



March 7, 2019

ESRC Annual HCP Review

Kahuku Wind Power and Kaheawa Wind Power I

Kahuku Wind Power

Observed and Estimated Take (*thru FY2019Q2*)

› **Hawaiian hoary bat**

2018 observed take: **0**

Total observed take: **4**

FY 2019 Q1-Q2 observed take: **0**

Estimated direct take: **9**

Estimated indirect take: **1.5**

Total estimated take: **12**

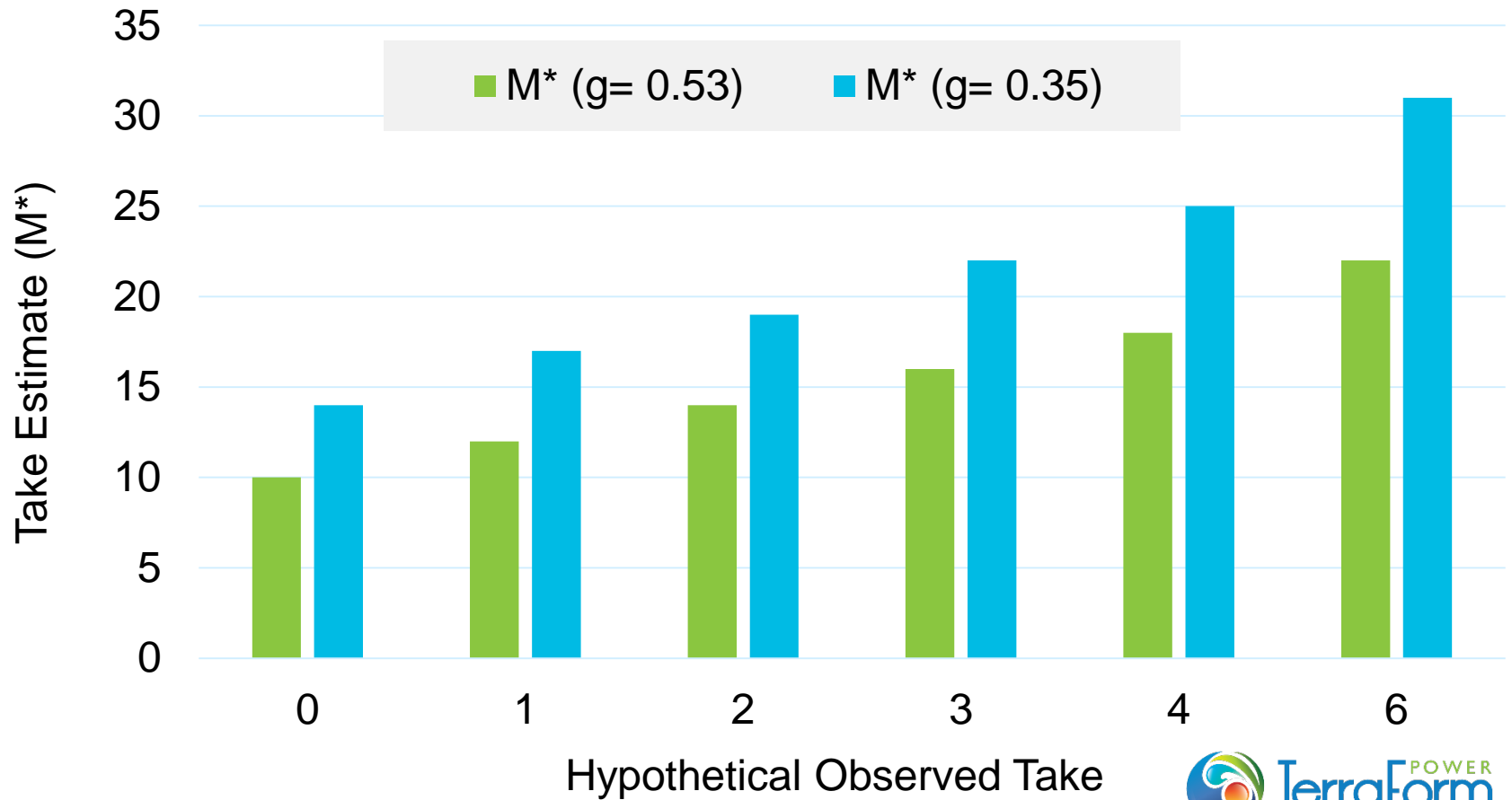
Tier 1 take: **15**; Tier 2 take **8**

Total permitted take: **23**

Projected total estimated take: **28**



Permit Term Take Estimate

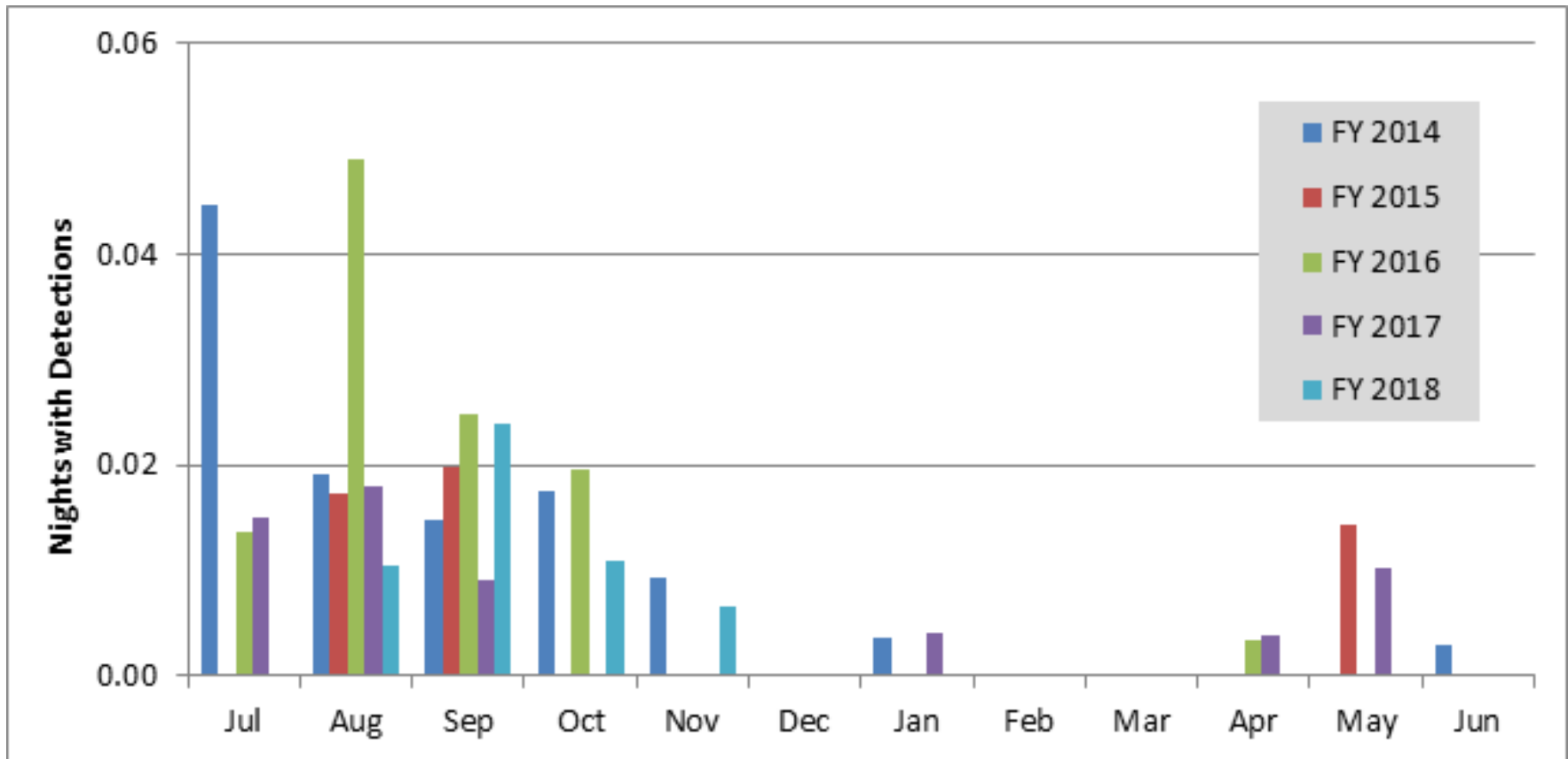


Take Estimation/Downed Wildlife Monitoring (*only FY2018*)

- › **Hawaiian hoary bat**
 - › SEEF: **92.6%**
 - › CARE: Mean **13.4 days** (SD 11.4 days)
 - › DWP: **70%**
 - › Detection Probability: **53.5 %**

- › **Seabirds: Hawaiian petrel, Newell's shearwater;**
Waterbirds: Hawaiian stilt, moorhen, coot, duck
 - › SEEF: **100%**
 - › CARE: Mean **28.0 days** (SD 0 days)
 - › DWP: **36%**
 - › Detection Probability: **34.4%**

Bat Activity (Nights with Detections)



Mitigation

- › **Hawaiian hoary bat**
 - › Tier 1 (**15** bats): complete. DOFAW Kahikinui FR restoration
 - › Tier 2 (**8** bats): USGS bat research project (**3** bats) complete in 2021
 - › TBD: (**5** bats)

- › **Seabirds: Hawaiian petrel, Newell's shearwater**
 - › Tier 1: complete. KESRP Kauai seabird colony assessment and predator control on Kauai and Lehua Island

- › **Waterbirds: Hawaiian stilt, moorhen, coot, duck**
 - › Tier 1: complete. DOFAW Hamakua Marsh predator control

Observed and Estimated Take (*thru FY2019Q2*)

› **Hawaiian hoary bat**

2018 observed take: **1**

Total observed take: **8** (3 incidental)

FY 2019 Q1-Q2 observed take: **1**

Estimated direct take: **26**

Estimated indirect take: **2.8**

Total estimated take: **29**

Tier 1 take: **20**; Tier 2 take: **30**

Total permitted take: **50**

Projected total estimated take: **43**



Observed and Estimated Take (*thru FY2019Q2*)

› **Seabirds: Hawaiian petrel, Newell's shearwater**

2018 observed take: **0**

Total observed take: **6** HAPE (1 incidental), **0** NESH

FY 2019 Q1-Q2 observed take: **0**

Hawaiian petrel:

Estimated direct take: **12**

Estimated indirect take: **2.6**

Total estimated take: **15**

Tier 1 take: **25**; Tier 2 take: **13**

Total permitted take: **38**

Projected total estimated take: **23**

Observed and Estimated Take (*thru FY2019Q2*)

› **Hawaiian goose:**

2018 observed take: **1** (4 goslings)

Total observed take: **23** (1 incidental outside search area, 5 goslings)

FY 2019 Q1-Q2 observed take: **0**

Estimated direct take: **37**

Estimated indirect take: **1.2**

Total estimated take: **39**

Tier 1 take: **60**; Tier 2 take: **40**;

Total permitted take: **60** (100 w/minor amend)

Projected total estimated take: **58**

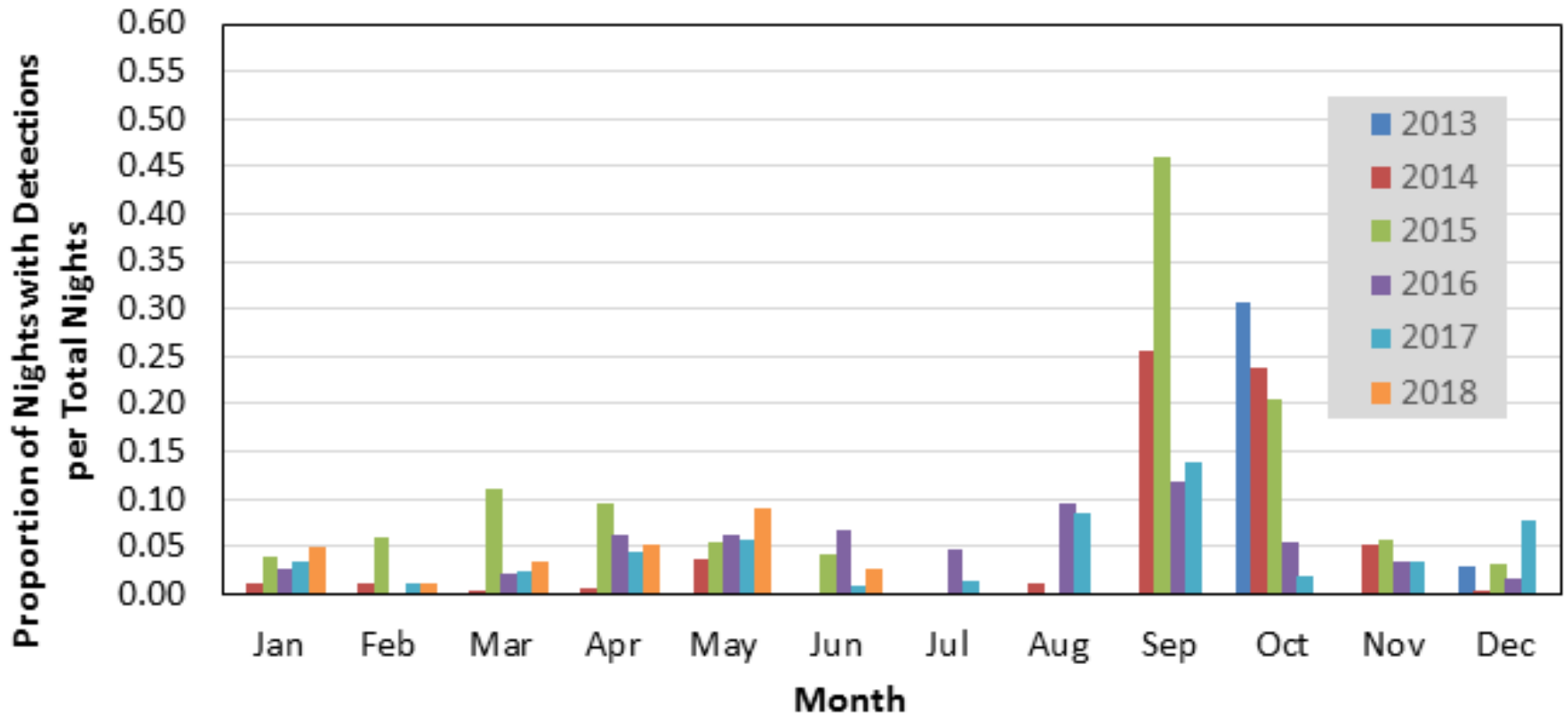
Take Estimation/Downed Wildlife Monitoring (*only FY2018*)

- › **Hawaiian hoary bat**
 - › SEEF: **95.4%**
 - › CARE: Mean **14.9 days** (SD 11.3 days)
 - › DWP: **57.3%**, Detection Probability: **45.9%**

- › **Seabirds: Hawaiian petrel, Newell's shearwater;**
 - › SEEF: **100%**
 - › CARE: Mean **28 days** (SD 0 days)
 - › DWP: **25.6%**, Detection Probability: **25.1%**

- › **Hawaiian goose**
 - › SEEF: **100%**
 - › CARE: Mean **28 days** (SD 0 days)
 - › DWP: **38.2%**, Detection Probability: **37.9%**

Bat Activity (Nights with Detections)



Mitigation

- › **Hawaiian hoary bat**
 - › Tier 1 (**20** bats): complete. USGS radio tracking study
 - › Tier 2 (**30** bats): ongoing. HTHarvey Ecological Consultants: Maui research (**15** bats), USGS Hawaii research (**1.7** bats)
 - › Complete in 2021: USGS Hawaii research (**13.3** bats)

- › **Seabirds: Hawaiian petrel, Newell's shearwater**
 - › Tier 1 (**25** HAPE, **4** NESH): Ongoing. Makamaka'ole colony protection (**0** fledglings accrued)
 - › Ongoing: Lanai colony protection (**39** HAPE fledglings accrued)

- › **Hawaiian goose:**
 - › Tier 1 (**60** nēnē): Ongoing. DOFAW Haleakala Ranch pen predator control (**50** fledglings accrued 2011-2018)

Mitigation

- › **Seabirds: Hawaiian petrel (HAPE), Newell's shearwater (NESH)**
- › Makamaka'ole seabird colony protection:
 - › **NESH only on game cameras in 2018** (no HAPE).
 - › HAPE and NESH flyovers continue.
 - › BUPE on game cameras (into December).
 - › **Three NESH eggs observed** (two collected, third photographed not found, egg fragments in fourth) in repeat burrows.
 - › A: 5 burrows visited with photos, 4 burrows visited no photos.
 - › B: 4 burrows and 1 natural area visited with photos, 3 burrows no photos.
 - › 5 or 8 rats and 3 or 11 mice in both enclosures
 - › No mongoose inside, many mongoose and rat outside
 - › One barn owl shot believed to be injured but not collected
 - › Erosion and rusting continue to require ongoing attention

Kaheawa Wind Power I

Enclosure A (calendar year)

| | A26 | | | | A43 | | | | A50 | A21 | A24 | A27 |
|-------|---|------------------|---|------------------|--|------------------|---|------------------|-----------------|-----------------|-----------------|-----------------|
| | 2017 | | 2018 | | 2017 | | 2018 | | 2017 | 2018 | 2018 | 2018 |
| Month | Photo Nights ("()="nights with 2 birds) | Egg ¹ | Photo Nights ("()="nights with 2 birds) | Egg ¹ | Photo Nights ("()="nights with 2 birds) | Egg ¹ | Photo Nights ("()="nights with 2 birds) | Egg ² | Photo Nights | Photo Nights | Photo Nights | Photo Nights |
| Mar | | | 3 | | | | | | | | | |
| Apr | | | 16 (1) | | | | 10 | | | | | |
| May | 12 | | 6 (1) | | 8 | | 1 | | | | | |
| Jun | 14 (2) | | 11 | | 6 | | 15 | 1 | | | | |
| Jul | 25 (10) | | 22 (1) | 1 | | | 19 | | | | | |
| Aug | 23 (2) | 1 | 26 (2) | | 28 (2) | 1 | 17 (1) | | 1 | 5 | 2 | 1 |
| Sep | 18 | | 15 (1) | | 13 | | 12 (1) | | | | | 1 |
| Oct | | | 8 | | | | | | | | | |
| Nov | | 1 | | | | | | | | | | |
| Total | 102 (14) | 2 | 107 (6) | 1 | 55 (2) | | 74 (2) | 1 | 1 | 5 | 2 | 2 |
| | ¹ collected | | | | ² NESH with egg "stuck" to brood patch (not collected) | | | | | | | |

Kaheawa Wind Power I

Enclosure B (calendar year)

| | B22 | | | B50 | | | | Uluhe | | | B42 | | | B21 | | |
|------------|--|--------------|------|---------------|----|------|----|---------------|----|------|------|----|------|------|----|----|
| | 2017 | | 2018 | 2017 | | 2018 | | 2017 | | 2018 | 2017 | | 2018 | 2018 | | |
| Spec. Code | NS | BP | HP | NS | BP | NS | BP | NS | BP | NS | HP | NS | BP | NS | BP | NS |
| Mon. | Photo Nights ("()") = Nights with 2 NESH), Egg = collected | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | |
| Apr | | | | 1 | | | | | 2 | | | | 1 | | | |
| May | 1 | 2 | | 12 (4) | 1 | | | 3 | 2 | | | 4 | | 1 | 5 | |
| Jun | 7 (1) | 3 | | 20 (12) | | | | 5 | 1 | | | 6 | | | | |
| Jul | 7 (1) | | 1 | 10 (5) | | 3 | 1 | 3 | | 15 | 4 | 2 | | | | |
| Aug | 16 | Egg | 6 | 23 (3) | | | | 4 | | 9 | 9 | | 1 | 1 | | 3 |
| Sep | 11 | | 2 | 23 (7) | | | | 8 | | 1 | 1 | | | | | |
| Oct | | | | Egg fragments | | | | Egg | | | | | | | | |
| Nov | | | | | | | | | 1 | | | | | | | |
| Dec | | | | | | | | | 5 | | | | | | | |
| Total | 42 (2) | 5 (1 BP Egg) | 9 | 89 (31) | 1 | 3 | 1 | 23 (1 NS Egg) | 11 | 25 | 14 | 13 | 1 | 2 | 5 | 3 |

Mitigation

- › **Seabirds: Hawaiian petrel, Newell's shearwater (cont.)**
- › 2019: contracted HT Harvey Ecological Consultants
 - › Change gravel in burrows to smooth pebbles, add more litter/soil
 - › More intensive owl control efforts
 - › Change call broadcast types and patterns to mimic seasonal changes
 - › Search inside and outside enclosures for extraneous nesting or predation

Mitigation Issues

› **Hawaiian hoary bat**

- › No current issues (Tier 2 complete by 2021 with HTHarvey and USGS research projects)

› **Seabirds: Hawaiian petrel, Newell's shearwater**

- › Fulfill any HCP requirements for West Maui only mitigation
- › Additional 41 HAPE fledglings required
- › Lanai HAPE colony protection- project ongoing
 - › Ensure state/federal access allowed
 - › Ensure mitigation secure for years needed

Mitigation Issues (cont,)

- › Makamaka'ole colony protection
 - › Discontinue focus on HAPE or adaptive management for success; focus only on NESH
 - › Reduce NESH permitted take to 2 to 4 total (combine both projects) with minor amendment
 - › Total fledglings then required: 7 to 13
 - › Other NESH alternatives
 - › Other contributors or sponsors
 - › Take over by other sponsor

Mitigation Issues

› **Hawaiian goose:**

- › 7 years remain on permit to accrue **73** fledglings (~10 fledglings/year)
- › Current accrued annual average at Haleakala Ranch pen (6.25/year, range 1 to 14/year)
- › 2018: **1** fledgling produced (2017: **14** fledglings produced)
- › KWP II Pi'iholo Ranch pen may not be viable

Mitigation Issues

› **Hawaiian goose (cont.):**

- › Combine KWP I and KWP II at Haleakala Ranch
- › Enlarge pen or additional pen elsewhere
- › TERP direct contract through RFP to ensure best results and consistent oversight
- › ~\$65,000 remains from initial KWP I funding
- › DOT emergency translocation funding supported pen management 2011-2017