

Measure title: **Influencing the choice of vehicle towards smaller and more fuel efficient vehicles**

City: **Norwich**

Project: **SMILE**

Measure number: **7.2**

A Introduction

Norwich is the main employment centre in East Anglia and attracts over 250,000 vehicle trips into the City each day. Whilst many commuters use park and ride and City Centre car parks, there has been a historic tendency for commuters to park in the residential streets within and surrounding the City Centre within easy walking distance of their place of employment. These areas are compact and characterised by narrow terraced housing streets with parking on both sides of the street, usually with two wheels on the footway. Over the past 10 years there has been a programme of designating these residential areas as Controlled Parking Zones (CPZ). Similar problems are associated with the university where CPZs have also been designated.

Within these zones parking is restricted to residents and their visitors within the City Centre and residents, their visitors and businesses within the zones outside the City Centre with the use of permits.

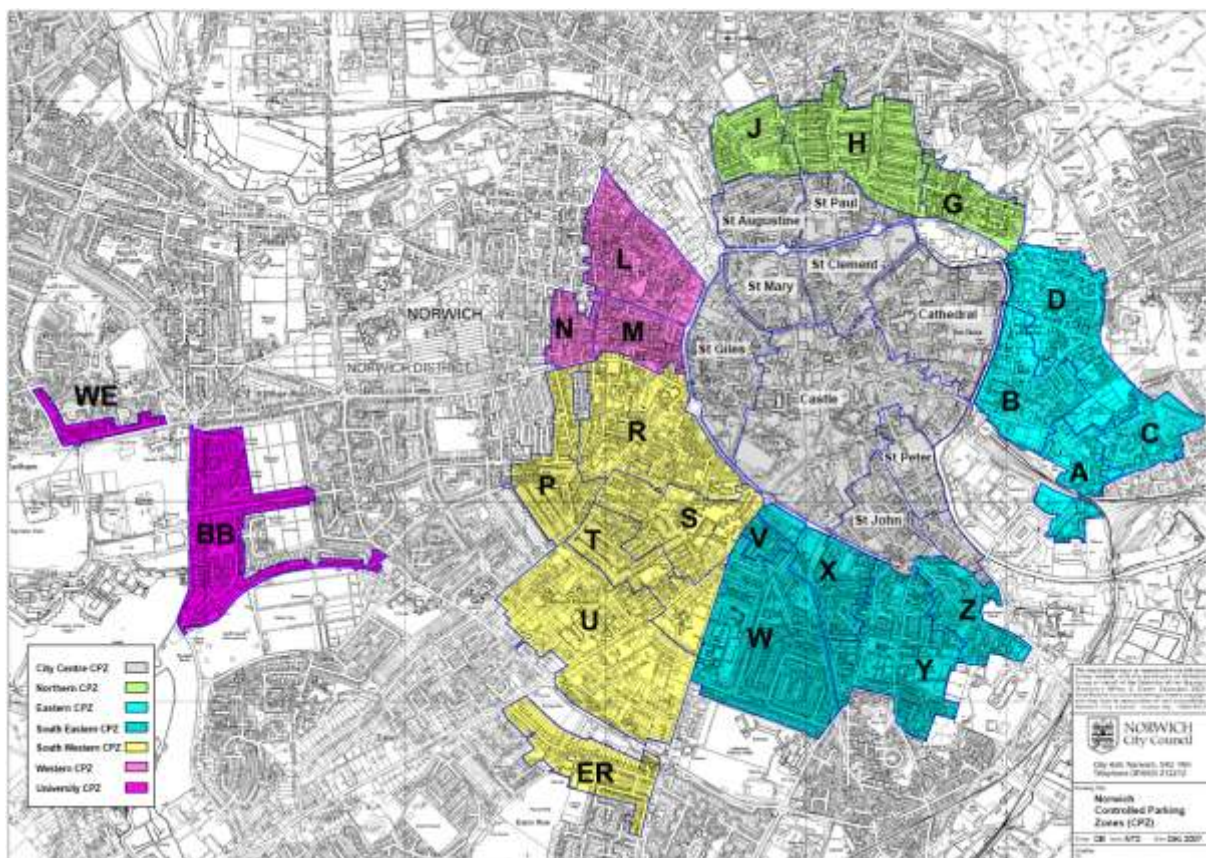


Figure 1: Map of CPZ zones

Over the years the demographic nature and car ownership levels of residents within these area has changed. There is now a younger and more mobile population, which has resulted in an increase in car ownership levels. The issuing criterion for permits has not been amended to reflect this change and consequently there are now too many vehicles parking on the street and not enough kerbside space to accommodate them all. The existing issuing criterion for permits within the Outer CPZs and the City Centre CPZs differs slightly but the permit costs are the same and there is no charge differential between types of vehicles.

In order to free up kerb space and improve the environment in the residential areas by reducing the number of vehicles parked on street it is necessary to reassess the issuing criteria and pricing structure for permits based on smaller and more fuel efficient vehicles in an attempt to influence the type of new vehicle or replacement vehicle.

A1 Objectives

The purpose of this measure is to influence the choice of vehicle that residents choose to own in Norwich's Controlled Parking Zones through a pricing and permit structure by providing benefits to those who choose smaller, more fuel efficient or alternative fuel vehicles. This will benefit the quality of the environment in terms of air quality and townscape by making better use of the restricted facilities available.

The measure objectives are:

- Objective 1:** Ascertain current ownership of fuel efficient vehicles;
- Objective 2:** Encourage changes in vehicle fleet towards smaller and lower emission vehicles within CPZs;
- Objective 3:** Engage political and public support;
- Objective 4:** Raise public awareness and perception of advantages in purchasing/leasing fuel efficient vehicles;
- Objective 5:** Reduce fuel emissions;
- Objective 6:** Assessment of on-street parking demand following implementation of pricing and criteria restructuring; and
- Objective 7:** Longer term objectives to increase the number of fuel efficient vehicles.

A2 Description

The measure has been implemented by the City Council to encourage residents living in the CPZ areas to purchase shorter cars or cars which use alternative more sustainable fuels/propulsion (e.g. electric vehicles or hybrid vehicles). In both circumstances such vehicles are likely to produce lower emissions of both greenhouse gases and air pollutants. In addition having smaller cars will increase the practical parking capacity of the CPZ areas.

The measure has been implemented using Norwich City Council's standard approach to introducing new transport schemes within the City. Following widespread public consultation the following tariff changes have been introduced

- £16 p.a. for small cars (under 3.92m length);
- £22 p.a. for medium cars (between 3.92 and 4.45m length); and
- £30 p.a. for large cars (over 4.45m length);
- £100 p.a. for business permits
- £22 p.a. for all other permits; and
- 100% discount for Alternative Fuel Vehicle private cars;

These tariffs are in contrast to the prior tariff charge of £16 across all vehicle types.

B Measure implementation

B1 Innovative aspects

The innovative aspects of the measure are:

- **New economic instrument, nationally** - Reductions in the price of parking permits for alternative fuel vehicles have been piloted elsewhere, but only one other scheme has been introduced that seeks to influence the choice of vehicle, irrespective of the fuel chosen and it does that according to a metric other than vehicle length.

B2 Situation before CIVITAS

In Norwich parking charges make no distinction between types of vehicle. The only concessions available are to disabled drivers. The general idea is to make it more attractive to own and use a clean vehicle.

B3 Actual implementation of the measure

The measure was implemented in the following stages:

Stage 1: Conceptual development (April 2005 to November 2005)

During the initial months of the project effort was focussed on the conceptual development of the measure. A number of different charging approaches presented themselves which could potentially encourage motorists to own less polluting and shorter cars. These options included charging by emissions rating, engine size and length. Cruder approaches based on e.g. fuel type were also considered. The benefits and dis-benefits of alternative approaches were assessed. A major factor in choosing a car length based solution was a perception that this would be more readily understood by the public compared to other approaches and that it was the proposal most overtly related to the objective to increase parking supply.

Stage 2: Detailed development (April 2005 to November 2005)

Having established the preferred concept, the approach was developed in detail. This work included collecting data on actual street parking practice, extraction of government and other information datasets and analysis of the existing population of permit holders. The specific implementation and post implementation of the measure was developed in detail including consideration of IT issues and sourcing reliable information about car length.

Stage 3: Public engagement and political agreement (*November 2006 to May 2007*)

In order to introduce new permit charges political authority was required to allow consultation on the proposals. This was obtained at the November 2007 meeting of Norwich Joint Highways Agency Committee (see appendix 1).

The Committee report considered a variety of ways that differential charging could be introduced. Charging based on emissions was ruled out as data for the majority of cars parked in the permit parking areas was not available. Charging based on engine size was also considered but charging based on length was recommended because it was felt to be more readily understood by permit holders. As well as introducing length based permit charges the proposals also sought to establish an overall inflation increase in permit charges based on national price indices.

The report goes on to discuss the relationship between vehicle length and emissions and showed, on average, that longer vehicles produce greater emissions.

Members considered the report and agreed that public consultation should take place. The actual consultation was carried out principally via the Council's magazine which is delivered to all households in the City. A centre spread article invited residents to comment on the proposals to help inform NJHAC's final decision on whether or not to proceed. The consultation was also publicised through the media (newspaper and radio).

There are in the region of 8400 permits in circulation and only 139 responses were received. This is a low level of response and was surprising as the proposals had attracted widespread media attention. Also similar proposals (e.g. in the London borough of Richmond upon Thames) had attracted national media's attention.

Of the 139 responses 35% supported the proposal, 52% opposed it and the views of 13% were unclear. Looking at those responses known to come from people living within permit parking areas and therefore directly affected by the proposals the figures are 31%, 55% and 14% respectively.

In the Eastern Controlled Parking Zone (CPZ) area the proposals became an election issue and an 'anti' position to length based charging was a prominent element in the sitting local Councillor's campaign. Also the Eastern CPZ was the most recently introduced permit parking area. If the views from the Eastern CPZ are ignored the figures were then 49%, 33% and 18% respectively.

Looked at in the latter way the level of support for the measure was surprisingly high. Additional 'taxes' are not usually welcomed by the public and officers had expected for there to be more objections to the proposals,

particularly as from local experience, it is those who feel aggrieved about something who are more likely to respond to a consultation.

The consultation responses were considered at the May 2007 meeting of NJHAC (see appendix 2). The Committee debated the officers' report at some length and with three members voting in favour and one against it resolved to approve the revised pricing structure for on street permit parking permits based on vehicle length.

Stage 4: Development of proposal in detail and implementation (May 2007 to May 2008)

Having confirmed political authority to proceed with the initiative, officers spent the following 12 months developing the practical aspects to implement the measure. This was much longer than originally envisaged due to two key technical issues.

Firstly the new tariffs required software changes to the Council's permit issuing system. The system uses propriety software normally used for contact management that has been adapted to manage permit issuing. When originally introduced the most cost effective method was to alter the programme but only for the specific purposes required at the time. Little thought was given to future changes, even including tariffs. Hence in order to effect the new permit charges the software had to be again changed. This proved to be a significant IT task which took several months to complete.

The second technical difficulty concerned establishing a reliable database of car lengths. There are a variety of databases available but in some cases the quoted car length differs. Also some providers were reluctant to be associated with the measure for fear of adverse publicity. Eventually a [database](#) was secured provided from multiple sources but again it took longer to procure than had originally been envisaged.

In the final months before implementation the project team developed a variety of publicity and PR material. This included an explanatory leaflet, [web pages](#) and press releases.

Parking permits Parking permits Parking permits

The new pricing structure applies to residential on-street permits displaying a vehicle registration number. All other permits will be charged at the following rates.

This initiative is part of the EU Civitas project which supports cleaner and better transport in cities.

PARKING PERMITS IN NORWICH ARE CHANGING

The way Norwich City Council charges residents for on-street parking permits is changing from **8 May 2008**.

Until now you have been charged the same rate whatever the size of your vehicle. Now the cost of your permit depends on the length of your vehicle and the amount of road space you take up.

By changing the permit pricing structure, we hope to encourage people to drive smaller cars which take up less road space and tend to have lower vehicle emissions.

Visitor / Community Carer Permits	
6 months	£14
12 months	£22
18 months	£30*
*not available for carers	
Statutory / Guesthouse Permits	
6 months	£53
12 months	£100
18 months	- not available
Landlord	
6 months	£53
12 months	- not available
18 months	- not available
Business Permits	
6 months	£53
12 months	£100
18 months	- not available

IN TRAN
Implementation for all

For more information or if you require this leaflet in another format or language please contact:

Norwich City Council
T: 01603 212212 F: 01603 213000
E: info@norwich.gov.uk
www.norwich.gov.uk

NORWICH City Council

CIVITAS NORWICH

Stage 5: Post implementation (May 2008 to present)

The revised permit tariffs were introduced for all permit renewals/requests from May 2008. As permit holders are able to purchase permits for up to 18 months it will not be until November 2009 that the tariffs will have been fully introduced thereby reducing any immediate impact of the measure.

Experience since May 2008 suggests that the new tariffs have attracted little attention and generated few complaints. The main source of complaint has not been the tariffs but a stricter application of rules to prove residency which was also introduced along with the new tariffs following an audit report.

The car length database has to be maintained as new models are produced. This activity is manageable within current resources but represents additional activity for the parking service.

B4 Deviations from the original plan

The deviations from the original plan comprised:

IT delays – Delays due to IT (see B3, Stage 4 above)

Car length database delays – Delays due to car length database issues (see B3, Stage 4 above)

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **Measure 9.2** – Development of car sharing club

C Evaluation – methodology and results

C1 Measurement methodology

C1.1 Impacts and Indicators

Table of Indicators

NO.	EVALUATION CATEGORY	INDICATOR	DESCRIPTION	DATA/UNITS
3	ENERGY	Vehicle fuel efficiency	Fuel used per vehicle km and per vehicle type	MJ/vehicle km quantitative derived
8	ENVIRONMENT	CO ₂ emissions	CO ₂ per vehicle km	g/vehicle km quantitative derived
13	SOCIETY	Awareness level	Degree to which the awareness of the policies/ measures has changed	Quantitative survey
14	SOCIETY	Acceptance level	Attitude survey of current acceptance with the measure	Survey
Local	ENVIRONMENT	Parking Supply	Increase in parking supply in residential streets	Quantitative measurement

Detailed description of the indicator methodologies:

- **Indicator 3 (Vehicle Fuel Efficiency)** – Vehicle fuel efficiency has been derived using data held by the Council which records the engine size of each vehicle issued with a permit combined with average fuel consumption obtained from the Government Vehicle Certification Agency (VCA) database.

The VCA data provides information for new cars on sale after July 2000. However the majority of cars issued with a permit were licensed before this date. Therefore rather than match VCA data with individual vehicles the VCA data has been used to establish a relationship between engine size and fuel consumption using simple linear regression. The expression derived from this has been applied to the Council’s engine size data set to provide average fuel consumption.

The methodology assumes that the relationship between engine size and fuel consumption for post July 2000 cars is the same as for pre July 2000 cars.

Furthermore the relationship between engine size and fuel consumption shows an R² value of 0.642, i.e. suggesting other significant variables explain fuel consumption rather than engine size alone.

- **Indicator 8 (Carbon Dioxide Emissions)** – Carbon dioxide emissions have been derived in similar way to vehicle efficiency, i.e. using engine size data for cars with permits and combining this with carbon dioxide emission information from VCA data.

As with fuel consumption data the VCA data is only available for new cars on sale after July 2000. Therefore as with the fuel consumption data, consideration needs to be given to whether it is valid to apply the model to pre July 2000 cars. Also with the fuel consumption data the R^2 value is 0.6987 again suggesting other significant explanatory variables.

- **Indicator 13 (Awareness Level)** – The public's awareness of the measure was recorded via a telephone survey of a representative sample of the population living in the Greater Norwich area. A total of over 800 responses were received of which some 260 were from residents of the more central urban area where the permit parking areas are all located.

- **Indicator 14 (Acceptance Level)** – Data for this indicator was obtained in the same way as Indicator 13.

- **Local Indicator (Parking Supply)** – To measure parking supply the first task was to measure the length of on-street parking available in the City's CPZs. This measurement was derived from the Council's parking management GIS system which accurately records the dimensions of all parking place legal orders (Traffic Regulation Orders) within the CPZs.

Secondly the average length of vehicles parked in the CPZs was recorded. This was carried out through sample surveys of a random selection of CPZ streets. The average vehicle length was then adjusted to reflect the space required to park a vehicle (i.e. to allow manoeuvring into/out of a space). This adjustment has been assumed at +1.4m. Adding the two gives the average kerb space required to park a vehicle with a permit.

The parking supply is derived by dividing the length of available on-street parking by the average kerb space required to park a vehicle.

C1.2 Establishing a baseline

- Indicator 3 (Vehicle Fuel Efficiency)

Age of vehicle	No. of vehicles	Fuel consumption l/100km
Pre August 2001 All	6282	7.54
Post August 2001 LGV	78	8.54
Post August 2001 Car	1881	7.47
Total	8241	7.53

Table 1: Baseline fuel consumption

The baseline data shows that fuel consumption average out at 7.53l/100km. There appears to be a slight downward trend in emissions when comparing the pre and post August 2001 data (allowing for the inclusion of the post August 2001 LGV data). This trend can potentially be explained by an increase in the proportion of diesel vehicles which increases from 16 to 20%.

- Indicator 8 (Carbon Dioxide Emissions)

Age of vehicle	No. of vehicles	CO ₂ emissions (g/km)
Pre August 2001 All	6282	167
Post August 2001 LGV	78	168
Post August 2001 Car	1881	164
Total	8241	166

Table 2: Baseline CO₂ emissions

The baseline data shows that carbon dioxide emissions average out at 166g/km. There appears to be a slight downward trend in emissions when comparing the pre and post August 2001 data (allowing for the inclusion of

the post August 2001 LGV data). This trend can potentially be explained by an increase in the proportion of diesel vehicles which increases from 16 to 20%.

With the above information and assuming an average distance travelled by vehicles with permits per year it is possible to estimate the total carbon dioxide emitted. Assuming 12,000 miles (19,200km) travelled p.a. average (based on standard vehicle warranty assumptions) the estimated carbon dioxide emitted is $8241 \times 19200 \times 166 = 26,265,715,200\text{g}$, i.e. 26,265 tonnes.

- Indicator 13 and 14 (Awareness Level and Acceptance Level)

The before implementation and after implementation levels of awareness and acceptance for the measure are described in section C2.5.

- Local Indicator (Parking Supply)

A baseline survey of average vehicle length was carried and suggests that average vehicle length to be 4.12m. The survey included 308 vehicles. Survey details are provided in appendix 3.

The figure compares with national data that suggests average vehicle length to be in the region of 4.0m.

Making allowance for manoeuvring as set out in the methodology, this suggests that each vehicle requires 5.5m of kerbside space to park on-street in the CPZs.

The Council's GIS data suggests that there is 60,203m of kerbside space to park on-street in the CPZs. Dividing this by an average kerb space requirement of 5.5m gives a theoretical capacity is 10,945. The following table provides further detail.

Zone	Total kerbside length (m)	Number of 5.5m spaces
NCPZ	11145	2026
WCPZ	5159	938
SWCPZ	17263	3139
SECPZ	17740	3225
ECPZ	8896	1617
Total	60203	10945

Table 3: Current number of spaces available

C1.3 Building the business-as-usual scenario

A key consideration assessing the business-as-usual scenario and actual results is the scale of the price signal arising from the new charging regime compared to the costs of car purchase and ownership. The measure has introduced a permit cost increase from £16 to £30 for large cars (4.45m+). Assuming a car is owned for four years this represents an additional cost of £56. This is equivalent to the cost of a tank of petrol for such a car and is therefore modest when set against total car ownership costs.

More significant cost increases may be agreed in future years (the London Borough of Richmond upon Thames charges up to £300 for the largest cars in their permit parking areas). However it is likely that the 'awareness raising' element of the initiative that will have most effect, rather than its direct economic impact.

The measure is intended to encourage motorists to drive smaller (and hence more efficient cars). For the measure to have an effect it requires motorists to purchase a different car to the one they are already driving. However motorists change their vehicle every few years. Making an assumption that car turnover is once every 6 years this equates to some 1,400 cars of the 8,421 total every year.

This potential turnover is further reduced as permit renewals are spread throughout the year with some being issued for 18 months periods. Therefore the full introduction of the new tariffs will not have occurred until October 2009. As the measure went 'live' in May 2008 it is therefore unlikely, even if it did have a major economic impact on motorists, to have a major short term effect.

A more significant factor that may have led to a change in average vehicle length and hence emissions is fuel inflation. In May 2007 petrol prices were £0.90 L⁻¹, whereas at present (September 2008) they are in the region of £1.05 L⁻¹. Such an increase represents an increase in total fuel costs assuming annual mileage of 12,000 miles and average fuel consumption of 35 miles per gallon of £85 (i.e. [12,000/35] x £0.25). This price signal is greater than the increase in permit charges (+£14) and in the short term it is likely to have had greater effect on any changes to average vehicle length, i.e. motorists purchasing cars with lower fuel consumption which on average are shorter, than any increase in permit charges.

However given relatively low vehicle turnover and the date when the measure was introduced it is likely that even this factor will only have limited effect. In conclusion an assumption that the business-as-usual scenario would be relatively static appears sensible.

C2 Measure results

The results are presented under sub headings corresponding to the areas used for indicators – economy, energy, environment, society and transport.

C2.1 Economy

This impact was not specifically measured. However the average permit cost increase associated with the measure is 36%, i.e. equivalent to the retail price index between 1993 and 2006. Given a population of 8241 cars with permits the increase would increase revenue by £44,831 from £131,856 to £176,687.

C2.3 Environment

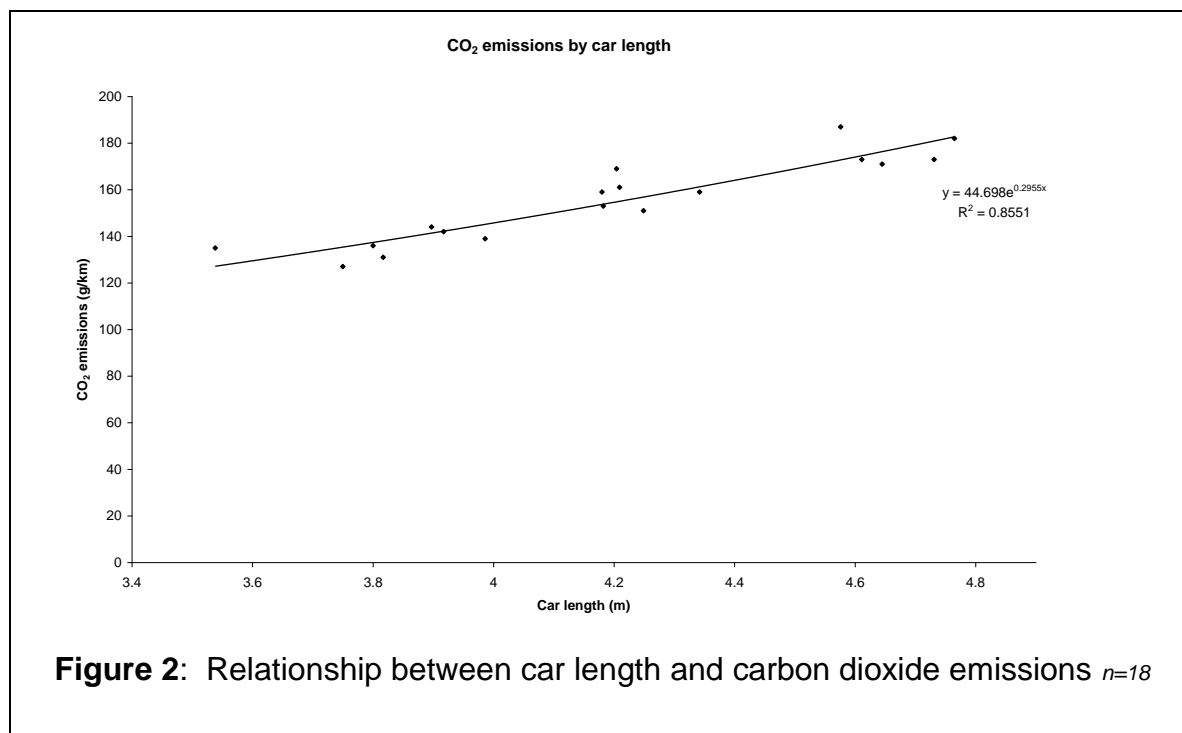
- **Indicator 8 (Carbon Dioxide Emissions)**

Age of vehicle	No. of vehicles	CO ₂ emissions (g/km)
Pre August 2001 All	6237	167
Post August 2001 LGV	69	168
Post August 2001 Car	1943	164

Table 4: Post implementation CO₂ emissions

The post implementation data shows only the slightest change in CO₂ emissions. This is unsurprising, however, given relatively low turnover of new vehicles and the comparatively modest change in tariffs.

In order to establish potential longer term effects the relationship between car length and fuel consumption has been correlated. The correlation is based on a relatively small sample of modern cars and is reproduced in figure 2.



The present average vehicle length in the permit parking areas is 4.12m. Figure 2 and the associated regression equation suggests that a related average CO₂ emission of 151g/km. The predicted emission level is lower than data in tables 2 and 5 would suggest. The relationship suggests that a 166g/km CO₂ emission level correlates with a 4.45m car.

This anomaly is potentially explained by the relatively small dataset used to establish the length vs. emission correlation, which excluded any LGV data. However this relationship does allow one to examine potential effect on emissions if average vehicle length were to decrease.

The following table uses the above relationship together with information about the number of vehicles with a permit to calculate average and total CO₂ emissions, the latter assuming average annual mileage of 12,000 miles (i.e. 19,200km p.a.).

	Existing	5% reduction in average vehicle length	10% reduction in average vehicle length
Average vehicle length (m)	4.12	3.91	3.71
CO ₂ emission (g/km)	151	142	134
Number of vehicles	8249	8249	8249
Annual CO ₂ emissions (t)	23918	22506	21176
Change (w.r.t. existing)		-1413	-2742

Table 5: Effect on emissions of changes in average vehicle length assuming no change in number of cars with permits

The table shows that the reduction in emissions is quite significant even for relatively modest changes in average vehicle length.

C2.2 Energy

- Indicator 3 (Vehicle Fuel Efficiency)

Age of vehicle	No. of vehicles	Fuel consumption l/100km
Pre August 2001 All	6237	7.54
Post August 2001 LGV	69	8.54
Post August 2001 Car	1943	7.46

Table 6: Post implementation fuel consumption

The post implementation data shows only the slightest change in fuel consumption. This is unsurprising, however, given relatively low turnover of new vehicles and the comparatively modest change in tariffs.

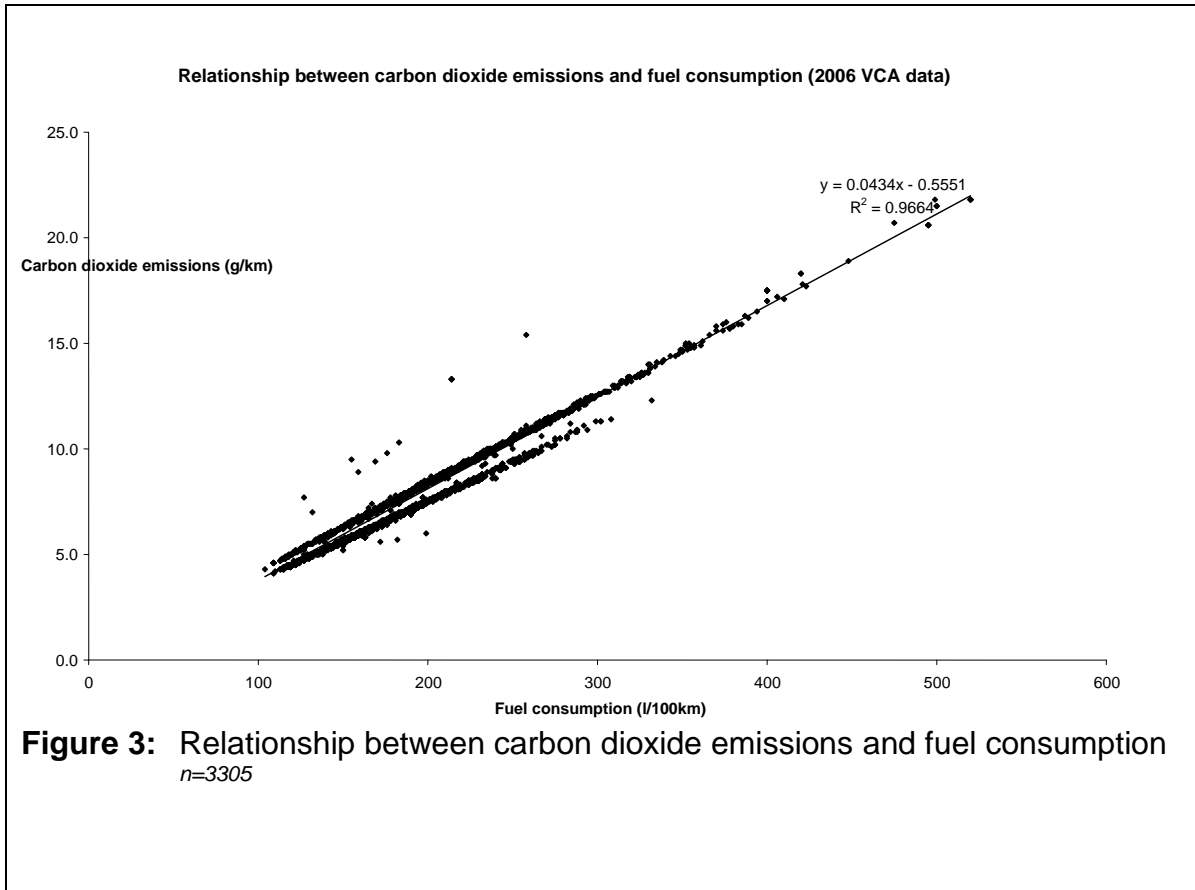
During the evaluation it has not proved possible to relate car length and fuel consumption directly as part of the evaluation. However Government data shows a strong correlation between carbon dioxide emissions and fuel consumption as shown in figure 3 on the next page.

It is therefore reasonable to surmise that the potential changes discussed in section C2.3 (i.e. a 5 or 10% change in vehicle length) would have similarly beneficial effects on fuel consumption. Using the regression equation shown in figure 3 it is possible to predict average full consumption as follows:

	Existing	5% reduction in average vehicle length	10% reduction in average vehicle length
CO ₂ emission (g/km))	151	142	134
Fuel consumption (l/100km)	6.0	5.6	5.3
Number of vehicles	8249	8249	8249
Annual fuel consumption (l)	9500156	8881520	8331622
Change (w.r.t. existing)		-618635	-1168534

Table 7: Effect on fuel consumption of changes in average vehicle length assuming no change in number of cars with permits (where fuel consumption = $[0.0434 \times \text{carbon dioxide emission}] - 0.5551$).

The table shows that the reduction in fuel consumption is also quite significant even for relatively modest changes in average vehicle length



- **Local Indicator (Parking Supply)**

A post implementation survey of average car length shows no significant change in average vehicle length. This is unsurprising for the reasons given in section C2.2.

However it is possible to expand on the 'what if' analysis in relation to CO₂ emissions to consider potential effects on parking availability as well as total emissions assuming additional parking capacity is then absorbed by more cars, i.e. a larger population of cars in the permit parking areas.

	Existing	5% reduction in average vehicle length	10% reduction in average vehicle length
Available kerbspace (m)	60203	60203	60203
Average vehicle length (m)	4.12	3.91	3.71
Average space to park (m)	5.50	5.23	4.95
Potential parking capacity	10945	11467	12161
Change (w.r.t. existing)		+576	+1216
Annual CO ₂ emissions (t)	31738	31436	31222
Change in t (w.r.t. existing)		-303	-516
Annual fuel consumption (l)	12605068	12346271	11581853
Change in l (w.r.t. existing)		-258796	-1023214

Table 8: Effect on emissions of changes in average vehicle length assuming additional kerbspace is used to park additional vehicles

The table shows that there is still a reduction in emissions and fuel consumption even where the additional potential parking capacity is used to park additional vehicles.

C2.4 Transport

Not applicable

C2.5 Society

- **Indicator 13 (Awareness Level)**

The following graph presents results of telephone surveys carried out in 2007 (before implementation) and 2008 (after implementation) of residents awareness of the of the proposed re-assessment of the issuing criteria and pricing structure for car parking permits.

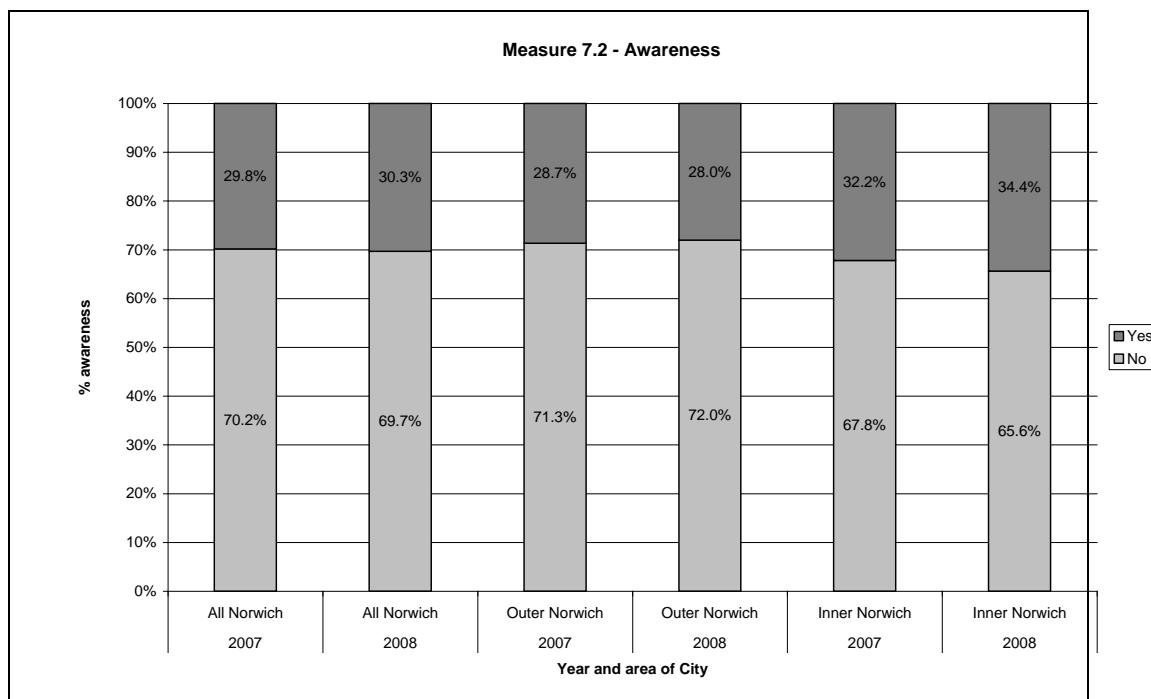


Figure 4: Results of ‘awareness’ telephone survey research *n=808/805*

The graph shows very little change in awareness at least for the overall ‘all Norwich’ data set and the Outer Norwich data set. In both cases the small changes are within the survey sampling error. For the Inner Area dataset the change is slightly greater. This seems logical as it is Inner Norwich where the measure was implemented. However the difference in values is again within the sample error.

In comparing the 2007 and 2008 data it is acknowledged that consultation on the proposals had already taken place when the 2007 survey was carried out. A greater change in awareness may have been recorded if the before survey had been carried out before this consultation. Nonetheless it is surprising that awareness had changed so little.

- Indicator 14 (Acceptance Level)

The following graphs presents results of telephone surveys carried out in 2007 (before implementation) and 2008 (after implementation) of residents acceptance (agreement) of the statement that issuing criteria and pricing structure for car parking permits in controlled parking zones in Norwich should reflect engine size, CO2 emissions and type of fuel used.

The first graph presents the entire results breakdown including those who responded by saying ‘do not know’ and those who responded by ‘neither agreeing nor disagreeing’ with the statement.

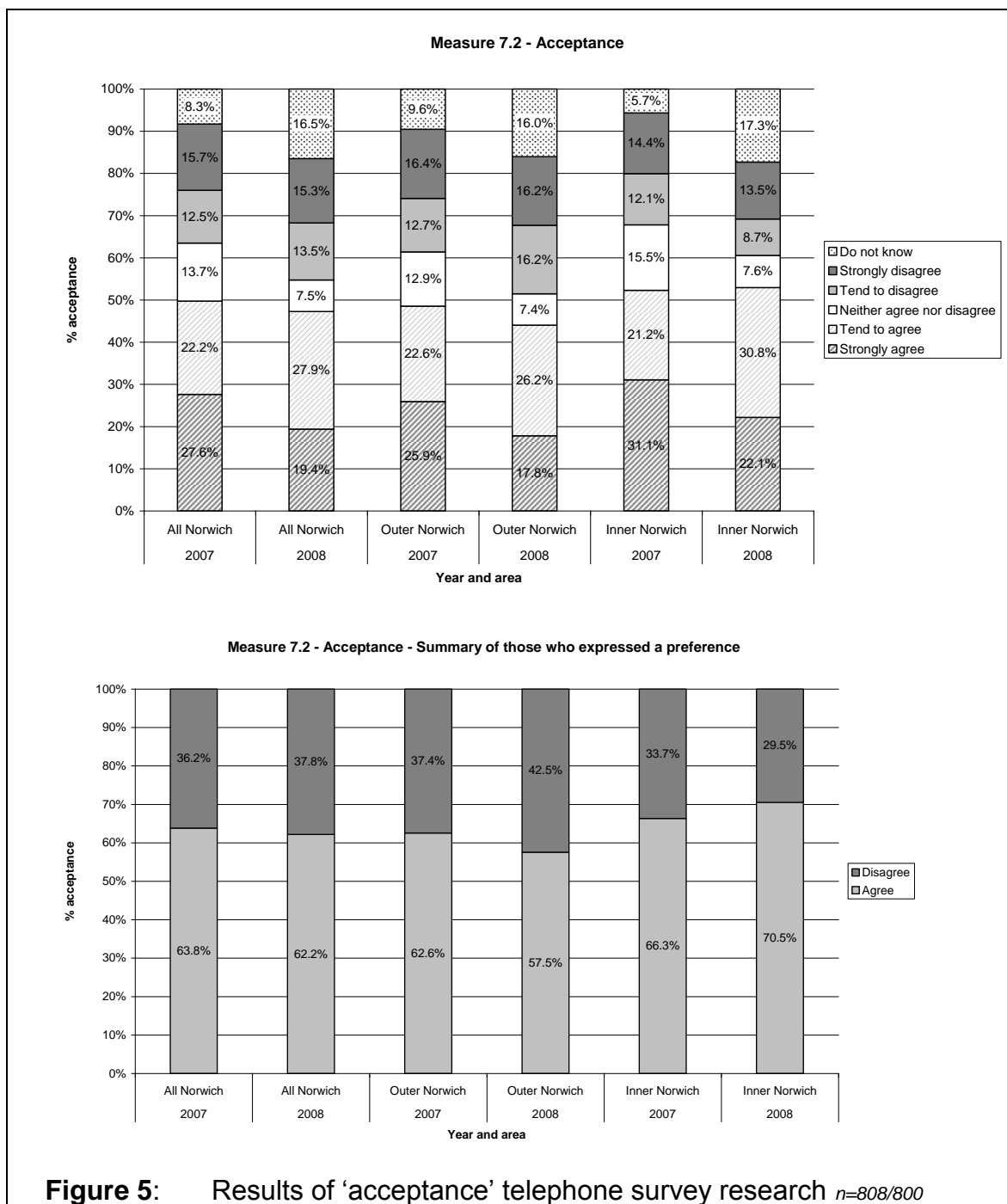


Figure 5: Results of ‘acceptance’ telephone survey research *n=808/800*

The graph shows very little change in levels of acceptance. As with the ‘awareness’ data, the changes, given the sample size and percentage values, are all within the margin of error. The results show, however, that levels of acceptance are quite high. Of those who expressed a preference over 60% either ‘tended to agree or agreed’ with the initiative.

For those living in Inner Norwich and therefore most effected by the measure (i.e. they are likely to live in one of the permit parking areas), the level of acceptance is greatest, even though they would be most likely to suffer financially from the revised tariffs. Whilst there is a slight upward trend in acceptance for this group, this is within the sampling error. Equally neither

has there been a reduction in acceptance which is encouraging given implementation of a measure which has resulted in greater costs for residents.

The questions asked do not allow conclusions to be made about whether the tariff changes are likely to influence future car buying behaviour. Insofar that acceptance has been maintained it is reasonable to assume that at least the measure in its present guise is unlikely to have generated an adverse reaction.

C3 Achievement of quantifiable targets

No.	Target	Rating
1	Ascertain current ownership of fuel efficient vehicles	**
2	Encourage changes in vehicle fleet towards smaller and lower emission vehicles within CPZs	*
3	Engage political and public support	**
4	Raise public awareness and perception of advantages in purchasing / leasing fuel efficient vehicles	*
5	Reduce fuel emissions	*
6	Assessment of on-street parking demand following implementation of pricing and criteria restructuring	NA
7	Longer term objective to increase the number of fuel efficient vehicles	*
NA = Not Assessed 0 = Not achieved * = Substantially achieved (at least 50%) *** = Achieved in full **** = Exceeded		

C4 Up-scaling of results

The measure has been applied to all permit holders in all of the CPZs in Norwich (both those in and around the City Centre and those adjacent to the University). There is therefore little scope to up-scale the measure in geographic terms unless further CPZs are created.

The reason to introduce CPZs is to help ‘protect’ residential streets from commuter parking as part of the overall parking strategy for the City. It is considered highly unlikely that further CPZs would be introduced primarily to influence car purchase through permit tariffs (i.e. the focus of this measure). Therefore any CPZ extensions will be a result of the former. At the present time the most pressure for extension is in areas near to the university (see also measure 11.5). There is also some pressure to extend the CPZ areas to the west and north of the City Centre, although recent petitions/consultations etc. have proved inconclusive.

It is difficult to estimate the effect of CPZ extensions on the impact of the measure. This is partly because the extent of any extension is unknown. Also in the area near to the university in particular more houses have off-street parking and therefore may be less likely to purchase permit. With these shortcomings in mind it has only been possible for a very crude assessment of impact to be made. At this level it is estimated that the present population of cars with permits might at most increase by 25% through CPZ extensions. Assuming these cars form a similar population to those with permits in terms of length, fuel economy and carbon dioxide emission then an eventual 10% reduction in length might be expected to reduce carbon dioxide emissions by 685 tonnes p.a.

The other opportunity to up-scale the measure would be to introduce length based charges to other forms of parking, e.g. public off-street, meter bays, visitor permits, etc. It is understood that some other UK local authorities are examining this, however, there is no doubt that there would be a number of practical difficulties. With the differential in tariffs being at present relatively low then it is unlikely that benefits would outweigh practical difficulties. This might change if tariff differentials increase sufficiently, however.

C5 Appraisal of evaluation approach

Any effect due to the measure is likely to be long-term for the reasons discussed in section C1.3. Therefore the ability to record any change during the lifetime of the project (4 years) is significantly reduced. This problem was exacerbated by introduction of the measure towards the end of the project in month 40. For this reason rather than simply publish results, work has been carried out to assess the potential effect of the measure on vehicle fuel efficiency, CO₂ emissions and parking supply. This scenario testing approach confirms the potential of the measure to produce significant benefits and will be useful in helping direct further development of the measure (e.g. in regard of tariff levels) over the medium and long term. As a key element of the local sustainable access strategy, it will be essential to continue monitoring and evaluating its success. It is planned to disseminate these results as and when via the wider CIVITAS Forum and CIVITAS CATALYST.

As part of the telephone surveys it would have been helpful to have asked a specific question on whether the measure would have influenced vehicle purchase or if not what price would need to be charged to significantly influence such a purchase.

C6 Summary of evaluation results

The key results are as follows:

- **Key result 1** – The introduction of permit charges that favour smaller vehicles has the potential to reduce overall fuel consumption in the population of cars with permits;
- **Key result 2** – The introduction of permit charges that favour smaller vehicles has the potential to reduce overall CO₂ emissions in the population of cars with permits;
- **Key result 3** – There remain potential fuel consumption and CO₂ emission benefits even if the additional available kerbspace created is used by new vehicles.

D Lessons learned

D1 Barriers and drivers

D1.1 Barriers

- **Public opposition** – As described elsewhere there was a reasonable degree of public support for the measure. However, it was acknowledged that public support would be likely to reduce if the changes were too extreme (e.g. a much greater price differential). No specific research was carried out on ‘willingness to pay’; however experience in setting parking charges in other circumstances had shown the danger of trying to push forward with major price increases.
- **Political support** – The measure was approved by Norwich Joint Highways Agency Committee. However of the four voting members one voted against the scheme. The politician, as portfolio holder, has considerable influence and could have influenced the voting of other voting members.
- **Information technology** – The detailed delivery of the measure relied on changing key internal IT systems as discussed elsewhere. With budget available it had been assumed that this would be relatively straightforward, however, the time taken far exceeded original projections. The delay was partly organisation in nature and partly due to unanticipated limitations in the software.
- **Information** – The other main barrier to implementation and cause of delay was finding a reliable source of information on car length. With different databases providing slightly different results for the same car additional and unanticipated effort and time was required to develop a robust system that satisfies public scrutiny.

D1.2 Drivers

- **Political support** – Whilst political support acted as a barrier or ‘brake’ on the measure, there is no doubt that enthusiasm from Members contributed to successful introduction. The Council now has the largest number of green councillors of any English local authority reflecting support amongst the wider community to ‘push’ the green agenda forward. This wider support may have also helped inform the views of other political groupings.
- **Shortage of parking supply** – There are parts of the permit parking areas where demand outstrips supply to a considerable degree. The measure offered a way to resolve this problem without going as far as limiting the number of permits in circulation.
- **On-street parking audit** – During the genesis of the measure an audit of on-street parking was carried out. This confirmed the need to increase tariffs (to cover costs) and to review the detailed permit issuing process. Introduction of the measure facilitated addressing these audit actions.
- **Cost inflation** – The permit charges had not been reviewed since 1993. With increasing costs a deficit was appearing in the permit parking

account. With ongoing budgetary pressures it was necessary to review pricing with the measure being attached to this wider agenda.

D2 Participation of stakeholders

- **General public** – The participation of the general public in the development of the measure are described elsewhere in the template. There were relatively few responses (139), with 35% overall supporting the measure.
- **Stakeholders** – No response to consultation was received from stakeholders. However discussions with Norfolk County Council, the police and other departments within the Council helped shape the outcome of the measure. This included, for example, discussion with Systems Support to determine the IT systems to implement the measure.
- **Politicians** – Key politicians were briefed at all key stages during the project development and soundings were taken to shape detailed aspects of the proposed measure

D3 Recommendations

- Rec. 1** Consider 'willingness to pay research': The revised pricing is based on retail price index information to result in a new pricing system that is price neutral overall. However the revised pricing may be insufficient to achieve behavioural change. 'Willingness to pay research' would have helped inform such pricing.
- Rec. 2** Consider charging based on emissions: There is a strong correlation between car length, engine size, fuel consumption, carbon emissions etc. Any of these indices has the potential to determine differential pricing depending on the specific objectives to be achieved. This measure set out to increase practical parking capacity however a scheme based on emissions might also result in similar outcomes and may be better understood by the public as e.g. vehicle excise charges are now based on emissions.
- Rec. 3** Consider extensive public relations: The measure has been generally well received but it has nonetheless attracted adverse comment often from national organisations rather than the local media. The adverse publicity could be challenged and it is considered that with better information it could be avoided. However such activity is resource hungry and was not possible within the budget for this project.
- Rec. 4** Consider information systems at an early stage: The implementation of the measure was delayed due to information system issues (pass issue system and car length database). Changing/creating such systems often take longer than anticipated and will often determine a project's critical path.

D4 Future activities relating to the measure

With differential pricing established further development of the measure will be to refine details to ensure that the original goals of reducing carbon dioxide and increasing parking supply are met. Most likely is an increase in the differential between tariffs. A way forward would be to keep tariffs the same for smaller cars and to only increase tariffs for medium and larger cars either in line with inflation or in line with sustainability priorities, the latter leading to faster and bigger tariff differentials.

There has been some comment about the fairness of charging by length. It is accepted that shorter cars may not always be the most fuel efficient and/or produce the lowest emissions compared to larger cars. Also there have been concerns about how the pricing may disadvantage families. The correlation between length and emissions works both ways and therefore a scheme which focussed on the latter would tend to encourage ownership of shorter cars. Such a change of focus may be examined in due course, particularly as other vehicle taxation is increasingly based on emission factors. Also such a system would remove the need for a car length database which draws on some resources to be maintained.

Appendix1

Report for Resolution

Report to Norwich Highways Agency Committee
9 November 2006

Report of Director of Regeneration and Development

Subject Review of Resident Parking Permit Charges

8

Purpose

To inform members of the conclusions and recommendations resulting from a review of the current residents parking permit structure.

Recommendations

Members are asked to approve public consultation on proposals to amend the tariffs for residential permit parking permits as follows:

1. £16 p.a. for small cars (under 3.92m length);
2. £22 p.a. for medium cars (between 3.92 and 4.45m length); and
3. £30 p.a. for large cars (over 4.45m length);
4. £22 p.a. for all other permits; and
5. 100% discount for Alternative Fuel Vehicle private cars

Financial Consequences

If the proposals in this report are implemented the average cost of a residential parking permit will rise in line with the retail price index since 1993. The proposals in this report, spread across the present population of vehicles with residential permits, are equivalent to an increase from £16 to £21.44. This is in line with the increase in the cost of living (as measured by the retail price index) since the last price review in 1993.

Corporate Objective/Service Plan Priority

This report aims to achieve the corporate objective to make Norwich an exemplar of a modern, European, 'liveable' city, i.e. one that is clean, safe, attractive and able to manage transport issues effectively and to achieve the service plan priority to review charges for permit parking and in limited waiting bays to take account of inflationary pressures and to encourage cleaner vehicles.

Contact Officers

Andy Watt 01603 212515

Background Documents

None

Report

Introduction

1. This report reviews the current level of charge for residential parking permits, which has remained at £16 since 1993. It also explores ways in which the pricing structure could be adapted to reflect the emission characteristics of different cars and hence encourages motorists to purchase lower emission cars.

Background

Price

2. The price of a residential parking permit in Norwich is presently £16. This cost has not changed since 1993 when the first area wide CPZ was introduced.
3. A comparison of permit charges between Norwich and other authorities in the region found that the rates charged for resident's parking permits vary significantly, with the highest charge of £70 in Uttlesford (Essex) and the lowest of £13.50 in Basildon. The Norwich charge is therefore one of the cheapest in the region. The full survey can be found in Appendix B.
4. The costs of maintenance, management and administration have all increased since the charge of £16 was introduced in 1993. It is therefore concluded that it would be reasonable to increase the charges for residential CPZ permits.

Demand

5. The escalating use of the private car and lack of parking provision has led to most large towns and cities adopting Controlled Parking Zones (CPZ) schemes as a way of managing demand and giving priority to residents. Such measures have been introduced in Norwich as part of the overall Norwich Area Transportation Strategy (NATS) parking strategy, helping to protect residential amenity and encourage use of park and ride.
6. Whilst CPZs have helped to control commuter parking in residential areas, potential demand for parking by residents and their visitors in the non-city centre CPZs alone exceeds the current level of provision by almost 7,000 vehicles (see Appendix A for full details). Members will be aware of representations to the Committee pointing out that demand for residential permits often exceeds supply of spaces. It would seem desirable, therefore, if more efficient use was made of the available kerb space to increase capacity.

Emissions

7. Use of the car brings many benefits; however, there are environmental dis-benefits. Road transport contributes significantly to greenhouse gas emissions, which damage to the earth's climate. Also, road transport contributes to air pollution, which can damage human health. The City Council has had to declare three air quality management areas in response to air pollution from road transport.
8. Measures that encourage motorists to drive vehicles, which produce lower levels of greenhouse gas and air pollution emissions, should therefore be encouraged.

Such an approach forms part of the Local Transport Plan and NATS.

9. Officers have considered the above issues to see if an integrated approach can be developed to help address the mismatch between parking demand and supply, inflationary pressures and reduce emissions. The results of this analysis are presented below.

Development of Way Forward

Price

10. The first area to be investigated was price. Since 1993, the cost of living has increased due to price inflation. The cost of a permit in real terms has therefore decreased.
11. Government data (see appendix C) indicates that the level of inflation as measured in the retail price index is 36%. This implies that permits are 36% less costly in 2006 than they were in 1993, despite increases in administration and enforcement costs.
12. For permits to be the same cost in real terms to 1993 they would need to increase 36%, i.e. increase from £16 to £21.44 p.a.
13. If such an increase were introduced, it would address inflationary pressures but do little to either make more efficient use of kerb space or encourage reduced emissions.

Pricing structure based on vehicle emissions

14. Officers have examined whether an increase in permit charge could be geared to encourage motorists to buy lower emission cars in a more overt way. Such an approach has been developed in Stockholm and Winchester (the latter in relation to off-street parking) and development of this project forms part of the part European Union funded CIVITAS project to develop sustainable transport in Norwich.
15. Specifically the CIVITAS measure aims to influence the choice of vehicle that residents choose to own in Norwich's Controlled Parking Zones, through a permit pricing structure that benefits motorists who choose smaller, more fuel efficient or alternative fuel vehicles.
16. Recently the Driver and Vehicle Licensing Agency (DVLA) have restructured the UK Vehicle Excise Duty Legislation in order to reflect a vehicle's emissions. It was initially considered that the resultant tax banding could be used as a basis to develop a differential permit pricing structure, which would encourage the uptake of lower emission cars.
17. Use of system based around the DVLA approach could have the benefit of being easier for the public to understand and accept, as it would be consistent with an existing environmental pricing system. However, a majority of vehicles presently issued with a residential parking permit were registered before 1st March 2001 where no emissions data is available. See Appendix D for full details.
18. Whilst linking the cost of residential permits to a vehicle's emissions would be an excellent way of encouraging the ownership and use of smaller and more efficient

vehicles, the lack of emission data available for the majority of cars with a permit means suggests that it could have practical shortcomings.

Pricing structure based on vehicle size

19. With practical problems in using the DVLA data, it was then considered whether differential pricing could be developed based on engine size or vehicle length. The former is recorded on vehicle registration documents and is attractive administratively. However, it is considered that the latter might be more readily understandable and by overtly encouraging shorter cars, it would more obviously help to increase on-street parking capacity¹. It was therefore concluded that it should be the preferable approach.
20. Figure 2 in Appendix E shows the relationship between car length and carbon dioxide emissions. Inspection of the data shows a good correlation between the factors with carbon dioxide emissions increasing with car length.
21. Table 6 in Appendix E shows the effect of average car length on on-street parking capacity. As an example an overall reduction in average vehicle length of 0.25m would increase parking capacity by approximately 500 vehicles.
22. The two effects of reducing emissions and greater practical parking capacity as average vehicle length reduces have been combined in Table 7. This table is the key finding of the analysis and is reproduced below.

Length of parking space	5.5m	5.25m	5m	4.75m	4.5m
Total spaces	10946	11467	12041	12674	13378
Average vehicle size (m)	4.12	3.87	3.62	3.37	3.12
Average CO ₂ (g/km)	151	140	130	121	112
Total CO ₂ (tonnes p.a.)	26448	25734	25098	24536	24055

Appendix F, Table 7: Effect of smaller average size of vehicle on parking capacity

23. It can be seen that not only would parking capacity increase if overall vehicle length was reduced it would also lead to a net reduction in carbon dioxide emissions. This is despite there being potentially a larger population of cars with permits.
24. In conclusion, the data presented above confirms that differential pricing based on vehicle length has the potential to increase available parking capacity and also to reduce carbon dioxide emissions.

Proposed pricing structure

25. Sample surveys have been carried out on the length of cars with permits. The data are presented in Appendix F and have been used to produce a price structure

¹ The Society of Motor Manufacturers and Traders Limited (SMMT), has agreed in principal and for a nominal charge that they will provide the detailed dimension data for all the vehicles that hold a resident's parking permit. This would provide a means of administering differential charges based on vehicle length as such data is not included on vehicle registration documents.

which would result in an overall price increase of 36% but with no increase for small cars (less than 3.92m), an approximately 'in line with inflation' increase for medium cars and an above inflation increase for large cars (more than 4.45m). The specific suggestions are presented below.

Vehicle length (m)	Typical example	Permit Cost
<3.92	Vauxhall Corsa, Ford Fiesta	£16
3.92-4.45	Vauxhall Astra, Ford Focus	£22
>4.45	Vauxhall Vectra, Ford Mondeo	£30
Average Permit Cost (from survey data)		£21.44

Proposed differential pricing structure

26. At present residents may buy permits for 6 and 18 months as well as 12 months. The former is 70% of the annual fee and the latter is 125% of the annual fee. It is suggested that this relationship be continued (rounded to the nearest whole pound). This is shown in the table below.

	Charge		
	12 months	6 months	18 months
Small	£16	£11	£20
Medium	£22	£15	£28
Large	£30	£21	£38

Charges for 6 and 18 months

27. Visitor parking permits are not vehicle specific and it would therefore not be possible to introduce differential pricing. For this reason it is suggested that the price for visitor permits be increased to £22.00. For the same reason this tariff is also proposed for all other permits (e.g. Q permits) except business permits. The latter will be reviewed in the near future.

Discount for alternative fuel vehicles

28. Encouraging residents to own Alternative Fuel Vehicles (AFV) would be a further way of reducing air pollution. AFVs operate on fuels other than petrol and diesel (e.g. electricity, propane, natural gas and ethanol) or are bi-fuel. As well as reduced emissions of carbon dioxide, they also produce greatly reduced air pollutant emissions (40% less than a EURO IV standard car).

29. The Government's Energy Savings Trust keeps a register of AFVs on behalf of Transport for London who operate a discount scheme for AFVs travelling within the congestion charge zone. It is suggested that a similar discount could be applied to permit charges in Norwich. As the population of AFVs is very small at present it is suggested that a 100% discount be applied to encourage take-up of such vehicles. This discount would need to be reviewed in due course as take-up increases.

Appendix A

Number of permits issued and spaces available

1. An assessment of the current scheme has been undertaken in order to ascertain the number of spaces available for residents and their visitors parking within the non-city centre CPZs. The following table summarises the number of spaces available, and is based upon the total kerbside available for permit holders and on an average space measuring 5.5 metres (5.5 metres makes an allowance for manoeuvring and for space between cars).

Zone	Total kerbside length (m)	Number of 5.5m spaces
NCPZ	11145	2026
WCPZ	5159	938
SWCPZ	17263	3139
SECPZ	17740	3225
ECPZ	8896	1617
Total		10945

Table 1: Current number of spaces available

2. Analysis of the Council's permit issuing database has allowed an estimate to be made of the number of non-city centre CPZ resident and visitor permits currently issued. Table 2 summarises this information. It should be noted that due to the nature of the system, the exact number of permits fluctuates on a daily basis.

Type of Permit	No Issued
Residential non city centre	8113
Residential non city centre visitor	9457
Total	17570

Table 2: Current number of permits issued

3. The above information demonstrates that the level of potential demand for parking in the non-city centre CPZs exceeds the current level of provision.

Appendix B

Comparison with other CPZ schemes in the Eastern Regions

4. Table 3 shows the current annual charges for non-city centre CPZ parking permits in Norwich against those currently charged by other authorities in the region.

	1 st vehicle	2 nd vehicle	Visitors	Comments
Uttlesford	£70			
Cambridge	£50			Charge £25 for motorcycle permits
Colchester	£50			Charge £16.67 for motorcycle permits
Epping	£50			
Ipswich	£32			
Braintree	£30			3 rd and 4 th permits charged at £50 and £100 respectively
East Herts	£25	£50		
Brentwood	£22			
Chelmsford	£18		£18	
Harlow	£17	£34	£10	3 rd and 4 th permits charged at £70 and £130 respectively
Norwich	£16	£16	£16	
Peterborough	£15		£5	
Thurrock	£15			
Basildon	£13.5			

Table 3: Comparative charges for residential permits in CPZs

5. Table 3 demonstrates that the rates charged for residents' parking permits vary significantly across the region, with the highest charge of £70 in Uttlesford (Essex) and the lowest of £13.50 in Basildon. Discussions with other Local Authorities has identified that many Councils have higher charges for annual residents permits. Edinburgh City Council currently charge £180 for an annual residents permit, Birmingham City Council £175 and Glasgow City Council £135.
6. There are currently no restrictions in Norwich on the number of permits issued to any one postal address; in addition, the cost of each subsequent permit does not vary from the first. Two of the Authorities sampled in the Eastern region allow up to four cars to be registered to a particular address, but with further permits at an increased cost.
7. In Harlow for instance, the first permit is £17 (comparable with Norwich's charges), however the second permit costs £34, the third £70 and the fourth £130. Incremental charging of this nature may reduce on-street

parking demand. It can also be argued to be a 'fairer' way of charging as it keeps the cost of the permits for households with one or maybe two cars relatively low, with those with three or four cars more heavily charged.

Appendix C

Cost of residents permits

8. In determining the proposed increase in the cost of permits, it was considered vital that the rise was fair and in line with increases in the overall cost of living. The Office for National Statistics has provided Retail Price Index (RPI) figures for the period from 1993 through to 2005. Using these indices it has been calculated that the overall cost of living in the UK has risen by 36% from 1993 to the present day.
9. Applying this percentage increase to the current cost of visitor and residential permits would result in a price increase from £16 to £22 (figure rounded up to the nearest pound). A potential increase of £16 to £22 would mean that the permit costs are still comparable to charges made elsewhere in the region (see Table 2 in Appendix B).

Appendix D

Pricing structure based on vehicle emissions

- 10. Recently the Driver and Vehicle Licensing Agency (DVLA) have restructured the UK Vehicle Excise Duty Legislation in order to reflect a vehicle’s carbon dioxide (CO₂) emissions.
- 11. The DVLA’s restructuring of the excise duty scheme has prompted many vehicle owners to re-examine their car purchasing preference and publicised the significance of vehicle emissions.
- 12. The changes introduced by the DVLA are based on CO₂ emission data supplied by motor manufactures. For older vehicles registered before 1 March 2001, reliable data is not available and therefore excise duty is based on engine capacity, i.e. over or less than 1549 cc. Where vehicle CO₂ emission data is available, the excise duty charges are calculated on a graduated scale based on the cars CO₂ output. Table 4 shows the bands used by the DVLA (which incorporate the amendments made by the Chancellor of the Exchequer’s March 2006 Budget):

Bands	CO ₂ emissions (g/km)
Band A	Up to 100
Band B	101 to 120
Band C	121 - 150
Band D	151 - 165
Band E	166 - 185
Band F	Over 185
Vehicles registered on or after 23rd March 2006	
Band G	Over 225

Table 4: Vehicle excise charging bands

- 13. Basing the permit charges on vehicle emissions would further serve to encourage residents to own or operate more environmentally friendly vehicles. However, care would be required in how the pricing of the permits is structured.
- 14. Emission data for the current fleet of vehicles issued with a residential parking permit has been obtained from the DVLA. This data has been combined with the vehicle excise bands to determine the number of vehicles with CPZ permits by tax band. This is shown in Table 5.
- 15. Approximately 6,300 vehicles currently issued with a residential parking permit were registered before 1st March 2001 and therefore no emission data is available. However an analysis of CO₂ emissions produced by different sized engines suggests that emissions increase broadly in line with cubic capacity in a relatively constant way. A number of ‘best fit’

equations have been used to describe this relationship with the best model shown in Figure 1.

Bands	CO ₂ emissions (g/km)	Number in current fleet
Band A	Up to 100	0
Band B	101 to 120	70
Band C	121 - 150	672
Band D	151 - 165	474
Band E	166 - 185	306
Band F	Over 185	362
Vehicles registered on or after 23rd March 2006		
Band G	Over 225	0

Table 5: Number of vehicles with CPZ permits by vehicle excise band

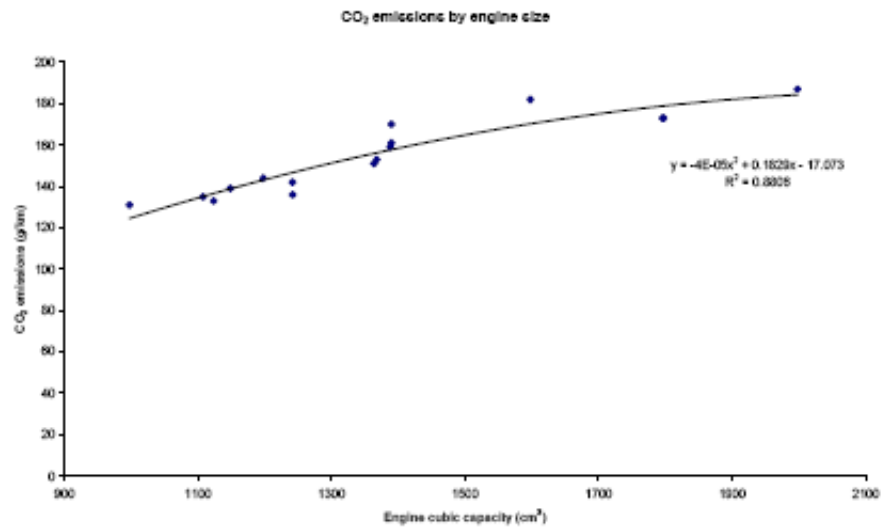


Figure 1: Relationship between engine size and CO₂ emissions

Appendix E

Pricing structure based on vehicle size

16. An 'average' car measures approximately 4 metres¹ in length. Encouraging residents to own smaller cars would increase the amount of available parking and could help reduce pollution. Based on an average space measuring 5.5 metres, Table 6 demonstrates the potential increase in the number of spaces in the CPZs that could be achieved through a reduction in the average car length and the subsequent reduction in the length of an average parking space.

Zone	Total kerbside length (m)	Number of spaces based on				
		5.5m (current)	5.25m	5m	4.75m	4.5m
NCPZ	11145	2026	2123	2229	2346	2477
WCPZ	5159	938	983	1032	1086	1146
SWCPZ	17263	3139	3288	3453	3634	3836
SECPZ	17740	3225	3379	3548	3735	3942
ECPZ	8896	1617	1694	1779	1873	1977
Total		10946	11467	12041	12674	13378

Table 6: Effect of smaller average size of vehicle on parking capacity

17. An assessment of the relationship between vehicle length and CO₂ emissions has been carried out. As with engine size and CO₂ emissions, emissions increase at a broadly constant rate with length. A number of 'best fit' equations have been used to describe this relationship with the best model shown in Figure 2.
18. The relationship shown in Figure 2 provides a means to assess the effect of reducing vehicle size on overall emissions. Data in table 6 has been combined with average car length information (see paragraph 0) and the equation in Figure 2. Assuming vehicles travel 16,000km yr⁻¹ (10,000 miles) it is possible to calculate the tonnes of CO₂ emitted. The results of this are shown in Table 7.
19. Inspection of Table 7 provides estimates of the effects of reducing average car length amongst permit holders. The present situation is shown in the first data column (i.e. 5.5m length parking space) with total CO₂ emissions p.a. estimated at 26448 tonnes.
20. If average car length can be reduced by 0.25m, whilst it would be possible to park approximately 521 more cars, because of consequent reductions in overall CO₂ emissions per vehicle, the total CO₂ emissions p.a. would

¹ Source: Highway Code

reduce by roughly 714 tonnes. A reduction in vehicle length of 0.5m – roughly the difference between driving a Volkswagen Golf rather than a Volkswagen Passat – doubles these effects.

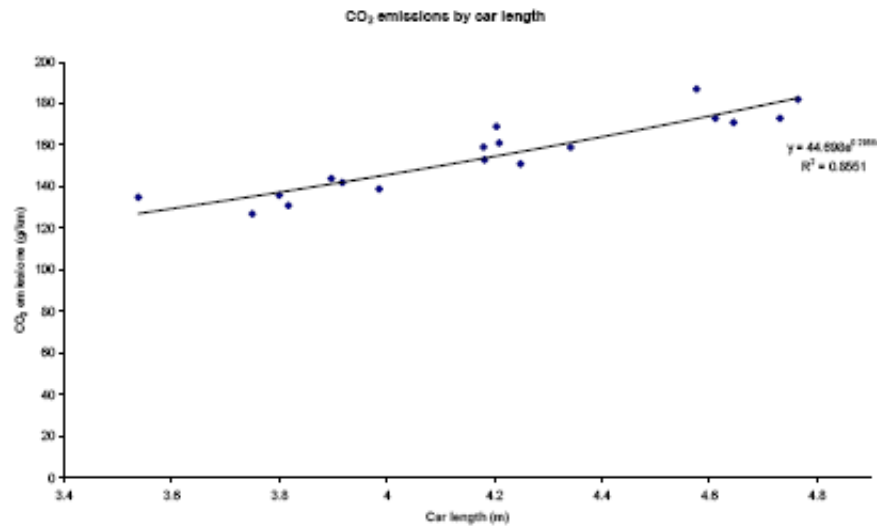


Figure 2: Relationship between vehicle length and CO₂ emissions

Length of parking space	5.5m	5.25m	5m	4.75m	4.5m
Total spaces	10946	11467	12041	12674	13378
Average vehicle size (m)	4.12	3.87	3.62	3.37	3.12
Average CO ₂ (g/km)	151	140	130	121	112
Total CO ₂ (tonnes p.a.)	26448	25734	25098	24536	24055

Table 7: Effect of smaller average size of vehicle on parking capacity

21. A survey of vehicles issued permits in Norwich's CPZs was undertaken to examine average vehicle lengths. Five streets in the Norwich CPZs were surveyed; Clarence Road, Marlborough Road, Orchard Street, Portland Street and Trafford Road. 309 vehicles were surveyed and vehicle lengths were obtained for each. It was found that the average vehicle length was 4.12m.

22. As discussed in Appendix A below application of Retail Price Index (RPI)

Vehicle length	No. of vehicles in survey	% of vehicles	No. of Vehicles issued permits	Old Charge	New Charge
<3.92m	110	35.6%	2,888	£16	£16
3.92-4.45m	138	44.7%	3,623	£16	£22
>4.45m	61	19.7%	1,602	£16	£30
Average charge				£16	£21.44

Table 8: Potential revised charges based on vehicle length and RPI increase

Appendix 2

Report for Resolution

Report to Norwich Highways Agency Committee
24 May 2007

Report of Head of Transport and Landscape

Subject Results of Consultation on the Proposal to Review
Resident Parking Permit Charges

Purpose

To inform members of the results of the consultation regarding the proposed changes to resident permit parking charges.

Recommendations

Members are asked to approve the revised pricing structure for on street permit parking permits as follows:

1. £16 p.a. for small cars (under 3.92m length);
2. £22 p.a. for medium cars (between 3.92 and 4.45m length); and
3. £30 p.a. for large cars (over 4.45m length);
4. £100 p.a. for business permits
5. £22 p.a. for all other permits; and
6. 100% discount for Alternative Fuel Vehicle private cars

Financial Consequences

If the proposals in this report are implemented the average cost of a residential parking permit will rise in line with the retail price index since 1993. The proposals in this report, spread across the present population of vehicles with residential permits, are equivalent to an increase from £16 to £21.44. This is in line with the increase in the cost of living (as measured by the retail price index) since the last price review in 1993.

The cost of implementing the proposals will be £36k, however this is offset against a potential rise in income over the period of a year assuming permit numbers stay constant, of approx 100K

There is potential funding available from the Civitas Project of up to 35% of the costs involved to implement this pricing structure.

Corporate Objective/Service Plan Priority

This report aims to achieve the corporate objective to build a successful economic future for Norwich and secure sustainable growth. It achieves the service plan priority of reviewing on street parking charges.

Contact Officers

Andy Watt

01603 212515

Joanne Deverick

01603 212516

Background Documents

Consultation responses

NHAC Committee report November 2006.

Report

Introduction

At your meeting in November 2006 you considered a report that looked at amending the pricing structure for parking permits within CPZs. The reasons for this were twofold: there has been no increase in permit prices since 1993 and there was a desire to look at ways that the pricing structure could be adapted to reflect the emission characteristics of different cars and hence encourage motorists to purchase lower emission cars. This proposal is part of the EU Civitas project that both the City and County Councils are signed up to.

After considering possible options, a pricing structure based on vehicle length was proposed on the basis that smaller cars tend to have lower emissions, vehicle length is easy to measure and clearly visible to the public, and ultimately if more people switched to smaller cars more spaces would be available on street. The following pricing structure was suggested:

- £16 p.a. for small cars (under 3.92m length);
- £22 p.a. for medium cars (between 3.92 and 4.45m length); and
- £30 p.a. for large cars (over 4.45m length);
- £100 p.a. for business permits
- £22 p.a. for all other permits; and
- 100% discount for Alternative Fuel Vehicle private cars

Consultation

An article was published in the March edition of Citizen¹ magazine advising the residents of Norwich of the proposed changes and asking for their comments on the proposals. The local press also carried an article on the proposal. The following table sets out the responses received, breaking them down into those that live in a CPZ, those who live outside and those who's location is unknown

Location of respondent	Support Proposals	Oppose Proposals	Views Unclear	Total Responses
<i>North</i>	6	3	5	14
<i>East</i>	2	31	3	36
<i>west</i>	0	1	0	1
<i>South-east</i>	3	2	0	5
<i>South-west</i>	5	5	2	12
<i>University</i>	1	1	0	2
<i>City Centre</i>	4	2	1	7
<i>Zone unknown</i>	5	2	1	8
All CPZs	26	47	12	85
Not in CPZ	7	2	3	12
Unknown	16	23	3	42

¹ Citizen is the free magazine published by the City Council and sent to all households in Norwich.

<u>Total</u>	<u>49</u>	<u>72</u>	<u>18</u>	<u>139</u>
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It can be seen that there was significantly more responses received from the Eastern CPZ than other areas. This is due to the fact that the local member circulated a letter to his constituents entitled 'Consultation' encouraging them to respond to the consultation. Many of these responses received from the Eastern CPZ were from the recently introduced extension and therefore these residents would see the price rises as significant, not having benefited from the fact that there has been no cost of living increase in over 10 years.

Overall, looking at all 139 responses, 35% supported the proposal, 52% opposed it and the views of 13% were unclear. Looking at those responses known to come from people living within CPZs and therefore directly affected by the proposals the figures are 31%, 55% and 14% respectively. However if the views from the Eastern CPZ are ignored the figures are then 49%, 33% and 18% respectively.

The main reasons for objecting to the proposals were; some people who need bigger cars (19), disbelief at the link between vehicle length and emissions (12), the increase was just another stealth tax (6) and that the principle was flawed / green issues are no concern of the Council (6).

Other comments raised by people who supported the principle of differential charging were; the differences between bands should be greater (10), 4x4's and vans should be charged an additional premium (9), charges should be based on emissions not length (8) and the 2nd and subsequent permits should be charged extra (5).

Additionally 9 respondents were against the principle of CPZs and 15 wanted operational changes to the CPZ which are beyond the scope of this scheme.

Discussion

Need for Large Vehicles – Some respondents said that due to their height or large family they needed a bigger vehicle and so the proposals discriminated against them. While accepting that some of the modern diesel-engined vehicles have lower emissions, most of the larger vehicle fleet has higher emissions than smaller cars and the principle of the scheme is to reduce emissions. The medium sized price bracket includes cars such as the Ford Focus and the Vauxhall Astra that can seat a family of 5. It should also be remembered that most of the properties in the CPZs are 2 and 3 bed-roomed terraced houses so the number of families that include more than 5 people would be limited.

Disbelief at Link between Vehicle Length and Emissions - An assessment of the relationship between vehicle length and CO2 emissions has been carried out. As with engine size and CO2 emissions, emissions increase at a broadly constant rate with length. A number of 'best fit' equations have been used to describe this relationship with the best model shown in Figure 1 overleaf.

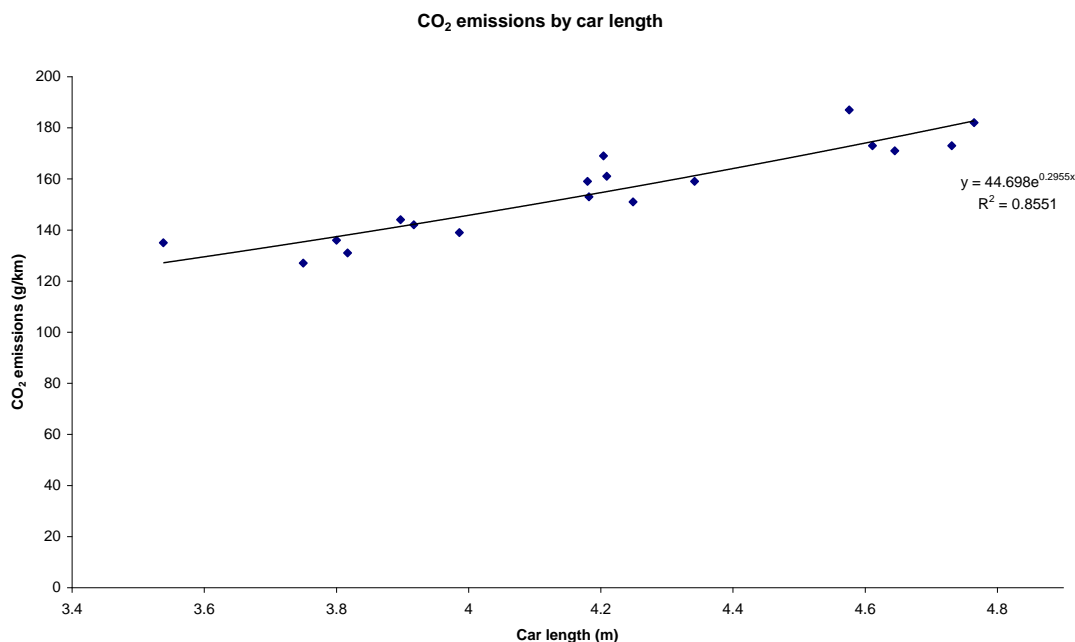


Figure 2: Relationship between vehicle length and CO₂ emissions

Stealth Tax – The cost of permits in Norwich has not been increased since 1993. The proposed increases result in a similar rise in income as if the £16 standard flat rate permit had been increased in line with the retail price index over the last 14 years.

Principle Flawed / Green Interests are No Concern of the Council – While a flat rate increase could be adopted, the idea of this scheme is to encourage people to driver smaller, cleaner, more fuel efficient cars. Increasing levels of pollution are a concern to everyone and the Council has a duty to ensure that vehicle pollution is kept within acceptable limits

Greater Differential between bands – The present difference between the bands is £14. While this may not seem significant at the current time, with inflation increases in the future the differential will increase. Also, once the principle is established and residents are aware that lager vehicles will be charged more, there is the potential to increase the charges for the larger vehicles proportionally more than smaller vehicles.

4 x 4's and Vans Charged More – The present proposed categories do not individually identify vehicles, however the vast majority of these would be in the large vehicle category. Both in terms of length and emissions these will have a similar profile to other bigger large vehicles and at present there are no plans to distinguish these. In future the categories could be refined.

Charge on Emissions, not Length – There is a direct link between emissions and length as demonstrated above. It was considered that the vehicle lengths were easier to identify and better understood by residents. A frequent complaint received from people living in CPZs is about the fact that larger vehicles take up more space, reducing the places available for others.

Second Permits Charged More – Some authorities charge more for second permits and this is something that could be considered in the future. However at this stage it was considered that to keep things understandable for local residents, not to try

and introduce too many changes in one go.

Conclusion

It would be unusual if a proposal that significantly increased the cost of a parking permit was met with an overwhelmingly positive response. However nearly a third of people who responded could see the benefits of introducing the differential charging, with some respondents claiming the proposals did not go far enough.

Had permits been increased by the retail price index over the last 14 years a residents permits would now cost £21.44. With a proposed price of £22 for medium sized cars and visitor permits, the proposed increases are broadly in line with inflation, and drivers with small cars see no increase at all. It is therefore recommended that the new pricing structure is adopted.

Facilitating the Way Forward

At present permits are issued through the City Council contact management system, Comino. To update the system to allow for the new pricing structure, and to amend it so that it can issue parking dispensations that are currently done manually would cost in the region of £36k. It is anticipated that the revised pricing structure would generate an additional £??k in its first year of operation that would more than cover this cost.

There is a commercial permit issuing system available that would have many benefits over the Comino system whereby it would be linked to the handheld units all the parking attendants carry enabling them to verifying any permit on street and identify the owner. The system would also enable permits to be applied for through the internet. However the cost of providing and maintaining the system over a period of 10 years is in the region of £200k. Development work is continuing in looking at the benefits such a system may afford.

Appendix 3: Average vehicle length in CPZs

Make	Model	Length (m)	Make	Model	Length (m)
FIAT	CINQUECENTO	3.230	FIAT	PUNTO 55 S	3.800
FIAT	SEICENTO SPORTING	3.332	FIAT	PUNTO 55 SX	3.800
DAEWOO	MATIZ SE PLUS	3.495	SEAT	IBIZA 1.9 TDi SALSA	3.810
KIA	PICANTO LX	3.495	SEAT	IBIZA S	3.810
TOYOTA	CARINA GL	3.520	SEAT	IBIZA CUPRA 20VT	3.810
ROVER	METRO S	3.521	VAUXHALL	CORSA LS	3.817
ROVER	100 KENSINGTON SE	3.521	VAUXHALL	CORSA MERIT	3.817
ROVER	100 ASCOT SE	3.521	VAUXHALL	CORSA LS	3.817
VOLKSWAGEN	LUPO SE 50 BHP	3.527	VAUXHALL	CORSA MERIT	3.817
SEAT	AROSA S	3.556	VAUXHALL	CORSA SXI	3.817
SEAT	AROSA 1.0 MPI	3.556	VAUXHALL	CORSA SXI 16V	3.817
RENAULT	5 GTX	3.560	VAUXHALL	CORSA TRIP 12V	3.817
PEUGEOT	106 XND GRADUATE	3.564	VAUXHALL	CORSA DESIGN 16V	3.817
HYUNDAI	AMICA GSI	3.565	VAUXHALL	CORSA COMFORT 16V	3.817
TOYOTA	YARIS SR	3.615	VAUXHALL	CORSA SXI	3.817
TOYOTA	YARIS GS	3.615	PEUGEOT	206 LX	3.822
TOYOTA	YARIS GS	3.615	PEUGEOT	206 CC	3.822
FORD	KA COLLECTION	3.620	PEUGEOT	206 SPORT	3.822
FORD	KA 2	3.620	PEUGEOT	206 LX AUTO	3.822
FORD	SPORTKA	3.620	PEUGEOT	206 L D	3.822
FORD	KA	3.620	VOLKSWAGEN	POLO 1.4 CL	3.822
FORD	KA	3.620	PEUGEOT	206 GLX HDI	3.822
FORD	KA COLLECTION	3.620	PEUGEOT	206 LX	3.822
MINI	MINI COOPER	3.635	VOLKSWAGEN	POLO L TDI	3.822
PEUGEOT	106 XN GRADUATE	3.678	PEUGEOT	206 LX D	3.822
PEUGEOT	106 XN ZEST 2	3.678	PEUGEOT	206 LX	3.822
PEUGEOT	106 INDEPENDENCE	3.678	VOLKSWAGEN	POLO S	3.822
FIAT	UNO S IE	3.689	VOLKSWAGEN	POLO SE	3.822
SUZUKI	SWIFT GLX	3.695	FORD	FIESTA FINESSE	3.828
VOLKSWAGEN	POLO 1.4 CL	3.708	FORD	FIESTA LX ZETEC	3.828
NISSAN	MICRA L	3.708	FORD	FIESTA FINESSE	3.828
VOLKSWAGEN	POLO L	3.708	FORD	FIESTA ENCORE DIESEL	3.828
VOLKSWAGEN	POLO CL DIESEL	3.708	FORD	FIESTA GHIA	3.828
CITROEN	SAXO VSX	3.708	FORD	FIESTA FINESSE	3.828
RENAULT	CLIO RT 1.4	3.708	FORD	FIESTA ZETEC	3.828
RENAULT	CLIO BIRRITZ	3.708	FORD	FIESTA GHIA X	3.835
VOLKSWAGEN	POLO 1.0 L	3.708	FIAT	PUNTO SX 60	3.835
CITROEN	SAXO EAST COAST	3.708	FIAT	PUNTO 1.2	3.835
CITROEN	SAXO FIRST	3.708	FIAT	PUNTO ACTIVE SPORT	3.843
NISSAN	MICRA LS	3.708	SKODA	FELICIA LXI	3.855
VAUXHALL	CORSA SRI	3.734	SUZUKI	VITARA JLX	3.861
NISSAN	MICRA SE AUTO	3.746	VOLKSWAGEN	POLO CL COUPE	3.897
FIAT	PUNTO 55 S	3.770	VOLKSWAGEN	POLO COUPE G40	3.897
SUZUKI	IGNIS SPORT	3.770	MG	MGF	3.910
RENAULT	CLIO DYNAMIQUE DCI 80	3.773	VAUXHALL	TIGRA	3.912
RENAULT	CLIO EXPRESSION 16V	3.773	FORD	FIESTA FLIGHT	3.917
RENAULT	CLIO DYNAMIQUE 16V	3.773	FORD	FIESTA FLAME	3.917
RENAULT	CLIO EXPRESSION 16V	3.773	FORD	FIESTA FUN	3.917
RENAULT	CLIO DYNAMIQUE 16V	3.773	FORD	FIESTA LX TDCI	3.917
RENAULT	CLIO RT	3.785	FORD	FIESTA FINESSE	3.917
RENAULT	CLIO DYNAMIQUE 16V	3.785	FORD	FIESTA FREESTYLE	3.917

Make	Model	Length (m)	Make	Model	Length (m)
FORD	FIESTA FLIGHT	3.918	ROVER	216 SI	4.110
FORD	FIESTA OLYMPUS	3.918	VAUXHALL	ASTRA LS 1.7 TDS	4.110
FORD	FIESTA POPULAR PLUS D	3.918	VAUXHALL	ASTRA CDX 16V	4.110
FORD	FIESTA DIESEL SVP	3.918	VAUXHALL	ASTRA SPORT 16V	4.110
FORD	FIESTA LX	3.918	VAUXHALL	ASTRA LS 16V	4.110
FORD	FIESTA LX	3.918	VAUXHALL	ASTRA 16V ELEGANCE	4.110
FORD	FIESTA CHICHANE	3.918	VAUXHALL	ASTRA SXI 16V	4.110
FORD	FIESTA LX ZETEC	3.918	VAUXHALL	ASTRA LIFE CDTI	4.110
VAUXHALL	TIBRA	3.921	TOYOTA	COROLLA GS	4.115
CITROEN	C3 PLURIEL	3.934	TOYOTA	COROLLA CD	4.115
SEAT	IBIZA SPORT 16V	3.953	TOYOTA	COROLLA GL	4.115
SEAT	IBIZA	3.953	TOYOTA	MR2	4.140
SKODA	FABIA CLASSIC 8V	3.960	RENAULT	MEGANE SCENIC RT ALIZE	4.140
RENAULT	MEGANE AUTHENTIQUE	3.967	FORD	ESCORT BONUS	4.140
ROVER	214 SLI	3.973	VOLKSWAGEN	GOLF GL	4.149
ROVER	214 SI	3.973	VOLKSWAGEN	GOLF GTI	4.149
ROVER	218 iS	3.973	VOLKSWAGEN	GOLF	4.149
NISSAN	SUNNY SEQUEL	3.975	VOLKSWAGEN	GOLF GTI	4.149
VOLKSWAGEN	GOLF DRIVER	3.985	VOLKSWAGEN	GOLF GTI ANNIVERSARY	4.149
FORD	PUMA 1.4 1.6V	3.988	VOLKSWAGEN	GOLF	4.149
FORD	PUMA 1.7 16V	3.988	VOLKSWAGEN	GOLF GTI TURBO	4.149
PEUGEOT	306 MERIDIAN	3.988	VOLKSWAGEN	GOLF GT TDI	4.149
PEUGEOT	306 XL	3.990	VOLKSWAGEN	GOLF CL 4+E	4.149
PEUGEOT	306 XN	3.990	VOLKSWAGEN	GOLF CL 4+E	4.149
KIA	RIO LX	3.990	VOLKSWAGEN	GOLF GT TDI	4.149
MAZDA	3 TS	3.995	VOLKSWAGEN	GOLF GTI	4.149
MAZDA	MX-5	3.995	AUDI	A3 1.8 SE	4.152
MAZDA	MX-5	3.995	FORD	FOCUS FLIGHT	4.152
FIAT	BRAVO 1.4 SX	4.013	FORD	FOCUS LX AUTO	4.152
FORD	FUSION + D	4.020	FORD	FOCUS ZETEC CLIMATE	4.152
NISSAN	KUBISTAR 70 SE DCI	4.035	AUDI	A3 T SPORT	4.152
HYUNDAI	ACCENT BARI COUPE	4.045	CITROEN	XSARA FORTE	4.166
HYUNDAI	ACCENT COUPE I	4.045	FORD	ESCORT AZURA	4.174
HYUNDAI	ACCENT COUPE I	4.045	FORD	ESCORT MEXICO	4.174
HYUNDAI	ACCENT CDX	4.045	FORD	ESCORT ENCORE	4.174
VOLKSWAGEN	CORRADO G60	4.050	FORD	ESCORT 55 D	4.174
VAUXHALL	ASTRA CD 16V	4.051	FORD	ESCORT 55TD	4.174
VAUXHALL	ASTRA LS DTI 16V ECO	4.051	FORD	ESCORT 55 D	4.174
CITROEN	ZX AVANTAGE DIESEL	4.065	SEAT	LEON S 16V	4.183
VOLKSWAGEN	1200 D LWB	4.091	FIAT	BRAVA 1.9 TD 100 ELX	4.187
CITROEN	BERLINGO MSPACE FORTE HDI	4.108	FIAT	BRAVA 100 ELX	4.187
VAUXHALL	ASTRA MERIT AUTO	4.110	VOLKSWAGEN	GOLF VR6	4.188
VAUXHALL	ASTRA CLUB 8V	4.110	NISSAN	ALMERA S	4.197
VAUXHALL	ASTRA SXI TWINPORT	4.110	NISSAN	ALMERA S	4.197
VAUXHALL	ASTRA CLUB	4.110	AUDI	A3 SE FSI	4.203
VAUXHALL	ASTRA GLS	4.110	HONDA	CIVIC SE EXECUTIVE	4.206
VAUXHALL	ASTRA MERIT	4.110	HONDA	CIVIC SE	4.206
VAUXHALL	ASTRA CLUB 8V	4.110	VOLKSWAGEN	GOLF PLUS S TDI 90	4.206
VAUXHALL	ASTRA GLS	4.110	VOLKSWAGEN	GOLF TDI S	4.206
VAUXHALL	ASTRA PREMIER	4.110	VOLKSWAGEN	GOLF TDI SE	4.206
ROVER	214	4.110	VOLKSWAGEN	GOLF MATCH TDI PD	4.206
VAUXHALL	ASTRA LS	4.110	VOLKSWAGEN	GOLF FSI SE	4.206
VAUXHALL	ASTRA DUO	4.110	VOLKSWAGEN	GOLF S TDI	4.206

Make	Model	Length (m)	Make	Model	Length (m)
VOLKSWAGEN	GOLF SE	4.206	FORD	SIERRA L	4.494
RENAULT	MEGANE DYNAMIQUE DCI 120	4.209	FORD	SIERRA SAPPHIRE GLX	4.494
RENAULT	MEGANE DYNAMIQUE 16V	4.209	VAUXHALL	VECTRA LS 16V	4.495
RENAULT	MEGANE DYNAMIQUE DCI85 E4	4.209	VAUXHALL	VECTRA CLUB DTI	4.495
RENAULT	MEGANE DYNAMIQUE+ CP A	4.209	TOYOTA	AVENSIS SE	4.496
RENAULT	MEGANE DYNAMIQUE+ CABRIO	4.209	SKODA	OCTAVIA CLASSIC	4.511
ALFA ROMEO	147 TS TI SE	4.223	VOLVO	V50 S D (E4)	4.514
ALFA ROMEO	147 T SPARK LUSO	4.223	VOLVO	V40 SE 2.0I	4.516
VOLVO	340	4.230	FORD	PROBE 16V	4.544
ALFA ROMEO	146 TI	4.235	MERCEDES	CLK 240 AVANTGARDE AUTO	4.567
HONDA	CIVIC SPORT	4.250	RENAULT	LAGUNA EXPRESSION 16V	4.576
RENAULT	SCENIC PR-LEGE VVT 136 A	4.259	PEUGEOT	406 S HDI (90)	4.598
TOYOTA	COROLLA CD	4.267	DAEWOO	ESPERO GLXI	4.615
TOYOTA	COROLLA SPORTIF	4.267	SAAB	9-3 S TURBO	4.622
PROTON	WIRA LUX	4.270	SAAB	9-3 S	4.622
CITROEN	XSARA PICASSO DESIRE 2	4.276	SAAB	900 I 16V	4.638
TOYOTA	COROLLA 1100	4.285	ROVER	620 GSDI	4.645
FORD	ESCORT TDX	4.293	VOLVO	850	4.661
FORD	ESCORT LX	4.293	RENAULT	ESPACE GTS	4.661
FORD	ESCORT 55 D	4.293	DAEWOO	LEGANZA SX	4.671
FORD	ESCORT FINESSE 16V	4.293	JAGUAR	X-TYPE V6 SE AUTO	4.672
FORD	ORION L	4.295	ROVER	VITESSE	4.690
ROVER	414 SLI	4.316	VOLKSWAGEN	PASSAT SE TDI	4.703
VAUXHALL	ZAFIRA COMFORT 16V	4.317	VOLKSWAGEN	PASSAT SPORT TDI	4.703
NISSAN	200 SX EXECUTIVE	4.321	VOLKSWAGEN	PASSAT SE TDI	4.703
VAUXHALL	COMBO 2000 CDTI 16V	4.323	VOLKSWAGEN	PASSAT SE 20V TURBO	4.703
FORD	FOCUS LX TDCI	4.342	VOLKSWAGEN	PASSAT SPORT 20V TURBO	4.703
KIA	SPORTAGE XE	4.350	FORD	MONDEO GHIA X	4.731
TOYOTA	COROLLA	4.369	FORD	MONDEO ST200	4.731
VAUXHALL	CALIBRA SE8	4.395	SAAB	9000 TURBO 16 5D M	4.760
RENAULT	MEGANE RT 1.4	4.415	VAUXHALL	VIVARO 2900 DI SWB	4.782
RENAULT	MEGANE RN 1.4	4.415	VAUXHALL	VIVARO 2900 DI SWB	4.782
BMW	328i COUPE	4.420	VOLVO	740 GL	4.785
BMW	318is	4.420	VOLVO	240 GLT	4.790
ALFA ROMEO	156 2.0 T.SPARK	4.430	AUDI	A6 2.6	4.801
CITROEN	XANTIA SX TD	4.440	KIA	SEDONA S TD	4.810
MITSUBISHI	SIGMA V6 AUTO	4.445	HONDA	ACCORD AERODECK LS AUTO	4.811
HONDA	CIVIC SPORT	4.448	MERCEDES	E230 AVANTGARDE A	4.818
HONDA	CIVIC CTDI S	4.448	VOLVO	940 SE TURBO	4.869
VAUXHALL	ZAFIRA 16V CLUB	4.467	VOLVO	940 SE TURBO A	4.869
VAUXHALL	VECTRA ELEGANCE 16V	4.470	VAUXHALL	OMEGA 2.0 16V CD AUTO	4.902
FORD	MONDEO MISTRAL	4.470	VAUXHALL	OMEGA 2.0 16V CDX A	4.902
FORD	MONDEO	4.470	VAUXHALL	OMEGA CD V6 AUTO	4.902
FORD	MONDEO 24V	4.470	VAUXHALL	CARLTON DIPLOMAT I A	4.920
VAUXHALL	VECTRA 2.0 CD	4.470	JAGUAR	X-TYPE V6 SPORT	5.024
FORD	MONDEO GHIA X TD	4.470	FORD	TRANSIT 80 POP D SWB	5.201
FORD	MONDEO ZETEC	4.470	FORD	TRANSIT 300 SWB TD	5.201
FORD	MONDEO VERONA	4.470	FORD	TRANSIT 80 SWB	5.201
FORD	MONDEO LX	4.470			
TOYOTA	CARINA E SOLAIR SE	4.485			
MERCEDES	C200 AUTO	4.487			
KIA	CARENS CRDI LX AUTO	4.493			
			Average		4.12