

# Analisis pergerakan penumpang komuterline di stasiun pada jam sibuk dan aplikasinya dalam peningkatan layanan kondisi normal dan darurat kebakaran = Analysis of commuterline s passenger movement in the station during peak hours and the application in improving services during normal condition and fire emergency

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## Abstrak

[<b>ABSTRAK</b><br>

Pengembangan sebuah wilayah perkotaan sudah seharusnya mempertimbangkan berbagai zona yang padat dan sibuk dengan aktivitas ekonomi termasuk stasiun kereta. Moda transportasi ini mempunyai kapasitas dapat mengangkut penumpang dalam jumlah yang besar, beroperasi secara cepat, nyaman, aman dan terjadwal dengan frekwensi operasi yang tinggi. Keselamatan jiwa penumpang dan orang yang bekerja di area tersebut harus menjadi prioritas utama dalam tahap desain, konstruksi, operasi dan pemeliharaan sistem. Kebakaran yang terjadi pada area padat dan sibuk seperti stasiun masih menjadi permasalahan besar, termasuk di Jakarta, Indonesia. Kebakaran di sistem transportasi massal memberikan dampak yang serius karena dapat membawa korban jiwa dan kerugian ekonomi yang besar. Kondisi keramaian dan padat yang berakibat orang terluka atau tewas tidak terbatas hanya pada keadaan darurat kebakaran. Bahkan kondisi ini dapat terjadi dalam keadaan yang nampak seperti normal. Dalam tahap desain stasiun komuterline dan mass rapid transit yang baru, karakteristik pergerakan penumpang lokal harus menjadi pertimbangan utama. Tulisan ini menampilkan hasil analisis pergerakan penumpang berdasarkan survey dari tiga stasiun komuterline tersibuk di Jakarta. Survey dilaksanakan selama jam-jam sibuk pada pagi hari dan sore hari. Hasil survey menunjukkan bahwa pergerakan penumpang dipengaruhi oleh kepadatan di berbagai lokasi di stasiun, di peron, di concourse dan tiket gate. Nilai aliran spesifik yang optimum juga diperoleh untuk dijadikan kerangka acuan yang dapat dipertimbangkan selama tahap desain. Secara umum, hasil penelitian memperlihatkan bahwa rata-rata kecepatan berjalan dan aliran spesifik penumpang lokal dalam tingkat kepadatan tertentu sedikit lebih rendah dibanding standard dinegara yang telah berpengalaman dengan sistem transportasi sejenis (Singapura, USA dan Jepang). Analisis teknik keselamatan kebakaran digunakan untuk mendapatkan tingkat keselamatan optimum di stasiun, jumlah, luasan, panjang/lebar lintasan evakuasi dan sistem pendukung lainnya. Hasil analisis diaplikasikan sebagai masukan dalam menyusun tingkatan optimum dalam peningkatan layanan normal dan darurat kebakaran di stasiun.

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<b>ABSTRACT</b><br>

The development of an urban area have to include the consideration of various zone which crowded by economic activity. Railway have become the most popular transportation mode due to by its capacity in carrying large number of passengers, rapid operation, comfort, safety and high frequency of operation. Life safety of the passenger is the main consideration during the design stage, construction, operation and maintenance of the whole systems. In this issue, a fire disaster that occurs in crowded and busy areas is still major problem, including in the city of Jakarta, Indonesia. A fire disaster in a mass public transportation system could cause serious impact due to thousand of pupils may be affected. During design stage of a new mass rapid transit lines, the walking characteristics of the local passengers should be greatly considered. This paper presented the result of passenger movement based on survey of three busiest commuterline stations in Jakarta. The survey was carried out during the peak hours both in the morning and in the evening. It is observed that the walking of the passenger was affected by density at various locations measured on the platform and concourse levels as well as at the ticket gates. The corresponding value of the specific flow was also derived to frame the average value that could be considered during the design stage of a new line. In general, the study show that both the average walking speed and the specific flow of the local passengers at certain density are slightly lower than the average value given in the international standards such as Standard for Fire Safety in Rapid Transit System (Singapore), NFPA 130 (USA) and MLIT (Technical Standard Requirement for Japan Railway). The study show that fire engineering analysis is necessary to determine system means of escape, number means of escape, area means of escape, width/distance means of escape and others ancylary system. Result of analysis applied as inputs in prepeparing the optimum level in improving services normal condition and fire mergency at railstation.;

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