Freight Formula Enhancements to be considered for SHIFT

Review of last meeting

Freight

Current formula uses:

1. Tier of Freight Network 1 (highest) to 4 (lowest)
2. Annual Truck Daily Traffic
3. Maximum Truck volume per Freight Network tier (1-38k, 2-7k, 3-4k, 4-500)

+Peer reviewed network
+Up for review in FY 2019 with ADDs
-Somewhat arbitrary on Tier thresholds

+Good, consistent, long history of data
-Not all segments have unique info
- single/combo not used much

+-Used primarily for scaling
+ Does not use single/combo
-Tier values can be perceived as arbitrary

Other Freight Considerations

Type of data	Availability	When?
Coal Haul/Extended Wt	Yes, change constantly	Now
Bridge Wt Restricted	Yes, possibly duplicated	Now
Single/Combo	Yes, not unique, need more Class Cnts	Now
Truck Crash	Yes, not much experience	Now?
Truck Reliability	Yes ?? Whole network-R'qs Data purch	2 yrs
Truck Speed < All Traffic	Yes ?? Whole network-R'qs Data purch	2 yrs
Low Bridge Clearance	Not yet on whole network	2 yrs??
Turning Radii	?? Not yet	2-100 yrs
Oversize/Overweight Use	Not yet electronic	2-100 yrs

Recommended improvements:

- Separate Single/Comb Trucks
- Truck Reliability

Formulas for Modification

Source		Formula	Purpose
Splitting Single Unit from Combined	Statewide	$\text{Freight} = (\ 20\ *\ SU\ \ + 80 *\ CV)$	Statewide to emphasize long distance vehicles (semis) and minimize local delivery (UPS truck) and Regional to emphasize the opposite
	Regional	$Freight = (\ 60\ *\ SU\ \ + 40 *\ CV)$	
Reliability Ratio		$RRatio = MaxTTT = \frac{95^{\text{th}}\ \text{Percentile}}{50^{\text{th}}\ \text{Precentile}}$	To give emphasis to those areas experiencing bad reliability

MaxTTT = Maximum Truck Travel Time Reliability of “Weekend”, “Overnight”, Midday, AM Peak, and PM Peak

Formula:

$$\frac{\text{FR8} * \text{AADT}}{\text{KHFN}}$$

$$V_{TR,KHFN\text{-}MAX}$$

Variables:

Statewide: $FR8 = (\ 20 * SU\ + 80 * CO)$

Regional: $FR8 = (\ 60 * SU\ + 40 * CO)$

SU = Single Unit

CO = Combo Unit

Freight: Statewide and Regional Factor

AADT: Annualized Average Daily Traffic

KHFN: Kentucky Highway Freight Network Tier

$V_{TR,KHFN}$: Max Truck Vol in each Tier

Ideas from Committee

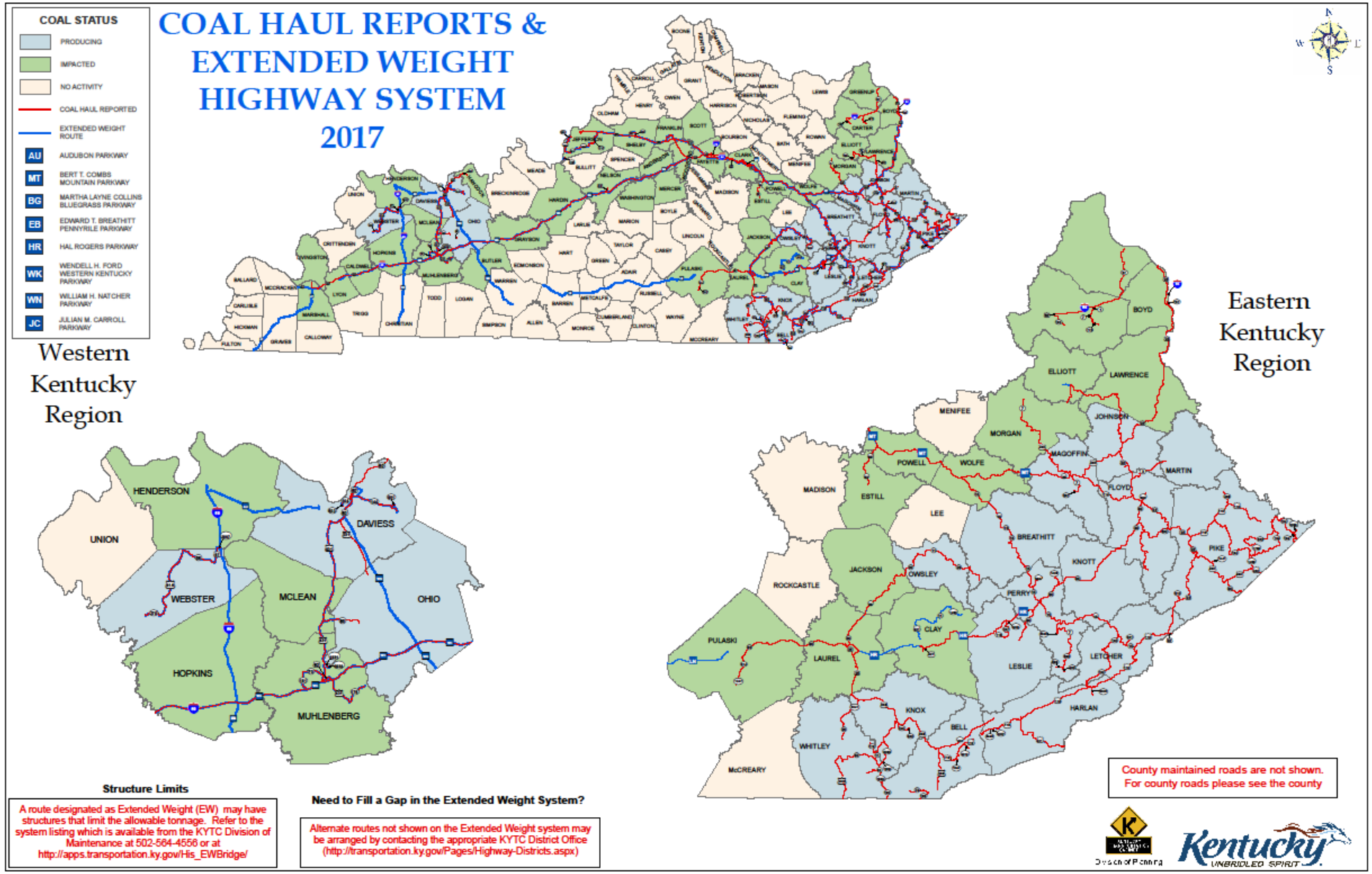
Idea 1: Coal Haul/Extended Wt

Idea 2:Truck Freight Bottlenecks

Idea 1: Coal Haul/Extended Wt

Coal Haul/Extended Wt

COAL HAUL REPORTS & EXTENDED WEIGHT HIGHWAY SYSTEM 2017



Structure Limits

A route designated as Extended Weight (EW) may have structures that limit the allowable tonnage. Refer to the system listing which is available from the KYTC Division of Maintenance at 502-564-4556 or at http://apps.transportation.ky.gov/His_EWBridge/

Need to Fill a Gap in the Extended Weight System?

Alternate routes not shown on the Extended Weight system may be arranged by contacting the appropriate KYTC District Office (http://transportation.ky.gov/Pages/Highway-Districts.aspx)

County maintained roads are not shown. For county roads please see the county

Division of Planning

Kentucky UNBRIDLED SPIRIT

Formula:

$$\frac{\mathbf{FR8 * AADT}}{\mathbf{KHFN +}}$$

$$\mathbf{V_{TR,KHFN+-MAX}}$$

Variables:

Statewide: FR8 $= (20 * \mathrm{SU} + 80 * \mathrm{CO})$

Regional: FR8 = $(60 * \mathrm{SU} + 40 * \mathrm{CO})$

SU = Single Unit

CO = Combo Unit

Freight: Statewide and Regional Factor

AADT: Annualized Average Daily Traffic

KHFN +: Kentucky Highway Freight Network Tier (**add Tier 5 – Coal Haul Routes)**

$V_{TR,KHFN}$: Max Truck Vol in each Tier

Idea 2:Truck Freight Bottlenecks

Formula:

$$\frac{\text{FR8} * \text{AADT}}{\text{KHFN}}$$

$$V_{TR,KHFN\text{-}MAX}$$

***RRatio**

Variables:

Statewide: $FR8 = (\ 20 * SU\ + 80 * CO)$

Regional: $FR8 = (\ 60 * SU\ + 40 * CO)$

SU = Single Unit

CO = Combo Unit

$$\boldsymbol{RRatio = MaxTTT = \frac{95^{th}\ Percentile}{50^{th}\ Precentile}}$$

Freight: Statewide and Regional Factor

AADT: Annualized Average Daily Traffic

KHFN +: Kentucky Highway Freight Network Tier $V_{TR,KHFN}$: Max Truck Vol in each Tier