

中国的高速公路雾区安全研究

*Research on traffic safety of
expressways with foggy area in China*

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背景

Background

- 高速公路上雾是一种很严重的交通安全隐患
- **The fog on expressways is very dangerous for drivers.**



国际上的高速公路雾区安全研究

The literature abroad

- 通过物理或化学方法使雾消散
- 对交通流和雾进行及时的检测，向驾驶员提供更加充分、合理的信息
- 研发、推广功能强大的车载器
- 建立国家级的道路气象信息系统

- **Dissipate fog by physics or chemistry methods**
- **Detect fog and traffic flow in time, provide information for drivers**
- **Develop devices mounted on vehicles to get information**
- **Establish national road weather information system**

国内的高速公路雾区安全研究

The literature in China

- 上世纪90年代开始研究
 - 北京、上海、广东、云南、河南
 - 2005年中国交通部和中央气象台签署了合作协议，就气象对交通安全的影响展开合作，其中雾是重点考虑的因素之一。
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- Studies began in 1990s
 - Beijing, Shanghai, Guangdong, Yunnan, Henan
 - In 2005, The MOC cooperates with National Observatory about the influence of meteorology on road safety, and fog is one of important factors

国内的高速公路雾区安全研究

The literature in China

- 我国的主要研究方向是建立面向具体道路项目的预报、监测、控制系统来降低雾区交通冲突，保障交通的安全
- **The main research field in China is how to predict and detect fog, provide information such as speed limit to reduce traffic conflicts, enhance road safety in foggy area.**

国内的高速公路雾区安全研究

The literature in China

- 雾的预测与预报；
 - 雾对交通安全的影响机理与表现形式；
 - 道路上雾的监视与交通安全控制；
 - 雾区路段交通事故的预防与紧急救援；
-
- Prediction of fog
 - The influence of fog on road safety in China
 - The supervision of fog and traffic control in foggy area
 - Prevention and emergent salvation of traffic accidents in foggy area

国内的高速公路雾区安全研究

The literature in China

- 车辆的性能
- 驾驶员的驾驶习惯
- 道路上的执法力度
- Vehicle performance
- Driver behavior
- Enforcement
- 中国交通条件与其它国家存在差异，国外的成功经验需要经过分析，验证。
- **The traffic condition in China is different, so the successful experience abroad should be analyzed and validated**

案例

A case

- 由交通部管理
- 目的是针对我国西部山区高速公路上存在的常年雾区的情况，提出科学、有效的解决方案
- 项目的开展依托于正在建设的云南省思小高速公路
- **Managed by MOC**
- **The target is to find the solution to enhance traffic safety of expressways with perennial foggy area located in mountainous area western China**
- **The research is supported by Sixiao Expressway in Yunnan Province**

案例

A case

- 研究的重点是寻求解决雾天交通安全问题的具体工程措施和管理手段
- 成功的经验逐步在西南类似地区推广
- **The major point is to find effective engineering and management measures**
- **The successful experience will be spread to southwestern China**

案例

A case

- 通过对气象条件长时间的观测，掌握高速公路沿线雾的出现、发展以及消散的规律。
- **Obtain the law of present, development and dissipation of fog by a long time observation for weather condition.**

案例

A case

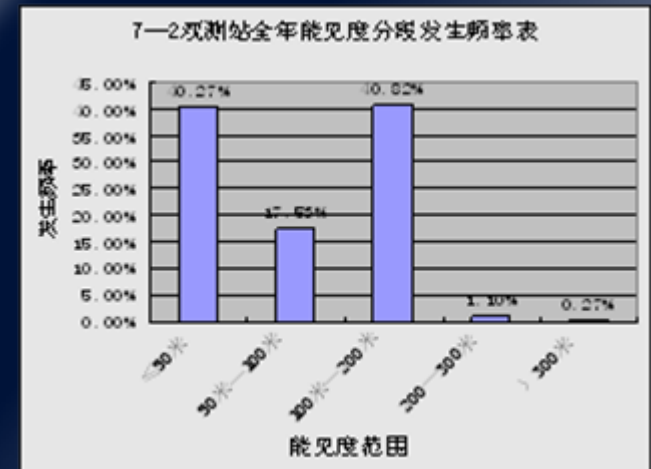
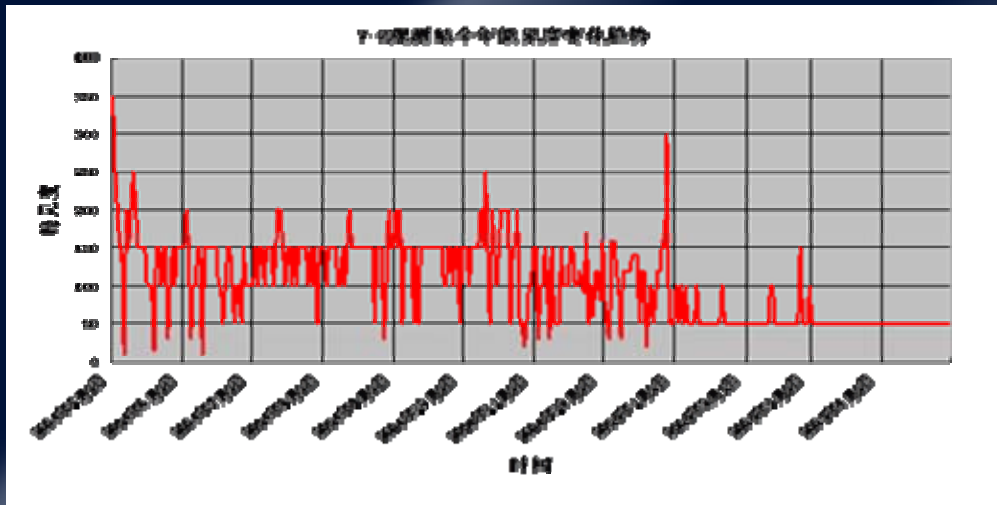
- 经常发生雾的区域及其严重程度
- Areas where fog often presents and relevant intensity of fog



案例

A case

- 一个观测点的全年能见度变化以及出现的频率
- The evolvment of the visibility and frequency of fog in a whole year at one observation station



案例

A case

- 根据雾的不同情况采取针对性措施
- 建立不同路段的雾预测模型，提供雾的预警信息
- **Pertinence measures can be took**
- **Develop models to predict fog for different road segments, provide advance warning information for fog**

案例

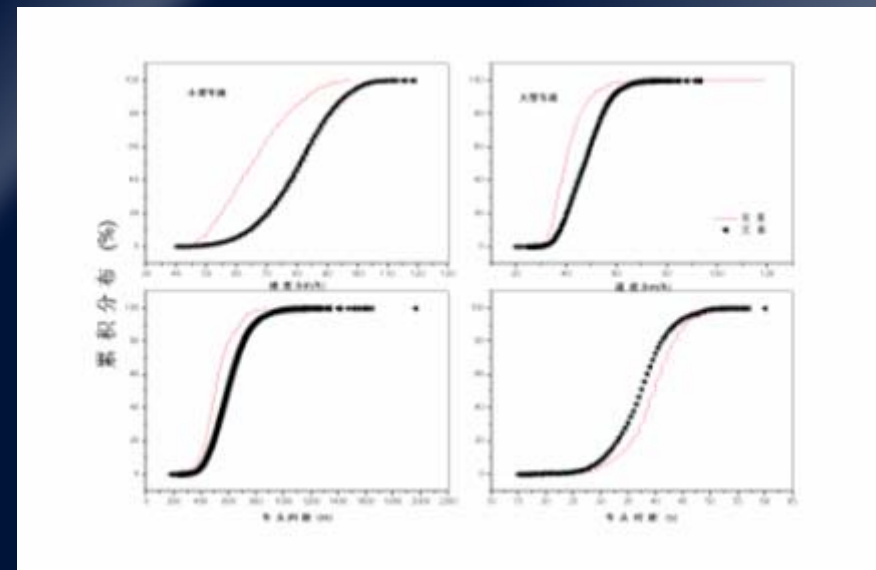
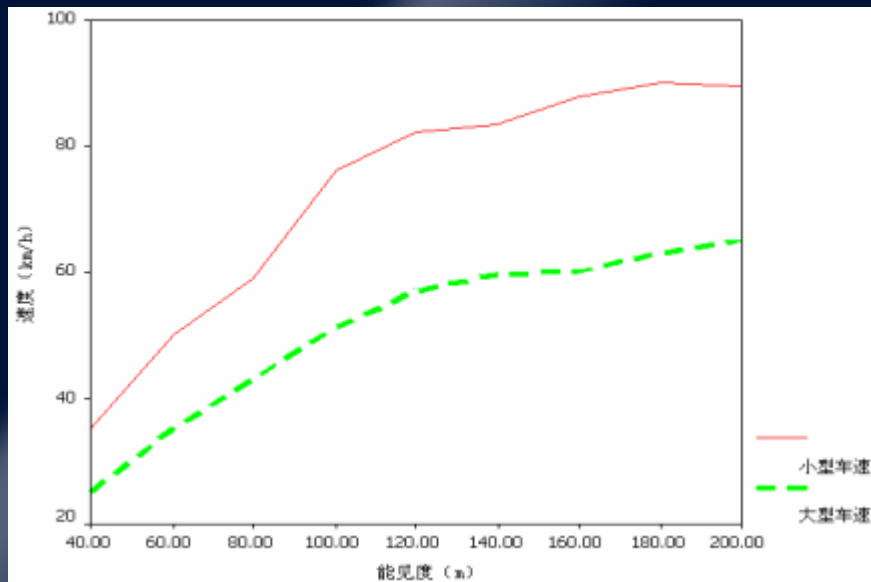
A case

- 选取与思小高速公路道路、交通条件相近的高速公路，分析雾对于交通安全的影响方式与影响程度。探究在中国特定的交通条件下，雾导致交通事故的机理以及驾驶员在大雾环境中对信息的需求。
- **Investigate the influence of fog on road safety, the mechanism of traffic accidents due to fog, and information that drivers need by analyzing a similar expressway in China**

案例

A case

- 雾对速度、车头间距的影响
- 有雾、无雾条件下的对比
- The influence of fog on speed and space headway
- The difference between foggy and common conditions



案例

A case

- 有雾状态下的速度比无雾状态下的速度低
- 在能见度为140—200m之间，速度还是相当稳定的，小型车速减少大约5.7%，大型车速减少大约8.4%。但当能见度低于100m时，速度开始剧烈的下降。
- 有雾条件下的车头间距低于无雾情况。
- **Speed decreases in fog.**
- **With the visibility between 140 and 200m, speed is fairly stable. The speed of small vehicle decreases by about 5.7%. The speed of large vehicle decreases by about 8.4%. When the visibility is less than 100m, speed decreases rapidly.**
- **Space headway decreases in fog.**

案例

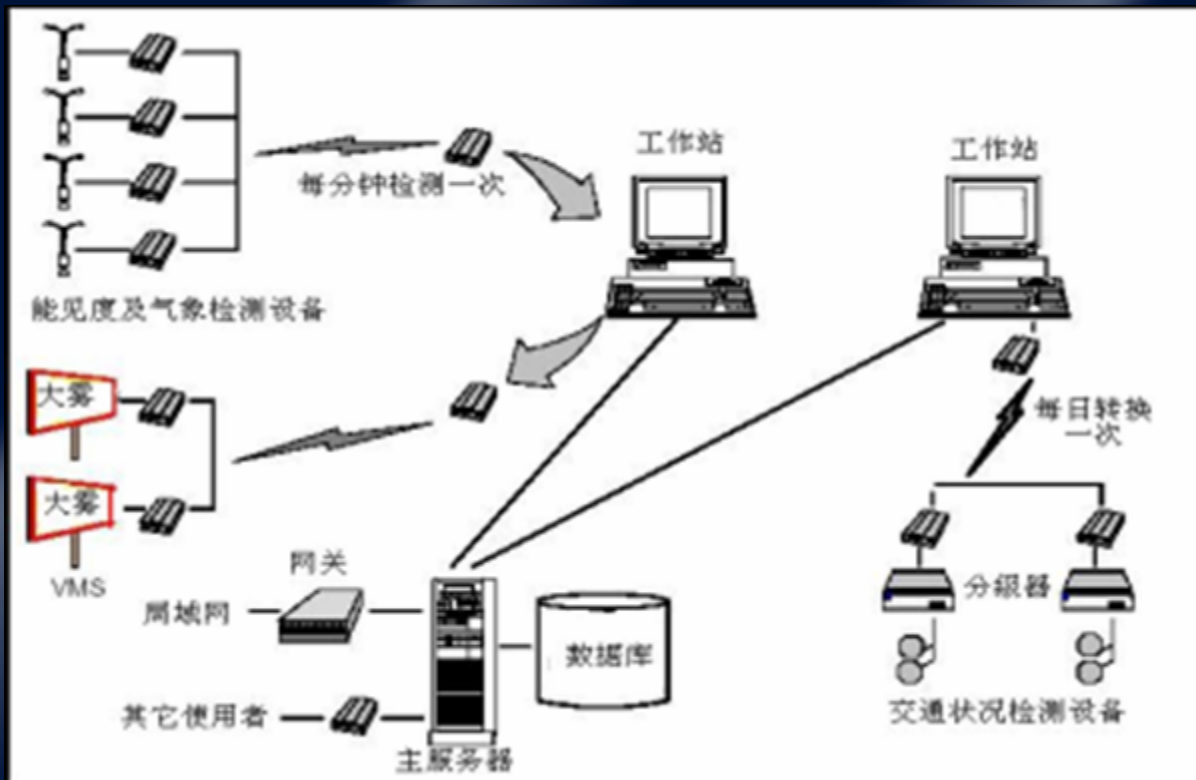
A case

- 研究不同能见度以及交通条件下应采取的分级控制措施，向驾驶员提供信息的方法，提供信息的具体内容以及信息的密度。
- **Study different control measures under different visibility and traffic conditions**
- **The way to provide information for drivers, and the contents and the density of the information**

案例

A case

- 我国雾区监控系统的典型模式
- The classic TSC system in foggy area in China



案例

A case

- 降低交通流的整体速度和车辆之间的速度差异，使交通流表现出均匀、稳定的有利于安全的状态
- **Reduce the average speed and the difference of speed among vehicles, make the traffic flow uniformly and stably**

案例

A case

- 在道路两侧设置的透雾性能很好的雾灯，标示道路的轮廓和前进方向，缓解驾驶员的心理压力和驾驶疲劳。
- **Use fog light to outline the road and the direction, alleviate the drivers' psychological stress and fatigue.**



案例

A case

- 研究雾天交通事故的紧急救援方式以及设备、人员的配置。
- 对实施后的雾区安全系统进行评估，验证措施的有效性以及经济性。
- **Evaluate the safe system in foggy area, and validate its effectiveness and economical performance**

说明

Some explanations

- 研究项目正在进行当中，预计于2006年底完成
 - 希望能够得到您的帮助
-
- **The research work is under way, anticipated to be completed at the end of 2006**
 - **Hope to get your help**

谢谢

The end

Thank you very much !