Three Options to Measure Vehicle Noise

Type of System	How does it work?	Technical and Legal Viability	Benefits and Disadvantages	Recommendation
Noise Monitoring **(Being used by the City of Calgary commencing Q3 2024 to identify vehicle noise hot spots)** **NOT RECOMMENDED FOR OKOTOKS AT THIS TIME**	- Noise monitoring systems are outdoor wireless sensors developed to work within the internet of things ecosystem. The sensors measure and report ambient noise levels in real time using the LoRaWAN network. - Devices can be set to specific thresholds to measure vehicle noise & send alerts in real time. - Data can be viewed on a dashboard or integrated app for a smartphone. - Devices have been piloted by City of Calgary IT & other business units (ex. To monitor noise for events).	Technical - Uses LoRaWAN network; - Battery operated (needs to be replaced every 1-2 years in each device); - Real-time noise measurement with an integrated dashboard & app; - Devices can be set to specific noise thresholds that send alerts once triggered. - In City of Carouge in Geneva, Switzerland: 1 device placed once every 30m. Legal - Not intended for use in courts or for violation tickets; - No privacy concerns because devices log decibel levels rather than specific sounds	Benefits - Gain an insight into target specific areas for a potential traffic team or vehicle noise ticketing system to target in the future Disadvantages - Has not been specifically verified for vehicle noise; - If devices were to be destroyed on lamp posts, added expense to replace; - Must replace batteries every 1-2 years (environmental concern, cost of replacement, cost of labor); - Used as a bridge toward potential adoption of ticketing systems in the future. Will not solve the problem NOW.	Use the City of Calgary's pilot program to review the effectiveness of the system if the system chosen for the Town does not crack down on the issue. There is a potential opportunity here for data research in the future to use as a stepping stone towards a fully automated noise ticketing system as the same becomes more developed in coming years.

Sensor

Sensor - opened

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Noise Ticketing System **(Not Recommended by the City of Calgary)** **NOT RECOMMENDED FOR OKOTOKS AT THIS TIME**	- Noise ticketing systems use technology to detect (visual and decibels) and issue tickets for violations at the street level. - Devices include a class one microphone combined with an array of smaller microphones, & two dedicated cameras for video recording & license plate recording. - Artificial intelligence & algorithms are used to trigger the system to record the offending vehicle's audio & visual data. - Data is sent to a secure cloud server by 4G cellular for review & action against noisy vehicles through an issued ticket.	Technical - Uses 4G Cellular Network - Technology is new and is still being tested with operating locations in London and New York. - Equipment has not been tested in a climate comparable to Okotoks. Legal - Success in courts is unclear; - No example court cases within Canada & limited examples in other jurisdictions	Benefits - Similar idea as speed cameras; - Completely automated system - Camera, therefore if devices are destroyed, can easily find individual liable; Disadvantages - Initial cost & a monthly subscription; - Dedicated power supply; - Requires strategic placement as devices are 20kg; - Microphone does not look to be able to sustain the extreme weather the Town can experience; - System is in its infancy with only one company at a level of interest.	Potential to move to fully automated system in the future once device matures and the device is improved to be sufficient in the Town's year-round climate.

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Sound Pressure Level Meter **(Currently used by City of Red Deer)** **RECOMMENDED FOR OKOTOKS**	- Sound Pressure Level Meters are used by Peace Officers to measure the noise level of a vehicle in decibels. - When preset levels have been reached, LED indicators flash green (80-85dB), yellow (85-105dB) and/or red (>105dB), to give a visual indicator of potentially hazardous noise levels. - The decibel reading appears on the device in real-time working similar to a speed radar gun.	Technical - Rechargeable. Lithium polymer battery provides up to 50 hours of use between charges. - Omni-directional microphone; Class/Type 2. - Tripod mount if necessary Legal - Provides proof that can be upheld in courts - No privacy concerns because devices log decibel levels rather than specific sounds	Benefits - Compact and lightweight; - Averaging functionality provides steadier readings in environments where noise levels are highly variable; - Cost-friendly solution to solve the issue now. Disadvantages - Designed for measurement of workplace noise levels.	1 device would be recommended for purchase for a one (1) year pilot. The City of Red Deer paid around $4,400.00 for 5 devices. Therefore 1 device = $880.00.

Success Data by City of Red Deer (Population 103,588):

Operating year from April 1, 2023 to March 31st, 2024:
Violations/Warnings Issued: 73
Incident Reports Filed: 96 regarding noise

Year to date from Jan 1, 2024 to Aug 6, 2024:
Violations/Warnings Issued: 23
Incident Reports Filed: 47
Requests for Patrols: 6

Sound Detector SD-200 components