# Supplementary Information for "A User Association Policy for UAV-aided Time-varying Vehicular Networks with Multi-access Edge Computing"

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***Lemma :*** For a V2V link, the link connection reliability in the $n^{th}$ slot

$$r_{ij}[n] = erf(\frac{2d^v_{\max}/T_s - \mu_r}{\sqrt{2}\sigma_r}) - erf(\frac{2d^v_{\max}/(T_s + T_p[n]) - \mu_r}{\sqrt{2}\sigma_r}). \tag{1}$$

*Proof:* The link connection reliability is defined as the probability that a direct communication link between two vehicles will stay continuously available over a specified time period. Given a prediction interval $T_p$ for the continuous availability of a specific link between two vehicles at $t$, the link connection reliability value $r_l(t)$ is denoted as

$$r(t) = \begin{cases} \int_t^{t+T_p} f_T(t)dt, & T_p > 0 \\ 0, & else \end{cases}. \tag{2}$$

For a specific communication link at the $n^{th}$ time slot, $T_p$ is defined as the continuous available time of a specific communication link and can be determined as

$$T_p[n] = \begin{cases} \frac{d^v_{\max} + d_{ij}[n]}{v_r}, v_i \le v_j \\ \frac{d^v_{\max} - d_{ij}[n]}{v_r}, v_i > v_j \end{cases}, \tag{3}$$

where $d^v_{\max}$ is the transmission range of vehicles.

Let $T = \frac{2d^v_{\max}}{v_r}$ be the random variable that represents the time duration for which the communication link between vehicles is active, the pdf of which can be calculated as

$$f_T(t) = \frac{f_{v_r}(2d^v_{\max}/T)}{|dT/dv_r|} = \frac{2d^v_{\max}/(\sigma_r\sqrt{2\pi})\exp(-\frac{(2d^v_{\max}/t-\mu_r)^2}{2{\sigma_r}^2})}{t^2} \quad . \tag{4}$$

Therefore, the connection reliability can be calculated as

$$r_{ij}(t) = erf(\frac{2d^v_{\max}/t - \mu_r}{\sqrt{2}\sigma_r}) - erf(\frac{2d^v_{\max}/(t+T_p) - \mu_r}{\sqrt{2}\sigma_r}). \tag{5}$$

For the length of a time slot $T_s$, the connection reliability will be

$$r_{ij}[n] = erf(\frac{2d^v_{\max}/T_s - \mu_r}{\sqrt{2}\sigma_r}) - erf(\frac{2d_{\max^v}/(\ T_s + T_p[n]) - \mu_r}{\sqrt{2}\sigma_r}). \tag{6}$$

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