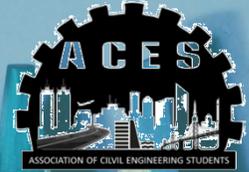




Vidya Vikas Education Trust's  
Universal College Of Engineering  
Kaman, Vasai - 401 212  
Department of Civil Engineering



# The Benchmark

Issue 005: December 2018 Edition

ACES InExCon

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## *Words of Wisdom*

### *Drishiti*

*Drivers behaviour on a highway indicates the quality of service experienced by motorists. One of the main behaviour characteristics is the choice of speed, which has direct implication on safety, efficiency and the size of environmental impacts both for an individual road user and the traffic system in general*

*-Mr. Asir Khan*

### *Drishiti*

*SMART DRAIN is a revolutionary new material for all water drainage needs! Smart drains uses micro channels to move water by capillary action and siphoning. Unlike common perforated tubes, smart drains not clogged, in addition, excess water is drained, reducing landslides.*

*- Mr. Miraj Thaker*

### *Page 03*

*From sports, technical fest and upgraded knowledge, students get the whole package of strength, motivation to compete and technical knowledge to deal with real time problems...*

### *Corazon*

*We say, Engineers are the Technical minds with creative ideas! But creativity by heart, reflects through their hobbies. Words to express and drawings to show skills & emotions, together becomes a good stuff to communicate heart to heart...*

## From General Secretary of ACES

Association of Civil Engineering Students (ACES), under The Institution of Engineers (India) (IEI), is the Student Chapter of the Civil Engineering Department which strives to enhance the academic and social environment of students by helping them discover hidden talents within themselves, familiarize them with the latest & recent trends in the field of civil engineering as well as allowing one to mingle with fellow peers and seniors, thus enabling fruitful networking.

“ We are introducing this edition as a special edition. Our main motto here is to release the end exam stress of the students. So along with the technical writing, upcoming events details, with great enthusiasm we are focusing on the new section, " Corazón", which means Heart in Spanish. The section where latent talent of creative engineers gets a platform to showcase their hidden potentials to reach-out hearts of all through their art-work.

*-From Editor's Desk*

”

# Drishti

## Study of variation in speed at different road profiles

by Mr. Asir Khan



**About the Author:** Author has completed his graduation from M. H. Saboo Siddik College of Engineering and has completed Master's degree in Transportation Engineering and Planning from SVNIT, Surat. He is currently pursuing his PhD in Traffic Engineering and has authored several papers presented in National and International Conferences. He is currently serving as Assistant Professor in Civil Engineering Department. Author is grateful to the first batch students of Civil Engineering UCOE for carrying tedious survey for the following study.

Drivers behaviour on a highway indicates the quality of service experienced by motorists. One of the main behaviour characteristics is the choice of speed, which has direct implication on safety, efficiency and the size of environmental impacts both for an individual road user and the traffic system in general. From the psychological perspective, the speed we observe in any given moment can be seen as a result of the many tasks a road user performs. These can be regarded as being related to decision-making on different levels. However, the speed of vehicles on a highway is affected by various factors. Specially in a mixed traffic situation of the type prevailing in India. A study was carried by students of first batch of Civil Engineering department to understand the factors that can affect drivers' actions. In the present study, vehicles were observed at 6 different locations to understand the variation in the speed. The factor studied here was the road profile. To make sure the reason of variation is only road profile, same vehicles were observed at all the selected locations so as to nullify the effect of change in driver's skill and vehicle characteristics. The vehicles were categorized in 5 different categories viz. two-wheeler, three-wheeler, Car, light commercial vehicle and truck.

Study was carried out at Chinchoti Anjur Phata road, Maharashtra along the road heading from Universal College of Engineer as shown in figure. Six locations were selected on the stretch having difference in road profile. One section with no gradient and no curve having normal road condition was selected as base section. The base section was free from any entry and/or exit point to the village. To understand the effect of gradient, 2 sections were selected such that they had rising and falling gradient each. It is also obvious that there is effect of horizontal curve on driver's speed, to understand the same, 2 sections at curves were selected. Further to understand if right hand curve and left-hand curve have similar effect, one section for each curve was considered. Also, to analyze the effect of entry point to any habitation, a section was selected near the village area.



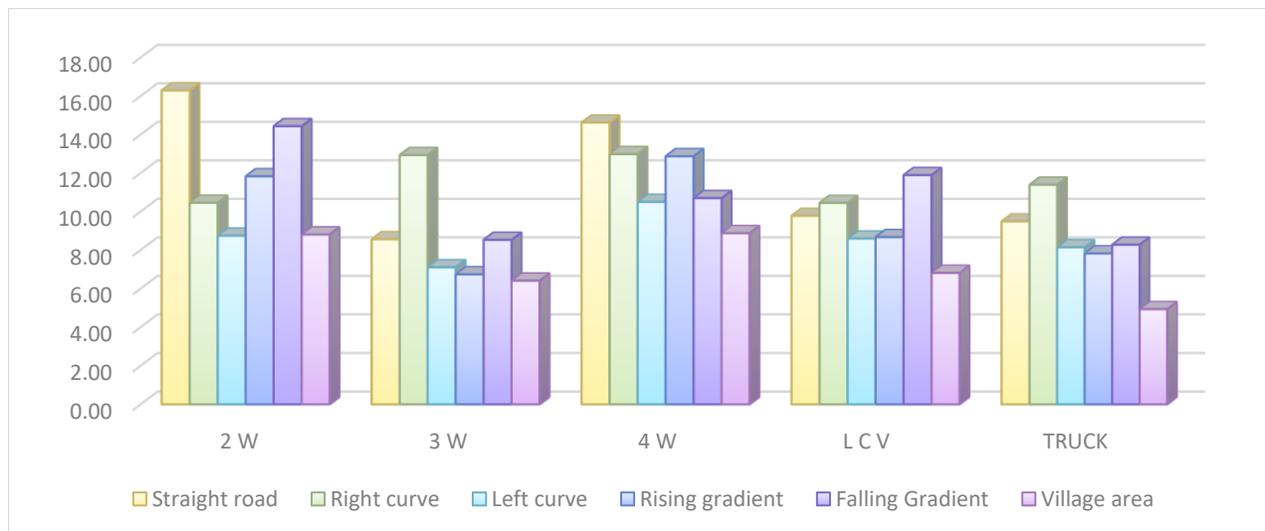
Location of Traffic Survey

Data was collected on a working Wednesday so as to avoid biased traffic condition. Students were divided at 6 sections. Students were allotted different tasks of identifying same vehicle at all locations, counting the flow and measuring the speed. The observed speeds are tabulated in the following table. It is clearly observed from the table that there is change in speeds of the vehicles at different sections. Considering the straight location without any gradient or curve as the base section, it is observed that speed changes as per road profile

Contd...

Vehicle Classification	Straight road	Right curve	Left curve	Rising gradient	Falling Gradient	Village area
<b>2 W</b>	58.64	37.63	31.47	42.58	51.94	31.69
<b>3 W</b>	30.80	46.55	25.57	24.25	30.69	23.07
<b>4 W</b>	52.63	46.74	37.79	46.33	38.50	31.94
<b>L C V</b>	35.19	37.60	30.93	31.21	42.80	24.52
<b>TRUCK</b>	34.14	41.00	29.30	28.15	29.78	17.75
<b>Speed reduction (%)</b>	0	1	36	23	9	64

However, the average speed of all vehicles at right hand curve is almost same as straight road but the left-hand curve result in reduction of speed by around 36%. This is due to the curvature effect specially at left hand curve where the driver tends to move closer to the center of road (Divider) and hence to not collide with divider, driver reduces the speed. Also, at rising gradient, high energy is required to pull the vehicle in upward direction and hence resulting in reduction of speed. Further, falling gradient tries to bring the speed of vehicle back to normal speed and hence the difference in average speed between falling gradient and base section is very close with reduction of 9%. This reduction may also be considered as a result of drivers of commercial vehicles which are heavily loaded, tends to lose control and to be safe, drivers reduce the speed. Highest variation in the average speed of all vehicles at around 64% is observed in case of entry point of village where continuous interruption to the flow was observed. Further to observe the behavioral change in different vehicle types at same location, following plot was studied



It can be observed that 2-wheeler and car have highest speed at straight sections but they reduce the speed at left hand curve as stated earlier. It is also observed that three-wheeler, LCV and Truck have higher speed at right hand curve since traversing it is convenient to the loaded vehicle. Further, 3-wheeler seems to be more sensitive to the change in road profile and hence the speed is observed to be reduced at all sections as compared to right hand curve. Trucks seem to be very cautious at entry points of the village which is a positive behaviour of the drivers in context to safety of entering and exiting vehicles and drivers from the traffic stream.

The study thus concludes that road profile plays a vital role in selection of the speed of vehicles by the drivers. Further, different vehicles are found to behave differently at varying road profile. The study can help in deciding the road profile for the highways with heterogeneous road condition. Also, the study can further be extended to understand the effect of radius of horizontal curve on speed. Similarly, a study on effect of amount of gradient can be carried out in future

# Smart Drain System

-by Mr. Miraj Thaker



**About the Author:** Mr. Miraj Thaker, from TE, has been appointed as the IIT Campus Ambassador, by IIT Bombay and IIT Gandhinagar. He will be the link between the College and IITs and is the go-to person for all the workshops and events associated with IIT.

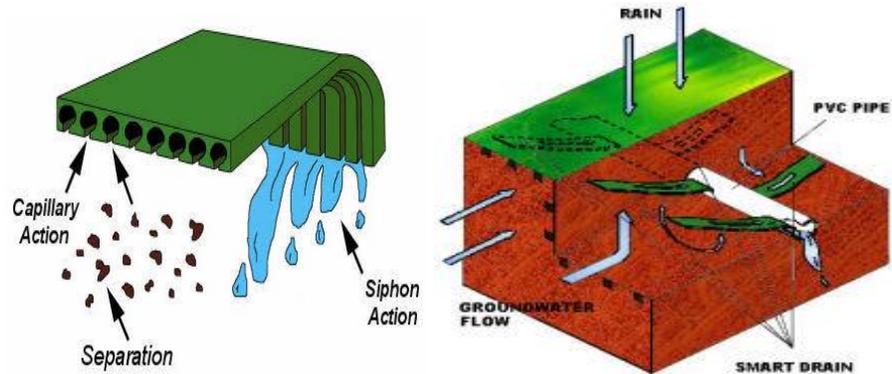
This article describes about the Smart Drain System with its clear view of practical application.

Smart Drain is a proprietary product designed to move water below the ground surface towards a collector pipe. It is used in bio-filtration basins and other storm water. Bio filtration systems as a way to increase detention time and hydraulic residency in order to increase filtration, aid with infiltration, and reduce peak flows. The “Smart Drain system” approaches and decision-aid tools for assessing the sustainable alternatives are discussed and compared. The Smart drain further explores some limitations and difficulties in the application of the innovative solutions and suggests an integrated and trans-disciplinary approach for sustainable drainage design.

Smart Drain is a belt system that could be placed in the filter media of a bio-filtration or bio-infiltration basin. Smart Drain is designed to be installed with channels down, which would allow for gravity to drop out Sediment and reduce the risk of clogging

## How it works:

Smart drain forms unimpeded columns of water in its micro siphons. Filter based systems like geosynthetic fabrics, stand in the path of water, trying to stop the soil fines, but these fines are what ultimately clog these systems as they build up over time and start to impede flow leading to clogging.



DRAINS SOONER  
DRAINS LONGER  
DRAINS BETTER



Field Image



Tunnel before Smart Drains



Tunnel after Smart Drains

## Upcoming Events :

### ***IIT Bombay Techfest... (14<sup>th</sup> December 2018 to 16<sup>th</sup> December 2018)***

IIT Bombay presents Asia's Largest Science and Technology Festival. Innovative minds always look up for challenges which aid in understanding the secrets of science and technology in each and every era. May it be the discovery of fire or the modern-day robots, competitions have always played a vital role. Techfest, IIT Bombay presents to you, a series of mind-boggling competitions where you are invited to take your experience from the past, execute the ideation in the present and thrive in your future endeavours. Providing a chance for the innovative minds across the nation to showcase their technical skills has been the motto of Techfest Competitions.

### ***Aurora 2k19... "Intercollegiate Sports and cultural Events"***

The most awaited event of the year upcoming in January 2019 ...!!!

The main objective is "TEAM – BUILDING" and it aims to enhance the unity amongst the team members.

This year too, we would be holding various sports activities such as Cricket, Box Cricket, Ring Football, Kho-Kho, Volley ball, Foot volley, Throw ball, Dodge ball, Tug of War ,Relay races. Also Indoor game like Carrom, Table tennis, Chess and so on....

Here not only physical strength of students is checked but also an opportunity to improve intellectual Strength.

The aim behind conducting this event is to encourage physical fitness and to inculcate moral values in students, such as maintaining competitive ethics ,working together maintaining team spirit.

Cultural activities would be including Singing, Folk dance, Drama, Instrumental, Photography, Cooking, Rangoli, where students would get an opportunity to show case their talent and hidden potentials. This platform would allow students to put forward their view, ideas, imagination, through various mediums of expression.

So, to all the readers sharpen up your skills, get ready for "AURORA 2K 19"

The "SHIELD" is calling you .....!!!!

All the best and may the best team win.....!!!!

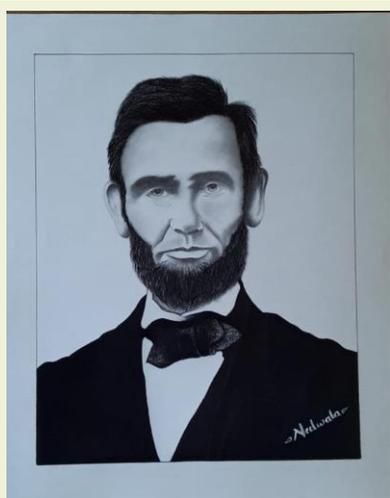
### ***Softwares to learn....***

In this modern world, if we want to design any structures by manual calculations, it will be like we are participating Formula 1 racing with our bicycle. Hence to speed up your design race, we can use modern design tools such as MS Project, Primavera, ETABS, STAADpro, Revit. In the upcoming semester (Even semester 2018-19), Department of Civil Engineering, going to conduct some software courses for the students, which will definitely help to enhance their subject knowledge through software training.

- **MS Project (2013)**, gives you new and easier ways to keep project organised and track of scheduled activities. It easily creates modern reports to measure progress and communicate project details effectively with your team and stakeholders.
- **Primavera** is the world's leading project and portfolio management software which enables project-driven organisations to intelligently manage their programs and project from small and simple to large and complex. It is the most powerful, robust and easy to use solution for prioritizing planning, managing critical activities and evaluating projects.
- **ETABS** is highly is a highly efficient analysis and design program developed especially for building systems. It is loaded with an integrated system with an ability to handle the largest and most complex building models and configurations.
- **STAADpro** is one of the most widely used structural analysis and design software. It supports over 90 international steel, concrete and timber design codes.
- **Revit** is building information software for architects and structural engineers. It allows users to design building and structures and its components in 3D modelling.

This is just a glance over these modern design tools, there are much more benefits of these tools which surely safeguards any structure in the world.

# Corazon

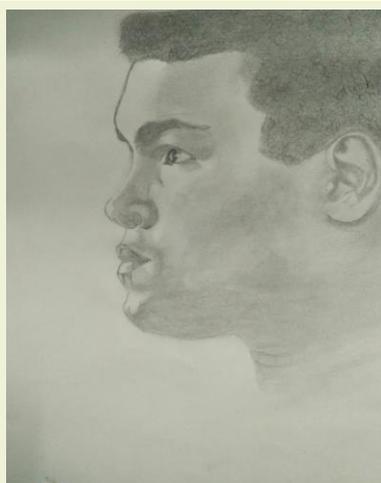


“You cannot the responsibility of tomorrow by evading it today...”  
-Mr. Abraham Lincoln (1809-1865)

Sketch By-  
**Mr. Neelkumar Wala (SE Civil)**

If you are rich then help the poor people for their happiness and satisfaction, because it forgives the glumness of poor people

-Mr. Rajkumar Sanchaniya (SE Civil)



“Don’t count the days; make days count.”

-Mr. Mohammad Ali (1942-2016)

Sketch By-  
**Mr. Tushar Chotaliya (TE Civil)**



Sketch By-  
**Mr. Tushar Chotaliya (TE Civil)**

Keep yourself away from people who try to suppress your ambitions. Weak people always do that, but really great make you feel that you can also become great.

-Mr. Sagar Butle

Sit on your comfortable throne long enough and you won't even realise you have been benched...

-Ms. Neha Jagdale (TE Civil)

Road towards dreams is not easy. There would be ups-downs, rights-left.

You may end up having too many haters,  
Or may end up being overwhelmed  
But never stop.

-Mr. Raphael Varela (TE Civil)

## **Ethics...**

Ethics are moral principles or values that govern the conduct of an individual or a group. It is not a burden to bear, but a prudent and effective guide which furthers life and success. Ethics are important not only in business but in academics and society as well because it is an essential part of the foundation on which a civilized society is built.

Ethical behaviour is what all career people should aim to have. Not just the ethical attribute but exceptional behaviour with this regard. This is because in order to build a career, one must be governed by the rules of ethics to safeguard oneself and others. Ethics are essential in the workplace because a tough ethical code provides a non-threatening environment.

Academic dishonesty is another facet of unethical behaviour. It is an action or attempt that results in creating an unfair academic advantage for oneself or a disadvantage for any other member of academic community. A child uses his or her experiences in society to shape personal ethics. Family has a strong influence on one's values and behaviour, parents establish rules from the start and it becomes the basis for our ethics and morals. A personal ethical commitment is part of what makes students a success. A lack of ethical commitment will always result in academic failure. I personally believe that students who are academically dishonest cheat themselves out of an education and harm their fellow students by lowering the grading curve for the class as a whole. Therefore, academic ethics are vital and students should commit themselves to maintaining highest personal ethical standards.

-Mr. Asir Khan