

People, Planners and Policy: Is There an Interface?¹

Susan J. Konica.^{2/}

Abstract: This research attempts to isolate some of the dimensions of human evaluations/perceptions of the built environment through the use of an Audience Response Machine and a video tape of environmental scenes. The results suggest that there are commonalities in peoples' evaluations/perceptions and that this type of inquiry has prescriptive value for design/planning.

INTRODUCTION

The impetus for this paper comes from three major sources. The first of these sources is the author's interest in the planning and design of environments. The theoretical/disciplinary biases of the paper are landscape architecture and natural resource planning and policy.

The second source of stimulation comes from the researcher's interest in the area of evaluation of environmental/behavioral contexts. This area falls within the discipline of environmental psychology (Rapoport 1977, Porteous 1977).

The third and final provoker was the discovery of a "tool" applicable to the analysis of the above two areas of inquiry: an Audience Response Machine. With the methodology provided by the Audience Response Machine this paper constitutes an empirical inquiry into the potential interface between landscape architecture, environmental psychology, and natural resource planning and policy.

THEORETICAL FRAMEWORK

The Man-Environment Model

The discussion of the theoretical base for this empirical pilot study must begin with a notion of the man-environment model. The basic assumption of this model is that human and environment systems are mutually dependent and have mutual effects upon one another. The inherent "tension" in the relationship places control in both the human and natural components. In addition, the human system has an element of responsibility if the relationship is to continue. Until the late 1960's this emphasis upon human responsibility and cooperation did not exist in popular discourse (Miller 1975, McHarg 1971). With the advent of the 60's and the NEPA came a realization of the increased pressures that man and technology had been placing on the environmental system. The American society as a whole became more aware of its interactions with nature, and the evaluation of the man-environment context became increasingly more important. Yet even today, some ten years hence, there are varying opinions on most environmental issues. Variance exists between those who make policies concerning the environment, and those who actually live within the environmental context for which the policy is being made. This discrepancy between the "public" and the planner/designer conceptions of the environment is the topic of exploration in this study.

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^{2/} Landscape Planner, Planning Resources Incorporated, Cleveland, OH.

^{3/} National Environmental Policy Act, 1969.

This discrepancy involves, what is known in the field of environmental psychology, as "environmental evaluation" or "environmental perception" (Rapoport 1977, Ittelson, Proshansky et al 1974). The discipline of environmental psychology is an off-shoot of some more established disciplines like psychology and sociology. The field's emphasis lies in the ramifications of built environments on human cognition, perception and behavior (Michelson 1976, Newman 1973). Its most admirable contribution is its search for a union between the theoretic aspects of sociology and psychology and the applied aspects of design and planning. The man-environment interface is clearly multifaceted. Environmental psychology with its multi-disciplinary focus may provide greater outcomes for the community of man.

Environmental psychology embodies the philosophy that people behave in certain ways as a result of the social and physical settings within or through which they move. Much of the research in this area has been descriptive in nature; phenomena are described as they occur and the researcher then tries to attribute behaviors to certain environmental causes which are based on past theoretical frameworks (Ittelson, Proshansky et al 1974). The merits of this field lie in its prescriptive abilities. If we can understand how and why people behave as they do in different settings, we can begin to design better environments: environments that reflect peoples' needs and wants.

Few studies have been done in this area which center their research interests on the prescriptive value of environmental psychology. Since much of the designers and planners' work is done in the areas of policy and, since policy is a process involving evaluation, this type of research approach was of interest.

Planning and design can be seen as "choice processes" which attempt to produce a single solution from numerous alternatives. This elimination of alternatives involves the application of criteria. What are the criteria and where do they come from? All man-made environments are a result of many decisions made by the inhabitants and outside "experts." Decisions are made as a result of conflicts between value states," i.e., the process of evaluation of positively and negatively weighted variables (Rapoport 1977). People try to match their values, norms, expectations and experiences with environmental settings. Examples of this would include the processes of design and human migration. The design of an environment involves the "encoding" of information by the designer, such that the

users "decode" the information in the expected manner. If the symbolic nature of the coding system is not understood there will be breakdowns in the system: the design or plan will fail or be improperly used. "Important is the need to achieve congruence with some ideal, so as to maximize a set of ranked values" (Rapoport 1977). In many cases this has proven impossible. Frequently, too many "multiplicative and idiosyncratic images" or ideals exist for any setting and any given group of users (Rapoport 1977, p.17). Clearly, design criteria must in some way embody the values and norms of the prospective users or the design outcome will be at best less than satisfactory. Mismatches between initial values and ultimate plans/designs usually result from the void between designer/planner and the user (Rapoport 1977).

The dimensions of evaluation and perception are of paramount importance in understanding peoples' reactions to environmental contexts. The perceptual system is concerned with experiencing the world; evaluation refers to the affective or expressive system where things are assigned values. The process of perception involves selecting from the environment those aspects which match one's images of the way things should be. or are.

This research study is a pilot attempt at looking into what it is that people like and dislike, think is aesthetic and unaesthetic and what they find to be exciting and unexciting about built environments.

The few studies attempting to develop methods for tapping the components of environmental evaluation fail to offer concrete directions for design and policy (Rapoport 1977). For this reason, this study does not claim to be anything more than a pilot. The findings are not meant to be generalized. The study is interested in the use of a specific measuring tool: the Audience Response Machine (A.R.M.) and its role in the tapping of the environmental evaluation process.

DISCUSSION OF RESEARCH PROCEDURES

An A.R.M. was employed in measuring the values people place on the environment. The A.R.M. is a mechanical tool for measuring responses to visual stimuli. It has been used most widely in the areas of communication and audience behavior studies. The system was first introduced to the field of Landscape Architecture by Banerjee et al. (1977), who did a study involving an I.R.P. Recorder (Instantaneous Reaction Profile; analogous to the A.R.11.), in which their

principle interests centered around people's reactions to coastal scenes in California. Although their findings were less than conclusive, they did substantiate the usefulness of the tool for policy decisions.

Measuring Instrument

As was mentioned previously, the A.R.M. measures subject responses to visual stimuli: films, slides, video tapes, etc. In this study, subjects were seated in a "living room laboratory"^{4/} where each of them had an individual recording console with five buttons on it labelled A through E.

Three independent groups of subjects were asked to respond to a video tape of environmental scenes by pressing appropriate buttons on their recording consoles. Table 1 presents the coding schemes each of the three groups employed.

Table 1--Coding Schemes for Three Subject Groups

Group Number	Recording Console Button Labels				
	A	B	C	D	E
1	Strong Like	Like	Neutral	Dislike	Strongly Dislike
2	Highly Aesthetic	Aesthetic	Neutral	Unaesthetic	Highly Unaesthetic
3	Very Exciting	Exciting	Neutral	Unexciting	Very Unexciting

Each subject's responses to the visual stimulus were recorded as they occurred in response to the stimulus and were printed on a computer printout.

All subjects reacted to the same visual stimulus but their reactions were within one of the three categories mentioned before, depending on the group in which they were placed.

Stimulus

The video tape used as the stimulus for this study was produced by this researcher with the use of a portable video tape recorder. The video tape consisted of twelve 70 to 75 - second views or pans. These "pans" were of environmental scenes. The environmental scenes were not chosen at random, but rather were chosen

with an intent to provide as much variance in environmental scenes as possible. The video tape was in black and white and lasted approximately 12 minutes. Included in the Appendix of this paper are written descriptions of each of the pans. In addition to the visual dimension to the tape, auditory aspects of each pan were also recorded. In the descriptions the character of the sounds in the pans is also included.

Subjects

The subjects used in this study were college students ranging in age from 18 to 25. Their academic standings ranged from freshman to graduate student. There were 31 total subjects; 10 females and 21 males. The subjects were solicited for the study informally through word of mouth, signs, and flyers around the university community. They were asked to participate in a study which would take 1 hour of their time. The participation was totally voluntary. The 31 subjects arrived at their convenience and were randomly assigned to one of the three subject groups. Ultimately, there were 10 subjects in the Like/Dislike and Aesthetic/Unaesthetic subject groups and 11 subjects in the Exciting/Unexciting subject group.

Questionnaire

In addition to responding to the visual stimulus through the manipulation of the A.R.M., the subjects were also asked to fill out a 50 item questionnaire after they had viewed the video tape. The questionnaire was employed for the purpose of tapping demographic data for use in subject profiles, and secondly, to test the subjects' ability to recall visual and auditory aspects of the video tape. The questionnaire consisted of a list of items to which the subjects responded "yes" or "no" to recalling from the video tape. The list included some false items which were randomly mixed in with the true items. The true items were originally retrieved from the video tape by the researcher; the false items were made-up. The demographic items on the questionnaire were: age, sex, and academic status. Total correct scores for each subject were calculated. An item analysis was also performed.

Methods of Analysis

There were three main methods of analysis used in this pilot study: an item analysis on the questionnaire, cross tabulations on data from both the computer printouts (A.R.M.) and

^{4/}The Communication Research Laboratory at The Ohio State University was employed in the research.

total scores from Recall questionnaire; and finally, a number of graphic displays of data, taken from the A.R.M. data and the questionnaires.

For ease of interpretation the Likert categories for each of the three subject groups were collapsed into three categories (High, Medium, Low). This was done by dividing the range of subject scores on the pans into thirds. Scores falling in the lower third were placed in the Low category, the upper third were placed in the High category and the remainder in the medium category.

After reviewing the computer tapes of the subject responses to the video tape it was decided that the response sequences in the first pan showed insufficient variance and were dropped from the analysis. This lack of variance was probably due to a "training effect." Subjects were still familiarizing themselves with their A.R.M. consoles and hence were not pressing buttons.

FINDINGS/RESULTS

The results are displayed both graphically and in tabular fashion. Figure 1 displays a plot of the grand means for each of the eleven stimuli (pans). The dotted line represents the Exciting/Unexciting category, the dashed line the Like/Dislike category and the continuous line the Aesthetic/Unaesthetic category.

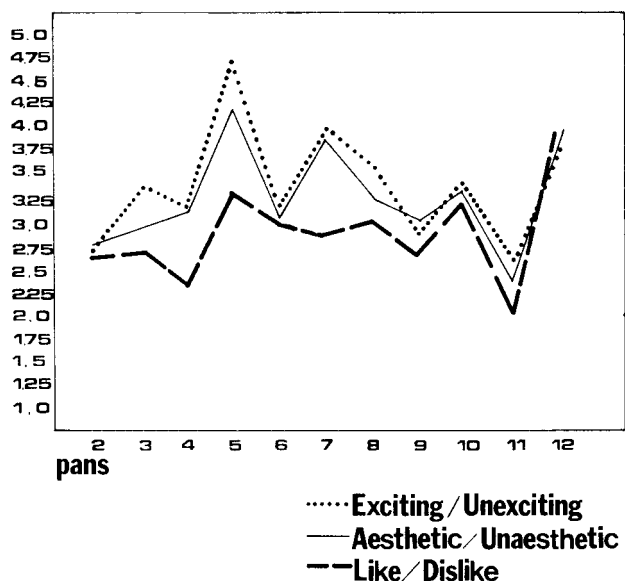
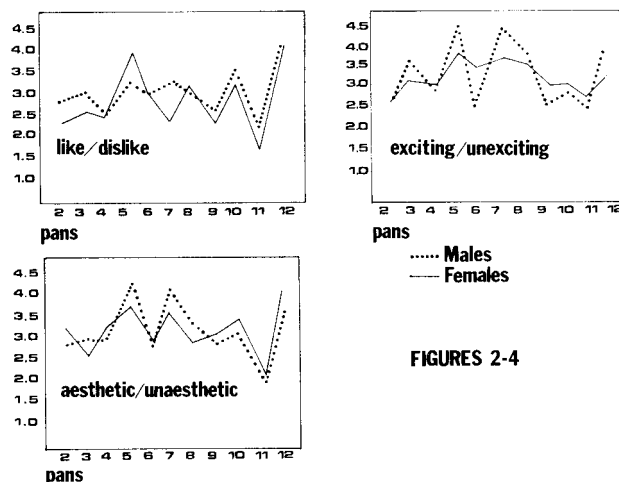


FIGURE 1

Elements of interest in Figure 1 are the covarying plots of the Exciting/Unexciting and Aesthetic/Unaesthetic categories and the more independent Like/Dislike plot. It appears that two independent dimensions of environmental evaluation were tapped: a Like/Dislike category and a category of Exciting/Unexciting - Aesthetic/Unaesthetic. Pans 4 and 11 were the most well-liked and were also among the most exciting and aesthetic pans. Both of these were characterized by less offensive audio dimensions and a dominance of pleasing visual imagery. (See Appendix for pan descriptions).

Figures 2-4 present each of the three treatment (category) groups broken down by sex of respondent. The continuous line represents females and the dashed line males. The greatest difference between female and male evaluations was in the Exciting/Unexciting category. In this category, male and female responses differed the most in their responses to pans 6 and 7. In both instances the males found these pans to be more exciting than the females. This is interesting since pan 6 is of The Ohio State University golf course and pan 7 is of the campus area. Perhaps the males were more familiar with both of these scenes than were the females.



FIGURES 2-4

Cross-tabulations of age by Mean Score (collapsed across the three category treatments) for all stimuli (pans) and sex by Mean Scores for all stimuli were calculated. (See Appendix, Tables 2 & 3). The general results of these cross-tabulations suggested that regardless of age most subjects, 63 per cent, found the stimuli to be somewhat less than neutral in appeal and that sex was not a discriminating variable in terms of the overall level of appeal of the stimuli (pans).

Table 2--Grand Means For Pans Collapsed Across Categories

Age	Score		
	Low (≥ 3.1)	Medium (3.09-1.79)	High (≤ 1.79)
18 - 19	6%	10%	3%
20 - 21	35%	6%	0%
22 - 23	19%	10%	0%
24 - 25	0%	3%	0%
25 & Over	3%	3%	0%
Totals	63%	32%	3%

***Percentages are of the total sample. (31 subjects)

Table 3--Grand Means For Pans Collapsed Across Categories

Sex	Score		
	Low (≥ 3.1)	Medium (3.09-1.79)	High (≤ 1.79)
Female	60%	40%	0%
	19%	13%	0%
Males	67%	28%	4%
	45%	19%	3%
Totals	64%	32%	7%

***Top percentages are for row total. (Males or females)
Bottom percentages are for total sample. (31 subjects)
"Totals" is of the total sample. (31 subjects)

Some interesting results surfaced in the analysis of the Recall Questionnaire. Figure 5 is a graphic representation of the frequency distribution of correct responses for both male and female subjects. While the means and standard deviations of the distributions do not vary significantly, the appearance of the distributions does. The male subjects were much more volatile in their distribution of responses than were the females.

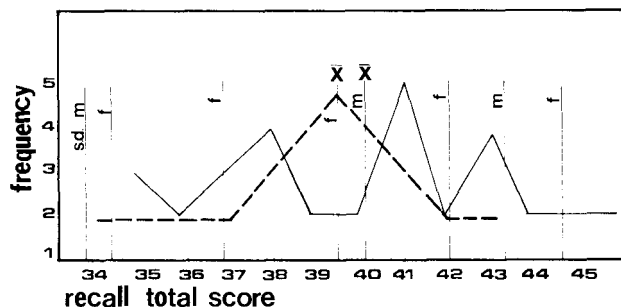


FIGURE 5

$\bar{x}$ mean
s.d. standard deviation
--- Female (f)
— Male (m)

Table 4 is a cross-tabulation of academic standing by recall score for females.

Table 4--Recall/Comprehension Questionnaire: Total Score for Females

Academic Standing	Score		
	High (≥ 40.7)	Medium (40.6-38.2)	Low (≤ 38.1)
Freshman	66%	33%	0%
	20%	10%	0%
Sophomore or Junior	40%	40%	20%
	20%	20%	10%
Senior or Graduate	0%	50%	50%
	0%	10%	10%
Totals	40%	40%	20%

*** Top percentages are for row total. (Freshman, sophomore...)
Bottom percentages are for total sample. (31 subjects)
"Totals" is of total sample. (31 subjects)

Of interest in this table is the difference between the freshman total scores and the senior or graduate total scores; freshman had 66 per cent in the High category, senior or graduates had 50 per cent in the Medium and Low categories. Sophomores and juniors were fairly well distributed in their scores. Eighty percent of the females scored in the Medium to High range on the Recall Questionnaire.

A cross-tabulation of age by Recall Score was also calculated for females. It essentially mirrored the Recall by Academic Standing analysis.

Table 6--Recall/Comprehension Questionnaire: Total Score for Females

Age	Score		
	High (≥ 40.7)	Medium (40.6-38.2)	Low (≤ 38.1)
18 - 19	66%	33%	0%
	20%	10%	0%
20 - 21	40%	40%	20%
	20%	20%	10%
22 & Over	0%	50%	50%
	0%	10%	10%
Totals	40%	40%	20%

*** Top percentages are for the row total. (Age groups)
Bottom percentages are for total sample. (31 subjects)
"Totals" is of total sample. (31 subjects)

The cross-tabulation of Recall Scores by academic standing for men is very similar to the cross-tabulation for female subjects. The freshman and sophomores tend to score consistently better than the juniors and seniors.

Table 5--Recall/Comprehension Questionnaire: Total Scores for Males

Academic Standing	Score		
	High (≥ 41.8)	Medium (41.7-38.6)	Low (≤ 38.5)
Freshman	50% 5%	50% 5%	0% 0%
Sophomore	44% 19%	33% 14%	22% 10%
Junior	22% 10%	22% 10%	55% 23%
Senior or Graduate	0% 0%	0% 0%	100% 5%
Totals	34%	29%	38%

*** Top percentages are for row totals. (Academic standings)
 Bottom percentages are for total sample. (31 subjects)
 "Totals" is for total sample. (31 subjects)

Table 8 cross-tabulates Average Pan Ratings with total Recall scores, as they differ between males and females. A Chi Square Test for Independence was used to analyze this particular Table (d.f. = 4, $X^2 = 4.057$, p .05). The Chi Square Test failed to reject a null hypothesis of "no difference within the table cells." While non-significant results should be interpreted with caution it appears that the frequencies of occurrence within the cells may be randomly occurring.

Table 8--Recall/Comprehension Questionnaire: Total Scores for Males & Females

Average Rating Score For Pans	Score		
	High (≥ 41.4)	Medium (41.3-38.5)	Low (≤ 38.4)
Low (≥ 3.1)	23%	23%	19%
Medium (1.79 - 3.09)	6%	16%	13%
High (≤ 1.78)	0%	0%	0%
Totals	29%	39%	32%

*** Percentages are of the total sample. (31 subjects)

Finally, the item analysis of the Recall Questionnaire indicated an interesting aspect involving the auditory dimension of the video tape. There were four auditory items on the questionnaire: 12, 30, 33 and 40. The item analysis indicated that those people who scored the lowest on the Recall Questionnaire were nevertheless able to recall three out of four of the auditory items; a better recall rate than those with higher overall scores. Auditory items 12, 33 and 40 were the most frequently recalled by this select group; these were car horns, birds singing, and a train whistle, respectively.

CONCLUSIONS AND RECOMMENDATIONS

This pilot study has indicated the usefulness of the Audience Response Machine for continuous measurement of the process of human evaluation of the environment. The use of a video tape for the stimulus has been shown to be a viable model of the perceived environment; it is continuous and it has sound, like the "real world." Other studies done in this area of research have traditionally employed slides, snapshots or artists' renderings of the environment for subject stimuli. In addition, these same studies use a questionnaire for their recording of subject responses. It is clear that the use of an A.R.M. and a video tape stimulus played over a T.V. monitor is much closer to getting at the actual continuous and process notion of environmental evaluation.

Within the body of this study there were some interesting findings which shed light on the evaluation process. Two categories of environmental evaluation were indicated. To be able to pick out differences in categories of evaluation is a good step toward understanding how it is that people evaluate. It begins to give us an indication of what kinds of questions we should ask people about their environment when we are engaged in design/planning.

Overall the video tape was rated unfavorably. This could be attributed to a number of aspects of the tape. The fact that the tape was in black and white and thus not as "realistic" as color could have affected the responses. A black and white stimulus does not portray the color dimension which is important to landscape scenes. The audio dimension of the tape was predominated by vehicular sounds; this was not appealing to the respondents. It is also possible that, in general, the content of the pans was predominated by negatively valued scenes. All of these issues need further exploration in future studies. A color video tape with dubbed in sounds should be implemented to give additional insight into the evaluation process.

This study indicated that there is more variability in male ability to recall environmental stimuli, than there is in female. This may be evidence that females and males have different recall "styles;" women appear to be more conforming and rigorous, men more erratic.

Also evidenced in the study was the difference between the ability of freshman to recall over upperclassmen. Again, perhaps the

older group is looking at a different set of variables in the stimuli than are the younger people and the recall test only addressed the components of the younger group's evaluation system.

The outcome of the Chi Square Test on table 8 indicates there are no apparent differences in the table cells. It could be that this is indicative of two separate and independent variables, i.e., the process of evaluation of stimuli is different from that of recall. Perhaps a correlation analysis should be done to unearth more information. It is interesting to entertain the notion that peoples' immediate feelings towards environmental stimuli (measured by the A.R.M.) may not have an effect upon what they are able to remember about the stimuli. This may add fuel to the philosophical argument that peoples' attitudes do not necessarily reflect their subsequent behaviors. This too, is an important aspect of human evaluation which designers/planners can utilize in their work.

The item analysis of the questionnaire indicated that there was a select group of subjects who were more attentive to the audio dimension of the stimulus. These respondents were also the lowest scorers on the Recall test. This indicates that the audio dimension of stimuli is attended to more by certain individuals or that certain sounds attract some peoples' attention more than others.

This study has been a first step in exploring a valuable potential method of measuring the complex process of human evaluation. Many new and interesting unanswered questions wait for investigation by those who feel the urgent need to come to grips with the gap that still lies between the public, the environment and the designer/planner.

APPENDIX

CONTENT OF VIDEO TAPE PANS

PAN 1 & 2: The Scioto River at Griggs Reservoir (Route 33; Columbus, OH) - These pans total a 360-degree view of a predominately pedestrian oriented parkway along a river. The first pan shows views of the water and the opposite shore. Pan 2 shows wooded hillside with picnic tables and play equipment. The audio includes vehicular, human and bird sounds.

PANS 3 & 4: Upper Arlington Shopping Mallway (Arlington Avenue; Upper Arlington, OH) - These two pans were of a two-block shopping area along one side of Arlington Avenue. The buildings are uniformly 1930's English Tudor in architectural style and represent a cohesive

and attractive commercial corridor. The pans were split between the two blocks. There are the sounds of automobiles.

PAN 5: Shopping Center Parking Lot (Henderson Road; Upper Arlington, OH) - This pan is representative of the genre of typical super-market/convenience-stores complexes that could be seen anywhere in America. The pan is monopolized by the presence of automobiles, power lines, pavement, and low line commercial buildings in the distance. The auditory dimension is consumed by the automobiles.

PAN 6: Ohio State University Golf Course and The City of Upper Arlington Municipal Building (Tremond Road; Upper Arlington, OH) - This pan shows the green, lush golf course framed by large canopy trees; the architecturally dynamic municipal building and its gracious lawn; and the three-way road intersection between the golf course and the municipal building. This pan also has the automobiles and the sounds of birds in its auditory dimension.

PAN 7: Campus Area - Seva Restaurant and Northwood School (High Street & Northwood Street; Columbus, OH) - This is a view of an intersection in the campus area of Columbus. There are a lot of "student ghetto" houses, parked and moving cars, pedestrians on the street, traffic lights, signs, and so on. The two dominant structures are the Seva Restaurant and the Northwood School, which are also old and dishevelled in character. The sound of automobiles is dominant in the audio dimension.

PAN 8: Goodale Park (Goodale Road: Columbus, OH) - This is a view of a downtown park which is in the English Landscape style. The park is somewhat overgrown and poorly maintained but yet remains gracious. There are the sounds of people, automobiles and birds.

PAN 9: Government Buildings (Gay and Town Streets; Columbus, OH) - This is a downtown, urban municipal scene. The pan is predominated by large, formal architectural styles, with formally landscaped lawns and walkways. Also of dominance in the audio are the automobiles, the traffic systems and the urban noise.

PAN 10: German Village (Fifth Street; Columbus, OH) - This pan is of a historic district in downtown Columbus. Most of the homes in the pan have been restored to their original character and offer a pleasing architectural impression. The streets are cobble stone. It is quiet except for an individual car stopping at a corner.

PAN 11: Fancyberg Park (Kioka Road; Upper Arlington, OH) - Fancyberg is in a suburban neighborhood where there are nice middle class homes, large lawns and a lot of open vistas. This pan is a view of a portion of this neighborhood and a look at the long vista across a very open park. The audio dimension is peaceful with the sound of chirping birds, a distant train.

PAN 12: "Five Point" (The Intersection of Fishinger, Tremont, Kenney & Northwest Blvd.; Upper Arlington, OH) - This final pan is another "typical American scene" of a heavily congested vehicular intersection with all the cars, light poles, and gas stations on every corner, that one would expect to see. The sound is very vehicular.

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