Additional on-street car parking in Church Street and Hill Street

Traffic Regulation Order - LJB/TRO/HILP2

October 2018

Impact of Proposed 'Road Narrowings' in Church St and Hill St on Pedestrian & Driver Safety and Public Health

Introduction

This document differs significantly in content and structure to the document submitted in April 2018. This revised document highlights the dangers of 'roadside' and 'kerbside' emissions to public health. It refers to several studies that show that even low or moderate levels of vehicle emissions cause permanent harm to the hearts and lungs of children. It also highlights the road safety dangers to all road users posed by the proposed parking bays, particularly in Church St where the proposed bay is in close proximity to a blind bend.

I would like to clarify that the contents of this document are not based on 'my opinion'. It is a collection of research findings undertaken by some of the world's most respected medical and environmental scientists and also by leading health and environmental organisations. The information is fully referenced and can be checked easily online. (see information sources - appendix 1)

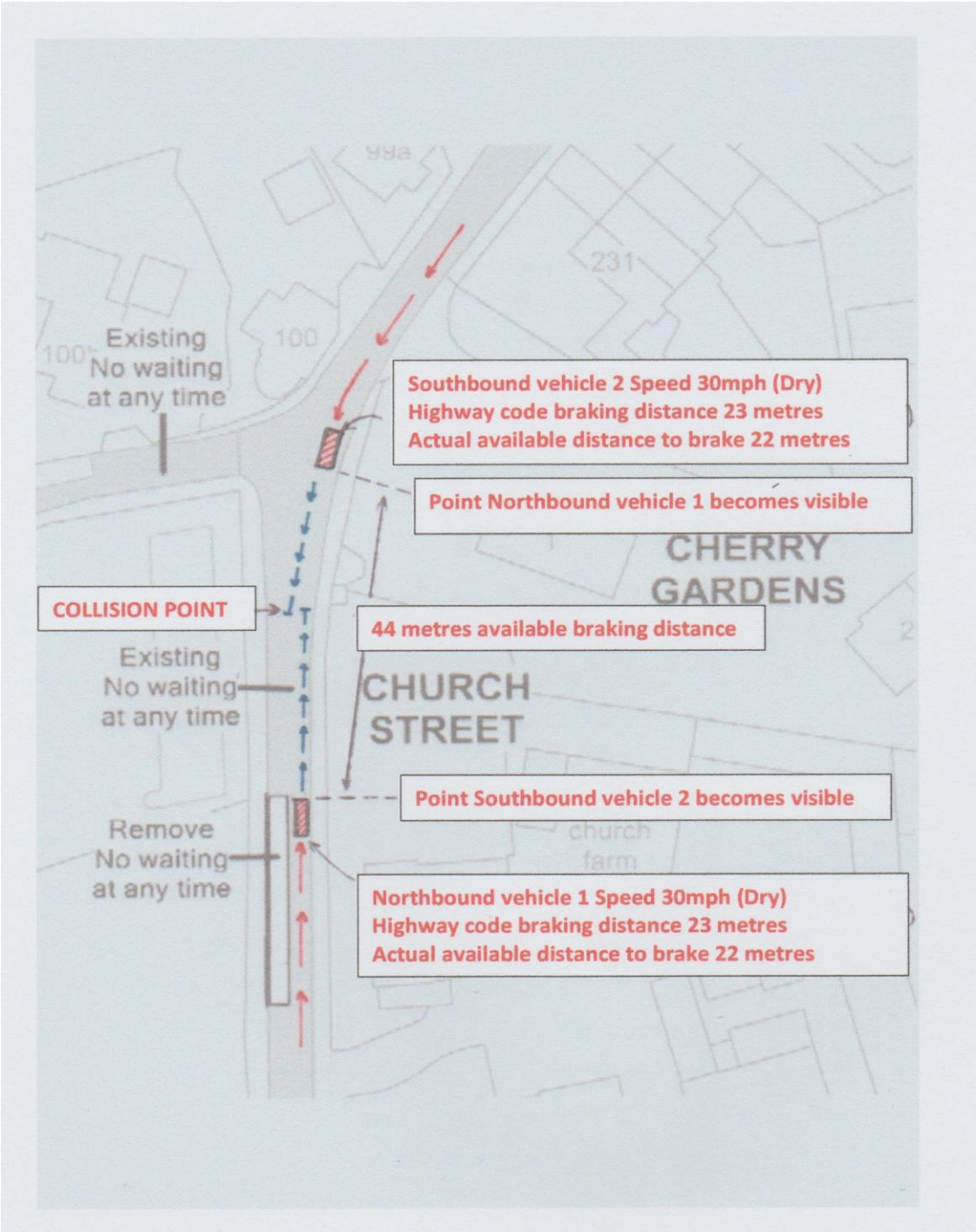
After studying the TRO proposal, I can see the merit of adding parking restrictions at the junction of Devizes Road and Trowbridge Road in terms of improved visibility and safety for pedestrians and vehicles. However, I have severe reservations regarding the two proposed parked car 'road narrowings' on the west side of Church Street between The Knapp and St Michaels Close and on the North side of Hill Street.

I am fully aware that once a TRO proposal is formally advertised, it is, in the vast majority of cases, an 'unstoppable force' irrespective of however credible, justified or informed the objections are. However, the irregularities in the public consultation process, the reliably sourced public health and road safety information and the legal 'duties of care' highlighted in this document, may be sufficient for WC to consider amending the proposed TRO to exclude the two additional parking bays in Church Street and Hill Street.

The proposed 'road narrowing' method of reducing speeding has been highlighted by HPC as an additional benefit of creating the proposed additional parking spaces. As you will see from the information contained in this document, 'road narrowings' have a significant negative impact on public health and road safety.

Despite evidence to the contrary, there is a misconception of 'speeding' in Church St held by a small number of residents, notably some who would benefit from additional on-street parking. I am sure there will be a number of positive responses to the proposal by some of these residents who, in order to alleviate their own personal parking predicaments, are prepared to ignore and to deny the significant risks to the health and road safety of residents, particularly children.

The impact of 'road narrowing' on Road Safety in Church Street



Southbound traffic -The approach to the proposed area of parking in Church St from the direction of Hill St is via a bend between Cherry Gardens and The Knap. Due to the nature of the bend and its impact on visibility of oncoming traffic, drivers approaching from this direction (southbound) will only be aware of an oncoming car in the middle of the road when they are in the process of negotiating the bend. A southbound driver in this situation will have only **22 metres** in which to react, brake and avoid a collision.

Northbound traffic - Drivers travelling northbound via Church St and passing the last parked car in the proposed parking bay, may, at this point, see an oncoming vehicle exiting the bend opposite The Knap. They will have no time or space to return to the correct side of the carriageway and will have only **22 metres** in which to react, brake and avoid a collision.

Both drivers will have less than 2 seconds in which to react, brake and avoid a collision.

According to The Highway Code braking distances, vehicles travelling in opposite directions at 30mph (13 metres per second) in dry conditions will each take approximately **23 metres** to stop. Therefore, the theoretical combined distance both vehicles will take to stop and avoid a collision is **46 metres.**

The total actual distance between both vehicles at the point at which both vehicles are visible to each other and the distance available to avoid a collision is only **44 metres.** (see above map)

Even in dry conditions, The Highway Code breaking distances confirm that a collision between northbound vehicles exiting the proposed road narrowing in Church St and oncoming southbound vehicles negotiating the bend between Cherry Gardens and The Knap is highly likely. In wet conditions it is inevitable.

How accurate are Highway Code braking distances?
Researchers from transport consultancy TRL examined a wealth of academic data looking into drivers' thinking time. They concluded that it takes much longer than the Highway Code estimates for drivers to see, recognise and react to an emergency. While the official thinking time is 0.67 seconds, TRL concluded that the human brain actually takes around 1.5 seconds. This is the figure used by the US equivalent to the Highway Code. In Canada it is 2.5 seconds.

Even though car breaking technology has improved in recent years, the majority of the overall stopping distance at most speeds is made up of the time taken to perceive the hazard and react. The TRL research shows that average thinking time is more than double that set out in the Highway Code.

At 30mph, thinking time goes from 9m to 20m. That increases total stopping distance to **34 metres** – nearly three car lengths longer than the Highway Code.
http://blog.greenflag.com/2017/highway-code-stopping-distance-review/

The WC Highways traffic survey carried out (at the location of the proposed parking bay) in March 2017, showed that approximately 1,500 of the 3,000 vehicles that travel through Church St every day, did so at speeds between 26mph and 30mph and approximately 400 vehicles between 31 mph and 35mph.

According to the Highway Code, braking distance of cars travelling at 35mph is approximately **30metres (**7 metres longer than a car travelling at 30mph). Cars travelling at speeds between 31mph and 35mph will have a much greater collision risk than cars travelling at 30mph.

Braking distances for heavy 4 wheel drive vehicles, vans trucks and buses are significantly longer than for cars and therefore have a greater collision risk.

The images below show the restricted visibility of northbound and southbound drivers at the bend between The Knap and Cherry Gardens.

The **northbound** image shows the point at which southbound vehicle 2 (map) emerges from the bend and is visible to northbound vehicle 1. This image was is taken where northbound vehicle 1 would overtake the last parked car in the proposed parking bay. The distance between this point and the oncoming southbound car in the foreground is **44 metres.** The Highway Code combined braking distances for both northbound and southbound cars at 30mph in dry conditions is **46 metres** (92 metres in the wet).

The **southbound** image shows the point at which vehicle 2 (map) will first see northbound vehicle 1 approaching in the same carriageway only 44 metres away. The Highway Code combined braking distance in dry conditions for both northbound and southbound cars at 30mph is **46 metres** (92 metres in the wet).

Photo taken in **northbound** direction at the point where vehicle 1 (see map) is overtaking the last parked car in proposed parking bay.

Photo taken in **southbound** direction at the point where northbound vehicle 1 becomes visible to southbound vehicle 2 (see map). Note: blue car in foreground is positioned at the end of the proposed parking bay

Note : Bullet point headings below in **'bold'** taken from Cambridge County Council's research on road 'priority narrowing' traffic calming.
https://www.cambridgeshire.gov.uk/residents/travel-roads-and-parking/roads-and-pathways/improving-your-local-highway/speeding/horizontal-speed-treatments/

- **Vehicles without priority may use excessive speed to pass the chicane (or parked cars) to get through before an oncoming vehicle with priority.**
  This situation happens regularly through the existing road narrowing in Church St. between St Michaels Close and Nursery Close.

- Parked vehicles reduce visibility of the road and pedestrian movements on the pavements**.** Pedestrians/children who unwisely take the risk to cross roads between parked cars could be killed or seriously injured. Every morning and afternoon when traffic volumes are at their highest in Church Street/ Hill Street, many primary and pre-school children walk or are transported by pushchair along Church Street/Hill Street on the way to and from school on a daily basis. Usually, they wait to cross where there are no parked cars to restrict pedestrian or driver visibility. One of these 'safer' crossing areas will be replaced by the introduction of the proposed parking bay road narrowing.

- Without give way road markings, some drivers are unaware that they should give way to oncoming vehicles before passing parked vehicles or other obstructions on their side of the road. (Rule 163 – Highway Code). This has happened occasionally through the existing 'narrowing' in Church Street.

The view of drivers exiting from The Knapp or from St Michaels Close will be obscured by the vehicles parked in the proposed parking bays and increase the likelihood of a collision.

- **Vehicles with priority are not required to reduce their speed if there is no oncoming vehicle approaching**
- **When traffic volume is low there is very little speed reducing benefit as drivers rarely have to give way**
- **Where there is little need to give way, drivers become used to not stopping and may fail to stop when necessary**
- **Drivers may try to pass a cyclist through the narrowing which could cause a collision** The Department of Transport has estimated that at least 70% of drivers attempt to overtake a cyclist within a traffic calming 'road narrowing'. (DOT leaflet 01/97) In the past five years, I have witnessed this on more than one occasion at the existing parking bay 'narrowing' in Church Street.

Why is there no documented evidence of any road safety assessment/review or any form of 'risk assessment' carried out by WC Highways before or during the design stage?

Traffic Engineers should identify existing and potential safety hazards that may affect road users including vehicle air pollution. The bend between The Knap and Cherry Gardens is a potential safety issue and therefore some sort of road safety risk assessment should have been carried out and documented prior to the design stage.

I emailed WC Highways on 4/10/18 and asked if any type of road safety, risk assessment or safety investigation carried out, If any measurements were taken at the bend and if safe braking distance' information was considered.

WC Highways replied on 16/10/18 confirming that **1**. *"all elements of road safety have been considered"* ***2.*** *" engineers did not formally record their thoughts in written format"* **3**. *" no documents have been produced"*

The lack of documented evidence to show that any elements of road safety have been considered is surprising. I find it hard to believe that this is WC Highways' standard practice when introducing traffic calming measures that have a potential road safety issue.

As I understand it, The Road Traffic Act 1988 section 39 places a statutory duty on local councils to take appropriate measures to prevent accidents.

Safety risk to Cyclists in 'road narrowing' traffic calming schemes.
Department of Transport research (Guidance leaflet 01/97) has found that at least 70% of drivers attempt to overtake cyclists within a traffic calming 'road narrowing' and that proximity of motor vehicles, especially at the point where the carriageway begins to be narrowed, was a concern for cyclists.

The impact of 'road narrowing' in Church St/Hill St on public health

Note : Bullet point heading below in **'bold'** taken from Cambridge County Council's research on road 'priority narrowing' traffic calming.
https://www.cambridgeshire.gov.uk/residents/travel-roads-and-parking/roads-and-pathways/improving-your-local-highway/speeding/horizontal-speed-treatments/

- **Stop-start movements may increase vehicle exhaust emissions** which effect the health of pedestrians (particularly children), residents and the environment. There is no longer any doubt that **road narrowings** expose pedestrians, residents and drivers to toxic levels of exhaust emissions even in low traffic areas where drivers slow, stop and pull away (see emissions information). The long high walls either side of the proposed parking in Church St. reduces the speed at which toxic exhaust fumes can dissipate leading to prolonged exposure to pedestrians and residents. (see Vehicle Emissions information)

- **May cause queuing of vehicles at peak times when there is increased traffic volume.** This will significantly increase the level of toxic emissions. Queuing of vehicles currently occurs at the existing road narrowing parking bay in Church Street at peak times. If this occurs at the proposed road narrowing parking area, queues between the two parking areas could join resulting in 'gridlock'.

"Even low or moderate short term exposure to traffic pollution permanently stunts the growth of your children's lungs, causes your blood to thicken, your arteries to inflame and your heart to beat irregularly. It makes you more likely to suffer a stroke or a heart attack, more likely to develop Asthma or have an Asthma attack and will shorten your life."
British Heart Foundation **[16]** Professor Steffen Petersen - Cardiovascular Medicine Queen Mary University. **[2]** BBC Documentary 2018 – **[26]**

"The emissions from only one or two diesel vehicles stopping and pulling away from a quiet junction is sufficient to expose child pedestrians to a dangerous level of 'kerbside' and 'roadside' emissions that can result in permanent lung damage. More worryingly, a child in a pushchair on the same pavement would be physically closer to the source of the emissions, have lungs more susceptible to damage by toxic fumes and would be at a much higher risk of permanent lung damage. ***[4] [6] [7] [26]***

"There is a tremendous [political] inertia which frustrates me enormously; by the time anything happens their lungs will have been damaged and they will not have obtained their maximum growth potential. In 10 years they will have suffered all the effects we now see coming through increased vulnerability to a range of respiratory disorders in childhood and goodness knows what that leads to in terms of vulnerability to disease in later life."
Jonathan Grigg, Professor of Paediatric Respiratory and Environmental Medicine at Queen Mary Hospital, London **[1]**

Research led by Kings College London has shown that vehicle pollution stunts lung growth in children. *" The impact of traffic-related pollution on children's health is truly alarming and has been known about for some time."* *" Even the half-hour daily walk to and from school is detrimental"* Prof Chris Griffiths, UK Medical Research Council. **[5]**

"The data shows that traffic pollution stops children's lungs growing properly"
Ian Mudway, a respiratory toxicologist at King's College London **[10]** Prof Chris Griffiths, UK Medical Research Council **[5]**.

Research has shown **ten times more** Nitrogen dioxide (Nox) at the 'roadside' when a diesel car pulls away at normal speed from a junction or from traffic queues than when driving at continuous speeds under 30mph. - Professor Rob Mackenzie - University of Birmingham **[7] [26]**

"We know that infants breathe in higher amounts of airborne particles relative to their lung size and body weight compared to adults. What we have proven here is that the height most children travel at while in a pram doubles the likelihood of negative impacts from air pollution when compared to an adult. When you also consider how vulnerable they are because of their tissues, immune systems, and brain development at this early stage of their life, it is extremely worrying that they are being exposed to these dangerous levels of pollution." Professor Prashant Kumar, who is a Chair in Air Quality and Health and the founding director of the Global Centre for Clean Air Research **[6]**

"The closer you get to an exhaust pipe the more serious the problem is. Each individual car's exhaust is causing damage to individual people on every street." Prof Frank Kelly - UK Government advisor on the medical effects of air pollutants. **[4]**

"Smooth driving reduces emissions and stop-start acceleration and deceleration braking is harmful. It is putting out more through the tail-pipe but secondly braking is also grinding bits of very fine particulate matter which goes into the atmosphere." Ralph Bagge, leader of South Bucks District Council and deputy chairman of the Nice Guideline Committee, https://www.telegraph.co.uk/news/2016/12/01/speed-bumps-could-removed-cut-traffic-pollution-save-lives/

Church Street - ' The Toxic Corridor'

Two additional parking bays in Church Street are proposed to the north of St Michaels Close. This stretch of road is bordered by a 12 foot wall on the west side and a wall on the east side that varies in height from 4 to 5 feet along its length. Both walls are a pavement's width from the road.

Scientists from Birmingham University have found that vehicle emissions rise up and spread to the pavements on either side of the road before falling. They also found that walls and houses close to the pavements prevent the emissions from dispersing and concentrate the toxic exposure to pedestrians. **[26]** It is worth noting that Church Street pavements are closely bordered by walls and houses along its entire length.

Currently, the 'toxic corridor', earmarked for a six car parking bay, is clear of parked cars due to parking restrictions which allows traffic to maintain consistent speeds and therefore emissions of Nitrogen dioxide (Nox) and Particulate Matter (PM) are minimised

However, even without high traffic volumes and any obstructions to cause vehicles to slow and accelerate away, vehicle pollution, especially carcinogenic particulates, is much more toxic along this stretch of road than elsewhere in Hilperton due to the high walls bordering the road.

Dust clouds of road dirt containing toxic particulates (PM) are regularly blown up from the pavements at this location on dry windy days and also by buses and vans travelling along this stretch of road at normal speeds.

This toxic dust is ingested by all pedestrians using the pavements on either side of the road which can permanently stunt the growth of children's lungs and cause heart disease, lung cancer and premature deaths in adults.

Twice a day, approximately ten primary school children from Hilperton, accompanied by a parent, (sometimes with a pre-school infant in a push chair) walk to and from school via Church St.

Their walk coincides with high levels of 'kerbside and 'roadside' emissions at peak traffic times when vehicles queue at the existing parking bay south of St Michaels Close. If the proposed parking bay is agreed, the very same children could breathe in twice the amount of toxic gases during their journeys through the 'Toxic Corridor.'

Why should parents have to accept that walking their children to school will expose them to toxic air that could permanently damage their lungs?

Some local councils claim that the level air pollution in their area is safe. Should you believe them?

If air pollution monitoring services or your local council claims the pollution levels in your area are 'low or moderate' and advise you to 'enjoy your normal outside activities', beware!

Air pollution monitoring equipment, usually installed some distance from roads, measures 'ambient' air pollution across a large area and for this reason can vastly understate the levels of air pollution in some areas.

Some councils monitor 'roadside' emissions but incorrectly fix the monitoring equipment to a lamppost above the specified minimum height and only record average monthly pollution levels which can be half of the actual levels.

Many local councils use this misleading air pollution monitoring data and 'low volumes' of traffic to counter objections to new roads, amendments to existing road layouts and to avoid having comply with their statutory duty to improve air quality or public health and also to avoid the expense of implementing the necessary air quality reduction measures.

Roadside and kerbside monitoring should record pollution levels on an hourly basis and at specific locations when and where pedestrians are at most risk. If measured correctly, roadside and kerbside emissions can, not only be many times higher than pollution levels monitored over a wide area, but also many times higher than European safety limits..

Some councils claim dangerous vehicle emissions are not a problem where there are 'relatively low volumes of traffic'. Should you believe them?

Diesel vehicle emissions are not only a problem in busy towns and cities with high traffic volumes. Exposure to toxic 'roadside' and 'kerbside' emissions can be as dangerous to health in rural villages with 'road narrowing' or speed hump traffic calming measures than in busy locations where vehicles travel smoothly at normal speeds.

Low daily volume of traffic does not mean there is not a serious risk to the health of adults or, more importantly, children using the pavements. It is how the traffic (light or heavy) is allowed to 'flow' without cause to stop/start that determines the level of 'roadside' and 'kerbside' emissions and also the risk of serious and permanent damage to health.

Ten times more Nitrogen dioxide (Nox) is produced at the roadside when a diesel car pulls away at normal speed from a junction or from traffic queues (*Professor Rob Mackenzie - University of Birmingham research 2017)* **[26]**

UK Vehicle pollution – "A National Health Emergency"

- Many environmental groups, scientists and health organisations are calling for the Government to take immediate action to address this 'national health emergency' that effects all drivers and pedestrians in the UK and not just those who live in large urban areas.
- Questions are now being asked by the media, health and motoring organisations and some councils to establish how much of this pollution is due to traffic calming measures, particularly speed cushions, humps and **road narrowing** (which require vehicles to stop, wait for priority traffic to pass the restriction and accelerate away).
- In response to the increasing concern and awareness of the lethal effect of exposure to toxic vehicle emissions, the Government produced a plan to reduce UK air pollution based on the growing volume of scientific evidence. One of the recommendations of the plan published by the Department for Environment, Food and Rural Affairs in May 2017 is the removal of speed humps and other measures which slow the flow of traffic. The Government has also advised local councils wherever possible to to improve the flow of traffic to ease air pollution levels. [20]

Procedural irregularities in the public consultation process

A Traffic Regulation Order cannot be made to facilitate additional parking spaces on a highway unless there are specific 'reasons' WC Highways has given two of these specific reasons **1.** reducing danger to pedestrians and vehicles ('speeding') and **2.** relieving 'congestion') Both reasons **do not** apply to Church St.

Speeding in Church Street?

- WC Highways conducted a seven day/24hr traffic survey in March 2017 which confirmed average traffic speeds were 25mph Southbound and 28mph Northbound.
- It also showed that 85% of vehicles did not exceed 30mph. These findings confirmed, officially, that there is not a speeding issue in Church St.
- The survey also revealed that the number of drivers who use excessive speed through Church St are low. However, the level of speeding in Church St is 'perceived' by a small number of residents, to be high, notably, by some who would benefit from additional on street parking.

Prior to the original TRO proposal:

- WC have no record of any previous collisions or injuries in Church St.
- WC have no record of any speeding complaints by residents.
- Parish Council minutes (going back 8 years) make no reference to speeding in Church St. In Trowbridge Road, yes, but **not** Church St.

Congestion in Church Street ?

- HPC have not contacted WC about 'congestion' and have not requested WC carry out a 'congestion' survey.
- WC have received only one complaint of 'congestion' in Church St caused by occasional inappropriate parking. This is a parking enforcement matter and does not cause 'congestion'
- Parish Council minutes (going back 8 years) make no reference to 'congestion' in Church St being discussed or mention receiving any residents complaints about 'congestion'.
- If the proposed parking bays are added, it is inevitable that during peak times, tailbacks from the existing parking bays to the proposed parking bays will meet and result in gridlock adjacent to the junction of Church Street and St Michaels Close and at the junction of Church Street and The Knapp.
- The irony is, that if the proposed additional parking bays are created in Church Street, it would create the very road safety 'dangers' and 'congestion' that WC Highways has claimed will be reduced by creating the bays.

What is the 'real' reason for creating additional parking bays in Hilperton?
According to HPC minutes, the proposal for lifting of parking restrictions in and around Church Street originated in February 2017 from a request to Mr Clark (HPC) from the local Church Warden to lift parking restrictions <u>to allow vehicles to park on the main roads</u> to help with parking around the church"

Clearly, implementing measures to address 'speeding dangers' or 'congestion' that do not exist in Church St and Hill St is questionable. It would however, allow WC Highways to introduce additional parking bays under the requirements of the The Local Authorities' Traffic Orders Regulations 1996.

Therefore, as WC Highways' reasons do not apply to Church St and Hill St, they are misleading. Despite two requests WC Highways have refused to provide a full explanation/ justification of those reasons to enable residents to make a considered judgement on the proposal, particularly during a public consultation.

Given the comprehensive, reliably sourced information (see source reference appendix 1) provided in this document and the lack of valid, applicable or justifiable reasons given for the additional parking bays in Church Street, it is difficult to imagine how the potential risks to public health and road safety are outweighed by the provision of just 9 additional parking spaces in Church St and Hill St.

Residents affected by the proposed additional parking bays in Church Street

Currently the tailbacks from the existing parking bay in Church Street are approx three to four vehicles long during peak traffic times.

Rush hour tailbacks from the proposed additional parking bay could easily reach back the 23 metres (four vehicles) to St Michaels Close. This would increase the existing level of traffic pollution and traffic noise that the residents of Church Street 226 to 228 and 1 & 10 St Michaels Close are already exposed to.

The meeting of North and South tailbacks from the existing and proposed parking bay will result in 'gridlock.' which will create the congestion that the scheme was supposedly designed to reduce.

Legal Implications

As I understand it, WC has the following duties of care:

- Common Law duty to protect people when creating, designing or maintaining highways.
- Statutory duty of care to ensure the safety of new highways or amendments to an existing highway.
- Duty of care to take reasonable care to avoid acts or omissions that can be reasonably foreseen as likely to cause harm or damage
- Duty of care to the vulnerable
- Statutory duty to improve air quality and public health.

Prior to a final decision being made by WC on this proposal, I would urge Wiltshire Council to carefully consider the issues below raised in this document and their impact on pedestrians (particularly children) cyclists, road users and residents:

- Procedural irregularities in the consultation process
- Road safety risks,
- Risks to public health caused by 'roadside and 'kerbside' vehicle emissions
- Environmental implications

Overwhelming scientific evidence to support the abandonment of traffic calming measures involving the slowing and accelerating of vehicles has been in the public domain for many years. This is crucial information Wiltshire Council <u>should already be aware of.</u>

Dismissal by WC of recent Government advice and of easily accessed, reliably sourced scientific information and to press on regardless with a seriously flawed traffic calming method will put the public's health and road safety at significant risk.

Should there be a fatality, life changing injuries or serious health damage sustained by pedestrians, cyclists or drivers as a direct result of the implementation of these traffic calming measures, it could have serious legal implications for WC, the costs of which will ultimately have to be met by council tax payers.

In view of the above, I would ask that WC reconsider its position and amend the proposal to exclude the two additional parking bays in Church St and Hill St.

If WC intends to proceed with the TRO in its original form, I would appreciate a detailed response to all the issues raised this document and reasons for the decision to proceed.

Supporting information - Vehicle Emissions

'Roadside' Emissions Monitoring Roadside sites are within 1m to 5m of a road and ideally located at breathing height. They give a better idea of public exposure than kerbside sites. Roadside monitors are usually mounted on lamp-posts or road signs

'Kerbside' Emissions Monitoring Kerbside sampling sites are within 1m of the kerb of a busy road and ideally located at or below breathing height. They give a better idea of exposure to pedestrians using the pavements than roadside sites. The monitor would usually be mounted to kerbside railings or street furniture

What is Nitrogen Dioxide (Nox)?
Nitrogen dioxide is one of many poisonous gases present in vehicle exhaust emissions, you can't see it and you can't smell it.

Health effects of inhalation of Nox vehicle emissions include:
* Increase in hospital admissions for heart problems
* Increase in overall mortality.
* Respiratory and cardiovascular mortality
*Children's respiratory symptoms and decreased lung function.

NOx also contributes to the formation of fine particles (PM) and ground level ozone, both of which are associated with adverse health effects.

What is Particulate Matter (PM)?
Particulate Matter also called PM or soot, consists of microscopically small solid particles or liquid droplets suspended in the air. The smaller the particles, the deeper they can penetrate into the respiratory system and the more hazardous they are to breathe.

Recent studies indicate that PM can have the following effects on our bodies:

* Lung irritation, which leads to increased permeability in lung tissue.
* Aggravates the severity of chronic lung diseases, causing rapid loss of airway function.
* Inflammation of lung tissue, resulting in the release of chemicals that can impact heart function.
* Changes blood chemistry that can result in clots that may lead to heart attacks.
* Increases susceptibility to viral and bacterial pathogens leading to pneumonia in vulnerable persons who are unable to clear these infections.

The smaller-sized particles - those 2.5 micrometers or less in diameter, called PM2.5 - are of greatest health concern because they can pass through the nose and throat and be absorbed deep inside the lungs. PM 2.5 are sometimes called "fine" particles, and they are about 1/28th the diameter of a human hair or smaller.

Particulate matter is not only passed into the air via a vehicle exhaust pipe but also by friction on brake pads and tyres which throws out fine particles into the air – this happens even if you drive an electric car.

Vehicle Exhaust Emissions

- Road narrowing increases toxic diesel emissions by 28% and carcinogenic particulates by 30%
- The study for ***The Lancet medical journal*** finds that Britain has the third highest rate of pollution deaths in western Europe, with 50,000 people dying each year, mostly through toxic traffic fumes. **[14]**
- Diesels vehicles emit six times more toxic gases than the legal limit. **International Council on Clean Transportation [19]** https://www.theguardian.com/environment/2017/jan/06/diesel-cars-are-10-times-more-toxic-than-trucks-and-buses-data-shows
- Modern diesel cars produce 10 times more toxic air pollution than petrol cars, heavy trucks and buses, new European data has revealed. **International Council on Clean Transportation [19]** https://www.theguardian.com/environment/2017/jan/06/diesel-cars-are-10-times-more-toxic-than-trucks-and-buses-data-shows
- 6 out of 10 vehicles on UK roads are diesels. 99% of HGV's, buses and vans run on diesel.
- Vehicle exhaust emissions kill not only people in large cities but also in towns and villages where there is slow moving traffic, traffic calming measures that cause stopping and accelerating away and stationary vehicles with engines left running (e.g. buses, taxis, delivery vans, ice cream vans).

- The Government's draft air quality plan published by the Department for Environment, Food and Rural Affairs on Friday, May 5 2017, gives 40 local authorities new powers to cut pollution. One of the options in the plan is the removal of speed humps and **other measures which slow the flow of traffic [20].**
- Multiple Air Toxics Exposure Study II, found that diesel particulates are responsible for about 70% of the total cancer risk from all toxic air pollution **[23]**.**California Environmental protection Agency** 2009
- *"Pollutants including nitrogen dioxide (Nox) and particulate matter (PM) from road traffic and sulphur dioxide, from the burning of fossil fuels, have been* linked *to suppressed lung growth in children, asthma, heart disease and the onset of type 2 diabetes. The exposure of pregnant women to air pollution has also been found to affect to foetal brain growth"* . **The Royal College of Physicians** - **[15]**
- "A contributing factor to the UK's high pollution levels is our dependence on diesel vehicles, notorious for pumping out a higher amount of poisonous particles and gases. These hit hardest people with a lung condition, children and the elderly." Dr Penny Woods, chief executive of the British Lung Foundation. h**ttps://www.independent.co.uk/environment/pollution-air-clean-water-vehicles-diesel-car-tax-lancet-report-deaths-fatal-disease-a8009751.html**
- It has been established by decades of research that any road narrowing/speed bump traffic calming measures that require vehicles to brake, stop and and accelerate away, significantly increase the levels of lethal vehicle emissions.
- A report on air pollution and health by the National Institute for Health and Care Excellence (**NICE)** was published in August 2016 **[18].** This report confirms the findings of many other scientific reports published over the last decade such as:
- 1. The overall effect of traffic calming measures was an increase in emissions of pollutants, particularly for diesel cars. **[18]**
- 2. Health related outcomes attributed to road traffic related air pollution are premature death, increased rates of cardiovascular disease, respiratory disease, cancer, asthma exacerbations and symptoms, inflammatory response, respiratory or cardiac symptoms, hospital admissions **[18]**
- 3**. NICE** also recommends that local councils consider different ways to promote smooth driving. Avoiding stop-start traffic has been shown to reduce emissions.' **[18]** https://www.nice.org.uk/guidance/ng70/documents/evidence-review-3
- The study for **The Lancet medical journal** finds that Britain has the third highest rate of pollution deaths in western Europe, with 50,000 people dying each year, mostly through toxic traffic fumes. **[14]** https://www.thetimes.co.uk/article/air-pollution-diesel-fumes-make-british-air-among-the-most-toxic-in-west-67kbf3lsz

Are modern diesel engine emissions clean?

- The popularity of diesel cars was originally encouraged by the Labour Government as a way to reduce carbon emissions. Currently, 60% of the vehicles on UK roads during business hours run on deisel.https://www.telegraph.co.uk/news/2016/06/10/calls-for-polluting-road-humps-to-be-removed-outside-schools/

- Diesel cars produce four times more nitrogen dioxide pollution (NO2) than petrol cars and 22 times more particulates - the tiny particles that penetrate the lungs, brain and heart. As new research shows that diesel fumes are worse than expected for health, triggering cancers, heart attacks and the stunting of children' s growth, many politicians have admitted a major environmental mistake. https://www.theguardian.com/environment/2015/sep/22/the-rise-diesel-in-europe-impact-on-health-pollution

Car makers have had some success in cutting the particulate matter of their engines but according to recent independent testing, toxic NOx levels remain stubbornly high. Heavy trucks and buses emit **7 times more toxic emissions** than European safety limits. **International Council on Clean Transportation [19]**

Greg Archer from campaign group Transport & Environment reveals that modern diesel cars produce **10 times more toxic air pollution** than petrol engines. https://www.theguardian.com/environment/2015/mar/11/have-diesel-cars-been-unfairly-demonised-for-air-pollution

---

See following pages for information source references

APPENDIX 1 - Information Source References

1. Prof Jonathan Grigg - Paediatric Respiratory & Environmental Medicine at Queen Mary University
https://www.theguardian.com/environment/2015/jan/08/air-pollution-will-scar-londons-children-for-rest-their-lives https://www.bbc.co.uk/news/topics/c34j30ng1ngt/uk-air-pollution

2. Professor Steffen Petersen - Cardiovascular Medicine Queen Mary University
https://www.sustainability-times.com/clean-cities/air-pollution-can-alter-the-anatomy-of-your-heart/
https://www.qmul.ac.uk/whri/news-and-events/items/qmul-study-finds-link-between-diesel-pollution-and-heart-damage.html

3. Professor Ian Colbeck, Environmental Science University of Essex

https://www.transport-network.co.uk/Experts-argue-over-benefits-of-speed-bumps/12948

4. Prof Frank Kelly - Environmental Sciences King's College London

https://www.theguardian.com/environment/2015/jan/08/air-pollution-will-scar-londons-children-for-rest-their-lives

5. Prof Chris Griffiths, UK Medical Research Council.
http://erj.ersjournals.com/content/erj/42/Suppl_57/P3621.full.pdf
https://www.theguardian.com/environment/2015/jan/08/air-pollution-will-scar-londons-children-for-rest-their-lives

6. Professor Prashant Kumar - Global Centre for Clean Air Research
https://www.airqualitynews.com/2018/08/14/study-highlights-air-pollution-risk-to-children-in-prams/

7. Professor Rob Mackenzie – Atmospheric Science at Birmingham University
https://www.youtube.com/watch?v=3FSrTX1ZsoM

8. Dr Penny Wood - The British Lung Foundation.
https://www.independent.co.uk/environment/pollution-air-clean-water-vehicles-diesel-car-tax-lancet-report-deaths-fatal-disease-a8009751.html

9. Dr Nay Aung - Advanced Cardiovascular Imaging Unit Queen Mary Uniiversity London
https://www.qmul.ac.uk/whri/news-and-events/items/qmul-study-finds-link-between-diesel-pollution-and-heart-damage.html

10. Ian Mudway, Respiratory Toxicologist -t King's College London
https://www.telegraph.co.uk/journalists/laura-donnelly/11953613/Air-pollution-stunting-childrens-lungs-study-finds.htm

11. The Environmental Change Institute - University of Oxford
https://www.theguardian.com/environment/2015/jan/08/air-pollution-will-scar-londons-children-for-rest-their-lives

12. Imperial College London - Emissions Research-
https://transportknowledgehub.org.uk/news/pollution-crackdown-may-end-speed-humps/

https://www.telegraph.co.uk/journalists/laura-donnelly/11953613/Air-pollution-stunting-childrens-lungs-study-finds.html

APPENDIX 1 continued - Information Source References

13. International Agency for Research on Cancer
https://www.iarc.fr/en/media-centre/pr/2012/pdfs/pr213_E.pdf

14. The Lancet Medical Journal https://www.thetimes.co.uk/article/air-pollution-diesel-fumes-make-british-air-among-the-most-toxic-in-west-67kbf3lsz

15. The Royal College of Physicians https://www.theguardian.com/sustainable-business/2016/jul/05/how-air-pollution-affects-your-health-infographic

16. British Heart Foundation - https://www.bhf.org.uk/informationsupport/support/practical-support/air-pollution

17. World Health Organisation http://www.euro.who.int/__data/assets/pdf_file/0006/74715/E86650.pdf

18. National Institute for Health and Care Excellence (NICE) - report on air pollution August 2016
https://www.telegraph.co.uk/news/2016/12/01/speed-bumps-could-removed-cut-traffic-pollution-save-lives/ https://www.nice.org.uk/guidance/ng70/documents/evidence-review-3

I9. International Council on Clean Transportation
https://www.theguardian.com/environment/2017/jan/06/diesel-cars-are-10-times-more-toxic-than-trucks-and-buses-data-shows

20. Department for Environment, Food and Rural Affairs - May 2017
https://www.telegraph.co.uk/news/2017/04/09/speed-bumps-could-disappear-uk-roads-part-new-plan-cut-pollution/

21. Imperial's Centre for Transport Studies https://www.telegraph.co.uk/news/2016/06/10/calls-for-polluting-road-humps-to-be-removed-outside-schools/

22. Transport & Environment campaign group
https://www.theguardian.com/environment/2015/mar/11/have-diesel-cars-been-unfairly-demonised-for-air-pollution

23. California Environmental protection Agency
https://**www.arb.ca.gov**/research/health/healthup/nov09.pdf · PDF file

24. Journal of American Family Medicine http://www.jabfm.org/content/21/1/55.full

25. American Heart Association https://www.lung.org/assets/documents/advocacy-archive/tobacco-and-health.pdf

26. Fighting for Air- BBC Documentary Jan
2018 *https://www.youtube.com/watch?v=3FSrTX1ZsoM*

27. Environmental charity Global Action Plan (GAP)
https://www.airqualitynews.com/2018/06/21/children-at-greater-risk-from-roadside-pollutants/