COMMUTING COSTS FOR COMMUNITY COLLEGE STUDENTS

by William Hyde

In calculating student financial aid awards and in estimating the likely enrollment response to changes in education costs, several costs are considered. They typically include tuition and fees, room and board for on-campus residents and transportation for commuters, books and supplies and miscellaneous and personal expenses. While there is disagreement over how costs should be defined and measured, possible errors in computing costs affect uniformly all institutional sectors with one exception. Commuting costs affect the average community college student budget more than the budgets of students attending other institutions. Conventional estimates of commuting costs underestimate the average budget of a commuting student. Analysis of data from the 1978 Current Population Survey (CPS) of the Bureau of the Census shows that commuting costs are substantially more than those reported by the College Scholarship Service (CSS), and the disparity is greater for the average community college student than for other students.

A commuting student incurs two costs: the cost of transportation and the cost of time spent commuting. Each of these costs is discussed separately.

The Cost of Transportation

CPS data show that, among community college students, 95.4 percent live at home and commute, and 89.9 percent of the commuters commute by automobile, making it the most popular means of attending classes. The mean one-way distance of full-time community college students who commute by automobile is 10.2 miles. Assuming that the student attends four days[1] a week for a full nine month year, the annual commuting distance is 2,938 miles. If a cost of 20 cents per mile is used to estimate the cost of commuting by automobile, the average transportation cost is $588, which is 36 percent higher than the $432 transportation cost for commuting community college students reported by the College Scholarship Service.[2]

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[1]This is probably a conservative estimate. A maximum estimate of the average number of days for attending class is five, and a practical minimum is three. Probably full-time students attend five days a week more often than three.

[2]Elizabeth W. Suchar, Stephen H. Ivens, and Edmond C. Jacobson, *Student Expenses at Postsecondary Institutions* 1978-79. (New York: College Entrance Examination Board, 1978), p. vii.

This greater cost of $156 (the difference between $588 and $432) would raise the community college commuter budget by 6.4 percent if (1) all commuters commuted by automobile or (2) the average cost was 20 cents per mile for all forms of commuting. However, some commute by other means. If the transportation costs reported by CSS approximate the actual nonautomotive transportation costs of commuting students, the effect of the estimated higher automobile commuting costs on the average commuter budget can be calculated by weighing the budgets by the number of students using a particular mode of transportation. Using data from CSS, the average annual budget for a full-time commuting student at a community college is $2,426. If the budget is adjusted for the CPS-derived higher transportation cost, the budget is $2,566, calculated in the following way:

CSS commuter budget	times	percentage of commuters commuting by nonautomotive means
$2,426	x	10.1 percent
plus		
CSS commuter budget adjusted for the CPS derived transportation cost	times	percentage of commuters commuting by automobile
$2,582	x	89.9 percent

equals $2,566. This is $140 or 5.8 percent higher than that reported by CSS.

This bias is not as severe for students attending other institutions because (1) transportation costs constitute a smaller fraction of the larger four-year institution student budgets and (2) fewer commuting students in other institutional sectors commute by automobile. The CSS reported estimates of transportation costs for public and private four-year institutions are $415 and $356 respectively. The CSS budgets and the CSS budgets adjusted for the CPS derived transportation costs are as follows for public and private four-year institutions: (Private two-year institutions are excluded because of small sample size.)

Public four-year institution

CSS commuter budget	times	percentage of commuters commuting by nonautomotive means
$2,604	x	20.6 percent
plus		
CSS commuter budget adjusted for the CPS derived transportation cost	times	percentage of commuters commuting by automobile
$2,777	x	79.4 percent

equals $2,741, an increase of $137 or 5.3 percent over the CSS commuter budget of $2,604.

Public four-year institution

CSS commuter budget	times	percentage of commuters commuting by nonautomotive means
$4,577	x	24.7 percent
plus		
CSS commuter budget adjusted for the CPS derived transportation cost	times	percentage of commuters commuting by automobile
$4,809	x	75.3 percent

equals $4,752, an increase of $175 or 3.8 percent over the CSS commuter budget of $4,577.

Even though the budget adjustment for transportation costs results in the greatest percentage change for community colleges, a greater relative difference would occur if a comparison is made which takes into consideration the proportion of commuting students in each institutional sector. Nearly all (95.4 percent) community college students commute and 89.9 percent of commuters commute by automobile so that the CPS transportation cost adjustment affects the vast majority (85.6 percent) of community college students. In contrast to this are students at public four-year institutions for which only 51.5 percent of the students live at home and commute by automobile contrasted to 44.0 percent of the students at private four-year institutions. If the commuter and resident student budgets are weighed, by the proportion of students in each sector commuting or residing on or near campus, to generate a hypothetical average budget, then the impact of the transportation costs becomes more apparent as shown in Table 1.

The average budget for the community college student would be $2,571 or 5.5 percent larger than the average community college budget that does not take into consideration the CPS-derived estimate of transportation costs. Comparable figures for public and private four-year institution student budgets are $2,851 (or a 3.2 percent increase) and $4,901 (or a 2.1 percent increase) respectively.

The relative effect of the transportation cost could be still greater than estimated depending upon how other costs are defined. The current practice is to include tuition and fees, board and room if residing away from home and transportation if commuting from home, books and supplies and miscellaneous and personal expenses in computing the student budget. However, some of these costs are costs that a person will incur regardless of whether he or she attends college. For example, most of the cost for board and personal expenses occurs anyway. It has been estimated that the actual additional nontuition cost of attending college may be as little as half of the student budget amount reported by CSS (Nelson, 1979). Consequently, transportation costs and the differences among institution sector budgets would comprise twice as large a portion of the student budget calculated in this way.

It should be pointed out that these estimates of transportation costs are sensitive to two main assumptions underlying the calculations. One assumption is

Table 1
COMPARISON OF AVERAGE STUDENT'S BUDGETS
BY INSTITUTIONAL SECTOR

Type of Budget	Public Two-Year Budget	Public Two-Year Proportion of Students	Public Four-Year Budget	Public Four-Year Proportion of Students	Private Four-Year Budget	Private Four-Year Proportion of Students
A. Reported by CSS						
(1) resident	$2,666 x	.046	$3,054 x	.352	$5,110 x	.416
(2) commuter	2,426 x	.954	2,604 x	.648	4,577 x	.584
(3) sum of (1) + (2)	= $2,437		= $2,762		= $4,799	
B. Adjusted for CPS derived transportation costs						
(1) resident	$2,666 x	.046	$3,054 x	.352	$5,110 x	.426
(2) commuter (nonautomobile)	2,582 x	.856	2,777 x	.515	4,809 x	.440
(3) commuter (automobile)	2,426 x	.098	2,604 x	.133	4,577 x	.144
(4) sum of (1) + (2) + (3)	= $2,571		= $2,851		= $4,901	
Percentage increase (A (3) /B (4) x100)	5.5 percent		3.2 percent		2.1 percent	

that the student, on average, attends classes four days a week. If the actual average were five, for example, all of the cost estimates would be increased by 20 percent. The choice of four days as the average seems reasonable and slightly conservative. There probably are full-time students who attend classes only three days a week.

The other assumption is that the cost of maintaining and operating an automobile is 20 cents per mile. If one examines reimbursement policies of employers for employees' use of their own private automobiles, common rates are currently 17 or 18 cents a mile, and it is well known that those rates lag behind actual costs. Rates among commercial car rental agencies (even excluding overhead costs) are much higher, but their depreciation rate is greater than what is normally expected of most individual car owners who generally keep a car for a longer period of time than a car rental agency. Both of the assumptions, therefore, lead to conservative estimates of the greater costs borne by community college students.

Finally it should be mentioned that it is difficult to assess whether automobile commuting costs are more or less than commuting costs by other means. Much depends on what alternatives exist and on what government subsidies are provided. While public transportation may cost the individual less than private transportation, the convenience of public transportation is usually less and requires spending more time commuting, which raises the second issue of commuting costs, the cost of commuting time.

Imputed Cost of Commuting Time

A cost that is regularly omitted from calculations of the cost of education is the value of time spent directly or indirectly obtaining the education. The imputed value assigned to such time depends upon the value of opportunities foregone. For a full-time adult student, a popular value of the time spent learning is considered to be the wages he or she could earn if working, but policymakers in the United States have been reluctant to include foregone earnings in calculating the cost of obtaining an education and in calculating student financial need. While one may argue that foregone earnings should be included in calculating costs, omission affects all sectors uniformly if it is assumed that time spent per credit hour in class and studying is the same in all sectors.

However, the failure to recognize commuting time as a cost of education has a greater effect on the budget of a community college student than on budgets of students at other institutions because commuting time is not uniformly distributed among sectors. Most of the commuting time is borne by community college students, and the degree of underestimation of this cost is greater for the average community college student than for the average student attending elsewhere.

Estimating the value of the additional time spent commuting by the student who lives at home consists of two parts: (1) calculating the amount of time spent commuting and (2) determining a value per unit of commuting time. In both instances, it is the marginal amount and cost of time that is sought for estimating the additional costs that must be incurred to go to college.

An estimation of the amount of additional time that has to be spent by a community college commuting student was derived from the results of regressing

commuting time, T, on commuting distance, D[3]. The regression yielded the following result:

$$T = 9.93 + 1.25D$$

The constant, 9.93, is the number of minutes that every commuter spends regardless of the distance traveled. This time can be interpreted as the time probably spent in parking, getting in and out of the car, and walking to and from the classroom building. It is fair to assume that this amount of time is also spent by noncommuters who must also go from building to building even though the distance traveled is insignificant in relation to the distance traveled by automobile by a commuter. Since approximately ten minutes are spent in this way by both commuter and noncommuter, the value of this time should not be included in the calculation of the additional cost of commuting.

The second term indicates that it takes, once travel has begun, an average of 1.25 minutes to travel a mile by car. Since the average one-way distance for a full-time community college student is 10.2 miles, the average amount of additional time that a commuting student must spend to attend classes is 12.75 minutes per trip or 61.2 hours per academic year. This is probably a conservative estimate because people are likely to underestimate the amount of time it takes to commute. Furthermore, an average speed of 48 miles per hour (60 minutes divided by 1.25 minutes per mile) is higher than can be expected, since many commuters are driving in metropolitan areas where the average speed is undoubtedly considerably lower.

It is uncertain what value should be assigned to these hours of commuting time. If the time spent in commuting could be used to earn income if not commuting, then the value of that time might be measured in terms of the amount of additional income that could be earned. If the time spent in commuting could be used only in nonincome-producing ways, then the value of the time is more difficult to assess. Although the commuter might not be able to earn income during the time he or she is commuting, the person does forego activities, such as spending time with his or her family or using that time to pursue other interests that are valued. Furthermore, commuting itself may be of some value to the commuter. Driving can be viewed as a transitory activity, allowing a person time to think about the classes he or she is attending, to think about other things, or simply to rest and daydream. Consequently, the additional education cost of commuting time should be defined as the difference in the value to the student of commuting time and the value to the student of spending that time pursuing his or her best available alternative.

An estimate of this cost can be derived from results of a survey by Hyde[4] of individuals' preferences for paying certain tuition amounts and commuting for

[3]Six time categories and ten distance categories defined the range of values.

[4]William Hyde, "Differences Between Youths and Adults in Educational Interests and Preferences for Delivery Mechanisms," *Journal of Education Finance* (August 1980).

certain lengths of time. In a series of related questions, each question asks the respondent to choose between two options, the difference between the options being that one option involves paying less tuition but commuting more than the other option. A schedule of values of commuting time can be derived from the answers. For conventional collegiate-age youths, the estimate of the value of commuting time is about four dollars an hour. For adults the value of time is about 15 percent greater. On a yearly basis the respective average costs would be $245 and $282 for the community college commuter. Although this cost is not explicitly included in a student's budget, it is an important hidden cost, and it affects half again as many community college students as the number of students attending four-year institutions.

Commuting Time and Distance for Different Students

Separate estimates of average commuting time and distance for community college students were made for part-time and full-time students and for the conventional collegiate youths (those less than twenty years old) and for adults (twenty years old and older) and are given in Table 2. Two important observations can be made. One is that the conventional collegiate-age students commute, on average, for greater time and distance than adults, supporting the reported finding that adults value time more highly than youths. The differences in commuting time and distance are not significant between conventional and adult full-time students; the difference is significant for the commuting distance for part-time students taking one to five credit hours; and the differences are significant for both distance and time for all students (full-time plus all part-time students). The greater significance for all students reflects primarily the larger sample size rather than a change in the difference in the means or standard deviations.

The second noteworthy obvservation is that full-time students commute significantly greater distance and time than part-time students taking one to five credit hours of instruction. The reason for this difference is not completely clear. The difference may be due to a difference in the purposes for attending. For instance, the full-time student may be more serious in his or her educational objectives of achieving a certificate or degree and has made a greater commitment than the part-time student who may be enrolled for a more casual purpose, for example, for learning an avocation. The difference also reflects the dominance of adults among part-time students.

Summary and Conclusion

There are several costs of education and some of them are not as apparent as others. The purpose of this paper was to estimate commuting costs, one of the costs that has been examined closely in the past. Results show that commuting costs, even when defined conservatively, are substantially underestimated and that the underestimation is greater for students at community colleges than for students at four-year institutions. A conservative estimate is that transportation costs are a third more than conventionally estimated, and the percentage change in the average student budget is about twice as much for the community college

Table 2
COMMUTING TIME AND DISTANCE
FOR FULL-TIME COMMUNITY COLLEGE
STUDENTS COMMUTING BY AUTOMOBILE, FALL 1978

	Age		
	19 or less	20 or more	Total
Full-Time			
Distance, mean	10.6	9.7	10.2**
standard deviation	7.9	7.9	7.9
Time, mean	23.9	22.6	23.3**
standard deviation	13.0	13.7	13.3
Number of observations	300	255	555
Part-Time (1-5 credit hours)			
Distance, mean	11.3*	8.5*	8.7**
standard deviation	7.6	7.5	7.5
Time, mean	20.8	20.6	20.6**
standard deviation	10.0	13.0	12.8
Number of observations	31	389	420
Total			
Distance, mean	10.5**	9.2**	9.6
standard deviation	8.0	7.8	7.8
Time, mean	23.2**	21.3**	21.9
standard deviation	12.5	13.0	12.9
Number of observations	377	962	1339

*, significant at the .05 level
**, significant at the .01 level

student as for the average student attending a four-year institution. Furthermore, the hidden cost of the value of time spent commuting is greater than the transportation cost and, as with the transportation cost, affects community college students more than other students.

These results indicate that the cost differences among institutional sectors may not be as great as generally considered. If this is true, it suggests that prospective students are more sensitive to cost differences than previously thought. Furthermore, the greater value of commuting time (and perhaps any time) to adults suggests that institutions can not expect prospective adult students to be as responsive as conventional youths to courses offered through traditional instructional delivery mechanisms.