

# Schools and Sustainable Urban Mobility

An approach paper with special reference to textbook analysis



April 2017

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#### About SUM Net

The Sustainable Urban Mobility Network India (SUM Net) is a democratic, secular, membership-based coalition of individuals, voluntary organizations, and civil society networks and movements. SUM Net seeks to improve the overall quality of life for all by securing deeply democratic processes of decision-making to ensure that urban transportation systems are universally accessible, socially just, safe and secure, economically viable, and environmentally sound.

SUM Net aims to

- Deeply democratise the processes of policy formulation and project level decision-making related to urban transportation at all federated governance levels
- Assist and support local communities to shape their urban transportation policies and systems
- Undertake public awareness initiatives and facilitate dialogue on transportation policies and projects
- Encourage cities to improve walking, cycling and public transportation facilities

#### About CEE

Centre for Environment Education (CEE) was established in August 1984 as a Centre of Excellence supported by the Ministry of Environment and Forests, Government of India. CEE, a national institution with its headquarters in Ahmedabad, has a mandate to promote environmental awareness nationwide.

CEE's mission is to enhance understanding of sustainable development in formal, non-formal and informal education through its work with schools, higher educational institutions, policy makers and reaching out to youth and the general community. It is to integrate education as a key driver for change in demonstrating and advancing sustainable practices in rural and urban communities, and in business and the public sector, and in meeting challenges of global issues such as climate change and biodiversity conservation. CEE also promotes individual and collective positive Handprint actions that are environmentally sound, economically viable and socially beneficial.

CEE's work in the field of sustainable transportation with schools attempts to focus on learners as responsible citizens as well as the school itself to be a site for demonstrating sustainable practices.

#### Shakti

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#### Keywords

Transportation, sustainable transportation, mobility, access, safety, Sustainable Development Goals (SDGs), Climate Change, Textbooks, Curriculum, whole school whole system, school education, urban planning, Article 6 of UNFCCC, education and climate change, SDG 3, 4, 11, 13, road safety, air pollution, public transport, disabilities, Right to Education (RTE), CEE, Parisar, Roopankan, NCERT, Maharashtra Board, Gujarat State Education Board, Rainbow BRT, Cycle Safe, Clean Air for Kids, National Curriculum Framework (NCF), learning outcomes, knowledge, disposition, competency, behaviour



## Introduction

The safety of school going children and their modes of mobility should be an important element in a city's transportation plans.

Schools generate a substantial proportion of the trips in any city. While safety is a paramount concern, the modes by which these school trips are made, must also be considered in the city's transportation planning. Close to half the population of a city is likely to be directly concerned with how children go to school, and so the school community is a prime stakeholder in urban transportation planning. It is essential that cities provide a platform for the needs of schools to be reflected in transportation systems and projects, including facilities for public transport, walk and cycle.

Equally important is the students' learning in relation to sustainable mobility. A city's transition to better mobility systems is likely to be easier if the citizenry is well-informed about the need for change, has supportive attitudes and is prepared to take the actions needed for the transition. Schools can help children learn about sustainable mobility. Schools can also be the vehicle for engagement of a much wider community of people in the city.

This paper is in two parts. The first part presents initial thoughts on how to approach the domain of schools and sustainable mobility, and the web of actors and actions needed. The second part, which is more elaborate, presents a rapid analysis of textbooks of NCERT, Maharashtra and Gujarat, that assesses the extent and nature of content related to the topic of 'transportation'. The purpose is to look at the status of content related to the topic of transport in the textbooks and open up the discussion for further ideas to strengthen curricular support/ interventions.

We present a framework of desirable learning outcomes in relation to 'sustainable mobility'. Assessed against this desired learning outcomes framework, there are considerable gaps in the comprehensiveness and continuity of content related to in the textbooks we have reviewed. There are some good examples of both content and presentation in some textbooks, notably in the Maharashtra textbooks.

Much work is needed on all fronts – in creating transportation systems and facilities that are school-friendly, developing and facilitating forums where the transportation needs of schools can be discussed, and for schools to provide learning opportunities for school children in relation to sustainable mobility.

We hope this paper may be a useful input for discussions on this topic among policy makers, local governments, associations of schools and parents, NGOs and CSR organizations, education and transportation professionals, and SUM Net. We request readers to get in touch with us at the email addresses below with their views, experiences and suggestions for further work in the schools and sustainable mobility domain.

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## Schools as Stakeholders of Urban Mobility Solutions

Schools are an important stakeholder in efforts to improve Urban Mobility. These include children as well as the adult community associated with schools. It also includes schools as an institution in society. Here are some reasons:

### Access and Mobility-related

Children (and staff) must be able to get to school safely and easily, in an affordable mode of transport; indeed, the lack of safe and affordable access is a barrier for children to get high quality school education.

- Typically, children of school-going age may constitute up to about a third of a city's population, and along with adults directly related to schools (as staff or parents/ care-givers), about half the city may be very directly concerned with mobility to and from schools.
- The number of trips that schools generate can be considerable, and the mode has an impact on the city, and certainly the neighbourhood – private motorized modes are likely to cause congestion in the neighbourhood and add to air and noise pollution etc when school starts and ends, adding to the health burden of the city from impaired air quality, especially affecting children.
- When schools are set up in the outskirts of cities, where land is cheaper, transportation arrangements have to be made; this can be a considerable cost and is often passed on to parents. Schools imparting high quality education, as well as having the necessary infrastructure including playgrounds as per agreed urban planning norms, are essential within reasonable distances. This aspect related to land-use, transportation as well as education management and school management.

Age Distribution of India's Population  
30% is children of school-going age  
(Based on Census of India 2011)

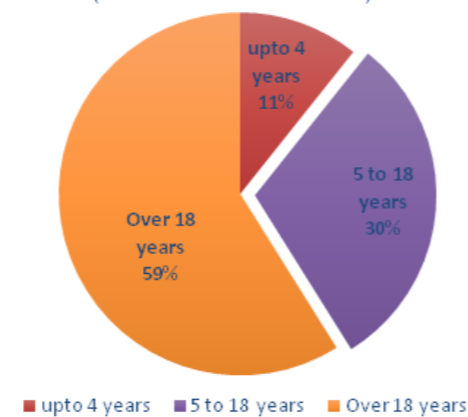


Figure 1 - Children of school-going age may constitute about 30% of a city's population

### Learning-related

- It is highly desirable that children learn about transportation as a system, its role in our lives, impacts etc, and form the correct attitudes in relation to transportation, as it is an important facet of their everyday life and experience, and a key issue of urban sustainability.
- The topic of 'Transportation' offers many opportunities for desired competences, such as systemic thinking, critical thinking, empathy, democratic values, etc

These reasons are coherent with the UN Framework Convention on Climate Change and the Sustainable Development Goals.

## Box 1 – Article 6 of the UNFCCC - Education and Climate Change

### Action for Climate Empowerment

The website of the United Nations Framework Convention on Climate Change introduces Article 6 of the Convention as follows:

The solutions to climate change are also the paths to a safer, healthier, cleaner and more prosperous future for all. To see this and to understand what needs to be done requires a sharp and sustained focus on education, training and public awareness in all countries and at all levels of government, society and enterprise.

That is why governments have agreed to educate, empower and engage all stakeholders and major groups. This common objective is anchored in Article 6 of the UN Framework Convention on Climate Change, and in Article 10 (e) of the Kyoto Protocol.

To achieve their goal, governments are working with the private sector and civil society stakeholders in six priority action areas: education, training, public access to information, public awareness, public participation and international cooperation.

It says (emphasis is ours):

- Understanding the reasons for climate change and its impacts are of critical importance to grasp the urgency of why everyone must act to reduce greenhouse gas emissions as rapidly as possible, and to adapt societies and economies to the climate change which is already in the system.
- It is equally critical that all parts of government, society and economy understand and therefore choose to act upon the huge range of opportunities and co-benefits that arise from this mitigation and adaptation action.
- Renewable energy and energy efficiency, cutting pollution, cleaning environments, making societies more resilient to climate change also have immediate results in reduced costs and risks, better returns and new employment opportunities for governments, business and individuals, producing healthier and more prosperous conditions across society.
- Action under Article 6 places great importance on achieving education, training and public awareness at both global and local level, whether it be school or university students, teachers, workers, farmers, government officials, investors or business leaders. Solving climate change is the door through which we will make a global transformation to a sustainable future and everyone has something to learn and to contribute to that debate and to that goal.

In short, Article 6 seeks to reduce the impact of climate change by enabling society to be a part of the solution.

### ARTICLE 6: EDUCATION, TRAINING AND PUBLIC AWARENESS

In carrying out their commitments under Article 4, paragraph 1 (i), the Parties shall:

- Promote and facilitate at the national and, as appropriate, sub-regional and regional levels, and in accordance with national laws and regulations, and within their respective capacities:
  - The development and implementation of educational and public awareness programmes on climate change and its effects;
  - Public access to information on climate change and its effects;
  - Public participation in addressing climate change and its effects and developing adequate responses; and
  - Training of scientific, technical and managerial personnel.

- (b) Cooperate in and promote, at the international level, and, where appropriate, using existing bodies:
- (i) The development and exchange of educational and public awareness material on climate change and its effects; and
  - (ii) The development and implementation of education and training programmes, including the strengthening of national institutions and the exchange or secondment of personnel to train experts in this field, in particular for developing countries.

### Learning and action for sustainable transport

As part of the International Education for Sustainable Development Conference on 'Transforming Education for Children and Youth' in September 2016, at Ahmedabad India, one of the sessions was on 'Learning and Action for Sustainable Transport'. Representatives from CEE, Ms Savita Bharti, presented Rainbow BRT and School outreach for Sustainable Urban Transport and Ms Rajeswari Gorana presented the NCERT Textbook Review of Sustainable Transportation. The session was chaired by Ms Adriana Valenzuela, UNFCCC Focal point for 'climate education and youth'.

Ms. Adriana shared her experiences about transportation improvements in other cities. She emphasized integration of land use and urban transport planning. Giving the example of Bogota she drew attention to the possibility of shifting from cars to public transport when such facilities are well planned. She said that along with convenience and time spent to travel, it also important to feel safe while travelling. If 'safety' aspects are not achieved no solution will work effectively. She observed that it was important to ensure children learn about transport and climate challenges in the schools.

### Box 2 – Extracts from the Sustainable Development Goals



In September 2015, the 193 Member States of the United Nations adopted the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals to end poverty, protect the planet, and ensure prosperity for all. Each goal has specific targets to be achieved by 2030.

Read more about the Sustainable Development Goals at <http://www.un.org/sustainabledevelopment/>

India's statement of commitment and the allocation of responsibilities to different ministries is presented on the website of the NITI Aayog, at <http://niti.gov.in/content/overview-sustainable-development-goals>

The Sustainable Development Goals are a useful framework to guide local action as well. Listed below are the Goals, and related targets and indicators, that are particularly pertinent to the domain of schools and sustainable mobility.

Goal	Target	Indicator
SUSTAINABLE DEVELOPMENT GOAL 3 Ensure healthy lives and promote well-being for all at all ages	3.6 By 2020, halve the number of global deaths and injuries from road traffic accidents	3.6.1 Death rate due to road traffic injuries
	3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination	3.9.1 Mortality rate attributed to household and ambient air pollution

SUSTAINABLE DEVELOPMENT GOAL 4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development	4.7.1 Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment
SUSTAINABLE DEVELOPMENT GOAL 11 Make cities and human settlements inclusive, safe, resilient and sustainable	11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons  11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries  11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	11.2.1 Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities  11.3.2 Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically  11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)
SUSTAINABLE DEVELOPMENT GOAL 13 Take urgent action to combat climate change and its impacts	13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula

Sustainable Transportation education aligns with the SDGs on many dimensions but most importantly to Goal 4 on Quality Education and enables the achievement of targets 11.2 and 11.3 which aims at providing sustainable means of transportation for people and build citizens capacities for participating in making cities sustainable. It is therefore important to intervene and improve sus-trans messages at all levels.

In the confluence of the domains of sustainable mobility and education, the Goals thus call for actions in relation to

- Road safety
- Control of air pollution
- Providing access to safe, affordable, accessible and sustainable transport systems, by expanding public transport, with special attention to the needs of women, children, persons with disabilities and older persons
- Improving capacity for participatory, integrated and sustainable human settlement planning and management
- Improving education, awareness-raising and human and institutional capacity on climate change
- Ensuring that global citizenship education and education for sustainable development are mainstreamed in national education policies, curricula, teacher education and student assessment

### Right to Education and Transport Facilities

The Right of Children to Free and Compulsory Education (RTE) Act, 2009, which represents the consequential legislation envisaged under Article 21-A, means that every child has a right to full time elementary education of satisfactory and equitable quality in a formal school which satisfies certain essential norms and standards.

Article 21-A and the RTE Act came into effect on 1 April 2010. The title of the RTE Act incorporates the words 'free and compulsory'. 'Free education' means that no child, other than a child who has been admitted by his or her parents to a school which is not supported by the appropriate Government, shall be liable to pay any kind of fee or charges or expenses which may prevent him or her from pursuing and completing elementary education.

Under the RTE, the admission process prioritizes students living closer by than those living further away. For example, in Maharashtra the admission process prioritizes students within a 1 km radius over those living within a 3 km radius, and then those living at distances over 3 km. From an access and mobility perspective, this is certainly helpful as it is possible to avoid motorized trips.

The question of who should bear the expenses related to transportation of students has been addressed variously in different states.

For example: In Maharashtra, if students are admitted to a school more than 3 km away if their parents have chosen such a school even though they had a school closer by, then the parents/ guardians have to bear the costs of transportation.

[https://rte25admission.maharashtra.gov.in/adm\\_portal/app/webroot/uploads/FAQ2017\\_18.pdf](https://rte25admission.maharashtra.gov.in/adm_portal/app/webroot/uploads/FAQ2017_18.pdf)

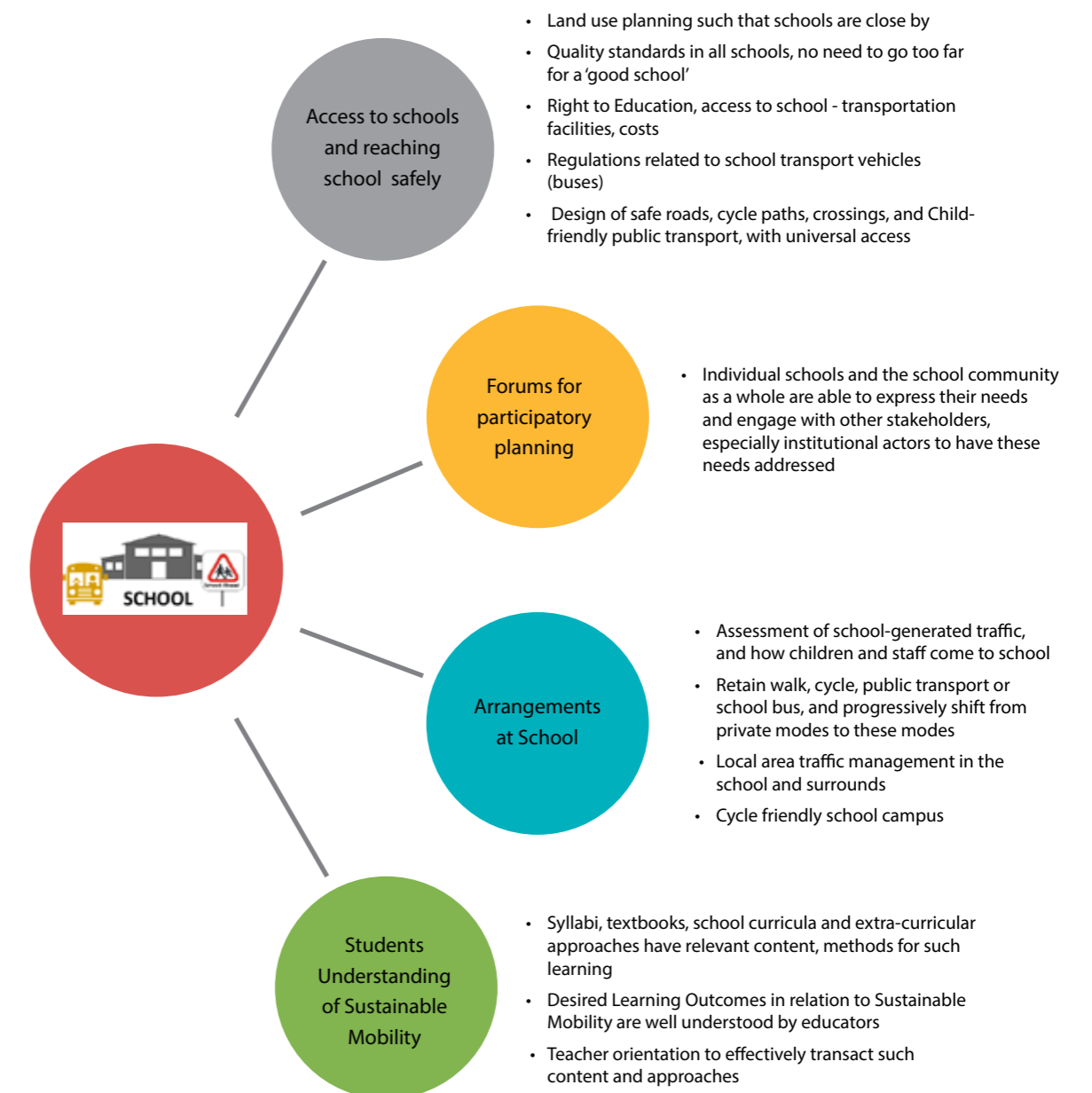
Whereas, the website of the Education Dept of Kerala states that " No direct (school fees) or indirect cost on uniforms, textbooks, mid-day meals, transportation etc needs to be borne by the child or parents to obtain elementary education."

[http://www.education.kerala.gov.in/index.php?option=com\\_content&id=93&Itemid=126](http://www.education.kerala.gov.in/index.php?option=com_content&id=93&Itemid=126)

*In the next section, we present a mapping of actors and venues for such actions.*

## School Transportation and the Whole School, Whole System Approach

Presented here is a mapping of elements in the schools and mobility domain.





National and State Actors	Local Actors
<ul style="list-style-type: none"> <li>Ministries: Human Resource Development, Road Transport and Highway, Urban Development, Housing and Urban Poverty Alleviation</li> <li>NCERT, CBSE</li> <li>State Education Department, Textbook Bureaus and SCERT</li> </ul>	<ul style="list-style-type: none"> <li>Schools – including the children, teaching and non-teaching staff, school managements, the School Management Committee, Transport Committee (where they exist), parents' associations</li> <li>School Managements / entities operating schools</li> <li>School Education Department</li> <li>Urban Local Body, administration and elected officials</li> <li>Traffic Police</li> <li>Service Providers</li> <li>Regional Transport Office</li> <li>Citizens' groups and NGOs</li> </ul>

The current discussions around school transportation, especially those presented in the English media, seem primarily to focus on accidents involving vehicles transporting school children, and the compliance/non-compliance with regulations related to school transport. There are also some reports on the need for streamlining the costs / reimbursements for transport facilities, especially in the context of the Right to Education. As regards students' learnings, both curricular and extra-curricular opportunities do exist. Schools activities such as rallies and campaigns are carried out in many cities during Road Safety Week every year in many cities. Deeper engagement on education for sustainable mobility has been done by Parisar, CEE, Roopankan and a few others.

#### Cycle Safe

As part of the Cycle Safe programme, CEE engaged students in carrying out a survey of how they come to school. Children who walk or cycle then prepared a map of spots and segments where they faced difficulties or felt unsafe. They were explained the structure of the civic government and then encouraged to write to elected representatives and the civic administration highlighting their survey and mapping results. This programme was based on similar earlier efforts taken up by Parisar in Pune and IDS in Delhi.

#### Rainbow BRT Outreach

School sessions were a part of the promotions and outreach programme developed for the Rainbow Bus Rapid Transit System by CEE and IBI Group, and commissioned by the Pune and Pimpri Chinchwad Municipal Corporations. An activity module on sustainable mobility was conducted in about 40 schools, including mind mapping, exploration and interpretation of various data sets related to transportation in Pune, video watch, quizzes and group work. Later, students also visited the BRT corridors to understand the features and advantages of BRT systems.

#### Cycling awareness programme in schools, Indore

Roopankan worked with four schools, including one for children with hearing and speaking disabilities, for conducting awareness sessions on the importance of cycling in developing sustainable transportation for the city. Each school was engaged for two days, one day for creating an atmosphere for the main session by conducting a cycling related survey and the main session, some days later. A poster series related to cycling was created for displaying at each school on the day of the main session. The main take away of this project is largely qualitative in nature. The interactions with students were rich and generated ideas well above the level one would expect from children their age. The survey done with the students and their parents revealed reasons why they cycle or don't and the issues they face.

#### Clean Air for Kids

Clean Air Asia, in collaboration with the US Embassy in India, is implementing the "Train for Clean Air: Clean Air for Kids" project in three schools in New Delhi. Students were engaged in interactive classroom activities on air quality, a walkability survey and an air-sensing activity in the school neighborhood.

A review of textbooks—NCERT, Maharashtra Board, Gujarat State Education Board—reveals that there is a range of content on transportation and related topics in textbooks. However, as we show in the next section, there are several conceptual gaps as well as a lack of continuity and coherence in textbook content.

*Thus, while some efforts do exist, the extent of work done in this domain is limited, and very far from sufficient. A comprehensive engagement effort is necessary across the country, and along policy-practice verticals, to ensure that the domain of schools and mobility gets the attention it deserves and the outcomes essential for our children's wellbeing.*

Sustainable transportation in schools may focus on learners as responsible citizens as well as the school itself to be a site for demonstrating sustainable practices. This is also the core principle in the Approach Paper on Habitat and Learning, prepared for the National Curriculum Framework, 2005 by the NCERT. This calls for a 'whole school, whole system' approach with education and outreach for all segments of society. The aim should be to support learners to understand the need for sustainable transportation and for them, and the school as a whole, to participate as active citizens in creating safe transportation in cities.

With this backdrop, we present in the next section, a closer look at school learning, with a focus on content in textbooks and its presentation.



Figure 2 - Screen shot of a news item on indiatoday about the setting up of a committee to examine school transport safety

<http://indiatoday.intoday.in/story/school-transport-delhi-policy-school-vans/1/751039.html>, accessed 10 April 2017

## 'Sustainable Mobility' in School Textbooks

### The Education System Context

Curricula, syllabi and textbooks form the core of the education system with the overall aim of facilitating learning for the children.

School Education is on the Concurrent List of the Constitution of India. The National Council of Education, Research and Training (NCERT) prepares the National Curriculum Framework (NCF) and syllabi. It also prepares textbooks, teacher handbooks and assessment methods. Various Examination Boards, including the Central Board of Secondary Education and various State Boards, the State Councils of Education, Research and Training (SCERT), and textbook bureaus may prepare their own syllabi, textbooks, teachers' handbooks etc, based on the National Curriculum Framework and syllabi (that is, they may adapt the national documents to suit state-specific needs).

The curriculum framework and syllabus are not usually formally shared with teachers, though they are usually easily available with state education departments and many are also online.

**Curriculum Framework:** A plan that interprets educational aims vis-a-vis both individual and society, to arrive at an understanding of the kinds of learning experiences school must provide to children.

**Curriculum:** Curriculum is, perhaps, best thought of as that set of planned activities which are designed to implement a particular educational aim- set of such aims - in terms of the content of what is to be taught and the knowledge, skills and attitudes which are to be deliberately fostered, together with statements of criteria for selection of content, and choices in methods, materials and evaluation".

**Syllabus:** refers to the content of what is to be taught and the knowledge, skills and attitudes which are to be deliberately fostered; together with stage specific objectives.

NCERT (2006). National Focus Group on Curriculum, Syllabus and Textbooks, Position paper.

### The Role of Textbooks

Though textbooks are one element of teaching and learning, in practice, the textbook is the most important resource that students and teachers have access to. Typically, it is the textbook that is 'taught' and evaluation is based on the content of the textbook.

Though teachers are in theory free to use a range of tools and methods, depending on the desired learning outcomes for different topics, in most schools, nothing outside of textbooks is taught for formal subject learning!

### Why do Textbook Analysis?

Considering the importance of textbooks in school teaching and learning, the design of any interventions to support or enhance students' learning should take the content of textbooks into account. Teachers and parents and care givers also have access to the information in the textbooks.

In the context of this paper, the analysis helps us, as educators and actors in the sustainable mobility domain, to understand whether the content matches the real situation, what could be the objective of content if present, how transport and mobility concepts are organized and taught, objectives and teaching within the textbooks, at which class levels and how they are presented etc. Educators (and other actors) can then plan activities that refer to the textbook content, complement or build upon the textbook

content to provide knowledge, and develop appropriate skills, understanding, values, attitudes, and dispositions.

This exercise can also help in strengthening school materials and teacher preparedness to reflect the everyday experience of students on the roads. The aim is to help develop the students' capabilities and give them opportunities to contribute to systemic interventions in creating safe and healthy cities for people.

### Objectives

The textbook review and analyses for this paper was carried out to understand:

- The extent of presence of transport- and mobility-related content in various textbooks
- The portrayal of content, including visual support
- The sufficiency and robustness (or, conversely, the insufficiency and weakness) of transport- and mobility-related content in textbooks

### Scope

The scope of the review included an examination of the texts/ images, graphics, diagrams/ tables that directly or indirectly relate to the theme of transport and mobility. Curricular effectiveness, in terms of objectives and outcomes, has not been carried out as part of this exercise. The following textbooks were reviewed:

#### Maharashtra Board, Marathi Medium

- Standards I to VIII: All subjects
- Standards IX: English, Hindi, Marathi, Science, Social Science (Geography, History, Social and Political Life)
- Standard X: English, Hindi, Marathi, and Science
- Standard XI: Environment and Sustainable Development
- Standard XII: Environment and Sustainable Development

#### Gujarat Board, English Medium

- Standard I: English
- Standard II: English, Maths, Environment
- Standard III to V: English, Maths, Environment Studies
- Standard VI: English, Maths, Science and Technology and Social Science
- Standard VII and VIII: English, Maths, Science and Technology, Social Science, Sanskrit.

#### Gujarat Board, Gujarati Medium

- Standard I: Gujarati
- Standard II: Gujarati, Maths, Environment
- Standard III: Gujarati, Maths, Environment Studies
- Standard IV to V: Gujarati, English, Hindi, Maths, Environment Studies
- Standard VI to VIII: English, Gujarati, Hindi, Sanskrit, Maths, Science and Technology, Social Science

#### NCERT, English Medium

- Standards I and II: Hindi, English and Mathematics
- Standards III to V: Hindi, English, Mathematics and Environmental Studies (EVS)
- Standards VI to VIII: Hindi, English, Mathematics, Science, Social Science (Geography, History, Social and Political life)

## Methodology

An initial orientation to the topic was undertaken by the team reviewing the textbooks. This was done by review of literature on sustainable mobility and discussion and reflection on the sustainable mobility related projects carried out by CEE. Separately, a list was prepared of potential desirable learning outcomes in relation to the sustainable mobility domain. This set of desired learning outcomes is presented later in this paper. This formed the backdrop of understanding about sustainable mobility with which the review of textbooks was carried out.

The review was done by going through each textbook page by page and recording the presence of content, and noted the nature of its presentation (poem, story, visual etc). The review provides a basis to analyse how the content contributes to knowledge, disposition, competence or behaviour in relation to transportation topics. However, individual content has not been analysed for accuracy, effectiveness etc.

Textbook content, such as texts, visuals, activities etc, was tagged as primarily contributing to knowledge, disposition, competence or behaviour in relation to transportation topics. For example, information on transportation modes would be tagged as contributing to knowledge. Text on pollution impacts is tagged as contributing to disposition. Content related to civic duties, or road safety, or encouragement for using particular modes of transport (such as a bicycle) is tagged as contributing to behaviour. Activities improving say analytical ability or expression are tagged as contributing to competence.

The tables of content so prepared were then sorted to give the quantum of content in various categories. Qualitative analysis was also done to identify the major themes and draw inferences on treatment, relevance, continuity and comprehensiveness.

The limitations with this method are that the classification is broad, and also does not give greater weightage to comprehensiveness of content; for example, a whole chapter is counted as one item and so is a single activity.

## Findings

The observations presented below are not meant as a qualitative comparison or assessment of the textbooks. The purpose has been to develop a method of textbook content review from the lens of the topic of transportation. It is acknowledged that the primary purpose of school textbooks is not to develop an in-depth knowledge of the particulars of transportation. The review merely states how the topic appears in textbooks currently. It should lead to further discussion on the merit of inclusion of the topic of transportation, and how it may be presented.

### Observations on quantum and nature of content

1. Maharashtra has a relatively larger proportion of content related to disposition and behaviour.
2. Gujarat textbooks have relatively more number of content items, mostly related to knowledge.
3. Content aimed at developing sustainability competence is relatively limited across all textbooks.

Table 1 - Number of items potentially contributing to varied learning outcomes

Board	Number of items potentially contributing to varied learning outcomes			
	Behaviour	Competence	Disposition	Knowledge
Maharashtra	3	4	8	12
Gujarat, Eng medium	13	1	11	51
Gujarat, Guj medium	10	5	9	77
NCERT	1	1	1	14

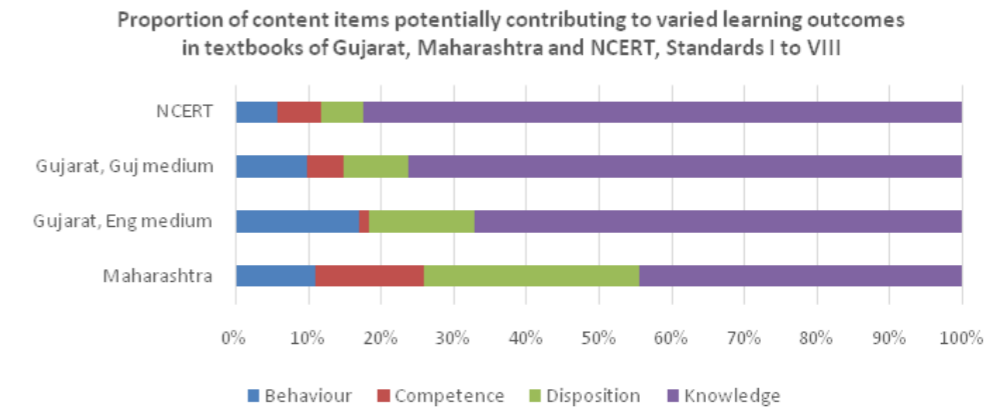


Figure 3 - Proportion of content items potentially contributing to varied learning outcomes in textbooks of Gujarat, Maharashtra and NCERT, Standards I to VIII

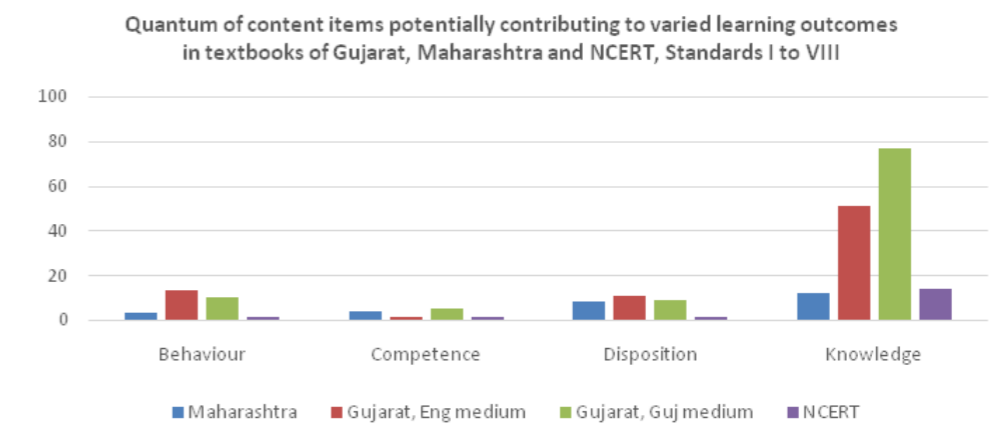


Figure 4 - Quantum of content items potentially contributing to varied learning outcomes in textbooks of Gujarat, Maharashtra and NCERT, Standards I to VIII

### Observations on themes of the content

1. Transport related content (including visuals) are present across subjects and classes.
2. The content does not necessarily match with real situation or real changes in transportation.
3. Much of the content relates to introduction of modes of transport, however there is limited or no discussion on choice of modes or criteria for choice when various modes may be appropriate for a journey.
4. Visual support for transportation topics is of varying quality in the same textbooks.
5. The need for transport is discussed briefly, but at no stage do the concepts of 'access' or avoidance of travel appear.
6. Air and noise pollution impacts of transportation are included, especially in connection with fossil fuels, global warming, climate change.
7. Behaviour related contents are primarily road safety which generally appears in the lower classes as precautions for crossing the road, following traffic rules, and civic duties for considering transportation infrastructure as public infrastructure, using it with responsibility and not damaging it.
8. While there is considerable content, no individual textbook or textbook set manages to provide a systemic understanding of transportation as a system, or opportunities for critical thinking and development of competence for actions for sustainable mobility.

### **Observations on presence of content related to the topic 'Transportation'**

The topic of 'Transportation' is introduced right at the Standard I and II level textbooks in all three Boards. The extent of content and presentation in the form of picture observation activities is relatively higher in Maharashtra and Gujarat textbooks. The Maharashtra textbooks cover transportation with some understanding of the child's experience on the roads and intends to arm them with key skills to be safe on the road. The Gujarat textbooks do cover the topic extensively from introducing students to road safety and road signs but also the consequences and impacts like accidents, global warming, air pollution etc.

At the III to V level, the topic continuity is maintained. The complexity increases in an age appropriate manner, especially in the Maharashtra and Gujarat textbooks, and content related to traffic rules, safe behaviour, public duties etc is introduced.

At the upper primary level, the Gujarat textbooks seem to cover the topic in more depth reinforcing road safety and also finds a mention in the chapter about air pollution, the topics miss a whole grade in standard VII. The Maharashtra textbooks seem to also show some complexity in content in terms of comparing different modes of transportation from the socio-economic perspective, but only in one grade and find no mention at all in the subsequent grades. Both boards only address it in one or two grades and don't attempt to delve in it beyond the different modes of transport and to some extent their impacts.

Interestingly, the NCERT textbooks delve into the history of transport and as a public amenity.

The upper primary level may be most appropriate level for introducing a more systemic understanding of the topic of transportation, overall. However, the topic (transportation) does not have adequate coverage at this level in all the textbooks reviewed.

The textbooks of standards XI and XII of NCERT and Gujarat need to be reviewed to make any conclusive points on how they fare at this level. Looking at the Maharashtra textbooks for this level, especially the Standards XI and XII textbooks, which seem quite comprehensive on the topics of sustainable development etc. transportation is discussed at important places reinforcing previous knowledge (for example, air pollution) as well as bringing out indirect impacts of transportation like mining, etc. New modes such as public bicycle sharing and bus rapid transit are also introduced. As such, the Environment Studies curriculum at the XI and XII level offers great scope for the conduct of projects and activities.

Board-wise summaries of the treatment of the topic of transportation are presented below.

#### **NCERT**

NCERT has textbooks for three subjects, Hindi, English and Mathematics, for Standard I and II. Students are introduced to concept of mobility through their experience of being on the train which appears in the Standard I Hindi textbook. The presentation is in the form of poems or songs.

At Standards III to V level, the topic of transport and mobility appears in few places again in the form of experiences of a ride on the train or the bus in the languages (English and Hindi), for introducing counting in Mathematics and different modes of transportation in Environmental Studies. The presentation is in the forms of poetry and story.

The main subjects for Standards VI to VIII include Hindi, English, Mathematics, Science, Social Science (Geography, History, and Social and Political life).. The history of transportation is covered in Standard V and VIII outlining the transport used in the Harappa civilization and the sea voyages of traders, kinds and pilgrims. Transportation completely skips a grade and reappears in Standard VIII with a whole chapter on

the bicycle and one on the bus journey in the Hindi Textbook, and in another chapter on Public facilities which uses the example of the Delhi Metro in the Social Science textbook.

The presentation at these levels is in the form of lesson texts, story and pictures.

#### **Maharashtra**

For Standards I and II, the subjects are Mathematics, Languages English and Marathi. The topic of Transportation appears as modes of travel students may be familiar with, like cycles, buses, which are used to explain concepts such as distances, directions, width, time, verbs, etc in mathematics and the experiences of travelling in the Language texts. The presentation is in the form of picture observation activities and poems.

It is worthwhile to note that transportation has been acknowledged as a topic relevant to student's everyday lives and has been handled as such at the for Standards III-V. The presentation appears in the form of poems, picture observations, recitation and discussion in the languages (Marathi) and Environmental Studies. Content includes traffic rules to reduce speeding and accidents, and being courteous to others on the bus and train. In class IV the history of transportation and transfer of information are discussed in one chapter (*Vaahatuk va sandeshvahan*). The pros and cons of different modes of transport is discussed in a chapter in class V (*Vaahatuk*) along with benefits of using bicycles. The textbook content addresses children's apprehensions of being on the road and how they can themselves be safe as well as be courteous to fellow travellers by following some basic rules and habits.

It is commendable that transportation is embedded in many lessons as it is cited as an example in understanding public amenities in the city and:

- planning for public amenities
- the role of rules and citizen action in a society
- impact of human development on environment (sprawl)

In lower classes transportation is presented simply as modes of transport used to explain various concepts such as distances, time, etc and on the experience of travelling. For classes III-V it seems to be connected to children's experience of being on the roads, addressing their fears and learning basic traffic rules, even as they are introduced to the history of transportation and comparing different modes of transport for shorter distances.

Transportation related content is also embedded within topics related to how our society works and what is our role as citizens, albeit solely restricted to following traffic rules which can solve many congestion and pollution related problems.

At the upper primary level (Standards VI to VIII), transportation only appears in standard VI and is missed completely in standards VII and VIII. Transportation appears in a few chapters in the languages in standard VI only with a whole chapter on the history of a bicycle and its social, economic and environmental benefits. Content in the other chapters includes metro as an efficient mode of public transportation and on describing the scenes at different public transportation terminals like bus, port, railway station, airport, etc.

The presentation is in the form of lesson-interview, poem, and picture observation activities.

In standards IX-X transportation appears as separate chapters on lessons about air pollution and its health impacts and modes of transportation and tourism. In standards XI-XII, sustainable development is handled in-depth in these textbooks giving students the conceptual understanding as well as activities and action projects. Transportation is explicitly covered in the chapter on 'Impact of Industry, Mining,

and Transport' which looks at the problems and solutions, planning for transportation, public transport, transport demand management, cleaner technology, etc. Examples of public bicycle systems and bus rapid transit are also provided.

### Gujarat

In Standards I and II, students are introduced to transportation with pictures of the different modes (for different helpers), their parts, distances, traffic discipline, and some poems on traffic and crossing the road using the zebra crossing. Picture and observation and colouring are other activities are used for traffic signal colours. There is also an activity which has children think about how they come to school to identify the model of transportation they use. The presentation is in the form of poems, pictures and activities

At the Standard III to V level, the content first refreshes their knowledge of traffic lights and modes of transportation from the previous years and then seems to focus on traffic lights further through stories, pictures, poem etc. In Environmental Studies, the concept of the necessity of food is explained with the analogy of fuel for vehicles. Environmental degradation and global warming is introduced in a chapter at this level. A couple of chapters, one in grade IV and another in grade V are dedicated to the issue of road safety where it is discussed with pictures of accidents and their consequences and of various road signs. Further on at this level, Nature conservation is introduced at Standard 5 along with bicycle use as one of the examples. It appears in Math for explaining counting, weight, multiplication, etc. The presentation is in the form of poems, pictures and stories.

At the upper primary level, especially in the Standard VI textbooks, several topics in science like energy, environment conservation, climate change, etc. and lessons on civic duties have examples from the transport sector. For example, pictures of smoke emission from vehicles, duties of citizens to follow traffic rules, etc. Traffic rules and road signs reappears with more description. Content on the importance of following traffic rules is also covered. The coverage in standard VII doesn't keep pace with the previous grade with no real signs of mobility topics other than modes of transport. In class VIII the only place it appears to have dealt with the transportation is in a chapter about air and air pollution as an effect of human activities on the atmospheric layers and a pictorial description of air pollution in the environmental pollution chapter. Presentation is in the form of lesson-texts, pictures, etc.

### Teacher's Handbook, Maharashtra

'Maintenance and repairing of bicycle' is a work experience teacher handbook for Class VIII which covers various topics such as the history of cycling, design/parts, repair tools, oiling and cleaning, fixing punctures, removing valve, tyres, chassis, seat, bell, lock, dynamo, chain, mudguard, pedal, break design and fitting, rules, traffic rules, etc. The booklet also contains assessment.

## A Framework of Desired Learning Outcomes

One exercise educators undertake while preparing curricula is to articulate desired learning outcomes. These are presented in the knowledge, disposition, competency and behavioural domains. We present below 'desired learning outcomes in the sustainable mobility domain for school students', for discussion and refinement by both educators and transportation experts.

Table 2 - Desired Learning Outcomes in the Sustainable Mobility Domain for School Students

Knowledge (What we know)	Disposition (How we respond to environmental issues)	Competency (Skill and abilities that we know how and when to apply)	Behaviour (Involvement and intentional and habitual behaviour)
<ul style="list-style-type: none"> <li>List mobility needs</li> <li>Explain the concept of access</li> <li>Explain the importance of transportation infrastructure in cities and villages</li> <li>Explain functions of roads and streets</li> <li>Identify users of roads and streets</li> <li>List and compare modes of transport</li> <li>List different types of fuels and their sources</li> <li>Recognize importance of regular maintenance of vehicles</li> <li>Understand the history of the automobile and transportation and its consequences (social, economic, environmental costs)</li> <li>Explain Impacts of transportation in a life cycle analysis of transportation</li> <li>State driving rules and regulations (includes knowledge of road signage, punctuality for traffic signals, carrying a driving license)</li> <li>Explain basic rules for pedestrians &amp; cyclists, and safe walking / cycling behaviour</li> <li>Classify the needs of different types of users in relation to emergency and universal design and management</li> <li>Explain transport demand and its factors</li> <li>Identify noise and silence zones</li> </ul>	<ul style="list-style-type: none"> <li>Influence selection of mode of transport</li> <li>Prevent unnecessary honking to avoid noise pollution.</li> <li>Influence for cleaner and greener fuel</li> <li>Explain the need for proper service and maintenance of vehicles to reduce emissions.</li> <li>Argue for options – walking, cycling, public transportation etc</li> <li>Argue for safe driving</li> <li>Argue for plantation of trees</li> <li>Demand safe conditions for cycling and walking</li> <li>Argue for preference of walking and cycling on road and providing for the needs of vulnerable (children, women, old, disabled)</li> </ul>	<ul style="list-style-type: none"> <li>Develop school as a stakeholder of transport</li> <li>Articulate demand for walking and cycling and safety for them</li> <li>Advocate for equity on road for disabled, women and poor</li> <li>Select the best options when given a choice</li> <li>Predict impacts with various behaviour</li> <li>Justify driving ethics – road equity for all, behaviour of motor vehicle driver towards cyclist or a pedestrian</li> <li>Evaluate policies</li> <li>Explore links of roads and transport with other area/ sectors (health, well-being livelihood, energy and biodiversity)</li> <li>Assess bike/walk-friendliness of the community</li> <li>Reflect on different worldviews (automobile/car-centric vs people-centric) and assess what is 'sustainable'</li> <li>Critical thinking on drivers of transition towards sustainable transportation (eg. technical and behavioural changes, etc.)</li> <li>Bike care and basic repairing</li> </ul>	<ul style="list-style-type: none"> <li>Give first preference to pedestrians and cyclist respect their dignity and need for safety on roads</li> <li>Convince adults to switch off engine on signals to save fuel and avoid emissions.</li> <li>Prefer a mode which is sustainable (like walking, cycling and public transport)</li> <li>Vehicle at home must have PUCs to control emissions from their vehicles.</li> <li>Opt for those long distances modes for transport which reduces an individual's ecological foot print (walk or cycle for short distances)</li> </ul>

## Recommendations and Conclusions

The recommendations below are primarily based on the textbook review for transportation-related content. There may be a need to add content, but more important are the approaches to selection and presentation of textual materials that can help the learner develop a systemic understanding of the sustainable mobility domain and acquire the requisite competences. Further, a careful building up of the topic through textbooks across subjects and over grades is needed, so as to maintain continuity and introduce the complexity inherent in the topic.

- Transport and mobility concepts are given place in the textbooks which indicates that it is part of content selection done at the curriculum and syllabus level. This is an opportunity to introduce transport and mobility in a planned and systematic way. Further work is essential to integrate appropriate content in an age appropriate manner considering the curriculum as a whole as well as the role and usage of textbooks.
- Development of a guidance document may be done by bringing together transportation experts, school educators and curriculum developers
- Further studies might be required to map the ecosystem of transportation learning in terms of what students know (their vocabulary), their experience and the problems they face.
- Continuity of transport and mobility concepts (distribution) across subjects and standards has to be given importance. This will ensure subject-knowledge is embedded in the concepts to be learnt. Continuity also supports a gradual introduction of a range of concepts and issues in an age-appropriate way. Essential learnings (and guidelines for visuals and data) for textbook writers, school managements and teachers should be developed.
- The quality and complexity of content has to be closer to real life situation as it is intended to have an outcome on a student's learning overtime. A student's pre-knowledge, systemic factors and developments in transport and mobility have to be considered.
- Transport and mobility concerns of individuals, communities, school managements and city governments may be included in textbooks and curricula, particularly so in the secondary stage when children are ready to travel alone and have individual experiences of travelling.
- Treatment of the context should progress from poems and stories to case studies and examples, and data, rules and regulations, policies. Methodology and approach should be clearly communicated (also important for bringing in complexity).
- At the senior secondary level, project work on transport and mobility issues should be taken up to provide experience of working with information and making interlinkages and therefore forming one's own opinions and choices is key at this stage.
- Learning should also focus on building competencies to assess various modes of transportation and pick the sustainable modes, or help learners express and advocate for such modes to be developed
- Transport and mobility concepts should be clearly linked to pollution, technologies, climate change, health, economic, environmental and social aspects.
- There has to be a clear focus on creating a positive attitude towards sustainable modes of transportation like the skills of walking safely, learning to cycle and cycle safety.
- With regard to knowledge, attitude and practice, there is a need to move beyond making children aware of traffic rules. It should discuss choices, beliefs and attitudes.
- There is a need to improve the supporting illustrations and graphics as they usually are dated in their representation.
- Good practices, ideas for taking action have to be covered.

Textbooks alone can't achieve the outcomes we would want to achieve. Textbooks will need to be substantiated with co-curricular elements (eg. action projects) which involve actual practice that will help students navigate through their daily lives on Indian roads. They should also help students to make a transition to sustainable modes of transportation and be open and prepared for such transitions.

The domain of schools and mobility deserves attention to accelerate efforts for sustainable mobility. As suggested earlier, sustainable transportation efforts in schools may focus on learners as responsible citizens as well as the school itself to be a site for demonstrating sustainable practices.

A comprehensive engagement effort that includes different actors in a 'whole school, whole system' approach would be appropriate. Such engagement would include school managements, parents associations, urban local bodies and their road/ transportation departments as well as school education departments, bus utilities, transportation service providers, Traffic Police, citizens groups and NGOs, transportation planners, etc.

The aim should be to support learners to understand the need for sustainable transportation and for them, and the school as a whole, to participate as active citizens in creating safe transportation in cities.

## Appendix

### Appendix

#### List of textbook content related to transportation

#### Textbook Analysis for Inclusion of Transport and Mobility in the Curriculum of Maharashtra State Board

Standard	Topic	Name of the lesson	Location (pg. no.)	Subject	Keywords
1	Verbs, actions, action song	Wheels of the bus	38-39	English (Ed: 2016)	bus, poem, public transport, activity, verbs
1	Numbers (number 9), singular-plural	Engine Number Nine	53-54	English (Ed: 2016)	Train, boats, aeroplane, cars, bicycles, math, English, grammar
1	Look and say, do action, how we travel	Let's Go!	68-69	English (Ed: 2016)	action, verbs, walking, cycling, two wheeler, auto rickshaw, motor cars, bus, train, boat, plane, spaceship
1	Opposites-narrow-wide	Tulana-Rundii	44	Math (Ed: 2016)	Road, narrow, wide, cycle, car, cars, multi lane, single lane
1	Counting, subtraction	Vaja Baaki	48	Math (Ed: 2016)	counting, cycle
1	Travel times	Kaal maapan: kami velh-jaast velh	75	Math (Ed: 2016)	travel times, cycle, aeroplane, train
2	Directions, show and tell directions-who is where on the road	Daava-ujvaa, maagey-pudhey	1	Math (Ed: 2016)	directions, view of road, cycle, truck, footpath, rickshaw, hawk, bullock cart, marine drive, Mumbai
3	What it's like in the city, how does the city look like	Riya in the city (what it's like in the city)	10,11	English (Ed: 2016)	wide roads, Buses, cars, cycles (bikes), traffic
3	Courtesy on the bus/train	Travel manners	65	English (Ed: 2016)	bus, travel manners, courteous to people, train
3	What traffic lights/rules mean	Traffic dada	78-79	Marathi (Ed: 2016)	traffic signals, no parking, fines, rules, traffic jam, speed, accidents
3	Glimpse of a city and village	Aaple gaaw, aaple shahar	38-41	Paryavaran Abhyas (Ed: 2016)	trucks, goods, bridge, motorbike, traffic, traffic police, motorbike, convenience, modes of transportation

3	Public amenities for community life-Public transportation, water, etc.	Samuhajeevanasathi saarvajamik sanstha	123	Paryavaran Abhyas (Ed: 2016)	public amenities, Bus stand	K
4	Impacts of human beings (population) and their actions on the environment	Aapan parisar dhokyat aanat aahot ka?	146-152	Paryavaran Abhyas (Ed: 2016)	Population, pollution, then, now, density of vehicles, long commutes in cities, air pollution, fuel, comparison over timescale	D
4	History of transportation/communication	Vahatuk va sandeshvahan	132-138	Paryavaran Abhyas (Ed: 2016)	History of transportation, speed of information travel, technology, comparison of different modes of information dissemination, messengers, birds, letters, phone, travel, etc.	K
4	how to overcome fear of the roads, how to cross the road and how to behave on the roads	Vaatadya	44-49	Paryavaran Abhyas (Ed: 2016)	crossing road, fear of roads, zebra crossing, look left, right, then left, then cross	B
4	Planning for public amenities-waste management, water, roads (accidents-therefore people follow rules)	Samuhajeevanasathi vyavasthapan	121	Paryavaran Abhyas (Ed: 2016)	Local, state level planning for infrastructure, roads, accidents, rules, public duty,	C
5	Pollution is a problem. Good behaviour on the roads and following traffic rules are possible solutions	Aaplya samasyaa, aaple upaay	43-44	Marathi (Ed: 2016)	Traffic, time of the day, peak hour traffic	D B
5	Impact of human development on environment (biodiversity). One case discussed is of roadways and railways infra in protected areas	Paryavaran aani aapann	87-95	Paryavaran Abhyas (Ed: 2016)	impact, roadways, railways, dams, industries, development, protected areas, forest/biodiversity conservation, global, local strategies, pollution, extinction, sacred forests,	K D
5	Comparison between different modes of travel for short distances in terms of time taken, dependence, comfort, fuel used and consumption, perception of pollution (noise, smoke). Pros and cons of vehicles. Benefit of using bicycles	Vaahatuk	68-72	Paryavaran Abhyas (Ed: 2016)	car, cycle, walking, fuel, comfort, air pollution, comfort, exercise, clean, speed, NMT-Cycle, private vehicle maintenance.	C
5	Example of traffic rules for explaining the role of rules in a society	Neeyam sarvaansaathi	28	Paryavaran Abhyas (Ed: 2016)	Traffic rules, rules	D
5	Example of why students love to cycle but there are no separate cycle tracks. Used to set context for responsibility of citizens to address public issues through conflict resolution means like dialogue/ discussion, and individual and community action	Aapnach sodvu aaple prashn	32	Paryavaran Abhyas (Ed: 2016)	Public issues, problem solving/ resolution, cycle track	D C

6	See and discuss the pictures: bus terminal, port, railway station and airport	Sair	2,3	Hindi (Ed: 2016)	bus terminal, airport, port, railway station, safety, cleanliness	K
6	Metro: a convenience, reduction in travel times, comfortable ride, a matter of pride.	Safar Metrochi	61-63	Marathi (Ed: 2016)	Metro, convenience, reduction in travel times, comfortable, a matter of pride.	D
6	Autobiography of a cycle: history of cycle, convenience, independence, economical, health benefits, global switch to cycling, etc.	Saaykal mhanto, mi aahe na!	02,3,4	Marathi (Ed: 2016)	cycle, exercise, clean, history, independence, health benefits, air pollution, economic benefits, sustrans	D
9	Modes of transportation, infrastructure and tourism	Vahatuk, sandeshvahan va paryatan	43-51	Geography (2012-13)	roadways, waterways, airways, post and telegram, telephone, radio, TV, internet, tourism	K
9	Impact of human development on natural resources, air pollution problems and solutions	Pradooshit hava har saans mein	17-18	Hindi (2012-13)	emissions, natural resources, fuels, air pollution, automobiles, global warming, carbon dioxide, afforestation	D
9	How our cities have grown (picture of flyovers and elevated walkways)	Badalte shahar	119-121	Marathi (2012-13)	urban sprawl	K
11	Picture of a cycle to explain how a cycle is a system, but not the separated parts of it. Topic: Systems form meaningful wholes	Paryavaraacha Pranal drushtikon (Systems perspective of environment)	4	Paryavaran aani Shashwat vikas	Parts of a bicycle, bicycle as a system	D
11	Section on transportation under 'Impact of Industry, Mining and Transport'	Human made artefacts, systems and the environment	102-105	Paryavaran aani Shashwat vikas (Edn: 2012)	Impacts of transportation sector on environment, natural resource decline, air and noise pollution, solutions, public transport, planning for shorter commutes, transport demand management, cleaner tech, BRT Brazil, Delhi, Ahmedabad, Pune; emissions, project, acid pollution, nitrous oxide, nitrogen cycle	K
8 (Teacher Handbook)	Activity oriented learning, attitude for making use of the skills, 'learning by doing'	Whole book			History of cycles, design/parts, repair tools, oiling and cleaning, fixing punctures, removing valve, tyres, chassis, seat, bell, lock, dynamo, chain, mudguard, pedal, break design and fitting, rules, vehicle rules, questions and assessment.	C

#### Textbook Analysis of Inclusion of Transport and Mobility in the Curriculum of Gujarat State Board, English Medium

Book Title	Standard, Semester	Subject	Medium	Mention of transport and mobility and related issues and consequences
English (First Language)	1, 1	English	English	Unit 1: First Day Page 11 Activity 10 (D): "Picture of an Airplane" Unit 2: Let's play hide and seek Page 17 Activity 5: "Picture of a girl riding bicycle" Unit 3: My Dream Page 41 Activity 10(B): "Picture of car"
English (First Language)	1, 2	English	English	Unit 4: Our Neighbours Page 57 Activity 2: "Picture of a milkman on bicycle" Page 58 "Picture of an airhostess with airplane" Page 60 Activity 6 "Picture of a railway station and train" Page 62 Activity 8 "Picture of Tractor, and airplane" Page 63 Activity 9 "Picture of various elements of a train (i.e. guard, train, engine)" Unit 5: Around me Page 71 Activity 1(A): "Poem on traffic and road crossing on zebra crossing" Page 72 Activity 2 "Colour the traffic signal" Page 73 Activity 4 "How do you come to school(mode of transportation)" Page 75 Activity 6 "Where are they going? Is it far? What they will take?" (Various modes of transportation ac. to distance) Page 76 Activity 7 "Pictures regarding traffic Discipline" Page 79 Activity 10(A) "Question answer regarding modes of transportation" Unit 6: Travel Near and Far Page 85 Activity 3 "Rhyme on Train"
English	2, 1	English	English	Unit 5: Our neighbourhood Page 41 Activity "Picture of a school bus"



English	2, 2	English	English	English	Unit 3: Cleanliness Page 13 Activity 3 "Inclusion of bus for school picnic"	K
Koojan	2,1	Maths-Environment	English	English	Unit 1: Let us count Page 6 "Colour the train"	K
Koojan	2,2	Maths-Environment	English	English	Unit 2: We Like Page 21 "Colour the Picture of Airplane Helicopter and cycle"	K
English	3,1	English	English	English	Unit 4: Mr. Rabbit Plays a Prank Page 31 Activity 10 "Pictures of modes of transportation" Unit 6: Traffic Lights Page 39 Activity 1 "Pictorial representation of various Traffic rules signs and symbols" Page 40 Activity 2 "Rhyme of Traffic lights" Page 40-42 Activity 3 "Story on Traffic lights" Page 48 Activity 10 "Pictorial representation of traffic signs by policeman"	K B4
English	3,2	English	English	English	None	
Mathematics	3,1	Maths	English	English	Chapter 4: Subtraction Page 45 "Picture of a Train for subtraction"	K
Mathematics	3,2	Maths	English	English	Chapter 11: Length Page 164 "Pictures of Airplane, Ship and Bus" Page 165 "Picture of Train" Chapter 12: Weight Page 171 "Story of Clever Donkey" (explain use of transportation for selling goods)	K3
My Surroundings	3, 1	Environment	English	English	Chapter 1: We must do this Page 1 "Few lines in song regarding traffic discipline"	B K2

					Chapter 2: Can we live without food? Page 8 "Pictorial info on importance of fuel for transportation" Chapter 6: Darkness-Light Page 52 "Paragraph in story on various modes of transportation"	
My Surroundings	3, 2	Environment	English	English	Chapter 7: Maunas at Uncle's village Page 67 "Picture of an ambulance"	K
English	4,1	English	English	English	Unit 1: The world around us Page 1 to 6 "The Fading Glory of Earth" (Activities related to importance of environment and introduction of Global warming) Unit 3: Birthday gift Boat Page 20 Activity 1 & 2 "Story on boat" Page 24 Activity 7 "Picture of earth in warming"	D2 K
English	4,2	English	English	English	None	
Mathematics	4,1	Maths	English	English	Chapter 2: Addition Page 22 "Picture of a car" Chapter 4: Multiplication Page 59 Activity 5 "Pictorial sum regarding train" Chapter 6: Time Page 85 "Picture of a bus station" Page 90 "Picture of a railway station" (Explanation of time with railway time table)	K4
Mathematics	4,2	Maths	English	English	None	
My Surroundings	4, 1	Environment	English	English	Chapter 1: Please be careful Page 1 "Pictorial description of road accident and its consequences" Page 6 "pictures of various road signs" How much Have you learnt 2 Page 48 "Picture of aeroplane"	B2 K
My Surroundings	4, 2	Environment	English	English	None	

English	5,1	English	English	English	Unit 1: Boundless Nature Page 6 Activity 9 Nature conservation, Save Environment "Use a Bicycle"	D
English	5,2	English	English	English	Unit 7: The Brave Little Kite Page 58 Activity 1 "Picture of an Airplane"	K
Mathematics	5,1	Maths	English	English	Chapter 1: Numbers Page 2 Activity 2 "Picture of a bicycle" Chapter 2: Addition and subtraction Page 19 Activity 3 "Pictures of various vehicles" Chapter 3: Multiplication and Division Page 34 Exercise 7 "A sum related to picnic in a mini bus"	K3
Mathematics	5,2	Maths	English	English	None	
My Surroundings	5, 1	Environment	English	English	Unit 1: Who will Do This? Page 9 "Picture of vehicular emission" Unit 2: All Together Page 19 Activity on "Connection of various professionals by the mode of transportation"	D C
My Surroundings	5, 2	Environment	English	English	Unit 15: Disaster and Rescue Page 110 "Pictorial representation of road accident and its consequences"	B
<b>Gujarat, English medium, 6 to 8</b>						
English	6	English	English	English	Unit 5: Invention Page 38 Activity 1 "Picture of a camel cart"	K
Maths	6,1	Maths	English	English	Chapter 1: Bar graph Page 9 Activity 1 "Picture of a busy road"	K
Maths	6,2	Maths	English	English	None	

Science and Technology	6,1	Science	English	English	Chapter 2: Living and non-living Page 14 "Picture of a bicycle" Page 15 "Picture of various modes of transportation" Chapter 10: Sound Page 92 "Picture of busy road and airplane as a source of noise"	K4 D1
Science and Technology	6,2	Science	English	English	Chapter 7: Energy Page 64 "Picture of Car and Scooter" Chapter 8: Conservation of Environment Page 71 "Picture of smoke emission from Vehicles and Industries"	K D
Social Science	6,1	Social Science	English	English	Chapter 4: Beginning of Human Life Page 22 "Paragraph on Climate change" Page 53-54 "Traffic rule and road signs and traffic rules description"	D B
Social Science	6,2	Social Science	English	English	Chapter 5: Gujarat: Agriculture, Industry and Transportation Page 45-46 "Chapter on Transportation" (Types of transportation) Chapter 11: Rights and Duties Page 83 "Paragraph on Duties towards traffic rules"	K B
English	7	English	English	English	None	
Maths	7,1	Maths	English	English	None	
Maths	7,2	Maths	English	English	None	
Science and Technology	7,1	Science	English	English	Unit 7: Motion, Force and Speed Page 68 Activity "Picture of vehicles" Unit 9: Sources of Energy Page 90 Activity: Petroleum Products "Picture of vehicles" Page 91 Activity: Natural Gases "Picture of auto rickshaw"	K3
Science and Technology	7,2	Science	English	English	Unit 2: Lever Page 11 Activity "Picture of a cycle" Unit 10: Air pollution Page 106-116 "Chapter on Air pollution"	K D

Social Science	7,1	Social Science	English	English	None	
Social Science	7,2	Social Science	English	English	Unit 5: India: Agriculture, Industry and Transportation Page 43-47 "Chapter on Transportation in India"	K
Sanskrit	7,2	Sanskrit	English	English	Chapter 6: Vigyanasya Chamtkara Page 21 "Paragraph on aeroplane"	K
English	8	English	English	English	Unit 2: Man's Relationship with Animals Page 11 "Story of a milkman using his horse for transportation and business"	K
Maths	8,1	Maths	English	English	None	
Maths	8,2	Maths	English	English	None	
Science and Technology	8,1	Science	English	English	None	
Science and Technology	8,2	Science	English	English	Unit 6: Combustion Page 63 "Picture of a fire brigade van and Ambulance"	K
Social Science	8,1	Social Science	English	English	Unit 1: Arrival of Europeans in India Page 1 "Description of Sea routes from where Europeans arrived in India" Unit 2: What is Around us? Page 11 "Few line description of air pollution in Effect of Human activities on spheres" Unit 4: How the traders became rulers? Page 21 "Picture of the first railway in India"	K2 D
Social Science	8,2	Social Science	English	English	Unit 2: Environmental Pollution Page 8-9 "Pictorial description on air pollution" Page 10-11 "Pictorial description on noise pollution" Unit 4: Supreme Court Page 30 "Picture of a labourer with wheel cart for goods transportation"	D2 K
Sanskrit	8,2	Sanskrit	English	English	None	

**Textbook Analysis of Inclusion of Transport and Mobility in the Curriculum of Gujarat State Board, Gujarati Medium, Standard 1 to 8**

Book Title	Standard, Semester	Subject	Medium	Mention of transport and mobility and related issues and consequences
Kalrav	1,1	Gujarati	Gujarati	Unit 1: Maru Ghar Page 8 Observation "Picture of an Auto rickshaw"  Unit 2: Chalo Farva Page 10 Sing and read and think "Picture of a busy road" Page 15 Role play "Picture of a scooter"  Unit 3: Chalak Chalani Page 24 Role play "Picture of a bus"  Unit 5: Maru Gam Page 39 Classification "Picture of traffic light, bus stand, railway station and bullock cart"  Unit 6: Varsad Ave Page 70 Puzzle "Picture of bicycle, bus, bike" Page 72 Puzzle "Picture of Aeroplane" Page 76 "Song on Bus" Page 80 Activity "Picture of car"  Unit 9: Game Page 112 Observation "Picture of Aeroplane and Bicycle" Page 115 Reading "Picture of boat"
Kalrav	1,2	Gujarati	Gujarati	Unit 4: Jaldi bol Page 40 "Puzzle on Aeroplane"
Kallol	2,1	Gujarati-Environment	Gujarati	Unit 6: Pankhi Ude Farr Page 48 Observation "Picture and Story on Railway engine" Page 57 "Pictorial questions regarding transportation" Page 59 "Song on modes of transportation"

						Unit 8: Ame Badha Page 77 Observation "Picture of a railway station" Unit 9: Amne Maja Pade Page 84 Observation "Picture of a bus"	
Kallol	2,2	Gujarati-Environment	Gujarati			Unit 1: Rangberangi Ramkada Page 7 "Song on train" Unit 2: Maji ne Khava Pavbhaji Page 15 Activity "Picture of a car" Unit 5: Wah Bhai Wah Page 38 Activity "Picture of a train" Unit 6: Bagicha ma Page 42 Activity "Picture of cycle"	K4
Koojan	2,1	Maths-Environment	Gujarati			Unit 1: Chalo Ganiye Page 6 Activity "Picture of a train engine" Unit 2: Mara Dada Page 12 Activity "Picture of a bus"	K2
Koojan	2,2	Maths-Environment	Gujarati			Unit 2: Amne gme Page 21 Activity "Picture of cycle, Aeroplane and helicopter" Unit 5: Ajab Gajab Page 59 "Picture of a cycle"	K2
Gujarati	3,1	Gujarati	Gujarati			None	
Gujarati	3,2	Gujarati	Gujarati			None	
Maths	3,1	Maths	Gujarati			Chapter 4: Subtraction Page 45 Activity and puzzle "Picture of a train"	K
Maths	3,2	Maths	Gujarati			Chapter 1: Length Page 164 Activity "Picture of various modes of transportation"	K3

						Chapter 12: Weight Page 172 "Story of Clever Donkey" (explain use of transportation for selling goods) Chapter 13: Capacity Page 197 "Picture of a car on petrol pump"	
Mari Aspaspas	3,1	Environment	Gujarati			Chapter 1: Atlu Krie j Page 1 "Few lines in song regarding traffic discipline" Chapter 2: Khadha Vina Chale? Page 8 "Pictorial info on importance of fuel for transportation" Chapter 3: Jiv chhe ke nahi? Page 14 "Picture of a bicycle" Chapter 6: Andharu-Ajvadu Page 52 "Paragraph in story on various modes of transportation"	B K3
Mari Aspaspas	3,2	Environment	Gujarati			Chapter 7: Maunas Mama ne gam Page 67 "Picture of an ambulance"	K
Gujarati	4,1	Gujarati	Gujarati			Unit 2: Thandi Page 7 Activity "Pictorial questions regarding traffic signs"	C K
Gujarati	4,2	Gujarati	Gujarati			Unit 4: Lakho Vanzaro Page 15 "Picture of a bullock cart for transportation"	K
English	4,1	English	Gujarati			Revision 3 Page 59 "Paragraph on a road accident"	K
English	4,2	English	Gujarati			Unit 2: Things around us Page 10 Activity 5 "Picture of a car"	K
Hindi	4,2	Hindi	Gujarati			Revision 2 Page 70 Activity 8 "Picture of a scooter and bus with drivers" Unit 1: Nayi rah Page 1 Activity 1 "Picture of a car"	K

Maths	4,1	Maths	Gujarati	Chapter 2: Addition Page 22 "Picture of a car" Chapter 4: Multiplication Page 59 Activity 5 "Pictorial sum regarding train" Chapter 6: Time Page 85 "Picture of a bus station" Page 90 "Picture of a railway station" (Explanation of time with railway time table)	K4
Maths	4,2	Maths	Gujarati	None	
Amari Aaspas	4,1	Environment	Gujarati	Chapter 1 Jo Jo Dhyani Rakhjo Page 1 "Pictorial description of road accident and its consequences" Page 6 "pictures of various road signs" Ketlu Sikhya 2 Page 48 "Picture of aeroplane"	B2 K
Amari Aaspas	4,2	Environment	Gujarati	None	
Gujarati	5,1	Gujarati	Gujarati	None	
Gujarati	5,2	Gujarati	Gujarati	None	
English	5,1	English	Gujarati	Little Steps 5 Page 20 Activity: 2 "Pictorial story of a picnic by bus" Unit 1: What is in this Unit? Page 25 Activity: 2 "Picture of car and bus"	K2
English	5,2	English	Gujarati	Unit 3: Travel Time Page 54 Activity: 1 "Poem on a bus" Page 56 Activity 2D "Picture of a railway station"	K2
Hindi	5,1	Hindi	Gujarati	Unit 1: Yatayat Page 1 to 6 "Whole chapter on Transportation (Pictorial information and questions regarding modes of transportation)"	K B2

				Unit 8: Bharat Milap Page 49 Activity 3 "Signs of traffic rules"	
Hindi	5,2	Hindi	Gujarati	Unit 12: Dumduma Gao ke Bacche Page 87 "Road signs" Revision 4 Page 109 "Picture of a bus stand" Page 111 "Signs of traffic rules"	B2 K
Maths	5,1	Maths	Gujarati	Chapter 1: Numbers Page 2 Activity 2 "Picture of a bicycle" Chapter 2: Addition and subtraction Page 19 Activity 3 "Pictures of various vehicles" Chapter 3: Multiplication and Division Page 34 Exercise 7 "A sum related to picnic in a mini bus"	K3
Maths	5,2	Maths	Gujarati	None	
Sauni Aaspas	5,1	Environment	Gujarati	Unit 1: Aa Kon Karse? Page 9 "Picture of vehicular emission" Unit 2: Sau Sathe Page 19 Activity on "Connection of various professionals by the mode of transportation"	D C
Sauni Aaspas	5,2	Environment	Gujarati	Unit 15: Aappati and Bachav Page 110 "Pictorial representation of road accident and its consequences"	B
English	6,1	English	Gujarati	None	
English	6,2	English	Gujarati	Unit 1: Rashtriya Shayar Page 5 Activity: 3 "Picture of a scooter and a bike" Unit 4: Journey to Bombay Page 43 Activity: Identify Occupations "Picture of a railway station" Page 55 "Picture of a bus stand"	K3

Gujarati	6,1	Gujarati	Gujarati	Gujarati	Unit 1: Railway station Page 1 "Pictorial question answer on a railway station"	K
Gujarati	6,2	Gujarati	Gujarati	Gujarati	None	B
Hindi	6,2	Hindi	Gujarati	Gujarati	Chapter 4: Pushtak Hamari Mitra Page 17 "Pictorial information of traffic rules"	K
Maths	6,1	Maths	Gujarati	Gujarati	Chapter 1: Stanbh Alekh Page 9 Activity 1 "Picture of a busy road"	K
Maths	6,2	Maths	Gujarati	Gujarati	None	K
Sanskrit	6,1	Sanskrit	Gujarati	Gujarati	Chapter 1: Chitrapadani-1 Page 4 "Picture of bus and aeroplane"	K3
Sanskrit	6,2	Sanskrit	Gujarati	Gujarati	None	K
Vigyan and Technology	6,1	Science	Gujarati	Gujarati	Chapter 2: Sajiv and Nirjiv Page 14 "Picture of a bicycle" Page 15 "Picture of various modes of transportation"	K3
Vigyan and Technology	6,2	Science	Gujarati	Gujarati	Chapter 10: Dhvani Page 92 "Picture of busy road and airplane as a source of noise"	K
Vigyan and Technology	6,2	Science	Gujarati	Gujarati	Chapter 7: Urja Page 64 "Picture of Car and Scooter"	D
Samajik Vigyan	6,1	Social Science	Gujarati	Gujarati	Chapter 8: Paryavaran ni Jadavani Page 71 "Picture of smoke emission from Vehicles and Industries"	D
Samajik Vigyan	6,2	Social Science	Gujarati	Gujarati	Chapter 4: Manav jivan ni sharuat Page 22 "Paragraph on Climate change"	K
					Chapter 5: Gujarat: Kheti, Udhhyog and Parivahan Page 45-46 "Chapter on Transportation" (Types of transportation)	B
					Chapter 11: Hak and Faraj Page 83 "Paragraph on Duties towards traffic rules"	

English	7,1	English	Gujarati	Gujarati	None	
English	7,2	English	Gujarati	Gujarati	Unit 3: Trip Time Page 35 "Paragraph on trip and conversation between chhkdawala and one man"	K
Gujarati	7,1	Gujarati	Gujarati	Gujarati	Chapter 4: Be khana no Parigrah Page 20 "Story includes transport through train and picture of train"	K
Gujarati	7,2	Gujarati	Gujarati	Gujarati	Chapter 6: Bhikhu Page 33 "Picture of busy road and vehicular emission"	D
Hindi	7,1	Hindi	Gujarati	Gujarati	None	
Hindi	7,2	Hindi	Gujarati	Gujarati	Chapter 5: Dharti ki Shan Page 29 "Few lines in poem on Helicopter"	K
Maths	7,1	Maths	Gujarati	Gujarati	None	
Maths	7,2	Maths	Gujarati	Gujarati	None	
Sanskrit	7,1	Sanskrit	Gujarati	Gujarati	Chitrapadani-2 Page 3 "Picture of a boat"	K
Sanskrit	7,2	Sanskrit	Gujarati	Gujarati	Chapter 6: Vignayansya Chamtkara Page 21 "Few lines on aeroplane with picture"	K
Vigyan and Technology	7,1	Science	Gujarati	Gujarati	Unit 7: Gati, Bad and Zadak Page 68 Activity "Picture of vehicles"	K3
Vigyan and Technology	7,2	Science	Gujarati	Gujarati	Unit 9: Urja na Stroto Page 90 Activity: Petroleum Products "Picture of vehicles" Page 91 Activity: Natural Gases "Picture of auto rickshaw"	K
Vigyan and Technology	7,2	Science	Gujarati	Gujarati	Unit 2: Ucchalan Page 11 Activity "Picture of a cycle"	D
Vigyan and Technology	7,2	Science	Gujarati	Gujarati	Unit 10: Hawa nu Pradushan Page 106-116 "Chapter on Air pollution"	D

Samajik Vigyan	7,1	Social Science	Gujarati	None	
Samajik Vigyan	7,2	Social Science	Gujarati	Unit 5: Bharat: Kheti, Udhog and Parivahan Page 43-47 "Chapter on Transportation in India"	K
English	8,1	English	Gujarati	Unit 2: LMBB (Learn more be brighter) Page 21 Activity 7: Observe graph and answer the question "Bar graph on Particle matter in air"	C
English	8,2	English	Gujarati	Unit 1 Page 7 "Paragraph on Air Pollution" Unit 3 Page 31 Activity 2 "Paragraph on sending a message through animals and birds centuries ago"	D K
Gujarati	8,1	Gujarati	Gujarati	Unit 1: Bajar ma Page 1 Activity 1: Observe the picture and answer the questions "Picture of a busy market with types of vehicles"	C
Gujarati	8,2	Gujarati	Gujarati	None	
Hindi	8,1	Hindi	Gujarati	None	
Hindi	8,2	Hindi	Gujarati	Unit 2: Kutch ki sair Page 11 "Picture of a camel cart using for transportation"	K
Maths	8,1	Maths	Gujarati	None	
Maths	8,2	Maths	Gujarati	None	
Sanskrit	8,1	Sanskrit	Gujarati	Chapter 1 Chitrapadani-1 Page 5 "Picture of a bus and plane" Chapter 5: Shilaya Pravas Page 18 "Picture of a bus with school children going for picnic"	K2
Sanskrit	8,2	Sanskrit	Gujarati	None	

Vigyan and Technology	8,1	Science	Gujarati	None	
Vigyan and Technology	8,2	Science	Gujarati	Unit 6: Dahan Page 63 "Picture of a fire brigade van and Ambulance"	K
Samajik Vigyan	8,1	Social Science	Gujarati	Unit 1: Bharat ma Europeans nu agaman Page 1 "Description of Sea routes from where Europeans arrived in India" Unit 2: Apni Aspas su? Page 11 "Few line description of air pollution in Effect of Human activities on spheres" Unit 4: Vepari Shashko kevi rite bnya? Page 21 "Picture of the first railway in India"	K2 D
Samajik Vigyan	8,2	Social Science	Gujarati	Unit 2: Paryavaraniy Pradushan Page 8-9 "Pictorial description on air pollution" Page 10-11 "Pictorial description on noise pollution" Unit 4: Sarvoch adalat Page 30 "Picture of a labourer with wheel cart for goods transportation"	D2 K

#### Textbook Analysis of Inclusion of Transport and Mobility in the Curriculum of NCERT

Book Title	Class	Subject	Year of Publication	Mention of transport and mobility
Rhimjhim 1 Pehli kaksha ke liye Hindi ki pathyapustak	I	Hindi	First Edition-January, 2006 Reprinted- October, 2012	Page 51-'Chuk chuk gaadi' poem on train
Marigold Book 1 Textbook in English for class I	I	English	First Edition- February, 2006 Reprinted- December, 2012	None
Maths Magic 1 Textbook in Mathematics for Class I	I	Mathematics	First Edition- February, 2006 Reprinted- October, 2013	None
Rhimjhim 2 Dusri kaksha ke liye Hindi ki pathyapustak	II	Hindi	First Edition- February, 2007 Reprinted- October, 2013	None

Marigold Book 2 Textbook in English for class II	II	English	First Edition- February, 2007 Reprinted- October, 2013	None
Maths Magic Book 2 Textbook in Mathematics for Class II	II	Mathematics	First Edition- February, 2007 Reprinted- November, 2013	None
Rhimjhim 3 Tesri kaksha ke liye Hindi ki pathyapustak	III	Hindi	First Edition- January, 2006 Reprinted- February 2014	None
Marigold Book 3 Textbook in English for class III	III	English	First Edition- February, 2006 Reprinted- January, 2012	Page 53- 'Trains'- Poem on train Page 61- 'The Bus'- Song on Bus
Maths Magic Book 3 Textbook in Mathematics for Class III	III	Mathematics	First Edition- February, 2006 Reprinted- January, 2012	None
Environmental Studies Looking Around Textbook for Class III	III	Environmental Studies	First Edition- February, 2006	Page 66- 'The Train'- Poem on train
Rhimjhim 4 Chauthi kaksha ke liye Hindi ki pathyapustak	IV	Hindi	First Edition- February, 2007 Reprinted- October, 2012	Page 44- 'Nav banao nav banao'- Poem on boat
Marigold Book 4 Textbook in English for Class IV	IV	English	First Edition- February, 2007 Reprinted- February, 2014	None
Maths Magic Book 4 Textbook in Mathematics for Class IV	IV	Mathematics	First Edition- March, 2007 Reprinted- December, 2012	Chapter 3- Page 23-27- 'A trip to Bhopal'- About buses
Environmental Studies Looking Around Textbook for Class IV	IV	Environmental Studies	First Edition- February, 2007	Page 60- chapter 8- 'Reaching Grandmother's House'- Story which describes different means of transport
Rhimjhim 5 Paanchvi kaksha ke liye Hindi ki pathyapustak	V	Hindi	First Edition- February, 2008 Reprinted- October, 2013	None
Marigold Book 5 Textbook in English for Class V	V	English	First Edition- February, 2008 Reprinted- December, 2012	Unit 9- Page 154- 'Around the world'- Story on train
Maths Magic Book 5 Textbook in Mathematics for Class V	V	Mathematics	First Edition- March, 2008 Reprinted- December, 2012	Chapter 1- 'Fish Tale'- Page 6,7,8,13- about boat

Environmental Studies Looking Around Textbook for Class V	V	Environmental Studies	First Edition- March, 2008	Page 160- 'Making tally Marks on road'- different vehicles mentioned
Honeysuckle Textbook in English for Class VI	VI	English	First Edition- February, 2006 Reprinted- October, 2013	Page 110- chapter 12- 'What if it finishes....?'- On transportation Page 120- 'A shelter so high'- chapter 13- On mobility
Vasant - Bhag 1 Kaksha 6 ke liye Hindi ki Pathyapustak	VI	Hindi	First Edition- January, 2006 Reprinted- February, 2012	None
Mathematics Textbook for class VI	VI	Mathematics	First Edition- February, 2006 Reprinted- November, 2013	None
Science Textbook for Class VI	VI	Science	First Edition- March, 2006 Reprinted- November, 2012	None
Social Science The Earth Our Habitat Textbook in Geography for Class VI	VI	Social Science- Geography	First Edition February, 2006 Reprinted November, 2013	None
Social Science Our Pasts-I Textbook in History for Class VI	VI	Social Science- History	First Edition- February, 2006 Reprinted- October, 2013	Chapter 4 'In the earliest cities' transport used in Harappa (picture + task), p. 38 Chapter 10- 'Traders, kings and Pilgrims'- p.100- description about sea voyages
Social Science Social and Political Life-I Textbook for Class VI	VI	Social Science- Social and Political Life	First Edition- February, 2006 Reprinted- November, 2013	None
Honeycomb Textbook in English for Class VII	VII	English	First Edition- February, 2007 Reprinted- October, 2013	None
Vasant - Bhag 2 Kaksha 7 ke liye Hindi ki Pathyapustak	VII	Hindi	First Edition- March, 2007 Reprinted- October, 2013	None



Mathematics Textbook for class VII	VII	Mathematics	First Edition- February, 2007 Reprinted-October, 2013	None	
Science Textbook for Class VII	VII	Science	First Edition- January, 2007 Reprinted-December, 2013	None	
Social science Our Environment Textbook in Geography for Class VII	VII	Social Science- Geography	First Edition- March, 2007 Reprinted- October, 2013	None	
Social Science Our Past-II Textbook in History for Class VII	VII	Social Science- History	First Edition- April, 2007 Reprinted- October, 2013	None	
Social Science Social and Political Life-II Textbook for Class VII	VII	Social Science- Social and Political Life	First Edition- February, 2007 Reprinted- November, 2013	None	
Honeydew Textbook in English for Class VIII	VIII	English	First Edition- February, 2008 Reprinted- December, 2012	None	
Vasant – Bhag 3 Kaksha 8 ke liye Hindi ki Pathypustak	VIII	Hindi	First Edition-February 2008 Reprinted- October 2013	Chapter 3-'Bus ki Yatra'- Story on bus Chapter 13-'Jahan pehiya hai'- full chapter on cycle	K B
Mathematics Textbook for class VIII	VIII	Mathematics	First Edition- January, 2008 Reprinted- November, 2013	None	
Science Textbook for Class VIII	VIII	Science	First Edition- January, 2008 Reprinted- October, 2013	None	
Social science Resources and Development Textbook in Geography for Class VIII	VIII	Social Science- Geography	First Edition- February, 2008 Reprinted- November, 2013	None	
Social Science Our Past-III	VIII	Social Science- History	First Edition- March, 2008 Reprinted- January, 2014	None	

Part 1 Textbook in History for Class VIII					
Social Science Our Past-III Part 2 Textbook in History for Class VIII	VIII	Social Science- History	First Edition- January, 2008 Reprinted- January, 2014	None	
Social Science Social and Political Life-III Textbook for Class VIII	VIII	Social Science- Social and Political Life	First Edition- March, 2008 Reprinted- December, 2013	Chapter-9-'Public Facilities'- Page 112- Paragraph on Delhi Metro	D

# Some examples of textbook content related to transportation

## Examples of textbook content from Maharashtra, Standards I and II

**Unit Seven**

**The Wheels On The Bus**  
Listen carefully and repeat with actions.  
શ્રી ટેકરા ભેતા, ભાતી, યાત્રાવારિય ભી ટાપી.

The wheels on the bus go round and round;  
રોલિંગ ગોલે ટાપી ટાપી.  
The wheels on the bus go round and round;  
રોલિંગ ગોલે ટાપી ટાપી.  
The wheels on the bus go round and round;  
રોલિંગ ગોલે ટાપી ટાપી.  
The wheels on the bus go round and round;  
રોલિંગ ગોલે ટાપી ટાપી.  
all through the town!

The horn on the bus goes beep, beep, beep.  
બીપ બીપ બીપ બીપ બીપ બીપ.  
બીપ બીપ બીપ બીપ બીપ બીપ.

**How many ?**  
કેટલા કેટલા ?

1. Look at the picture and repeat after me.  
દેખો ચિત્રો અને પુનરાવર્તિત કરો.

one balloon	many balloons	one bird	many birds
one kite	many kites	one train	many trains
one boat	many boats	one aeroplane	many aeroplanes
one car	many cars	one bicycle	many bicycles

2. Look at the picture. Say with me.  
ચિત્રોને જોઈને કહો સાથે મારી સાથે.  
Count the vehicles, answer the question and write the number in the box.  
ગણો વાહનોનો સંખ્યા, પ્રશ્નોનો જવાબ આપો અને સંખ્યા બોક્ષમાં લખો.

	How many trains ?	<input type="text"/>
	How many boats ?	<input type="text"/>
	How many aeroplanes ?	<input type="text"/>
	How many cars ?	<input type="text"/>
	How many bicycles ?	<input type="text"/>

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રિકાર્ડમાં ચોક્કસ સંખ્યા સંદર્ભમાં ✓ અથવા યોગ્ય સંખ્યા સંદર્ભમાં X આગળ લખો.

## Examples of textbook content from Gujarat, Standards I-II (English)

**guard**

**engine**

**train**

**stethoscope**

Stop \_\_\_\_\_  
Look \_\_\_\_\_  
Go \_\_\_\_\_

There is something coming, wait a bit,  
અહીં કંઈક આવે છે, થોડુંક રાહ જાઓ.

If I run out, I may be hit.  
જો મેં ભાગી જાયું, મને ટક્કર મારી શકે છે.

Ah, now the road is clear,  
હા, હવે રોડ સ્વચ્છ છે,

No car or bus is near.  
કોઈ ગાડી અથવા બસ નજીક નથી.

Stop and look.

Come Near Go Far  
જાઓ નજીક જાઓ દુર  
Chhoo, Chhoo, Chhoo, Chhoo, Chhoo, Chhoo

I see a little train.  
મેં એક નાની ટ્રેન જોઈ છે.  
Come, dear,  
આવો, પ્રિય,  
Get in here,  
અહીં ઉતરો,  
Let's go for a ride.  
ચાલો ગાડી ચલાવવા માટે.

Near the river, near the bridge  
જાઓ નદીની નજીક, બેઠકાની નજીક  
Far away from the hill.  
દુરથી ટાળો ટાળો ટાળો  
Chhoo, Chhoo, Chhoo, Chhoo, Chhoo, Chhoo  
Let's go for a ride.

Near the hill, near the pond  
જાઓ ટાળો નજીક, ટાંચાની નજીક  
Far away from the field  
દુરથી ટાળો ટાળો ટાળો  
Chhoo, Chhoo, Chhoo, Chhoo, Chhoo, Chhoo  
Let's go for a ride.

Near the field, near the well  
જાઓ ટાળો નજીક, ઘેલો નજીક  
Far away from the river  
દુરથી ટાળો ટાળો ટાળો  
Chhoo, Chhoo, Chhoo, Chhoo, Chhoo, Chhoo  
Let's go for a ride.

Examples of textbook content from Gujarat, Standards I-II (Gujarati)

**SUBJECT - GUJARATI**

નાની નાની ચાલી આવે સાથે સીને લેતી આવે, એમાં કરવું ખૂબ વામે ભરત... કરતી ભરા ભરે.

હવામાં કું ઊડું છું, ધરરર અવાજ કું છું.

ભર સ્ટેશન

**સુબોટા :**  
દીવાસળીનાં ખોખાં લીધાં, તેના તો મેં ડબ્બા કીધા.

**સોબી :**  
સોબી આગળ મોટું ખોખું, જનાવી દીપું એન્જિન મોટું.

**પાડણ :**  
સોટી વાગે પુર પુર, ચાડી ચાલે છુક છુક.

**બુલબુલ :**  
બુલબુલ એન્જિન ચાલું જાય, પાડણ ડબ્બા દોડ્યા જાય.

**જાતાં :**  
જાતાં જાતાં આવી ભીંત, મગસ ! અથડાયું એન્જિન.

**દડેક :**  
એન્જિનના તો બુલકા કયા, દડેક ડબ્બા છૂટા કયા.

**અમે :**  
ડબ્બા મટીને ખોખાં કયાં, અમે રમત રમી રલ્યાં.

Some examples from the NCERT Textbooks (Standards III-V)

**Song time**

Let's sing

**'The Bus'**

The wheels on the bus go round, round, round,  
round, round, round, round, round.  
The wheels on the bus go round, round, round,  
all through the town.

The horn on the bus goes beep, beep, beep...

The wipers on the bus go swish, swish, swish...

The money on the bus goes clink, clink, clink...

The babies on the bus go waa, waa, waa...

The driver on the bus says, "Move on back" ...

The bell on the bus goes ding, ding, ding...

The windows on the bus go up and down...

**6 નાવ બનાઓ નાવ બનાઓ**

નાવ બનાઓ, નાવ બનાઓ।  
ઢેયા મેરે, જલ્દી આઓ।।

વહ દેખો, પાની આયા હૈ,  
ઘિર-ઘિર કર ચાંદલ છાયા હૈ,  
સાત સમુંદર ભર લાયા હૈ.

તુમ રસ કા સાગર ભર લાઓ।  
ઢેયા મેરે, જલ્દી આઓ।।

પાની સચમુચ્ચ ખૂબ પડેગા,  
લંબી-ચૌડી ગલી ભરેગા,  
લાકર ઘર મેં નદી ધરેગા,

એસે મેં તુમ મી લહરાઓ।  
ઢેયા મેરે, જલ્દી આઓ।।

ગુલ્લક ભારી, અપની ઓલો,  
હલ્કી મેરી, નહીં ટડોલો,  
પૈસે ના-ના-હી રોલો,

**Waiting for the Buses**

Sahiba jumps out of the line to see if the buses are coming. She shouts loudly — Hey! I can see them. Run! Grab the window seats.

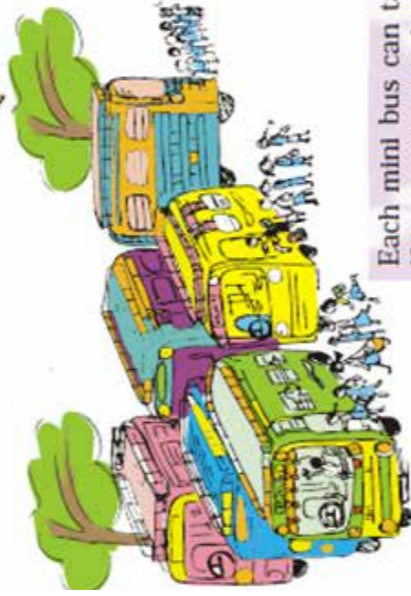
Many children start jumping in excitement. But .....



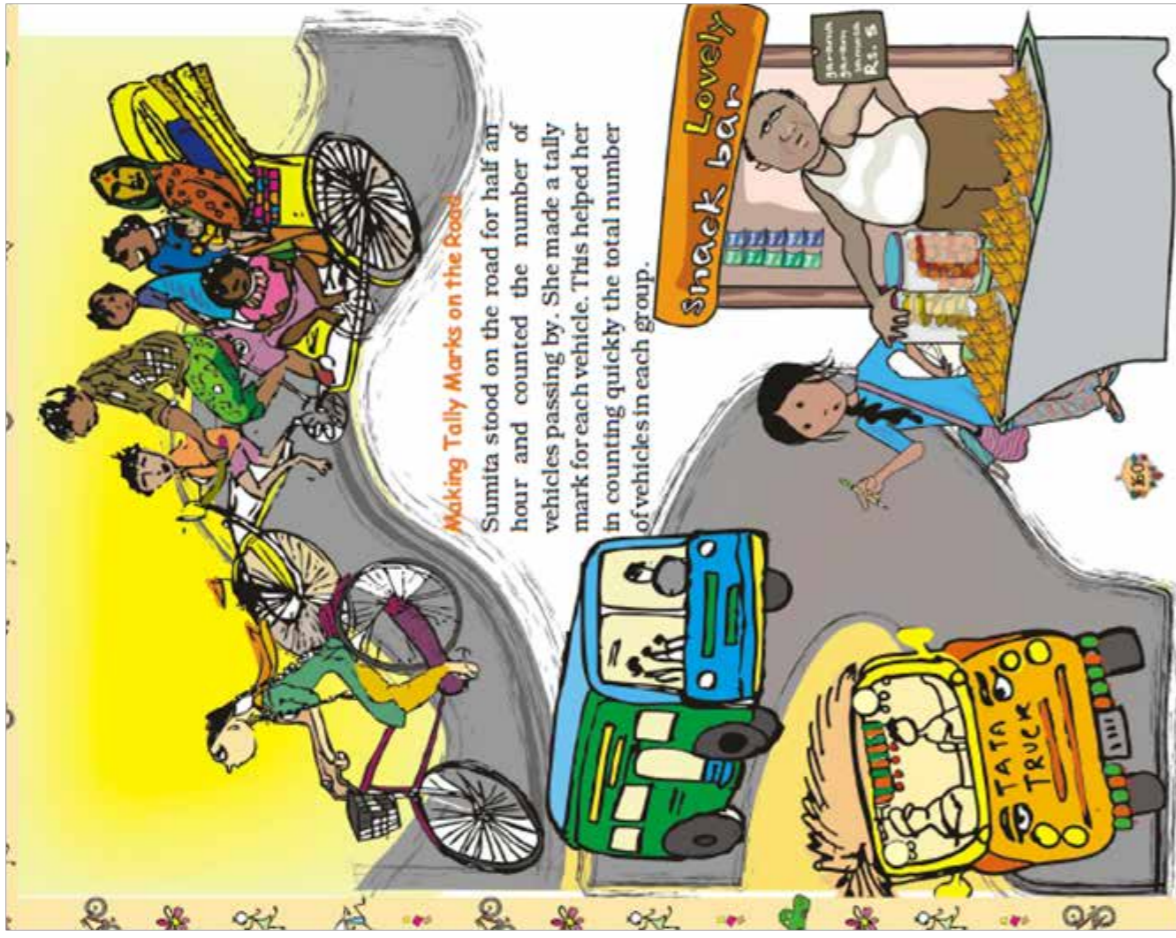
Now there is an argument.

We told you to bring big buses!

We did not have enough big buses. So we got many mini buses.



Each mini bus can take 35 students. How many mini buses are needed?



**Making Tally Marks on the Road**  
Sumita stood on the road for half an hour and counted the number of vehicles passing by. She made a tally mark for each vehicle. This helped her in counting quickly the total number of vehicles in each group.

Snack bar

TATA TRUCK



**Some examples from the Maharashtra Textbooks (Standards III-V)**

**२४. ट्रॅफिकदादा**

एका. मृणा. बाबा.

ट्रॅफिकदादा, सांगा सांगा, तुमची भाषा आम्हांला सांगा. छोट्यांचा ऐकून एकच गलका, ट्रॅफिकदादा म्हणाले, 'एका.' दिस्ता समोर लाल दिवा, गाडीला तुमच्या ब्रेक लावा. खांब्यावर दिस्ता पिवळा दिवा, इकडे तिकडे नीट लक्ष ठेवा. हिवा दिवा लागेल तेव्हा, गाडी तुमची पुढे चालवा. लावाल वाहन 'नो पार्किंगला', होईल दंड नक्कीच तुम्हांला. खूप धू वाहन सोडता, दुस्मती करा वेळ न लावता. पाळा नियम वाहतुकीचे, संकट ना येई 'ट्रॅफिक जाम'चे. वेगावती ठेवा नियंत्रण, अपघाताला नको निमंत्रण.



— पुतळक शेळ

**शब्दांची :** ट्रॅफिक - रस्त्यावरील वाहतूक. पार्किंग - वाहने ठेवण्याचे ठिकाण. ट्रॅफिक जाम होणे - वाहनांची गर्दी होणे. नियंत्रण - ताबा, संवय.

**स्वाध्याय**

१. समान अक्षराने शब्द होणारे कवितेतील शब्द शोधा व लिहा.
२. खालील प्रसंगी काय करावे ?  
ट्रॅफिक सिग्नलचा -  
(अ) लाल दिवा लागला (आ) पिवळा दिवा लागला (इ) हिवा दिवा लागला

**Travel Manners**

Look, listen, repeat and learn to use.  
पहा, ऐका, माझ्यापाठोपाठ म्हणा आणि वापरयला शिका.



Do you mind giving me some place ?



I'm sorry, but there isn't any place here.

Mind if I open the window ?



Thank you.

No, not at all. Go ahead.

You're welcome.

## २१. समूहजीवनासाठी सार्वजनिक व्यवस्था



सार्वजनिक सोई व सुविधा

### सांगा पाहू

- वरील चित्रांच्या आधारे सार्वजनिक सोई व सुविधा यांची यादी तयार करा. या सुविधांचा आपल्याला कोणता फायदा होतो ?
- या सुविधा नसतील, तर कोणत्या अडचणी येतील ? आपले कुटुंब हे आपले घर असते. घराबाहेरील आपले जीवन सार्वजनिक असते. सार्वजनिक जीवनात विविध सुविधांची गरज असते. सार्वजनिक सुविधा म्हणजे आपणा सर्वांसाठी असणाऱ्या सोई, वाहतूक, शाळा, दवाखाने यासारख्या अनेक सुविधांचा आपण सार्वजनिक जीवनात वापर करतो. सार्वजनिक सेवासुविधा या सर्वांना व सर्वांसाठी सारख्याच उपलब्ध असतात. त्यांचा वापर आपण जबाबदारीने केला पाहिजे.

### स्थानिक शासन आणि गावातील सुविधा

आपण गावात किंवा शहरात राहतो. गावाची लोकसंख्या कमी असते. शहरातील लोकसंख्या जास्त असते. शहरात कारखाने असतात. बाजारपेठा असतात. तिथे रोजगाराच्या संधी जास्त असतात. सार्वजनिक सुविधा शहरात मोठ्या प्रमाणात असतात.

गाव असो की शहर, तेथील कारभार तिथेच असणारी शासन संस्था पाहते. तिला आपण स्थानिक शासन संस्था म्हणतो.

गावाचा कारभार ग्रामपंचायत बघते.

नगराचा कारभार नगरपालिका पाहते.

मोठ्या शहरांसाठी महानगरपालिका असते.

१५.

## आपल्या समस्या – आपले उपाय

- चित्र पाहू. संवाद वाचा.



केराव : बापरे! किली ही गदी आणि किली ह्या गाड्या!

बाबा : तू आज पाहतोस होय ही गदी! रोजच अशी गदी असते इधे.

केराव : एवढी सगळी मानसं कुठे चालली असतील बर! ह्या सगळ्या गाड्यांना किली पेट्रोल, डिझेल लागत असले ?

बाबा : आणि वाहनातून निघणाऱ्या धुरांधं काव ?

केराव : गदी, पूर, वाहनांचे आवाज, कर्कश हॉर्न... कधी एकदाचं इंधून लांब जातोच, असं झालं आहे मला.

- खालील वाक्ये वाचा. तुम्हांला योग्य वाटत असेल, तर ✓ अशी खुण करा आणि अवोय वाटत असेल, तर X अशी खुण करा.

१. एखाद्या गाडीचा छोटसा अपघात झालेला आहे. तो पाहण्यासाठी तेथे गदीं काणे.

२. ओळखीची व्यक्ती रस्त्यात भेटल्यास, भर रस्त्यात वाहत उभे करून गप्पा मारणे.

३. दुकानात बसून आणायला गेल्यावर, आपले वाहन पार्किंगच्या ठिकाणी लावणे.

४. गदींमधून जाताना जोरजोराने हॉर्न वाजवणे.

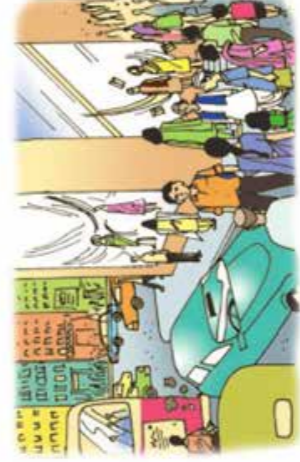
  
  
  


प्रदूषण ही एक मोठी समस्या आहे.

४३

- २० वर्षापूर्वी शहराशेजारी शेते होती. तिथे आता नवी वस्ती झाली आहे. रेल्वेच्या फाटकापाशी भलेथोरले झाड होते. त्या झाडावर घाटी बांधून तऱ्हेतऱ्हेचे पक्षी आणि अनेक किडे सुखाने नांदत होते.

- आता ते पक्षी आणि किडे कुठे गेले असतील ?



शहर



गाव



जंगल

- शहर, खेडेगाव आणि जंगल यांत तुम्हांला कोणकोणत्या चावर्तीत सारखेपणा आढळतो ?

- फरक कोणकोणते आढळतात ?

(१५६)



सांगा पाहू



चित्रांचे निरीक्षण करा.



१. वरील वाहतूक साधनांचा वापर आपण कशासाठी करतो ?

२. या तीनपैकी मानवाने सुरवातीस वापरलेले साधन कोणते ?

३. तीनही वाहतूक साधनांत कोणता भाग समान आहे ?



माणूस लाकडी ऑडके व गोलाकार टाड डोंगरउतारावरून घुंगळत जाताना पाहायचा. या निरीक्षणावरून त्याला चाकाची कल्पना सुचली असावी असे मानतात.

पूर्वी बसू ओढण्यासाठी लाकडी फळ्यांचा वापर केला जायचा. नंतर या फळ्यांना चाक जोडल्याने वाहतुकीस वेग आला. वेळेची व श्रमाची बचत होऊ लागली. चाकाचा शोध हा माणसाच्या विकासातील एक महत्त्वाचा टप्पा आहे.



माहीत आरे का तुम्हांला



आधुनिक काळात वाहतुकीची अत्याधुनिक साधने निर्माण झाली आहेत. पंतु आजही काही भागांत वाहतुकीसाठी माणूस व प्राणी यांचा वापर केला जातो. उदा., दुग्ध भागात बाक, बाळवंटात उंट, उंचावती जाण्यासाठी पालखी/डोली वापरतात.

## सायकल वापराचे विविध फायदे

सामरिक व्यायाम

थोड्या प्रमाणात सामान वाहून नेता येते.

घाहनांची गरजी होत नाही



छोट्या जागेत ठेवता येते.

पेलेची बचत होते

स्वायत्तचल

## SUBJECT - ENVIRONMENT

रस्ता ओजोगवाમાં ધ્યાન રખાય,  
આડી-બસમાં બેસતાં ધક્કામુક્કી ન કરાય,  
આપણા જેવા સરખાની દોસ્તી કરાય, આ વાત કદી ન ભુલાય.




રજા પડી. મીનસ મામના ધરે ગયો. બસમાંથી ઊતરી રિક્ષામાં બેઠો. મામનું ધર આબું. મામા ધરે જ હતા. મામા મોટર-સાર્થક પર હેલ્મેટ પહેરીને બેઠા. મામા મીનસ અને ઢિરલને મોટર-સાર્થક પર વાડીએ લઈ ગયાં. વાડીમાં મોર અને હરણ હતાં. પતંગિયું અને








સાઈકલ


















**SUBJECT - ENVIRONMENT**

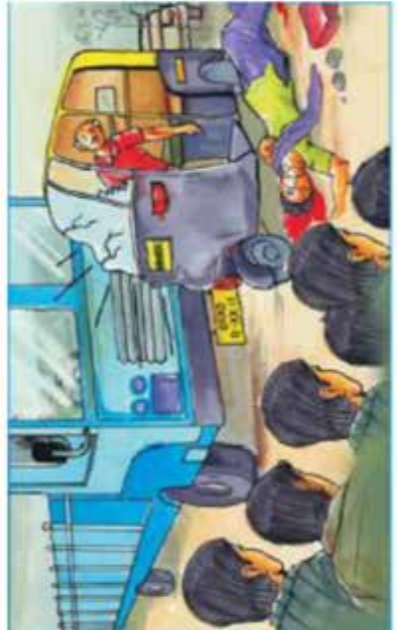


**SUBJECT - ENVIRONMENT**

 STOP સ્વરૂપે	 NARROW BRIDGE સંકોચિત્ત બેજી	 ROUND ABOUT ચક્રાકાર રસ્તા
 NARROW ROAD AHEAD સામે સંકોચિત્ત રસ્તા છે	 NARROW ROAD AHEAD સામે સંકોચિત્ત રસ્તા છે	 NO ENTRY વળતર નહીં
 VEHICLES PROHIBITED IN BOTH DIRECTIONS	 COMPULSORY CYCLE TRACK	 CYCLE PROHIBITED
 COMPULSORY TURNING LEFT	 COMPULSORY TURNING RIGHT	 COMPULSORY KEEP LEFT
 COMPULSORY TURNING LEFT	 COMPULSORY TURNING RIGHT	 COMPULSORY AHEAD ONLY

**SUBJECT - ENVIRONMENT**



**Some examples from the Gujarat Textbooks (Standards III-V) English Medium**

**SUBJECT - ENVIRONMENT**



**SUBJECT - ENVIRONMENT**







**STANDARD - 3**

**SUBJECT: ENGLISH**

**ACTIVITY - 1**  
Study the following traffic signs and their meanings. You have to identify places where you see these signs.

**ACTIVITY - 2**  
Ring like a game in class.

**Red light! Red light!**  
What do you see?  
I see stop sign!  
Stop right away!

**Change light! Change light!**  
What do you see?  
I mean wait wait!  
All the light goes green.  
**Green light! Green light!**  
What do you see?  
I see go, and go right away!



**SUBJECT: ENGLISH**

**Please... Be careful**

**See and Write:** 

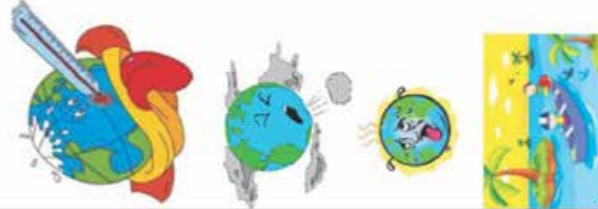
**Observation:**  

**Discussion:**   



STANDARD – 4

SUBJECT: ENGLISH



SUBJECT: MATHS

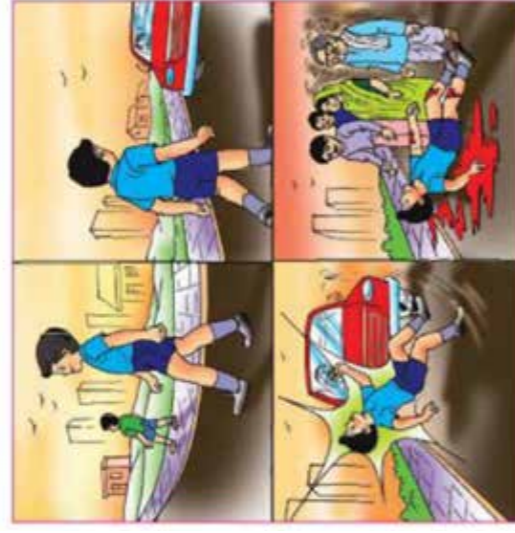
Activity 6 :  
Read the bus timetable and write the answers in the given table



Study the Railway Timetable and answer the following questions :



SUBJECT: ENVIRONMENT



Some examples from the NCERT Textbooks (Standards VI-VIII)

1. What are public facilities? Why should the government be responsible for providing public facilities?
2. The government can get private companies to deliver some of the public facilities. For instance, contracts for building roads are given to private contractors. Distribution of electricity in Delhi is done by two private companies. However, the government must keep a close watch on these and ensure that they fulfil their commitment to reach these facilities to all people and at affordable prices.  
Why do you think the government must assume the overall responsibility for public facilities even when it gets private companies to do part of the job?
3. Look at your water bill and find out what the minimum rate is for municipal water in your area. Does the rate increase as the use of water increases? Why do you think the government charges a higher rate for greater use of water?
4. Find out the various kinds of taxes people pay to the government by talking to a salaried person, a person running his or her own factory/business and a shopkeeper. Share your findings in the classroom with your teacher.



Buses are the most important forms of public transport over short distances. It is the main link to the workplace for majority of the working people. With rapid urbanization, the public bus systems even in the major cities has not been able to keep up with demand. As an alternative, the government has planned ambitious metro rail projects for Delhi and other metropolitan cities. Rs 11,000 crore was spent from the government budget for the construction of the first segment of the metro-rail in Delhi using the latest technology. People have pointed out that this massive expenditure could have been avoided if only a fraction of this amount was spent on upgrading the public bus systems. Would you agree? What do you think could be the solution for other regions of India?



**२ सायकल म्हणते, मी आहे ना!**

साहजिकपणे सोडवता येईल महान आव्हाने वेगळे वाहन म्हणजे सायकल. पर्वतीय व आरेष्याच्या रूंदपट्टे हिलकॉम्ब, कमी ऊर्बिक, वारग्याज सहजता असलेली सायकल घेत. आपली माहिती या पाठ्यपुस्तक संगणक आहे. हा एक अत्यवधारनात्मक पद आहे.

खालील चित्रे पाहा. ज्या वाहनांनी तुम्ही प्रवास केला आहे, त्यापुढे दिलेल्या चौकटीत ✓ अशी खुण करा.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

मी आहे सायकल! काही लोक मला दुचाकीही घेतल्या सायकलीची दंतकथाही बसवली; पण मला खरा वेग आला तो खरी टायरसुळे. १८८७ साली जॉन बॉट्लर इंग्लंडचा बॉट्लर याने ते सायकल काढले होते.

पहिली दोनशे वर्षे मी रूढत आले; पण पुढची शंभर-दोन्ही वर्षे मी कधी थांबले नाही.

माझा प्रचार-प्रसार आणि वापर खूप मोठ्या प्रमाणात झाला. जगातील असा एकही देश नाही, की जेथे माझा वापर होत नाही. लहान मुलांचे पहिले वाहन खेळण्यातला लाकडी चोडा असेल; पण दुसरे वाहन मीच आहे. आई-वडील आपल्या मुलांना सायकल हंगामस आणून देतात. का माहीत आहे? एक तर किपत पायक आणि अपघाताची शक्यता एकटय कमी! तुम्ही त्यावरून पडलात तरी खरचटेल, चौडीशी तसे म्हटले तर माझा जन्म १९९० चा. फ्रान्स रुखात होईल, अन् ती लगेच बरी होईल. मात्र तुम्ही देशातील एम्. डी. सिव्हर्क हे माझे बन्धूकले. १८७६ त्यातून धडा निकाल. एकदा का तुम्हाला आत्मविश्वास साठी एच्. जे. लॉसन याने मला गती यावी, म्हणून आला, की मग तुमची याही संगत कायची उजळते.



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### सहर मेट्रोची

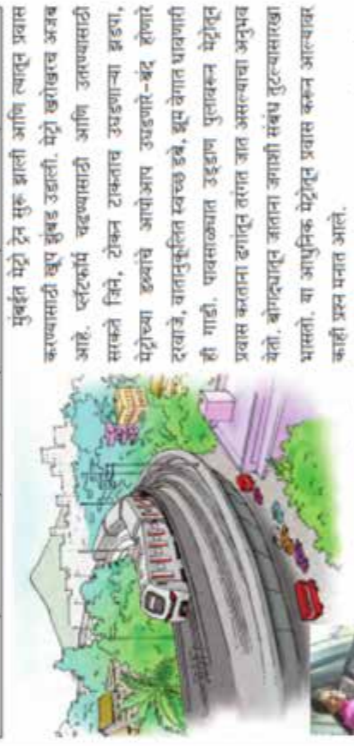
१६

ब्रिटीश मेट्रोपोलिटन-वॉटर-वर्क्स-१९१०) नॉर्थव्हिल लेझिक. फिओरबॉनी मुलासाठी अर्थसामाजिक विषयांवर ललितलेखन.

विमान व तंत्रगणना पुढागळे अनेक नवे नवे तंत्रे तयार जत आले. प्रगल्भता पाहतायुद्धी वेगाने वाढत होत आहेत. त्या त्या प्रदेशाची भौगोलिक परिस्थिती व मागांच्या गाटा यांचा विचार करून वास्तुकीचा वापर जत होत आहे. मेट्रोची पहिली पहिल्या सारकी चकण यांचा मेट्रो चालण्याचा अनुभव व मेट्रोचा परिचय संगणकयुक्त दिलेला आहे. 'कल्प' या मासिकातून हा संगणक घेतलेला आहे.

- खालील तक्त्यात दिलेल्या क्षेत्रातील कर्तृव्य मान महिलांची नावे लिहा.

क्षेत्र	क्रिया	विमान	वैद्यकीय	सिध्दांत	राजकीय
महिलांची नावे					



मुंबईत मेट्रो ट्रेन मुरु झाली आणि त्यातून प्रवास करण्यासाठी खूप हुंबड उडाली. मेट्रो खरोखरच अजब आहे. प्लॅटफॉर्म वदण्यासाठी आणि उतरण्यासाठी सक्ते तिन, टोकन टाकताच उघडण्याच्या झडपा, मेट्रोच्या हड्ड्यांचे आयोजन उघडणारे-बंद होणारे दरवाजे, वातावरण स्वच्छ डबे, झप वेगात धावणारी ही गाडी, पावसाळ्यात उडणान पुलावरून मेट्रोतून प्रवास करताना दगांतून लंगत जात असल्याचा अनुभव येतो. बोगद्यातून जाताना जगाशी संबंध तुटल्यासारखा भासतो. या आपुनिक मेट्रोतून प्रवास करून आल्यावर काही प्रश्न मनात आले.

रपाती चकण ह्यांच्याची साधलेला हा संगणक. त्या मेट्रो चालकगान्या पहिल्या महिला सारकी ठरल्या आहेत.

**प्रश्न :** मेट्रो पायलट होण्यासाठी तुम्ही काय काय प्रयत्न केले. कोणता अभ्यास केला ?

**स्वाामी :** मी कोकणातील सिंधुदूर्ग जिल्ह्यातील मुलगी. सिंधुदूर्ग शिक्षण प्रसारक पंडळाच्या अभियांत्रिकी महाविद्यालयातून इंजिनियर झाले. मेट्रोपुढे पायलट होण्यासाठी इंजिनियर व्हावे लागते. एवढेच नाही तर चाकणी परीक्षाही पास वहावे लागते. ही चाकणी खूप अवघड असते.

११

- देखो, समजो और बताओ :

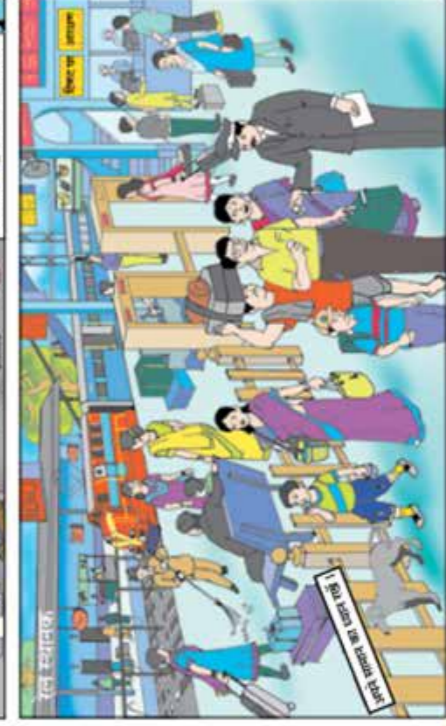
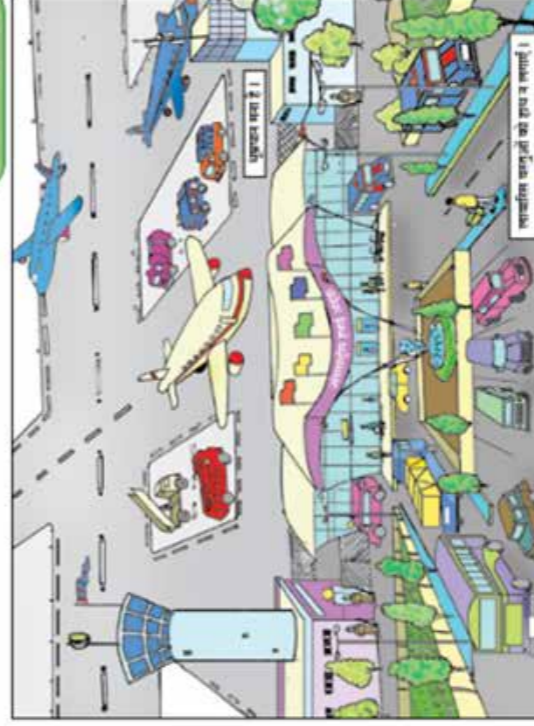
१. सेर



- चित्रां मी बघा-बघा दिखतां दे रहा है, उपर चर्चा की। विद्यार्थी मी अपनी बघा का कोई ज्ञान सुनने के लिए आई। उमरे आवागमन के साधनों का जहा, धार, वायु मार्ग के अनुयायी बर्तिकाय का प्रत्येक चित्रो महिन विस्तृत ज्ञानकारी का साक्ष्य कागर्ण।

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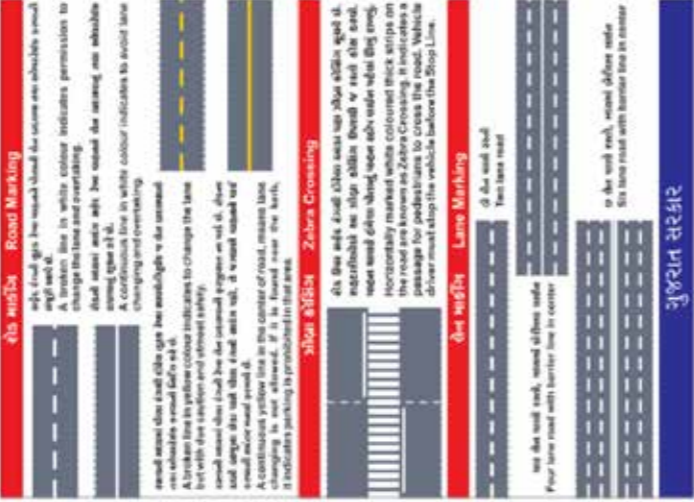
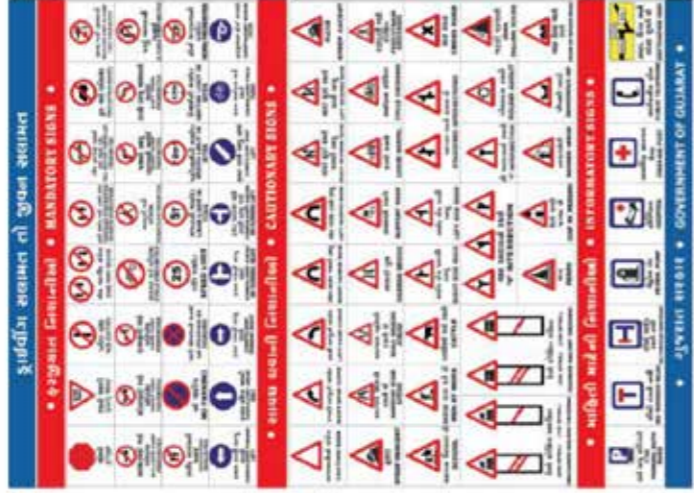
### पहली इकाई



- विद्यार्थी मी आवागमन के साधनों का महत्त्व कहलवार्ण। दिए गए चर्चाओं को स्पष्टकर उमरे पूरी प्रकार के अन्य चर्चाओं का संक्षेप कागर्ण। सांख्यिक रूपों की स्पष्टता पर उमरे चर्चा की। बघा मी महिनार्णो एवं सुदृशी की महत्ता के लिए प्रेरित की।

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SUBJECT: SOCIAL SCIENCE



STANDARD - 7

SUBJECT: SCIENCE AND TECHNOLOGY



STANDARD - 8

SUBJECT: ENGLISH



SUBJECT: SCIENCE AND TECHNOLOGY



SUBJECT: SOCIAL SCIENCE



Some examples from the Gujarat Textbooks (Standards VI-VIII) Gujarati

STANDARD – 6

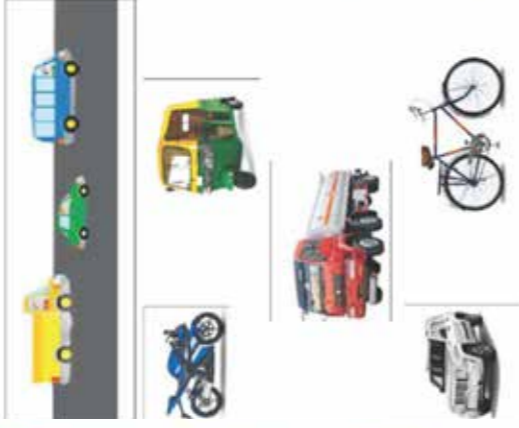
SUBJECT – ENGLISH



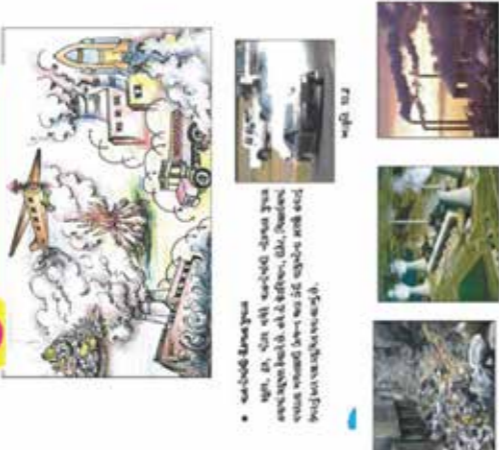
SUBJECT - GUJARATI



SUBJECT: SCIENCE AND TECHNOLOGY



10 એવું સિદ્ધાંત (Air Pollution)



આ સમસ્યાને ઘટાડવા માટે અમે શું કરી શકીએ છીએ? આ સમસ્યાને ઘટાડવા માટે અમે શું કરી શકીએ છીએ?



SUBJECT: SOCIAL SCIENCE



1.2 Sea Route



4.6 The first railway in india



2.3 Pictures showing air pollution



2.5 Noise Pollution

## List of keywords / phrases / themes from the literature review

1. Benefits of Walking and Cycling: Social, economic, ecological
2. Bicycle policy
3. Bus rapid transport
4. Clean fuels
5. Climate change
6. Congestion in Indian Cities
7. Cycling skills
8. Eco driving
9. Energy security
10. Experience of commuting (travel times) and etiquettes
11. Global sustainability
12. Greenhouse Gas Emissions
13. Health effects from vehicular emission
14. Impact of human development on the natural resources and the environment
15. Jawaharlal Nehru National Urban Renewal Mission (JnNURM)
16. Land use
17. Livability
18. Modes of transport in India in the 50s and 60s
19. Modes of transportation
20. Motorization
21. National Urban Transport Policy 2006
22. Non-motorized transport
23. Parking problems
24. Planning at city level for public amenities
25. Public transport
26. Public transportation as a community resource
27. Road safety
28. Substances chiefly involved in air pollution
29. Sustainable urban transportation
30. Technology in transport
31. Traffic management
32. Traffic management and citizen responsibilities
33. Traffic signal control
34. Transport demand management
35. Urban Air Pollution
36. Urban Mobility
37. Urban sprawl

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