TRANSPORTATION AND STAGGERED WORK HOURS

BY
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Urban transportation systems in cities across the country are faced with the need for newer and better solutions to the crushing problems of peak hour loads. But planners and transportation experts have learned that more and more transportation facilities are not always the best response to that need. Sometimes, they are too expensive and, sometimes, in terms of the way they are used throughout the 24-hour day, they are not the most efficient response to the peak hour travel demand. As Secretary Volpe has said, "we must look at the plight or agony of the commuter. There is no rational reason for his daily travels to or from work to be periods of tension, waste and frustration."

With greater frequency, we are trying to find better ways, more efficient ways to use the transportation facilities which are already available to us. And at the same time, we are looking at non-capital improvements which might give us more transportation service for our transportation dollar.

One technique, one such non-capital improvement is the concept of staggered work hours.

I will try to provide an overview of the area of staggering work hours, and mention how the concept is accepted by the Federal Government.

1. The Context

Staggering work hours is one of a variety of measures for alleviating today's most serious transportation problem, that of peak hour congestion. Urban traffic is highly concentrated not only in time but also according to route and direction. The travel demand resulting from workers moving between the suburbs and the central business districts during two 2-hour portions of the day has overcrowded transportation facilities in most large urban areas of this country.

The traditional approach to this problem has been to plan large new transportation systems to meet peak hour demand. The existence of large federal grant programs in the transportation area has helped to create or reinforce this approach. However, large new transportation projects are unsatisfactory for solving peak hour congestion for several reasons:

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1. The lead time between decision and implementation is quite long.
2. Large new facilities are extremely expensive both in dollar and environment terms. This is particularly true for construction of new urban freeways.
3. Such freeways are unlikely to continue tobe built in many urban areas because of the nationwide revolt against them.
4. New facilities become congested due to induced traffic and new development stimulated by the facility. As economist Anthony Downs states, "peak-hour traffic congestion rises to meet maximum capacity".
5. Investment in facilities to meet peak hour load is very uneconomic, since they are underutilized for most of the day.

An alternative approach is the use of a variety of low cost methods to utilize existing facilities more efficiently. Alternatives fall into two categories. The first includes ways to accommodate the peak hour demand more efficiently, and includes the use of reversible lanes, inducements to form car pools, exclusive bus lanes and pricing mechanisms such as congestion tolls or increased parking charges. The second category encompasses ways of modifying or spreading peak hour traffic, including the staggering of work hours. It is the latter category which we are here to discuss tonight.

In this context, staggering work hours can be viewed as one low cost means of traffic control which is designed to spread peak hour travel demand. However, it is important to also take a broader approach. Since one means of staggering work hours is to institute a shorter work week, 4 days or 3 days, it should also be regarded as catalyst for producing changes in behavior patterns and even in life styles in this country. Ultimately it leads to increased leisure time, country/city living, second homes, secondary and part time employment. Each of these changes in life styles have important impacts on transportation demand.

II. Approaches to Spreading Travel Peaks

A. Shift of Nonessential Traffic

One approach to spreading travel peaks is to shift non-commuter peak hour travel to off peak hours. Included are downtown shoppers, sports events, truck movements and urban goods deliveries, and scheduled arrivals and departures by air and rail. Such shifts can be facilitated through the use of incentives, direct regulation, or pricing mechanisms. These devices are being carefully analyzed by transportation planners.

B. Staggering Work Hours—General

Another technique for peak spreading includes staggering of work hours, by either formal or informal means. The more uniform spread of peak travel demand produces a more efficient use of existing transportation capacity.

C. Formal Staggering

On a formal basis, various business individually or collectively can stagger the starting and finishing times of their employees. This is the traditional approach and has been attempted with varying degrees of success in Washington, London, New York, Atlanta and other cities.

However, in general, this approach is quite low in cost and offers significant potential, at least theoretically, for reducing peaking. The TRANS model run by the U.S. Department of Transportation in conjunction with the 1972 Highway Needs Study looked at the effect of staggered work hours. It indicated that there would be a 12% reduction in highway investment needs for 1970-1990 in urban areas of over 1 million population, if all work travel within the morning and afternoon peak hours were distributed uniformly throughout the peak period. In this connection, the results reported to us from the Lower Manhattan experiment indicate a general reduction in crowding and congestion.

Passenger counts on the Port Authority Trans-Hudson rapid transit line showed a 13% reduction in the peak, with the difference being spread over the previous hour. A reduction of 6% was also found at New York transit stations in the area during the morning peak. More dramatic reductions in building and elevator congestion were also reported. This project was implemented at reported cost of around $50,000.

In general, the following kinds of results are likely to occur, depending on the size of the project and the degree of cooperation:

—A reduction in congestion of transportation facilities, roads, elevators, and perhaps restaurant facilities and stores, if lunch hours are staggered as well.
—A reduction in commuting time. This is less of a potential for a fixed rail facility but offers greater possibility where access is principally by road.
—Increased worker efficiency, if the workers see measurable benefit from the new working arrangements.
—Reduction in pollution, resulting from the cutting down of stop and go driving.

These results would vary, of course, based on the magnitude of the

shift. A single firm may stagger work hours for its employees and have no effect on overall congestion, while a project involving a significant portion of the downtown area has a great deal of potential.

However, since urban life is interrelated, the following potentially troublesome aspects must also be examined in connection with a staggered work hour attempt:

—Staggering may make the formation of car pools difficult or impossible.
—The staggering must be carefully coordinated with mass transit schedules. Such schedules are difficult to change and a change is fairly expensive for the transit operator.
—If road congestion is reduced, employees may shift from mass transit to the automobiles.
—Inter-action between firms during the early and late parts of the work day will be reduced.
—The effect on all parts of the transportation system must be analyzed. For example, even if transit stations in Lower Manhattan were less congested, what was the effect on transit stations in other areas? Were new peaks created?

Institutional inflexibility seems to be the major impediment to implementing a comprehensive program of staggered work hours. Most organizations in the central business districts are autonomous. Lack of cooperation among firms and employees seem to be responsible for the lack of success of staggering in London and Atlanta. In this regard, the New York Times of April 6 reported in dispute in Flemington, New Jersey over a 3-day work week at the Lipton plant. One of the major sources of concern seemed to center on the "highhanded" manner in which the program was imposed on the employees without their consultation. This story highlights the need to work closely with all affected parties both employers and employees in implementing any major new programs.

In London, staggered hours were instituted in 1959 for 145 firms. However, these firms were scattered over the central business district, rather than being concentrated in one area as in the case of Lower Manhattan area project. Twenty-one thousand employees participated but this was a small percentage of the 1,000,000 daily commuters in London. The project was organized by the British Ministry of Transport and not by a smaller local merchants' group. The Ministry met much opposition to changing work hours. As a result, all firms expressing interest were made part of the project, despite their diverse geographic locations. Seventy-two percent of the firms approached by the government group refused to participate for the following reasons: loss of business efficiency; contacts

with customers, and business associates would be limited; and the need to maintain business hours and maximize periods for intercontinental communications. Twenty-three percent of the firms also stressed staffing problems. Firms felt they could not risk losing present employees nor impede further recruitment by adopting what employees regard as unattractive hours.

For London it is quite possible that no substantial change in processing efficiency resulted from the changes in hours that were made. Not only were the involved firms spread throughout the city, but the hour changes were very small, usually fifteen minutes rather than the thirty minute changes that prevailed in New York City.

Let me say a few words about the experience of the Federal Government in Washington, D.C. to stagger work hours. Prior to 1941, over 95% of all federal employees in Washington began work between 8:30 and 9:00. The Bureau of the Budget devised a staggered work hour plan in 1941 for federal employees in an attempt to relieve traffic congestion. The plan, which staggers arrival times from 7:00 to 9:00 in 15-minute intervals, has been in operation since the mid 1940's. However, 1963 study revealed that despite the plan, over half (57.4%) of the federal employees arrived between 8:30 and 9:00. A remedial plan suggested by the 1963 was not adopted, but most new federal buildings constructed since that time have experimented with staggered hours.

The two most recent examples of federal attempts have been the Southwest Mall employment area where the Department of Transportation building happens to be located, and Crystal City in Virginia just outside of Washington. Both projects had three advantages. First, the Federal Government was the major employer in both locations. Second, the plans were tied with New York locations which decreased employee resistance since new travel patterns were required anyway. Third, a single entity, the Government Services Administration made all the moving and staggering arrangements. GSA very carefully polled employee attitudes to determine preferences, and arranged the work hours to match the preferences as much as possible. GSA worked closely with transit companies to accommodate the revised work hours and the New York locations. Unfortunately, no attempt was made to record the actual effect of the staggering plan. Since both projects involved new employment locations, "before" data was meaningless. No specific data is available on time savings, volume processed, or costs. However, the plan seems to be operating quite efficiently and there seems to be a high degree of employee acceptance.

Regarding institutional constraints, and city or area considering work

scheduling changes should pose these key policy questions in evaluating the adoption of work hour changes in their area:

1. Is there a single, large employer, e.g., the Federal Government, or a strong merchants' association within a specific portion of the central business district, favourable to the plan?
2. Does the proposed plan concentrate on a specific work area or portion of the central business district, or does it apply instead to the whole city or region?
3. Is it likely that public transit will cooperate in making any routing or scheduling additions or changes necessary? The plan may work best in areas where transit is fairly solvent or is publicly controlled.
4. Is the area involved one which has a concentration of administrative offices or an area of offices or stores depending heavily on consumer contact?
5. Is the area one in which most offices are to be newly opened, so that employee scheduling and arrangements are disrupted anyway?
6. Is the plan one which union officials will accept? Note that unions generally oppose longer daily hours as well as a reduced number of days per week in which the days off are not consecutive.

In any further study of staggered work hours, an important question is the extent to which hours can be changed without interfering with the functions of the affected businesses or public agencies. Without this data, campaigns to persuade reluctant employers and employees would be premature. More investigation into employer, union, and employee attitudes on the effect of changes in hours on contracts, day-to-day transportation arrangements and office procedures is needed.

D. Gliding Work Hours

An informal approach to staggering work hours is being tried in Germany. Each employee chooses his own work day between the hours of 7 a.m. and 7 p.m. This method called "Gleitende Arbeitszeit", or, Gleitzeit (gliding work time), is currently in effect in the Lufthansa headquarters office in Cologne and in the Boelkow aircraft plant in Munich. This approach has the double advantage of reducing congestion and providing a freedom of choice for employees.

Under this approach, workers can adjust their work time according to their own preferences. Punching a time clock is required to verify the time actually worked. Varying degrees of flexibility can be incorporated. The

least flexible is to require an 8-hour day, 40-hour week every week. Variations would include requiring a 40-hour week, with the number and length of work days left to the employee; or to require a monthly total, with no daily or weekly requirements. These latter alternatives would provide significant new freedom to the worker and must be viewed for its impact on life styles and behavior. New life styles are possible. It would have a significant impact on recreational resources, and could significantly reduce *weekend* congestion, which is even more serious in some areas than workday peaks.

The possible disadvantages of Gleitzeit include the following:

—Although peak hours are reduced, they may vary significantly from day to day, depending on individual preferences.
—Interoffice communication is affected even more than through other formal staggering arrangements. Under formal hours, the availability of people is predictable; it would not be in the floating hours under Gleitzeit.
—Labor laws and union work agreements may restrict the flexibility possible.

The advantages would include:

—Reduced peak hour congestion, but not necessarily on a predictable basis.
—Significant flexibility. Recreation, other business activities, and medical appointments could be more easily accommodated.
—More opportuity for women with children to arrange their work hours to accommodate school hours, day care centers, baby sitters, or availability of the husband to care for the children.

E. Changes in The Work Week

A third approach to peak spreading is adoption of a 3 or 4 day work week at one end of the scale and spreading work over 5 or 6 days at the other end. By mid 1971, about 600 firms offered some form of the four-day work week for at least part of their employees. Days off either float or are lumped into long weekends. There are indications that an expansion of this approach is likely to continue. Already, Congress has rescheduled several national holidays so that they fall on Mondays, thereby creating four day work weeks. The New York Times reports that more than 1,000 companies across the country are close to instituting a four day work week. New Jersey presently has 65 companies using the shortened schedule, New York 34 and Connecticut 31.

The impetus for 4 day work weeks has come from management. The

results are overwhelmingly favorable, namely:

—Greater productivity and lower unit cost,
—Improved morale, and
—Reduced absenteeism, tardiness, and turnover.

For manufacturing plants, the higher output is attributed to the reduction in starting and closing down relative to operating time, and the tailoring of work schedules to fit the time required for completing a specific operation rather than to a standard work week. For businesses, increased productivity is due to fewer and shorter meetings, fewer non-productive hours, better pre-planning of agendas and improved work-load planning.

From the worker's point of view, the four-day week is appealing for the following reasons:

—An increase in his usable leisure time.
—A decrease in the number of commuting trips, and hence in the cost and the amount of time spent commuting,
—Reduction in other costs associated with commuting, e.g., transit fares, restaurant lunches, and child care.

In terms of the transportation system itself, the four-day week provides a means of reducing congestion and improving transportation service without additional investment in equipment and facilities. If all workers is an urban area worked four ten-hour days every week, the number of daily commuting trips would be reduced by a fifth if employment were distributed evenly over five days, Monday-Friday; and would be reduced by one-third if employment were distributed for six days, Monday-Saturday. Even if only one-third of all employees participated in a four-day week, it would result in substantial economies from their staggering during the four days when 100% of the labor force were at work, and some reduction in the number of trips on the fifty day during the peak, as a consequence of those not working.

Analysis of this latter schedule for Los Angeles indicates a potential reduction for the Los Angeles central business district of 8% in the traffic peak during the first four days and 15% during the fifth day. In the former schedule with all employees on a four-day work week uniformly spread over 5 days, the reduction would amount to 25%.

The increased leisure time resulting from three day weekends could mean a different life style for many people. There would be increased demand for second homes in the country, a need for more recreational resources, and second jobs. Present weekend peaks would be reduced.

Certain adverse consequences of a four-day work week must be anticipated:

—More weekend travel may result in a much higher number of automobile accidents than we have presently. Current injury accident rates are about 30% higher on weekends than on week days. Also, three days weekends have a much higher proportionate accident rate than two-day weekends.
—Mid-week peaks, Tuesday through Thursday, would not necessarily be reduced.
—Since people would be working 10-hour days, a major rescheduling of transit facilities would be necessary. This is difficult to accomplish and expensive for the transit operator.
—Since each person's work week would be reduced by one day, the total revenue of mass transit companies could fall significantly. Opposition is likely from labor unions who oppose lengthening the 8-hour work day.
—Some legislative changes would be necessary, since overtime rates are often required for work days longer than 8 hours.
—Worker productivity may fall as the result of a lengthened work day. The efficiency tests used to justify a reduction of the work day from 10 to 8 hours indicated that there would be no appreciable loss in output due to increased efficiency during the shorter day. Now we must see the effect on productivity of lengthening the work day again. The Lipton plant experiment in New Jersey created employee opposition to the 12 hour shifts required, according to the New York Times. The issue of employee efficiency and acceptability remains to be explored farther.

III. Federal Policy

I should like to comment on the policy of the U.S. Department of Transportation regarding staggering work hours. In recent years, the Department of Transportation has begun to place high priority on a variety of low capital improvements to existing transportation systems. These techniques offer extremely high rewards in increased capacity, particularly as compared to the investment required, and they have a relatively short lead time. Exclusive bus lanes in particular have been tried in a number of cities and have proved to be highly successful. Staggering work hours is an important element in this package of low cost alternatives. Secretary Volpe and Federal Highway Administrator Turner have both emphasized the importance of staggered work hours on a number of occasions. I have already mentioned the work of the Federal

Government in implementing staggered work hours for its own employees.

Unfortunately, there is no single source of federal funds, or of managing funds on behalf of a staggered work hours program, but there are several areas where funds might possibly be utilized. The traffic studies and traffic operations aspects of such a program may be eligible within the TOPIC's program funded by the Federal Highway Administration and the state highway departments. Application could be made for Urban Mass Transportation Administration planning funds to determine mass transit needs and to facilitate necessary rescheduling. In addition, the Department of Labor may have funds available for studies of personnel.

I also want to mention a proposal now before the Congress. As most of you are aware, Secretary Volpe has suggested the broadening of the use of the Highway Trust Fund in the 1972 Federal-Aid Highway Act. His proposal would create a Single Urban Fund for expenditure in large urban areas on any highway or mass transportation improvement. Forty percent of this money would be passed through directly to metropolitan areas. This program would provide broad new flexibility to urban areas to define their own transportation needs and make their own decisions of appropriate transportation investment. If local areas wished to emphasize low capital improvements to existing transportation facilities, this should provide the needed resources. Therefore, I commend Secretary Volpe's proposals for your review and suggest that they would give local areas significant new opportunities to implement schemes such as these discussed.

IV. Conclusion

In conclusion, let me reemphasize that staggering work hours, as one of a variety of low capital alternatives, offers the potential of substantial reductions in peak hour commuter travel and improving travel service with little capital cost for transportation facilities.

Institutional inflexibility must be overcome, and the needs of employers and employees must be carefully considered to implement a successful program. However, those programs presently underway show favorable employer and employee response without a loss in business efficiency.

Therefore, all signs point to *go* in this area.