents photos of the same street scene with different levels of lighting depicted in each picture, the team hoped to obtain their responses with reference

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to a common stimulus. Initially, the team expected to find that either the Street Lighting Photograph Display or the Street Lighting Simulator would prove to be clearly superior to the other instrument in early pretests and that only one of these devices would be selected for further development.

Street Lighting Photographs

One means of obtaining pictures of a single street scene with several different levels of lighting represented is to actually alter the light on the street by changing bulbs or varying current to the street lights. Such a procedure would be costly and time consuming. It would be necessary to obtain the cooperation of city and utility company officials in altering lighting levels to meet the needs of the project. In addition, this might interfere with the rights of local residents in the consumption of public services.

This approach, however, was thought to offer the advantage of producing photographs which reproduced known lighting levels. The same instrument used to obtain objective measures of lighting levels on blocks where interviews were to be conducted could be used to measure light levels at the time each photograph was taken. This would provide the foundation for some rather powerful comparisons among respondents and between a given respondent's perceptions and preferences and actual levels of light on his or her block.

Consultations with two local photographers revealed, however, that accurate reproduction of lighting levels in photographs was not possible. The level of light depicted in any photograph is more a function of the technique used in developing the negative than it is a "true" record of

the light level photographed. Since decisions about what light level to show in a developed photo are arbitrary, it would be impossible to relate photos to light meter readings in interval terms. Therefore, it would be pointless to alter the actual level of lighting on the block to be used for photographs for the display.

A second means of obtaining a series of photos of a street scene showing various levels of lighting, however, was to use different techniques in developing a single negative into several prints that appeared to be photos of the same street under different lighting conditions.

Such an approach was relatively simple and inexpensive. It required only that a skillful photographer take a single shot of an existing light level and make the appropriate darkroom adjustments to yield photos of apparently different lighting levels. This allows at least ordinal comparisons among respondents' answers and between respondents' reports and actual lighting levels if the photos could be rank ordered by apparent brightness.¹

Selecting Photographs

Once the decision to use photographs was made, a number of questions arose about which specific photos to use. The Workshop team first explored the possibility that other studies had employed photos similar to those envisioned for the Measures project and had established their

¹If a group of impartial observers could agree that photograph 1 depicted a brighter level of street lighting than photograph 4, for instance, and respondent A reported that the level of lighting on his/her block was most like the level shown in photo 1, while respondent B reported that the level of lighting shown in photo 4 was most like that on her block, for example, one could conclude that A perceived his block to be brighter than B. Moreover, by rank ordering blocks by brightness as measured with the light meter, informed observations could be made about the accuracy of citizen perceptions by use of the photograph display.

validity as indicators of citizens' perceptions and preferences for lighting levels. A search of relevant literature revealed no such studies.² It therefore became necessary to make an original set of pictures.

An early decision was made to use black and white photographs in order to avoid confounding the color dimension (which was not under study) with the dimension of brightness.

One possible source of invalidity in the use of photos was the potential interaction of the characteristics of the block depicted in the photos with respondents' evaluation of lighting levels. To reduce the potential influence of such factors, a street scene was selected which showed little of the detail of the houses along the street and revealed no serious flaws in the street surface, curbs or sidewalks.

A local photographer was retained to take the original photo and do the necessary developing work. The prints shown in Appendix I to this report were made from the negative selected for use in the display. The same street was depicted in all photos used in the study (including pretests).

Once this negative was selected, ten prints showing apparently different levels of street lighting were made by altering the time of exposure of the print paper to the developing fluid. Six photos were then selected on the basis of the team's judgment that they 1) represented

²The literature search did reveal references to the use of photographs to measure citizen perceptions of and preferences for other phenomena. The Urban Institute has utilized photos in obtaining citizen perceptions of the cleanliness of city streets and alleys. (See Louis H. Blair and Alfred I. Schwartz, How Clean is Our City, Washington, D.C.: The Urban Institute, 1972.) The U.S. Forest Service used a series of photos in obtaining measures of citizens' preferences for various features of recreational areas. (See Elwood L. Shafer Jr., John F. Hamilton Jr. and Elizabeth A. Schmidt, "Natural Landscape Preferences: A Predictive Model," Journal of Leisure Research, I, 1 (Winter, 1969), 1-20.

a sufficiently wide range of lighting conditions to encompass the lightest and darkest streets that would be encountered and 2) depicted light levels which were sufficiently distinct to allow respondents to perceive differences readily.

A folding display board was constructed to present the photos in two parallel rows when opened. When closed, the board concealed and protected the photos. Thus mounted on the display board, the prints were then used in the first round of pretesting to attain measures of citizens' perceptions of and preferences for street lighting levels on their own blocks.

Pretesting the Photograph Display

Three pretests were conducted in Bloomington during the fall of 1973 prior to the larger pretest in Indianapolis in the spring of 1974. (Descriptions of the early pretests are presented in Report Number 3 in this series.) The first pretest revealed that citizens were able to discriminate among the photos by brightness levels and could relate those levels to lighting conditions on their own blocks. Those living on darker blocks generally identified the darker photos as showing levels of lighting most like what was on their block, while those living on brighter blocks generally chose brighter photos. When asked whether they preferred using the photo display or the SLS in reporting their perceptions and preferences, a majority of the respondents indicated a preference for the photo display. They frequently described it as "more realistic" and "easier to relate to actual street lighting."

Some of the respondents indicated, however, that they felt that their blocks were even darker than the darkest photo in the display and that

some areas were brighter than the lightest of the pictures. In addition, team members had observed that uniform exposure of the surface of the negative to the developing fluid produced some undesirable effects. In the lighter photos, highly lighted areas (like the surface of the street) appeared glaringly bright, while dark areas (like the fronts of homes) in the darker photos appeared virtually black. Contrast in the photos was too great.

These problems were explained to the photographer and he was asked to produce a second set of photos which would ameliorate them. The first of the difficulties was remedied by changing developing times on the darkest and lightest of the prints to make them show slightly darker and lighter levels of street lighting. The second difficulty was substantially resolved by use of two techniques of photographic development known as "burning" and "dodging." Burning has the effect of subduing bright areas in photos while dodging lightens the darker areas. Appendix II to the report is a table showing developing time and application of the burning and dodging techniques to various parts of the photos used in the final set.

The photos produced by this method were used in the third phase of pretesting with a modified display board which could be used as a stand for the Street Lighting Simulator.³ This pretest revealed that respondents no longer felt the extreme photos were inadequate and that they could still make consistent distinctions among prints. Respondents were almost evenly divided in their preferences for using either the photo display or the SLS. Consistent results were being obtained with both

³The revised photo set was not available for the second phase of pretesting and the original set was used again.

instruments and both proved easy to administer. On the basis of these results, the team decided to use both instruments in the Indianapolis pretest. Accordingly, the second set of photos was reproduced to make enough copies to be used in the final pretest. Three additional display boards were constructed and utilized.

Conclusions and Recommendations

Details of the results of using the Street Lighting Photograph Display in the Indianapolis pretest will be presented in subsequent reports in this series. General observations about the use of the instrument in the field include the following.

The display proved to be an easily administered instrument to which most respondents reacted favorably. Its length, 36 inches, does pose some mobility problems, but interviewers soon gain facility in manipulating it and no accidents related to the size of the board were reported during the entire study. The display is simpler to use and potentially more reliable in the field than the SLS, as it presents fewer opportunities for interviewer error in recording responses. In addition, the potentiality for equipment failure is less with the display than with the SLS. The principal precaution that must be taken with the display is that ambient room light not be allowed to affect respondents' perceptions of the photos by causing glare or providing insufficient illumination.

A major frustration in using the display is that it allows only ordinal level measurement. This seems to rob analysis of some of the potential power inherent in the interval character of the outside light meter's measures. Any decision concerning the usefulness of the data gained through use of the Display, however, should be made after reading of the data analysis contained in later reports.

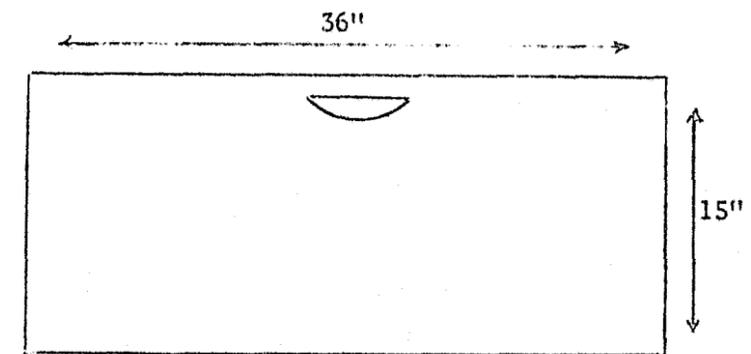
Appendix II

Development Techniques for Street Lighting Photo Display

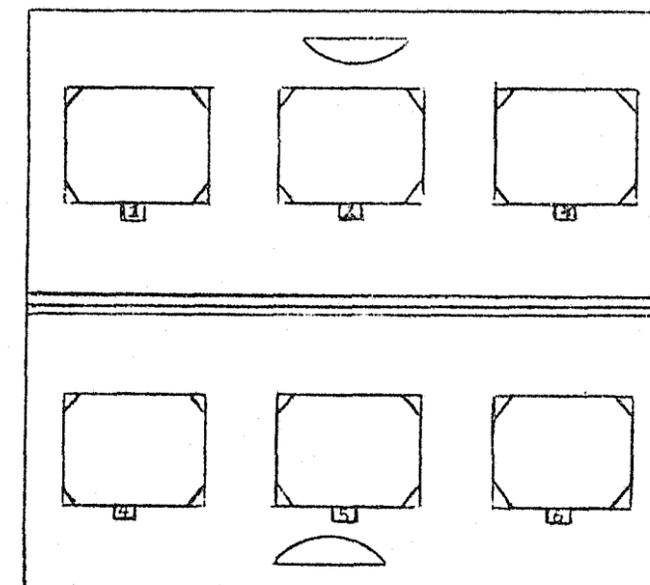
Photo No.	Seconds of Exposure	Dodged Areas	Seconds Dodged	Burned Areas	Seconds Burned
1	5	House	2	Street	3
2	7½	-	-	-	-
3	5	-	-	Street	3
4	10	-	-	-	-
5	7½	-	-	-	-
6	5	-	-	Street	4

Appendix III

GRAPHICAL REPRESENTATION OF STREET LIGHTING PHOTO DISPLAY



Closed for Carrying



Open for Display

END