



高等学校**应用型本科**规划教材

路桥工程专业英语

主 编 赵永平
副主编 盛可鉴



人民交通出版社

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Luqiao Gongcheng Zhuanye Yingyu
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内 容 提 要

《路桥工程专业英语》是为了适应应用型本科院校土木工程专业、道路桥梁与渡河工程专业及其相关专业英语的教学需要而编写的。

本教材题材选自近期国外各种公开出版的出版物以及各类工程技术标准与规范等,选题面较广泛,突出当代路桥工程建设新材料、新技术、新工艺。本书选材涉及工程地质、土力学与土质学、测量学、道路建筑材料、路基工程、路面工程、桥梁工程、交通工程、工程管理、计算机应用等学科。本书共分 25 个教学单元 (Units),每单元包括精读课文 (Text)、单词与词组 (Words and Expressions)、练习 (Exercises)、阅读材料 (Reading Material) 及阅读材料参考译文。

本书是高等学校应用型本科规划教材,适合于应用型本科院校学生、高等学校继续教育学院本专科学生和高职高专院校专升本学生使用。

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前 言

《路桥工程专业英语》是为了满足应用型本科人才培养的需要,专门针对路桥工程类专业英语课程的教学要求,根据应用型本科院校的培养目标而编写的。本书以培养学生专业英语阅读能力及专业英语文献的翻译能力为目的。通过本书的学习能够使学生掌握必要的专业词汇,使英语学习与专业知识的获取有机地结合在一起。本书的使用对象为已完成基础英语课程学习的路桥工程类专业本、专科学生。本书适合于100~150学时的教学安排,在使用时应根据教学计划学时情况灵活掌握,选择全部或部分内容进行教学。本书也可供土木工程技术人员作为进一步提高专业英语阅读能力的参考读物。

本书题材选自近期国外各种公开出版的学术期刊、杂志、教材、专著以及各类工程技术标准与规范等,选题面较广泛,突出当代路桥工程建设新材料、新技术、新工艺。本书选材涉及工程地质、土力学与土质学、测量学、道路建筑材料、路基工程、路面工程、桥梁工程、交通工程、工程管理及计算机应用等学科。在编写中吸取了我国各种相近专业英语教材的优点和公共英语教学的经验。本书共分25个教学单元(Units),每单元包括精读课文(Text)、单词与词组(Words and Expressions)、练习(Exercises)、阅读材料(Reading Material)及阅读材料参考译文等。在每单元的练习中包括判断对错、阅读与理解、词汇练习及汉译英等内容,以便于基础英语与专业英语的衔接和过渡、提高学生的学习兴趣。阅读材料附有参考译文,可供学生课外自学阅读及翻译训练之用。

本书由黑龙江工程学院赵永平担任主编,由黑龙江工程学院盛可鉴任副主编。

本书编写工作的具体分工为:黑龙江工程学院赵永平编写第1、10、18、22单元,并负责全书的统稿工作,黑龙江工程学院盛可鉴编写第14、15、16、17单元,内蒙古大学李艳丽编写第2、4、5、6、9单元,黑龙江工程学院张瑞德编写第8、11、12、13单元,黑龙江工程学院魏建军编写第3、7、24、25单元,黑龙江工程学院王景波编写第19、20、21、23单元。

在本书的编写过程中,曾得到各兄弟院校及有关单位的帮助和支持,在此谨表谢意。

由于水平所限,本书难免存在不少的缺点和错误,诚请读者提出宝贵的批评和建议。

编 者

2006年9月

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Unit 1 Highway Introduction

公路概论

内容概要

这篇文章从公路的发展历史、公路的作用和公路的分类三方面对公路进行了概述。在公路的历史回顾中,作者以罗马道路为例,讲述了罗马道路的产生,以及它在当时为什么耐用的原因;分析了英国道路系统衰退的原因,从而反映了人们对道路建设和管理的认识过程。随后,作者在公路作用这部分中,指出经济发展与现代交通的相互影响是交通系统发展的主要原因,并对铺面道路作了详细的解释。最后,作者对现代公路进行了分类,并对其进行了定义和说明。

A. Text

The Highway Concept

1 A historical note

The first road builders of any **significance** in western Europe were the Romans, to whom the ability to move quickly from one part of the Empire to another was important for military and civil reasons. Roman roads are characterized by their linearity and, in popular perception, by their durability. A good alignment was sought since this provides the most direct route and since the risk of **ambush** in **hostile** territory is reduced. It was for this reason that the surface of the road was often elevated a meter or more above the local ground level—to provide a clear view of the surrounding country; hence the modern term “highway”. The durability of such pavements is less absolute but nevertheless well exceeds anything achieved for many centuries after the fall of the Empire.

A typical major Roman road in the UK consisted of several layers of material, increasing in strength from the bottom layer, perhaps of **rubble**, through intermediate layers of lime-bound concrete to an upper layer of **flags** or stone slabs **grouted** in lime. The

total thickness of such a pavement would be varied according to the ground conditions. In sound ground a thickness approaching one meter might be found; elsewhere this would be increased as necessary.

During the Dark Ages — and indeed well after that — no serious attempt was made in the UK to either maintain or replace the Roman road network, which consequently deteriorated. By the end of the Middle Ages there was in practice no road system in the country. Such routes as existed were unpaved tracks, **swampy** and impassable for most of the year and dusty and impassable for the remainder. **Diversions** around particularly poor lengths of road, private land or difficult **topography** had resulted in **sinuous** alignments. The general lawlessness combined with these characteristics to discourage all but the most determined travelers.

The first small change in this state of affairs was bought about by an Act of 1555 which imposed a duty on each **parish** to maintain its roads and to provide a Surveyor of Highways. As this post was unpaid and under-resourced, and as the technical skills did not exist to match the task in hand, the obvious expectation that the post of Surveyor was unpopular and ineffective is generally correct.

This lack of resources remained a problem for over a century. In the latter part of the seventeenth century the first experimental lengths of **turnpike** road were established on the Great North Road (now the A1 trunk road). Turnpiking is a toll system whereby travelers pay for the use of the road. In the first part of the next century Parliament produced a series of Acts which enabled the establishment of Turnpike Trusts on main routes throughout the country. In this improved financial climate road building techniques gradually developed through the work of such pioneers as Metcalf, Telford and the eponymous Macadam. By about 1830 a system of well-paved roads had evolved of such quality that they imposed little or no constraint on road traffic. Journey times were limited not by the state of the road but by the nature of road vehicles.

The next improvement in the speed and cost of travel came about as a result of a radical change in vehicle technology — the building of the railways. The effect of this was to reduce road traffic between towns to such a low level that the turnpike system became uneconomic. Although road building in towns continued, the Turnpike Trusts collapsed. Legislation in the late nineteenth century set the scene for the current administrative arrangements for highway construction and maintenance but the technology remained empirical and **essentially** primitive. Only in recent years has that situation changed to any great extent.

2 The aims of highway engineering

In order that economic activity can take place, people, goods and materials must move from place to place. The necessary movement has to some extent always been possible, but

the growth in economic activity which characterized the Industrial Revolution in eighteenth century England and which has occurred or is occurring throughout the world since then, **placed** demands on the transport system which in its original primitive form it was quite unable to meet. This system developed to meet the new needs much more rapidly than it had previously, the economy expanded further, generating more traffic, and in this interactive way were produced canals and turnpike roads, then railways and most latterly a network of modern roads.

The tendency is for economic growth to be concentrated in areas where transport facilities are good — for example the construction in the UK of a motorway network during the quarter century starting in about 1960 has increased access from formerly remote areas to the capital and to international links, and those areas have **prospered**. In the previous century the railways had a similar effect; areas formerly several days' travel from any centers of population were, with the opening of a connecting railway, suddenly only a few hours away, and benefited as a result. Roads provide a key element of the infrastructure whose function is to promote economic activity and improve the standard of living of the population. Highway engineering is concerned with the best use of resources to ensure that a suitable network is provided to satisfy this need of a economically sophisticated society.

Originally roads were little more than tracks across the countryside and were hard, dry and dusty in summer and **sodden** and impassable in winter. The practice arose, initially in towns, of paving the surface of the road with resilient naturally occurring materials such as stone flags, and such a surface became known as a pavement. Today this term is applied to any surface intended for traffic and where the native soil has been protected from the harmful effects of that traffic by providing an overlay of imported or treated material. The purpose of providing this protection is to enable traffic to move more easily — and therefore more cheaply or quickly — along the road.

3 Highway Types

3.1 Freeway

A freeway, as defined by statute, is a highway in respect to which the owners of **abutting** lands have no right or easement of access to or from their abutting lands or in respect to which such owners have only limited or restricted right or easement of access. This statutory definition also includes expressways. The engineering definitions for use in this manual are:

(a) Freeway—A divided **arterial** highway with full control of access and with **grade separations** at intersections.

(b) Expressway—An arterial highway with at least partial control of access, which may or may not be divided or have grade separations at intersections.

3.2 Controlled Access Highway

In situations where it has been determined advisable by the Director or the CTC, a facility may be designated a “controlled access highway” in lieu of the designation “freeway”. All statutory provisions pertaining to freeways and expressways apply to controlled access highways.

3.3 Conventional Highway

A highway without control of access which may or may not be divided. Grade separations at intersections or access control may be used when justified at spot locations.

3.4 Highway.

(a) Arterial Highway—A general term denoting a highway primarily for through traffic usually on a continuous route.

(b) Bypass—An arterial highway that permits traffic to avoid part or all of an urban area.

(c) Divided Highway—A highway with separated roadbeds for traffic in opposing directions.

(d) Major Street or Major Highway—An arterial highway with intersections at grade and direct access to abutting property and on which geometric design and traffic control measures are used to expedite the safe movement of through traffic.

(e) Radial Highway—An arterial highway leading to or from an urban center.

(f) Through Street or Through Highway—Every highway or portion thereof at the entrance to which vehicular traffic from intersecting highways is regulated by stop signs or traffic control signals or is controlled when entering on a separate right-turn roadway by a yield-right-of way sign.

3.5 Parkway

An arterial highway for noncommercial traffic, with full or partial control of access, and usually located within a park or a ribbon of park-like development.

3.6 Scenic Highway

An officially designated portion of the State Highway System traversing areas of outstanding scenic beauty which together with the adjacent scenic corridors requires special scenic conservation treatment.

3.7 Street or Road.

(a) Cul-de-Sac Street—A local street open at one end only, with special provisions for turning around.

(b) Dead End Street—A local street open at one end only, without special provisions for turning around.

(c) Frontage Street or Road—A local street or road auxiliary to and located on the side of an arterial highway for service to abutting property and adjacent areas and for control of access.

(d) Local Street or Local Road—A street or road primarily for access to residence, business, or other abutting property.

(e) Toll Road, Bridge or Tunnel—A highway, bridge, or tunnel open to traffic only upon payment of a direct toll or fee.

~ New Words and Expressions ~

significance[siɡ'nɪfɪkəns]	n. 重要(性), 紧要, 重大
ambush[ˈæmbʊʃ]	n. 伏击; 埋伏(处)
hostile[ˈhɒstail]	a. 敌人的, 敌方的
rubble[ˈrʌbl]	n. 毛石, 块石
flag[flæg]	n. 薄层; 薄层砂岩
grout[graʊt]	n. 薄胶泥, 薄浆, 石灰浆 v. 用薄泥浆填塞
swampy[ˈswɒmpi]	a. 沼泽的; 多沼泽的; 潮湿的
diversion[daɪˈvɜːʃən]	n. ([英国]因修路等车辆)绕行, 绕路
topography[təˈpɒɡrəfi]	n. 地形(测量)学; 地形, 地势
sinuous[ˈsɪnjuəs]	a. 曲折的, 错综复杂的
parish[ˈpærɪʃ]	n. 教区(郡下的分区, 每区设一教堂)
turnpike[ˈtɜːnpaɪk]	n. 征收通行税的路(收费公路)
essentially[iˈsenʃəli]	ad. 本质上; 本来; 根本
placed[pleɪst]	v. 放; 安置; 排列, 整顿
prosper[ˈprɒspə]	v. (使)兴隆, (使)繁荣; (使)成功
sodden[ˈsɒdn]	a. 浸透了的, 泡胀了的
abut[əˈbʌt]	v. 邻接, 毗连, 贴近, 靠紧, 接近
arterial[ɑːˈtɪəriəl]	a. 干线的
grade separations	立体交叉
right-of-way	公路用地
expedite[ˈɛkspɪdaɪt]	v. 加快, 促进; 迅速做好(工作等)
roadway[ˈrəʊdwei]	n. 路幅

~ Notes ~

1. A typical major Roman road in the UK consisted of several layers of material, increasing in strength from the bottom layer, perhaps of rubble, through intermediate layers of lime-bound concrete to an upper layer of flags or stone slabs grouted in lime.

译文: 在英国, 典型的罗马道路由多层材料组成。从可能由块石修筑的底层, 到石灰结合

的混凝土中间层以及用石灰胶结的石板的上面层来增加道路的力度。

2. Diversions around particularly poor lengths of road, private land or difficult topography had resulted in sinuous alignments. The general lawlessness combined with these characteristics to discourage all but the most determined travelers.

译文:对不良路段或私有土地或困难地形的绕行,导致了路线线形的错综复杂。具有这些特征的道路的无规律的组合让人们感到失去了信心,除了那些有坚强意志的旅行者。

3. The tendency is for economic growth to be concentrated in areas where transport facilities are good — for example the construction in the UK of a motorway network during the quarter century starting in about 1960 has increased access from formerly remote areas to the capital and to international links, and those areas have prospered.

译文:经济增长的趋势是会集中在那些交通设施好的区域。例如,从上世纪60年代开始,经过20多年时间,英国的汽车公路网人口已经从以前的比较偏僻的区域增加到首都,而且与国际公路网也有连接,这给那些地区带来了繁荣。

Exercises

I. True or False

1. By the end of the Middle Ages, the state of Roman road network in the UK were already paved and in good condition. ()
2. The Turnpike road is a road that permits traffic to avoid part or all of an urban area. ()
3. Today the term “pavement” is applied to any surface intended for traffic and where the native soil has been protected from the harmful effects of that traffic by providing an overlay of imported or treated material. ()
4. Roman roads are characterized by their linearity and, in popular perception, by their durability. ()
5. Freeway is an arterial highway with at least partial control of access, which may or may not be divided or have grade separations at intersections. ()

II. Reading and Choose the best one

1. What are the characteristics of Roman roads?

(A) linearity and comfortable	(B) durability
(C) linearity and durability	(D) comfortable and durability
2. Why dose Roman road have very strong strength?

(A) because of its pavement structure	(B) because of its pavement materials
(C) because of its pavement thickness	(D) all of the above
3. What are the benefits of the building of the railways?

- (A) speed and cost of travel increase
 - (B) make the turnpike system economic
 - (C) impel the Turnpike Trusts collapsed
 - (D) increase road traffic
4. The aims of highway engineering are _____ .
- (A) promote economic activity
 - (B) improve the standard of living of the population
 - (C) save traveling time
 - (D) all of the above
5. What are the characteristics of originally roads?
- (A) hard, dry and dusty in winter
 - (B) sodden in summer
 - (C) paved and passable
 - (D) little more than tracks across the countryside
6. What does the pavement mean?
- (A) any surface intended for traffic
 - (B) protected the native soil from the harmful effects of the traffic
 - (C) an overlay of imported or treated material
 - (D) all of the above
7. The difference between freeway and expressway is _____ .
- (A) the control of access
 - (B) the grade separations at intersections
 - (C) the vehicle speed
 - (D) whether owners of abutting lands have right of access to or from their abutting lands
8. By the end of the Middle Ages, the state of Roman road network in the UK were _____ .
- (A) existed but consequently deteriorated
 - (B) already paved and in good condition
 - (C) swampy and impassable
 - (D) accepted by the travelers
9. According to the text, when did road network really develop?
- (A) by the end of the Middle Ages
 - (B) issue of an Act of 1555
 - (C) by about 1830
 - (D) in 1960
10. What is the Turnpike road?
- (A) a road whereby travelers pay for the use of the road
 - (B) a road that permits traffic to avoid part or all of an urban area.
 - (C) a road leading to or from an urban center.
 - (D) a road with separated roadbeds for traffic in opposing directions

III. Vocabulary Practice

1. A good alignment was sought since this provides the most direct route and since the risk of ambush hostile territory is reduced.

- (A)ensnarement (B)attack (C)assault (D)bother

2. In sound ground a thickness approaching one meter might be found; elsewhere this would be increased as necessary.

- (A)normal (B)hard (C)good (D)reliable

3. During the Dark Ages — and indeed well after that — no serious attempt was made in the UK to either maintain or replace the Roman road network, which consequently deteriorated.

- (A)worsen (B)decrease (C)bad (D)better

4. By about 1830 a system of well-paved roads had evolved of such quality that they imposed little or no constraint on road traffic.

- (A)developed (B)burgeoned (C)involved (D)changed

5. The next improvement in the speed and cost of travel came about as a result of a radical change in vehicle technology—the building of the railways.

- (A)grown up (B)turned up (C)repeated (D)appear

6. Legislation in the late nineteenth century set the scene for the current administrative arrangements for highway construction and maintenance but the technology remained empirical and essentially primitive.

- (A)prehistoric (B)undeveloped (C)archaic (D)out-of-date

7. Roads provide a key element of the infrastructure whose function is to promote economic activity and improve the standard of living of the population.

- (A)erect (B)establish (C)advance (D)elevate

8. Originally roads were little more than tracks across the countryside and were hard, dry and dusty in summer and sodden.

- (A)inundate (B)swampy (C)saturated (D)expansive

9. A freeway, as defined by statute, is a highway in respect to which the owners of abutting lands have no right or easement of access to or from their abutting lands or in respect to which such owners have only limited or restricted right or easement of access.

- (A)in view of (B)in regard to (C)regard as (D)with regard to

10. In situations where it has been determined advisable by the Director, a facility may be designated a “controlled access highway” in lieu of the designation “freeway”.

- (A)take the place of (B)represent (C)stand for (D)eliminate

IV. Translate the following into English

1. 道路是基础设施中很重要的一个要素,它的作用是促进经济发展和提高人们的生活水平。

2. 公路工程师所关心的是,充分利用资源确保修建出合适的路网,能够满足一个节约的、高级的社会要求。

3. 利用天然的弹性材料如片石铺筑在道路的表面的实践产生了。这个实践最初发生在城镇里。像这样的表层我们称之为铺面。

4. 修筑这层保护层的目的是能够使车辆在路上行驶时更容易,因此也会更经济、更快速。

5. 法规中对高速公路的定义是指:就那些公路邻近的土地所有者来讲是没有权利或便利,或者只有有限的权利和便利进入公路。

B. Reading Material

Highway Cross Section and Pavement

1 Geometric Cross Section of Highway

1.1 Lane

(a) Auxiliary Lane—The portion of the roadway for weaving, truck climbing, speed change, or for other purposes supplementary to through traffic movement.

(b) Lane Numbering—On a multilane roadway, the traffic lanes available for through traffic traveling in the same direction are numbered from left to right when facing in the direction of traffic flow.

(c) Multiple Lanes—Freeways and conventional highways are sometimes defined by the number of through traffic lanes in both directions. Thus an 8-lane freeway has 4 through traffic lanes in each direction. Likewise, a 4-lane conventional highway has 2 through traffic lanes in each direction.

(d) Median Lane—A speed change lane within the median to accommodate left turning vehicles.

(e) Separate Turning Lane—An auxiliary lane for traffic in one direction which has been physically separated from the intersection area by a traffic island.

(f) Speed Change Lane—An auxiliary lane, including tapered areas, primarily for the acceleration or deceleration of vehicles entering or leaving the through traffic lanes.

(g) Traffic Lane—The portion of the traveled way for the movement of a single line of vehicles.

1.2 Median. The portion of a divided highway separating the traveled ways for traffic in opposite directions.

1.3 Outer Separation. The portion of an arterial highway between the traveled ways of a roadway for through traffic and a frontage street or road.