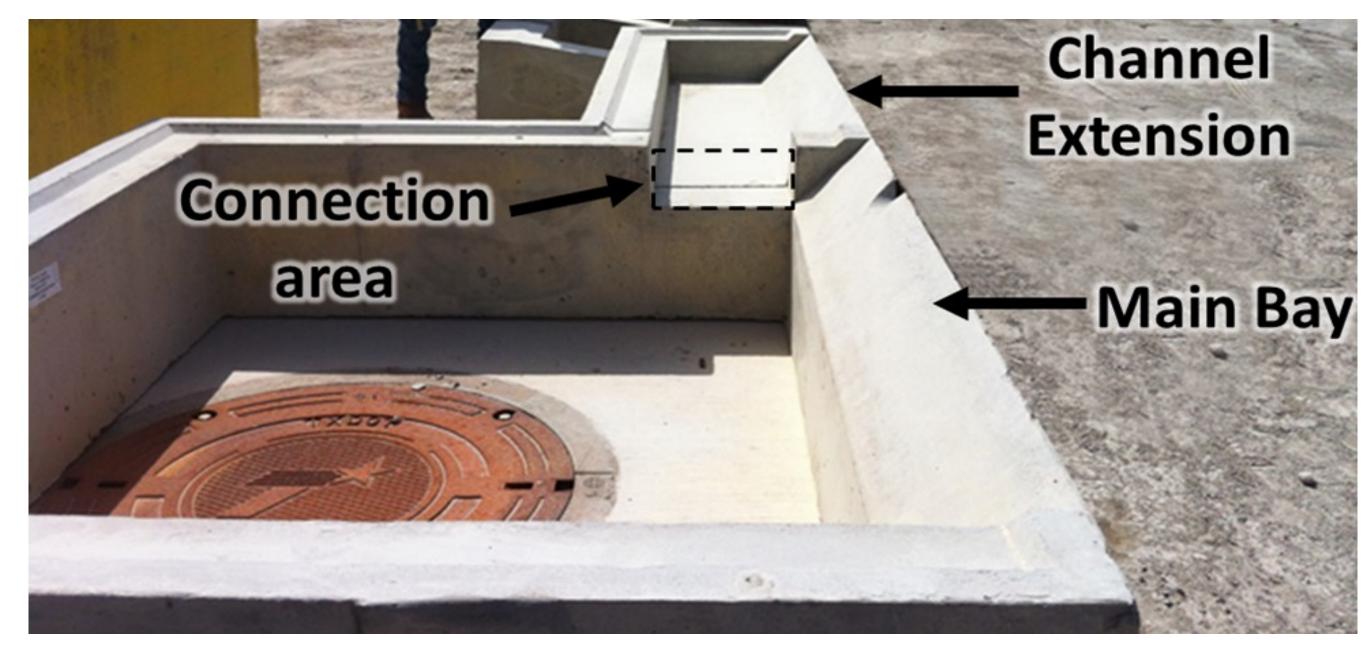


Assessment of Potential Flow Restrictions in Curb-inlets with Channel-extensions Presenter: Muhammad Ashraf



Background

- The new TxDOT standard precast curb inlet (Type PCO) consists of a main bay and side extension channels
- For a compact design, the cross-section of the extension channel is significantly smaller than the inlet opening



Problem Statement

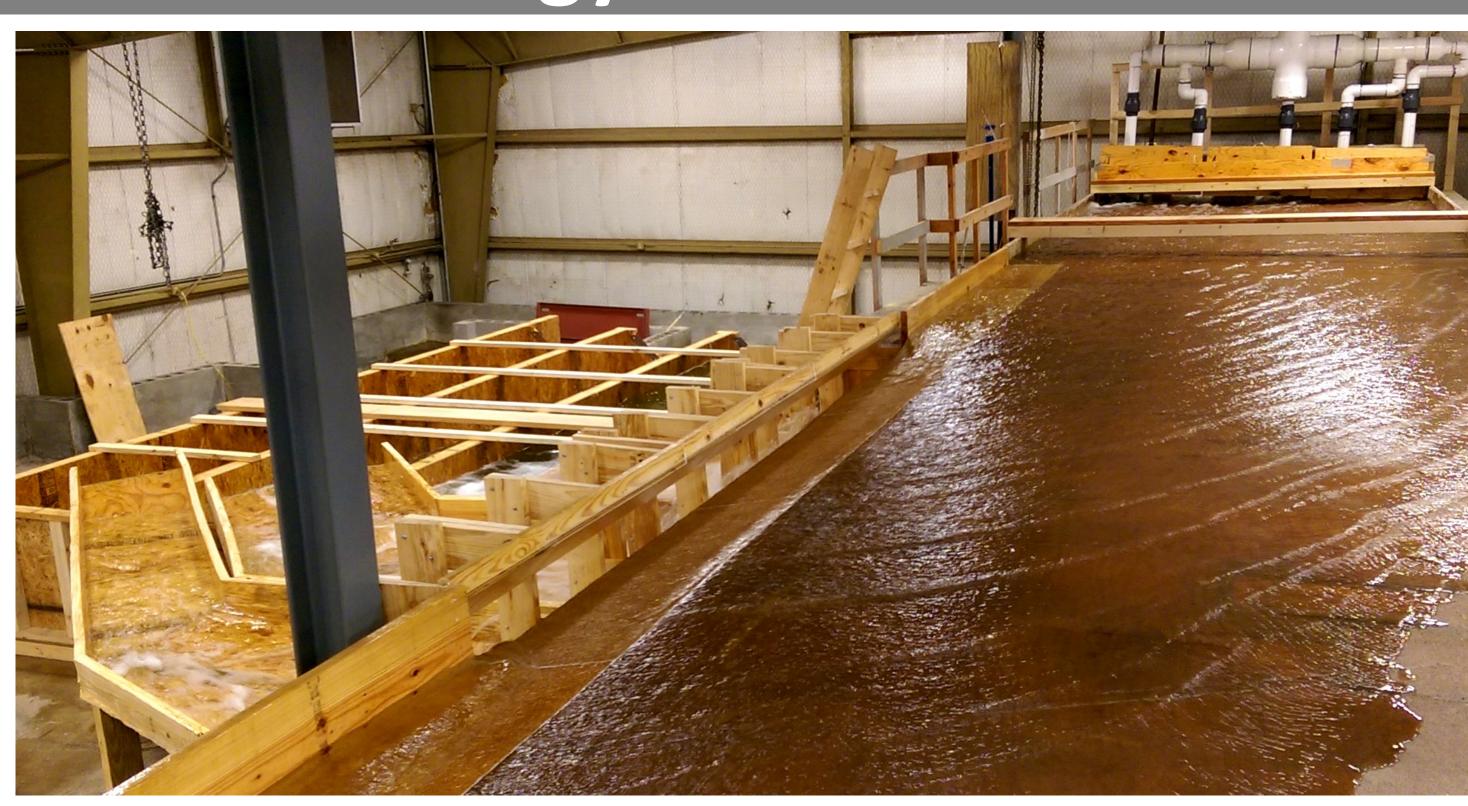
- Reduction in cross-section area may decrease the inlet's interception capacity
- Underperforming inlets increase the hazards of flooding and vehicle hydroplaning

Research Objective

Quantify the effects of channel extensions on interception capacity of inlets **on-grade** and **in a sag**

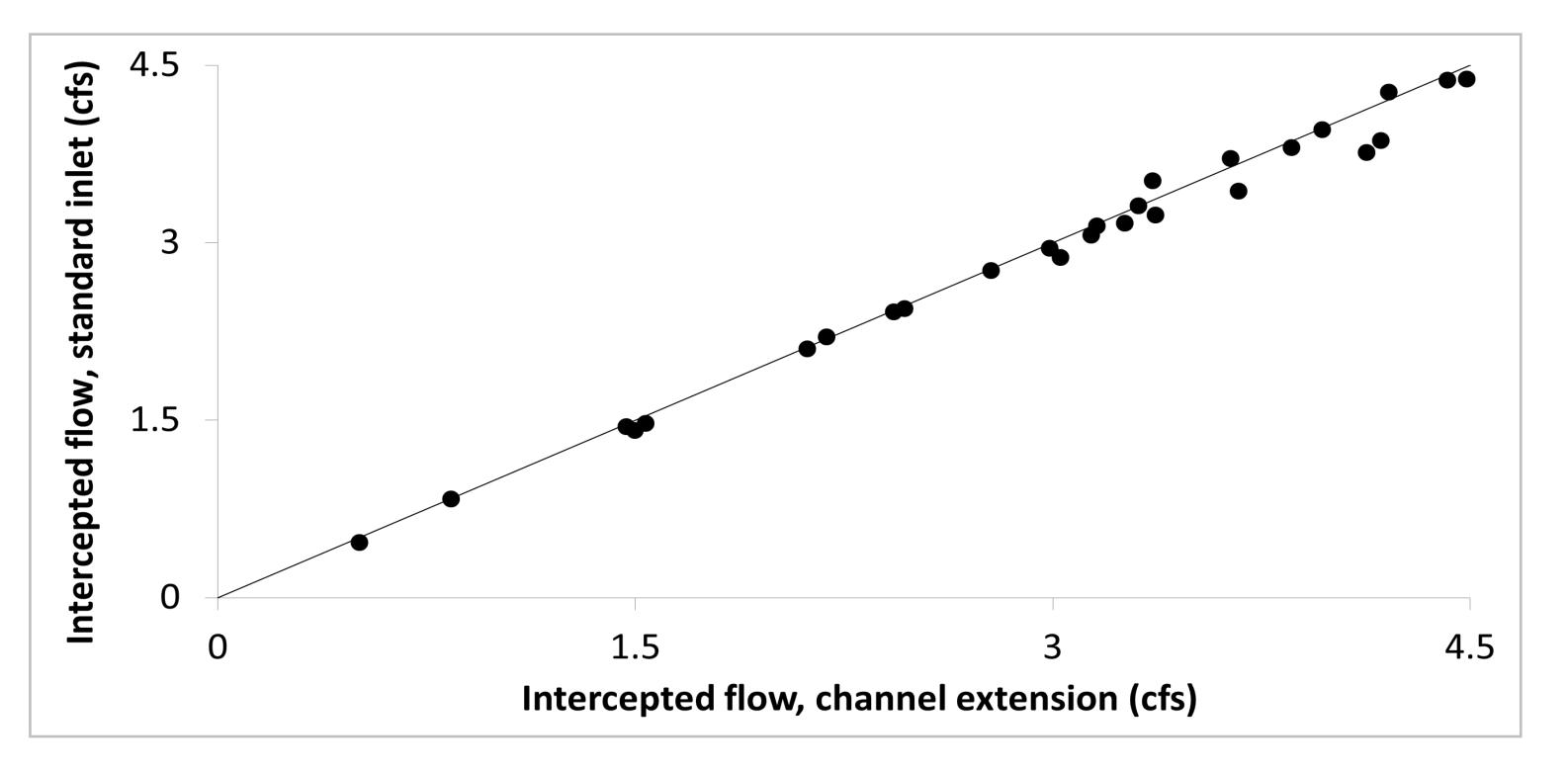
Methodology

- Construct a full-scale physical model of the curb inlet
- Test the model with and without restricted extensions

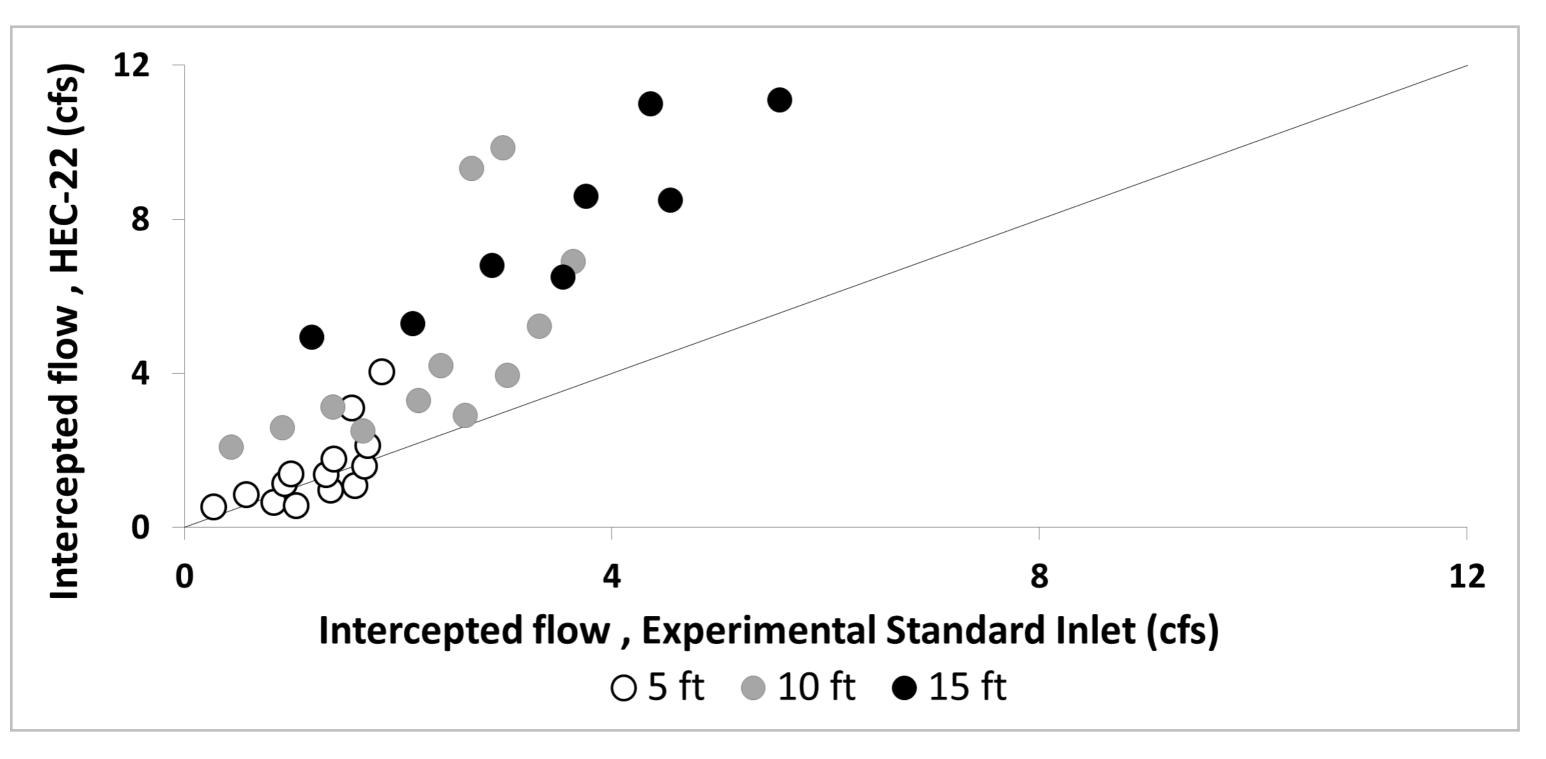


Results and Discussion

Inlet on-grade: **Similar performance** was observed for standard and PCO inlets



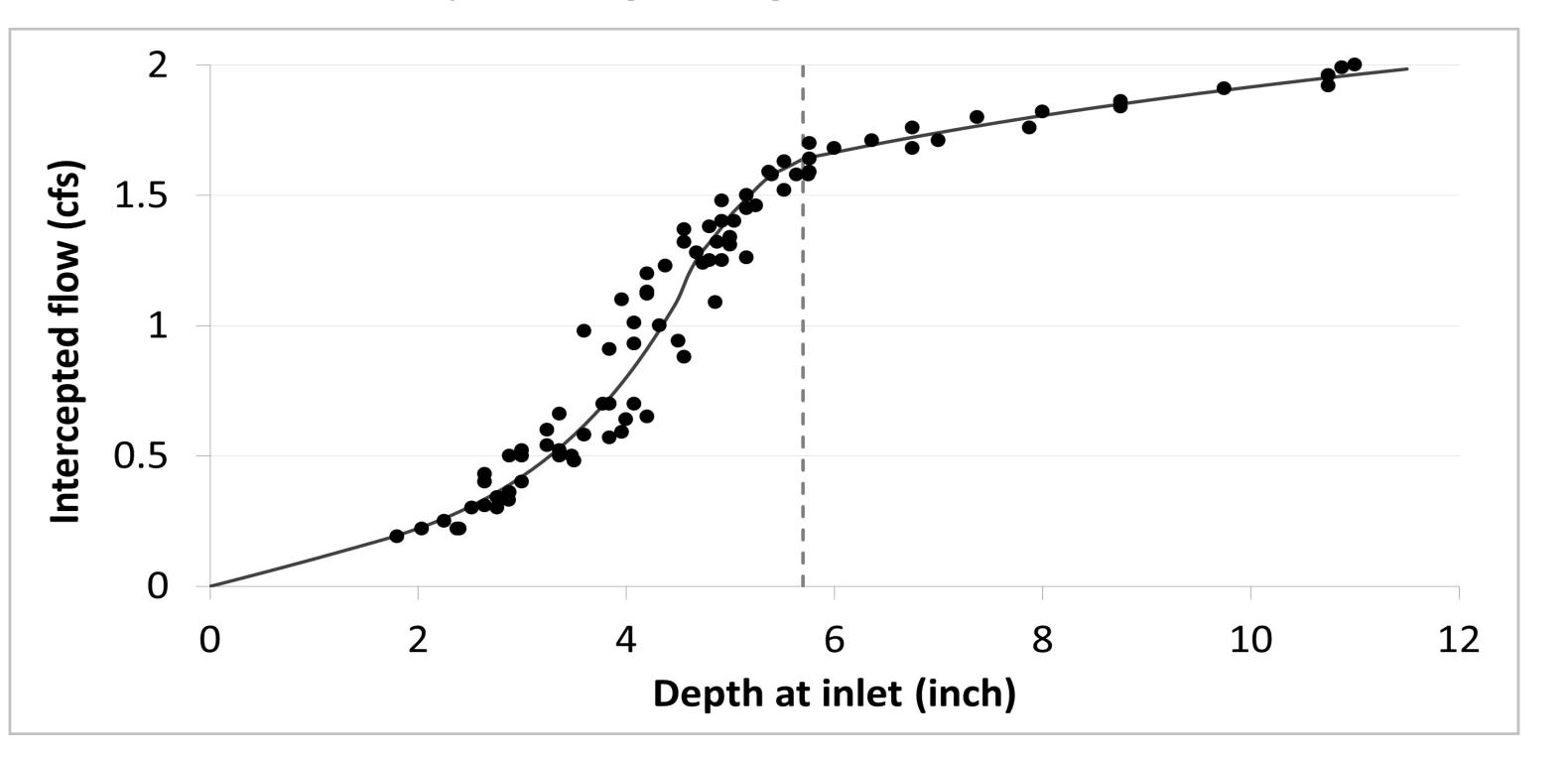
However, capacity of a standard inlet is **significantly lower** than predicted by HEC-22 (endorsed by FHWA)



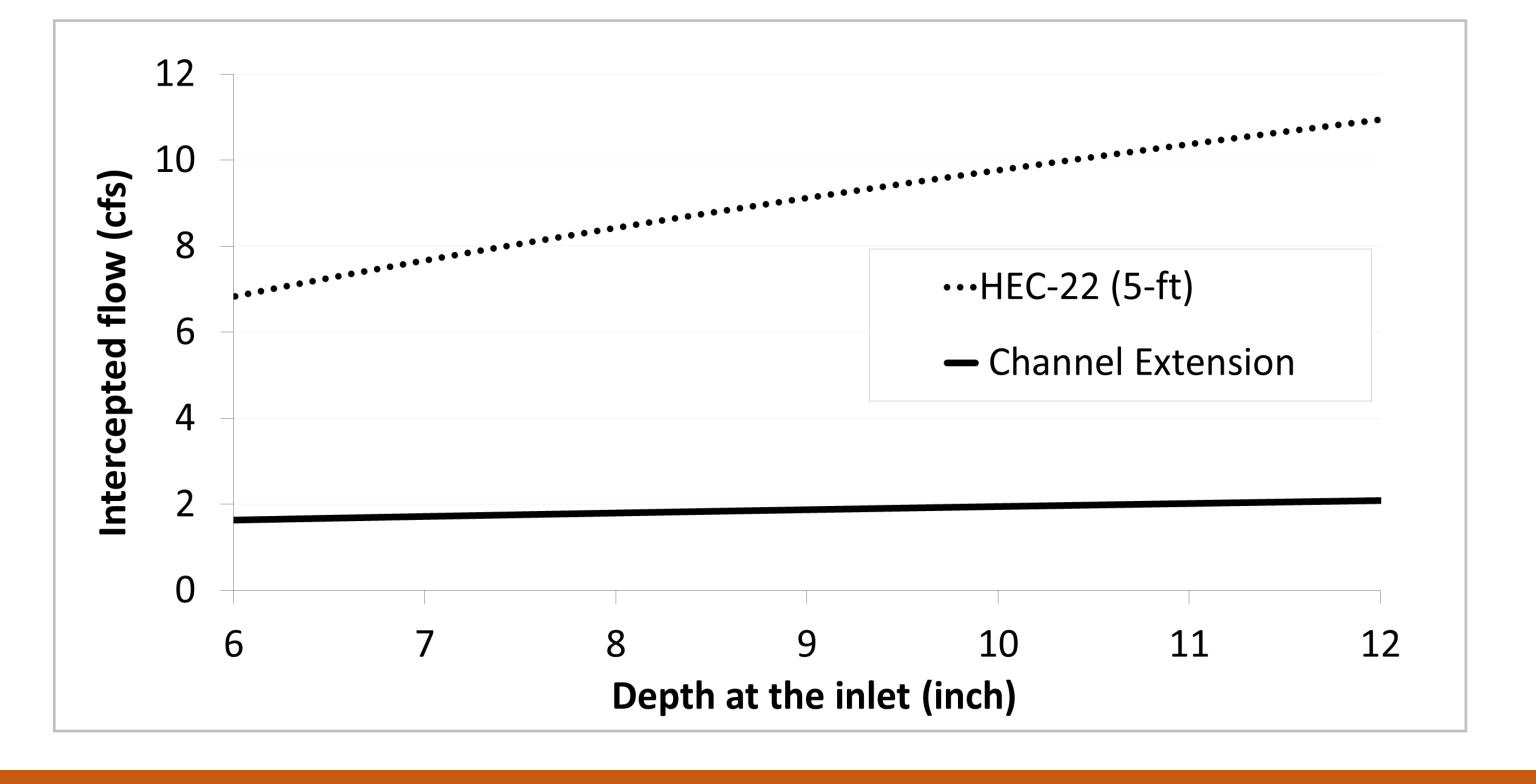
Conclusions

- A 10-ft PCO on-grade is equivalent to a standard inlet
- HEC-22 overestimates interception of inlets on-grade under most conditions
- PCO-type inlets in a sag have drastically less capacity compared to standard inlets
- Increasing the extension connection area of inlets in a sag can potentially increase interception capacity

Inlet in a sag: **Sharp drop** in inlet performance as depth approached inlet opening height (6")



■ The extension performs at **20**% of predicted by HEC-22; 10-ft and 15-ft PCO inlets will perform at **58**% and **47**%



Future Research

Propose new modifications to HEC-22 equations

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