

The Impacts of the Segregation Wall on Travel Behavior in the Palestinian Territory

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ABSTRACT

This study examines the affects of the Israeli political decision to construct a separation wall in the West Bank. This wall resulted in the closure of main roads, divided regions and cities from each other, and cuts off public transportation lines for a number of communities which the Wall isolates. Additionally, the separation wall blocks access to destinations that exist outside the borders of the west bank, especially in Israel, where a considerable number of job opportunities exist.

The main objectives of this study are: first, to examine the impacts of the segregation wall on Palestinian daily travel behavior, including: travel time, number of trips, travel modes, travel destinations and travel purposes. The second objective is to identify changes in accessibility to various activities including work, leisure and shopping. The third objective is to examine how changes in mobility and accessibility influence people's standard of living, well being, and welfare. The final objective attempts to highlight the travel behavior differences between the Palestinians and Arab Israeli minority, who also suffer from State discrimination but still have the freedom to move and travel within and outside the Israeli borders (except most of the Arab countries). For the research's purpose three Palestinian communities affected by the wall construction were selected: Qalqilya, Jayyus, and Aida Camp, in addition to Majd Al-Krum which is an Israeli Arab town. This study utilized a descriptive data analysis and comparative method was applied to explore the various impacts of the wall construction on travel behavior. Data collection based on the survey includes 183 Palestinian households from the West Bank and 101 Arab Israeli households.

The results of the study indicate that significant changes in the Palestinian's travel behavior occurred due to the separation wall. Trip distance and travel time have increased, and changes in destination and travel mode were observed. Access to agriculture land and to the Israeli areas was restricted to the Palestinian population and as a consequence limited their accessibility to job opportunities. The wall led to severe deterioration in the Palestinians quality of life, restricted their ability to visit their relatives and their friends, as well as limited their participation in various social activities.

Keywords: West Bank, Palestine Territory, Travel Behavior, Separation Wall

1. INTRODUCTION

This study starts by presenting the story of Hasan, a Palestinian child from the West Bank who suffers from the separation Wall:

Hasan: Look dad how beautiful this car is. Buy us one.

Hasan's father: Why should we buy a car?

Hasan: In order to visit my sister and go to the beach.

Father: Don't you see those high walls at the west and the military barriers at the east? We can't go anywhere with a car.

Hasan: But what is there beyond these walls?

Hasan's father: There is a state for the Jews called Israel.

Child Hasan: What do we benefit from our neighbors?

Hasan's father: We walk instead of using cars. In this way we don't get fat and don't care about fuel high prices. And because of that we have less road accidents and breathe cleaner air. True we have pedestrian congestion at the barriers but mostly with no casualties. True we can't go to work but we can stay at home and enjoy our time together.

Hasan's story is shared by every child in the West Bank and clearly shows that promoting sustainable travel behavior should not come on the account of accessibility. Accessibility is a concept that has taken on a variety of meanings, including the amount of effort for a person to reach a destination, the number of activities which can be reached from a certain location (see Geurs, 2004; for an overview), or the freedom of individuals to participate in activities in the environment (Weibull, 1980).

Many research studies have attempted to examine the relationship between infrastructure investments, land use changes and accessibility (see Geurs, 2004; Wegener, 2000; Handy, 2005). Land use and the transportation system provides people with access to various activities, including job opportunities and recreation, which provide them with social and economic benefits. Furthermore, the level of accessibility to opportunities affects various household decisions, such as where to reside, work, study, and participate in leisure activities. Therefore, improving accessibility level would decrease travel time and cost for individuals. Furthermore, more destinations may be reachable in a given travel time. Changes in accessibility as a result of changes in the transportation system and land uses can have significant economic and social impacts, i.e. it, may influence people's standard of living, well being and welfare (Geurs, 2001). Furst et al. (1999), Furst et al. (2000), Spiekermann and Wegener (2006) and Wegener et al. (2000) showed a positive relationship between accessibility level and productivity and economic development (in terms of GDP) since improving commuting conditions may improve the labour market, giving rise to improved productivity (Johansson, 1995; Prud'homme & Lee 1999).

Changes in accessibility level have equity aspects. According to the economic literature (Gerus, 2004) equity is normally used to refer to fairness in the distribution of goods and services among groups of individuals, and many studies indicated a positive relationship between accessibility to various opportunities and equity (Wach & Kumagai, 1973; Domanski, 1979; Shen, 1998; Zhang et al., 1998; Talen & Anselin, 1998; Schurmann et al., 1997; Furst et al., 1999).

This study deals with a unique situation that resulted due to a political decision to construct a separation wall between Palestine and Israel, which resulted in closure of main roads, division of regions and cities from each other, and cutting off public transportation lines for a number of communities which the wall isolates. Additionally, it blocked access to destinations that exist outside the borders of the West Bank, especially to Israel, where a considerable number of job opportunities exist.

The main objectives of this study are: first, to examine the impacts of the segregation wall on Palestinian daily travel behavior, including: travel time, number of trips, travel modes, travel destinations and trip purposes. The second objective is to identify changes in accessibility to various activities including work, leisure and shopping. The third objective is to examine how changes in mobility and accessibility influence people's standard of living and well being. The final objective attempts to highlight differences in travel behavior between the Palestinians and Arab Israeli minority, who also suffer from State discrimination but still have the freedom to move and travel within and outside the Israeli borders (except most of the Arab countries). For the research's purpose three Palestinian communities affected by the wall construction were selected: Qalqilya, Jayyus, Aida Camp, in addition to Majd Al-Krum which is an Israeli Arab town. This study utilized a descriptive data analysis and comparative method was applied to explore the various impacts of the wall construction on travel behavior.

2. BACKGROUND

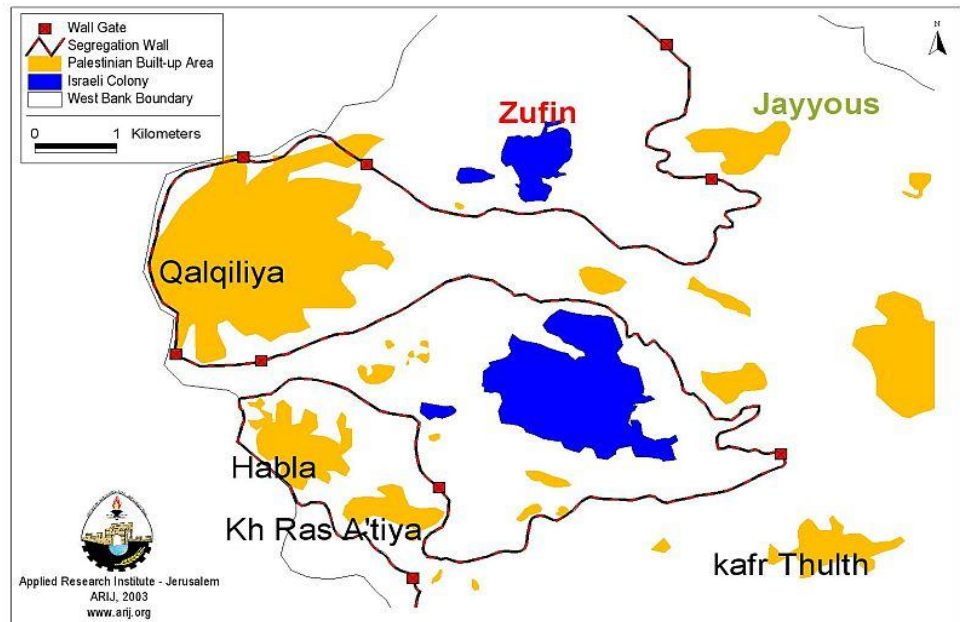
In April 2002, the Israeli authorities began construction of a Segregation Wall in the West Bank. The wall when completed will isolate areas located between the wall and the 1949 Armistice Line, which comprises 46% of the total area of the West Bank (Abu Esheh, 2004). The total length of the wall once completed is estimated to be 788 kilometers, three times as long and twice as high as the Berlin wall (Shalhoub-Kevorkian, 2007). The majority of the wall complex consists of multiple components that vary in width between 30 and 100 meters and are up to 8 meters high (ICJ, 2004). This wall is not only separating Palestinians from Israelis, it is fragmenting Palestinian communities and isolating them from their lands, support networks and other facilities in neighboring towns (Al-Sahili, 2007). Pertinent information on the case study is provided below, including diagrams showing the relative placement of the security barrier for each enclave. Each study location is described in the numeric sequence shown in Fig. 1, beginning with the northern-most site and moving south.

Enclave 1: Jayyus

A West Bank village (Figure 1a) with a total area of 12,500 dunams (dunam=1000 sq ms). As of 2006, a Jayyus had a population of 3,300 people comprising 550 households. Barrier construction in the vicinity began in September 2002 and was completed by 2003. As shown in Fig. 1a, the barrier runs in a semi-circular path, primarily bounding the village's westerly perimeter at a distance of as little as 200 meters.

Enclave 2: Qalqilya

A West Bank town (Figure 1a) with a total area of 25.6 km² and a population of 44,700 people comprising 7,980 households. The barrier construction in the vicinity began in September 2002, and was completed by 2003, and as illustrated in Fig. 1a, nearly encircles the enclave. Access to and from the city is controlled by the Israeli Defense Forces. Following the construction,



The Wall around Bethlehem - February 2005

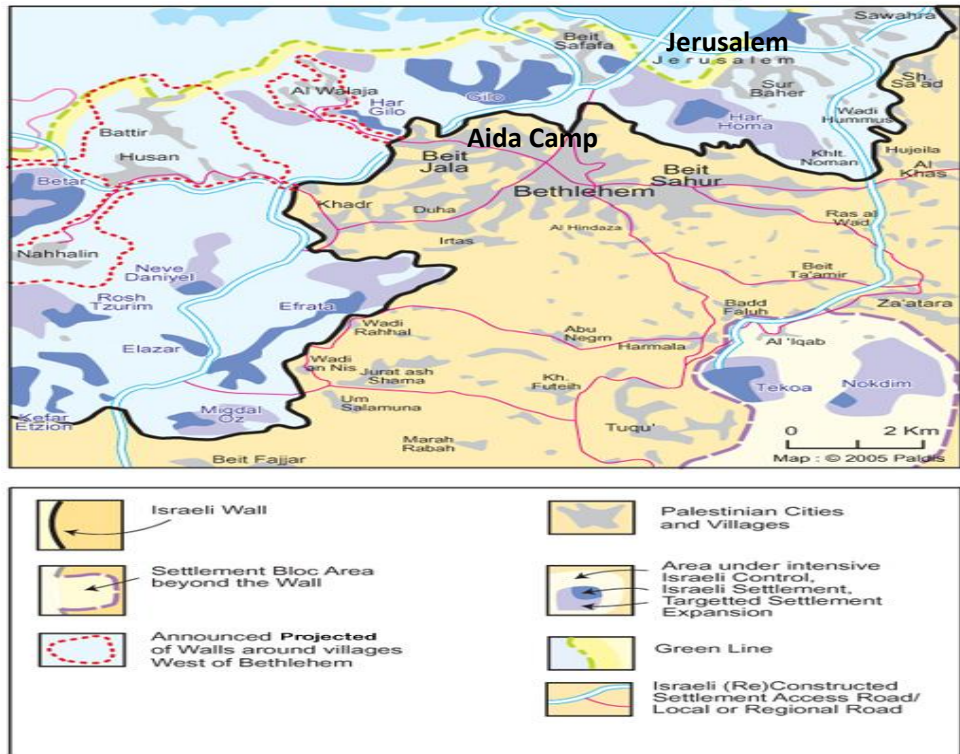


Figure 1. The Wall around Qalqiliya, Jayyus and Aida Camp

employment in neighboring centers essentially ceased to exist, while part-time work activity the enclave increased.

Enclaves 3: Aida Camp

Aida Camp is part of the West Bank's Bethlehem Governorate. Established in 1948 to accommodate Palestinian refugees of the Arab-Israeli War, Enclave 3 currently has a population of 3,250 people in 580 households. The barrier was constructed in this vicinity in 2003, and divides Bethlehem's city center and partially encircles Aida Camp, Fig 1b. The wall runs along the northern part of Aida Camp as described in Fig 1b. The wall has isolated Aida Camp completely from Jerusalem and limited access of the laborers to Israeli areas.

Arab Israeli Town: Majd Al-Krum

Majd Al-Krum is an Arab town located in Northern Israel and has a population of 12,700 residents, comprising 2,320 households.

3. METHODOLOGY

To understand the impacts of the Wall construction on travel behavior, and to understand the role of accessibility and mobility on individual's travel behavior and on people's well being and, a descriptive comparative analysis was conducted. The significance of the changes in mode choice, travel time, the number of trips before and after the wall construction, as well as differences in travel behavior between Palestinians from the West Bank and Arab Israeli citizens were tested using t-test, One-Way ANOVA, and Tukey's post hoc tests and Pearson's χ^2 test, with the confidence interval of 95%.

The study is based on extensive data collection, including demographic and socio economic characteristics and travel behavior. The data were collected by household surveys in the selected communities. The survey included questions about detailed socio-economic and demographic characteristics and a 24 hour travel diary for each household member over age six. The sample included 183 Palestinian households from the West Bank and 101 Arab Israeli households. In the West Bank, the survey also asked about changes in various variables, such as income level, number of cars in the household, and work type that occurred as a result of the wall construction. Furthermore, the household questionnaires included a comparison between work participation and travel behavior before and after the wall construction, which included the number of workdays, travel mode, travel time, and travel destination.

4. RESULTS

4.1 Socio-economic and demographic characteristics

All four communities, both the Palestinian and Israel towns, share distinct socio-economic characteristics - in particular, low socio-economic status, large household sizes, and high growth rates. From table 1, it is evident that the income level among the Arab Israeli community (Majd Al-Krum) is higher than the Palestinian communities. The striking indicator is the low

motorization rate among the Palestinian communities compared with Majd Al-Krum (Israeli town). Not surprising, the percentage of participants that have driving license is relatively very low in the Palestinian towns and lower than the Arab Israeli participants, especially among the women.

TABLE 1
Socio-Demographic Characteristics of West Bank Communities and Majd Al-Krum

Variable	Unit	Majd Al-Krum	Qalqilya	Jayyus	Ayda Camp	
Population	Total Population	Persons	12,700	44,709	3,307	3,260
	Growth Rate	%	3.25	3.8	3.8	3.5
Households	Total Households	Households	2,320	7,844	538	509
	Average Household Size	%	5.04	5.3	5.4	5.2
Economic	Monthly Income (Before)	₪(₪1 = US\$ 0.23)	-----	4,944	2,355	2,200
	Monthly Income (After)	₪(₪1 = US\$ 0.23)	8.151	2,135	1,155	1,088
	Motorization Rate	Vehicles per 1000	187.1	24.2	35	40
Age Structure	0 to 19	%	49.7	53.4	53.4	51.6
	20 to 64	%	47.2	42.5	42.5	44.6
	65 and Above	%	3.1	4.1	4.1	3.8

*The Israel Central Bureau of Statistics 2007, rates socio-economic levels on a scale from 1 (lowest) to 10 (highest)

The West Bank sample consisted of 241 women and 301 men, ranging in age from 6 to 85 years (mean= 29.18; S.D=16.41). The Arab Israeli sample consisted of 216 women and 211 men, ranging in age from 6 to 93 years (mean= 29.65; S.D=17.37).

In Camp Aida, Qalqilya and Jayyus approximately 50% of the men hold a driving license while 89.7% of the men in Majd Al-Krum hold a driving license. In Camp Aida 13.5% of the women have a driving license; in Qalqilya and Jayyus, only 2.3% of women have a driving license. In comparison, 54.4% of the Arab Israeli women hold a driving license (Table 2). In contrast, the educational level of the Palestinian population is high for both men and women and even higher than the Arab Israeli community, especially the women.

TABLE 2
Distribution of Driving Licenses, Years of Schooling According to Community and Gender*

			Aida camp	Qalqilya and Jayyus	Israeli Arab town Majd Al-Krum
			FREQUENCY (%)	FREQUENCY (%)	FREQUENCY (%)
Years of Schooling	Male	0-9	48 (46.6)	37 (24.8)	40 (29.2)
		10-12	31 (30.1)	43 (28.9)	55 (40.1)
		13+	24 (23.3)	69 (46.3)	42 (30.7)
		Total	103	149	137
	Female	0-9	48 (45.7)	51 (39.5)	43 (32.6)
		10-12	28 (26.7)	44 (34.1)	56 (42.4)
		13+	29 (27.6)	34 (26.4)	33 (25.0)
Total		105	129	132	
Holds Driver's License	Male	Licensed	46 (43.4)	75 (50.3)	122 (89.7)
		Total	106 (100.0)	149 (100.0)	136 (100.0)
	Female	Licensed	14 (13.5)	3 (2.3)	72 (54.5)
		Total	104 (100.0)	129 (100.0)	132 (100.0)

* Participants whose age is over 17

4.2 Travel Behavior –Comparison

Table 3 presents the distribution of the main activity of the interviewed day, which was the day before the interview took place, for participants who are at least 17 years old by gender and community. Four activities are considered: working, education, stay at home and other.

Women participation in the labor force in all the case studies is significantly lower than the men's participation. However, in the three Palestinian communities the women's participation in the labor force is extremely lower than the Palestinian men and the Israeli women as well. Whereas in Majd Al-Krum 35.6% of the women's main purpose of daily travel is work, in Camp Aida, Qalqilya and Jayyus only 8.5% and 13.2% respectively report that the main reason for travel is work. Despite the fact that the educational level of the Palestinian women is higher than the Arab Israeli women, the percentage of working Palestinian women is lower and this result is inconsistent with the literature that showed a positive relationship between human capital which is characterize by education level and the participation in workforce. Education is only one factor affecting participation in the labor force. Without job

opportunities in the local market, there is no chance for the Palestinian women to work and the restrictions of accessibility to various opportunities outside the borders of the town are placed by the wall. One of the most interesting results is the high percentage of Palestinian women that stay at home. More than 50% of Palestinian women stay at home and do not participate in any activity. In Camp Aiad 65.1% of the women stay at home and in Qalqilya and Jayuus 68.3% stay at home. These percentages are significantly higher than the Arab Israeli women. This is also evident among the Palestinian males. In comparison between the Arab Israeli men and the Palestinian men it is evident that the percentage of Palestinians' that stay at home is significantly higher than Arab Israeli men. Table 3 shows that the Palestinians' participation in other activities, such as shopping and leisure, is low and lower than the Arab Israeli participants. Palestinians' women participation in these kinds of activities is significantly lower than Palestinian men, and lower than the Arab Israeli women.

These results may highlight the limited accessibility and freedom of Palestinians to participate in various activities.

TABLE 3
Distribution of the main travel activity for one day (participants over 17)

	Camp Aida		Qalqilya+Jayuus		Israeli Arab town Majd Al-Krum	
	Male n=107	Female n=106	Male n=150	Female n=129	Male n=139	Female n=135
Stay at home	25.2	65.1	7.3	58.9	2.2	21.5
Work	48.6	11.3	66.7	7	68.3	35.6
Study	8.4	8.5	17.3	13.2	5	7.4
Other	17.8	15.1	8.7	20.9	24.5	35.6

Significant difference , $p < 0.0001$)

Table 4 presents the mode shares for all trips before and after the construction of the wall. Non-motorized modes of transportation include both biking and walking, even though very few bicycle trips are recorded. The results show a significant variation between the travel mode before and after the wall construction. In addition, a significant variation in travel mode exists between the Palestinian communities themselves. Not surprisingly, the findings indicate a significant difference in travel mode between the Palestinian communities and the Arab Israeli community. After the wall construction, a significant increase in non-motorized travel was seen in two Palestinian communities, Qalqilya and Jyyus. The striking result is seen in the town of Qalqilya, where after the wall construction more than 70% of trips are non-motorized (walking), while in Israel only 24.5% of the trips are non-motorized. In the last decades, great efforts have been invested to promote sustainable travel behavior, reduce the use of private cars, and encourage walking. However, these results indicate that promoting sustainable travel behavior is only part of the story, and it should not come on the account of accessibility.

The findings show that the percent of car drivers is very low in all the Palestinian communities, with the highest percentage being 17.5% in Aida Camp and the lowest 6.5% in Qalqilya. In contrast, in Majd Al-krum about half of the trips (55.9%) involve driving cars. This result is expected given the very low motorization rates and relatively low percentages of driving

licenses. Therefore, the results show an insignificant decrease in the percentage of public transport use (bus). However, a new phenomenon can be identified particularly in Jayyus, where about a third of the trips involve a combination of bus and walking. This is due to the closed access for motorized modes to various destinations. As a result, busses drop people off at the closest point and then participants continue by foot to the trip destination, which is often Israel or other illegal or closed agriculture areas (this information is based on the study survey). In both Aida Camp and Jayyus the findings indicate a heavy dependence on the bus where more than 40% of trips are by bus. In contrast, in Majd Al-Krum (Israeli community), only 1.7% of the trips are by bus; this difference between the West Bank and Israel is statistically significant, even in Qalqilya where the percentage is significantly higher than Israel. In Qalqilya a significant decrease in organized mode share from 23.5% to 0.3% was observed. The study finding shows that the destination for all these trips before the wall construction was Israel.

TABLE 4
Trip Distribution According to Trip Mode Before and After the Wall (Participants over 17)

	Qalqilya n=324		Jayyus n=128		Aida Camp n=240		Israeli Arab n=1200
	After %	Before %	After %	Before %	After %	Before %	%
Driver	6.5	10.8	9.4	10.2	17.5	16.9	55.9
Passenger	4	4.6	3.1	7	7.5	6.8	14.8
Bus	3.4	5.2	12.5	44.5	45	46.6	1.7
Organized	0.3	23.5	1.6	1.6	2.5	3.4	2.8
Taxi	15.1	7.4	0	0	0.8	0.8	0.3
Walking	70.7	48.5	43.7	36.7	25	23.7	24.5
Bus-walking	0	0	29.7	0	1.7	1.7	0.0

Significant difference , $p < 0.0001$)

Table 5 presents the distribution according to the destination of the trip (outside the town, inside the town) before and after the wall construction by town. In Qalqilya, before the wall construction, 31.2% of the trip destinations were outside the town; this is similar to the percentage in Majd Al-Krum. In Jayyus and Aida camp, the percentage of trips outside the towns before wall construction is significantly higher than Qalqilya and Majd Al-Krum. One possible explanation for this result is the differences in accessibility to the various activities. Qalqilya is a big town with relatively many job opportunities, universities, shops and various social activities whereas Jayyus, Camp Aida, and Majd Al-Krum are small towns where most of the activities and services are outside the towns' borders. The wall construction had a strong significant affect on trip destinations, particularly for Qalqilya residents, and the percentage of trips for destinations outside the town decrease to 4.0% after the wall construction. In Jayyus the percentage decreased from 46.9% to 37.5%. In Aida Camp only a slight decrease was identified.

TABLE 5
Trips Distribution According to Destination* (Participants over 17 years)

Town	Destination	Before	After
		(%)	(%)
Aida Camp	Outside	58.3	53.8
	inside	41.7	46.2
Jayyus	Outside	46.9	37.5
	inside	53.1	62.5
Qalqilya	Outside	31.2	4.0
	inside	68.8	96
Majd Al-Krum	Outside	-	31.3
	inside	-	68.7

Significant difference ,p<0.0001)

* (Inside=within the city, Outside = outside the city)

Table 6 presents the daily travel behavior characteristics in an activity-based framework of tours and trips segregated by community and gender for participants age 17 years and older. Palestinian and Arab Israeli women make fewer trips than men in all the communities, this difference is statistically significant at the 5 percent confidence level (i.e., when $\alpha \leq 0.05$). Palestinian women and men make much fewer trips than the Arab Israeli women and men, this difference is statistically significant at the 5 percent confidence level. The finding also indicate significant differences in number of trips between the Palestinian communities themselves and the data reveals that Qalqilya's women and men make more trips (0.573 and 1.291 respectively) than Jayyus (men=0.828, women=0.208) and Aida Camp (men=0.774, women=0.355) Palestinians. Women also make significantly less trips than men in all the Arab communities, but the Palestinian men and women make significantly less trips than the Israeli Arab men and women. The striking finding is the low number of motorized trips that Palestinian women make. In Camp Aida women made only 0.486 motorized trips per day while men made 1.162 trips, this was significantly less than the number of motorized trips of Israeli women and men. In Qalqilya women and men made the lowest number of motorized trips among all the Palestinian communities, while in contrast they make the highest trips by foot. In Qalqiya women make less non-motorized trips than the Arab Israeli women. This observation confirms the existence of travel disparities between women and men and between the Palestinian participants and the Arab Israeli participants, and also demonstrates that the extent of those disparities varies by community.

TABLE 6
Comparison of Daily Travel Behaviors by Gender and Community for participants over 17

City	Variable	Group Statistics				t-test for Equality of means			
		Male (Mean)	Female (Mean)	Male (S.D)	Female (S.D)	t	Sig (2-tailed)	95% Confidence Interval of the Differences	
							Lower	Upper	
Aida camp	Number Of Tours	0.774	0.355	0.463	0.500	-6.332	0.000	-0.549	-0.288
N female=107 N male=105	Number Of Trips	1.533	0.710	0.935	1.000	-6.214	0.000	-1.083	-0.561
	Trips by car	1.162	0.486	0.991	0.862	-5.300	0.000	-0.927	-0.424
	Trip by foot	0.318	0.229	0.734	0.697	-0.907	0.366	-0.283	0.105
Qalqilya	Number Of Tours	1.291	0.573	0.457	0.524	-9.278	0.000	-0.870	-0.565
N female=76 N male=86	Number Of Trips	2.767	1.118	0.966	1.045	-10.433	0.000	-1.961	-1.337
	Trips by car	0.884	0.316	1.241	0.787	-3.427	0.001	-0.895	-0.241
	Trip by foot	1.884	0.803	1.418	0.980	-5.573	0.000	-1.464	-0.698
Jayyus	Number Of Tours	0.828	0.208	0.380	0.409	-8.487	0.000	-0.765	-0.476
N female=53 N male=64	Number Of Trips	1.656	0.415	0.760	0.819	-8.487	0.000	-1.531	-0.951
	Trips by car	1.125	0.075	1.000	0.385	-7.207	0.000	-1.338	-0.761
	Trip by foot	0.531	0.340	0.890	0.758	-1.238	0.218	-0.498	0.115
Majd Al-Krum	Number Of Tours	2.261	1.323	2.005	1.003	-4.884	0.000	-1.315	-0.559
N female=135 N male=139	Number Of Trips	5.633	3.096	3.172	2.415	-7.433	0.000	-3.209	-1.865
	Trips by car	4.396	2.111	3.453	2.323	-6.407	0.000	-2.986	-1.586
	Trip by foot	1.245	0.985	1.977	1.630	-1.183	0.238	-0.691	0.172

4.3 Changes in commute travel time

Table 7 presents the commute travel time before and after the wall construction in all the case studies. It can be discerned from Table 7 that in all communities, except Qalqilya, a significant increase in commuting travel time occurred but not at the same rate. Jayyus is the most affected community, where the commute travel time increased significantly from 24.24 to 94.15 minutes. In Aida Camp, travel time increased from 17.8 to 27.52 minutes. In Qalqilya it was obvious that the wall construction did not negatively affect travel time since the employees had no chance to work outside the city, thus, employees' travel time significantly decreased.

TABLE 7
Changes in travel time to and from work

City	Group Statistics				t-test for Equality of means			
					t	Sig (2-tailed)	95% Confidence Interval of the Differences	
	Before (Mean)	After (Mean)	Before (S.D)	After (S.D)			Lower	Upper
Aida camp N =124	17.80	27.52	11.98	37.40	2.93	0.004	3.158	16.278
Qalqilya N =132	22.31	9.49	12.58	4.03	-10.89	0.000	-15.146	-10.489
Jayyus N =80	24.24	94.15	14.95	56.38	10.86	0.000	57.094	82.711
Majd Al- Krum N =413	-	17.52	-	22.51	-	-	-	-

4.4 Changes in work destinations

One of the main questions that arose in the present study is whether the wall construction in the West Bank affected work destinations. The study findings indicate that the most affected community is Qalqilya, where 72.6% of the household heads changed their work destination as a result of wall construction. It is noteworthy that 88.9% of those who changed work destination worked in Israel before the wall construction. However, in Qalqilya the situation today after the wall construction indicates a reduction in the percentage of household heads that work in Israel from 66.1% before the wall to 0% after construction. This indicates after wall construction no one worked outside the border of Qalqilya even within the Palestine Territory.

In Jayyus, the percentage of the heads of the households who changed work destination was low, 6.7%. It is noteworthy that 75.0% of those who changed work destination worked in Israel before the wall construction. There are two reasons for this low percentage of employees who changed their work destination. First, 21.7% of Jayyus employees continue to work in Israel, while before the wall the percentage was 42.0%. It is important to note that all those employees who work in Israel with illegal status take a high risk in order to support their families. The second reason for this low percentage is the high percentage of unemployed people after the wall construction (21.5).

In Camp Aida, 23.1% changed work destination with 75% of these being participants who worked in Israel before the wall. A significant decrease was seen in the percentage of employees who worked in Israel from 47.2% to 15.1% after the wall construction. Furthermore, the limitation of access to various job opportunities as a result of the wall construction caused a significant increase in the percentage of unemployed people, from a rate of unemployment of 16.7% to 50.0%.

4.5 Changes in Households' Trips to Visit Relatives

The wall not only affects work destinations and commuting travel time, but it also affects accessibility to relatives. Table 8 presents the changes in relative visits for the Palestinian households. Camp Aida is the most affected town where 19.4% of the households stopped visiting their relatives and 12.8% decreased the number of visits. The average number of relative visits for households that changed their relative visits decreased from 1.6 to 0.4 visits and in parallel the travel time increased from 29.6 to 69.5 minutes. The explanation of this result refers to the geographic location of Camp Aida and the wall location, as mentioned above in the background the wall cut access to the closed neighborhoods where relatives live. In Jayyus, 8.3% of the households decrease the number of relative visits from 2.4 to 0.2 visits and a significant increase in travel time was observed from 31 to 179.2 minutes. The most interesting finding is the increase in relative visits in Qalqilya, 7.0% of the households increased the number of relative visits and an insignificant change in travel time was observed from 6.5 to 5.9 minutes. The explanation of this increase according to participant's reports refers to the lack in job opportunities and the decrease in work hours, thus participants reported having more time to visit relatives within the town after the wall construction.

TABLE 8
Changes in Households' Visits to Relatives

Community	Camp Aida	Jayyus	Qalqilya
	N=180	N=180	N=186
	Visits	Visits	Visits
No changes	66.7%	91.7%	91.9%
Stopped visiting	19.4%	0	1.1%
Decreased the number	12.8%	8.3%	0
Increased the number	1.1%	0	7.0%

4.6 Changes in households' shopping activities

Table 9 presents the changes in household's shopping trips versus the changes in income after the wall construction in both Aida camp and Qalqilya (In Jayyus data referring to changes in shopping is not available). In Aida Camp, 23.3% of households decreased their shopping activities with the weekly average number decreasing from 1.2 to 0.4 times. In Qalqilya, 14.8% of the households decreased their shopping activities and the average weekly number decreased from 3.8 to 1.0 times. The data analysis indicates a positive relationship between the decrease in shopping activities and decreasing in the households' income. It is not surprising that the income of most of the Palestinian household decreased (Table 1), but there is variation in the change rate and it is depend on wall construction as well as various demographic and socio-economic characteristics. Among Aida Camp and Qalqilya households who decreased their shopping activities after the wall construction, they reported a decrease in about two third of their income,

while households who didn't change their shopping activity stated they lost about half of their income. In order to understand this decrease, it is important to note the very low income itself (Table 9).

TABLE 9
Changes in Households' Shopping Activities vs. Income in a Week

Shopping	Camp Aida		Qalqilya	
	N=14 Changed		N=9 Changed	
	N=46 not Changed		N=53 not Changed	
	Before	After	Before	After
Number of trips (one week)	1.2	0.4	3.8	1
Travel time (minutes) those who visit	22.1	34.3	No change	No change
Income for those who changed	2460	742	4944	1511
Income for those who didn't change	2120	1128	4943	2241

5. DISCUSSIN AND CONCLUSIONS

The study results show that construction of the segregation wall in the West Bank has significant effects on accessibility to the various activities which led to significant impacts on the Palestinian's travel behavior. The wall construction increased trip distance and travel time, and cause changes in destination and travel mode. Access to agriculture land and to Israeli areas was restricted to the Palestinian population and as a consequence limited their accessibility to job opportunities. Furthermore, consent with Elias et al (2008) the study findings confirm the existence of travel behavior disparities between women and men and the variation in these disparities by community. The wall has resulted in severe deterioration in the Palestinian's quality of life, restricted their ability to visit their relatives and their friends, as well to participate in various social activities. These changes have led to negative economic and social effects. While the case analyzed in this paper is unique, it is still consistent with the literature presented in the introduction showing the effect of accessibility on labour market, productivity, and economic development.

This study discusses a unique case here the justification of the project "wall construction" is Israeli security. In this case the Palestinians are loosing in all fronts. Their land was confiscated, they loss their jobs opportunities, and access to the various opportunities and activities. Without getting any compensation the wall construction results in significant injustice and equity issues not considered by the project.

5.2 Conclusions

The study findings indicate a heavy dependence on non-motorized travel and public transportation in the Palestinian community. This is partly a result of accessibility restriction resulted from the wall construction and the low motorization rate which reflect the poor economic situation of the Palestinian population. Transportation mode, travel time, and participation in various daily activities appear strongly connected to community and gender affiliation. For example, in Qalqilya which is completely encircled by the wall, a significant difference in travel mode, travel time, and changes in work destinations after the wall construction was observed in comparison to the other communities.

Palestinian and Arab Israeli women make fewer trips, less motorized and walking trips than men in all the communities. The striking result is the limited mobility of Palestinian women, with more than 50% of them stay at home and do not participate in any activity. Additionally, the participation of Palestinian men in the various activities is significantly less than the Arab Israeli men. These results highlight the access limitation to various activities as well as the limitation of Palestinians' freedom to participate in such activities. Therefore, one can see that despite the fact that the Arab Israeli minority suffers from discrimination by the State authority the findings indicate that they still have the freedom to move and travel within and outside the Israeli borders.

In summary, this study, as also reflected by Hasan's story above, shows that in evaluating sustainable transportation policies we must consider environmental, social, equity, economic, and accessibility impacts together. Looking only at shifting transportation modes towards environmental friendly ones shows only part of the story. While this is clear in evaluating various auto restraint policies, such as congestion pricing, the effect of political restrictions can have far reaching affects on both travel behavior and the well being of the population which do not always coincide.

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