Train Bridge Fire

The Union Pacific Railway bridge over the Guadalupe River near Willow Street caught fire at 3:15 AM Wednesday morning, Nov. 1, 2017. (To see some pretty impressive video of the fire, go to: http://kron4.com/2017/11/01/video-fire-on-caltrain-bridge-in-san-jose/)

Fortunately the San José Fire Department extinguished the fire quickly.
Despite the headlines in the newspaper article ("Early fire engulfs train trestle near Willow Glen / Fire that consumed wooden structure was contained within an hour" -- http://www.mercurynews.com/2017/11/01/fire-engulfs-train-trestle-in-san-jose-minimal-delays-to-caltrain-service/), the damage to the trestle was actually quite minimal.

I went out the afternoon of the fire to see the trestle for myself, and I talked with a crew of Union Pacific bridge inspectors who happened to be there and on break.
They said that the trestle is fine and suitable for freight trains.
I asked about the criteria, and they said they hit the various posts with a hammer: if the char on the timbers is less than an inch deep, it'll carry the weight.
(I told them about our efforts to save a nearby historic trestle for use as a bike/ped bridge and mentioned the concern about fire. They said that, for bikes and pedestrians, the piles could be nearly charred thru and still be strong enough!)

Recently I got a first-hand view of a freight train crossing the trestle. I only had my cell-phone with me, but nonetheless here is photographic evidence that the trestle was not "consumed" or even significantly damaged by the fire.
(The viewing angle was not great and there are two parallel bridges there: the newer concrete bridge in the foreground is used by CalTrain, and behind it is the older Union Pacific steel-and-concrete bridge

Freight train on the recently-charred Union-Pacific trestle over the Guadalupe River.
(Trestle is behind the newer CalTrain bridge with the metal railings)

with a wooden trestle-like “entrance ramp” -- the part that caught on fire. As can be seen in the photo, the train is on that second bridge, as both sets of hand-rails on the foreground bridge are plainly visible.)

Trestle fires can produce toxic smoke, due to the creosote. House fires also produce toxic smoke, due to the carpets, vinyl and plastic contents, furniture, wiring and insulation, etc.). Creosote is like a car tire: both produce black smoke, yet both continue to be in common use -- and both are actually quite difficult to ignite.
BTW: the restoration plans for the Willow Glen Trestle include fire sprinklers (to suppress any nearby brush- or trash-fires) and an alarm system (and there are three fire stations within a mile and a quarter with easy access to the trestle).

Fire is not good for wood, but fire is not good for metal, either.
As engineers and architects can tell you, metal weakens when heated.
At the temperature of a small brush- (or trash-) fire, steel will lose 90% of its “yield-strength”: the metal doesn’t melt, but the structure will crumple.

In many cases, wood can actually be better than metal: the wood chars on the outside but remains strong within, whereas the metal can quickly crumple.
You can observe this for yourself. Go look at the Willow Glen Trestle, and you can see the damage from a brush fire a decade ago. The wood beams are charred but still strong, but the metal cat-walk sagged: if that metal had been in a structural truss, the whole structure might have crumpled and collapsed.
(I provided a link to a technical paper on the yield-strength of steel and a photo of the sagged catwalk in the comments I submitted some years ago on the Willow Glen Trestle
-- see http://www.wgtrestle.org/LLA_DEIR_comments.pdf , pages 3 and 4.)

So a trestle fire is like a Baked Alaska Flambé: the fire can be very showy, but the inner part is just fine so long as the fire is extinguished in a timely manner.

~Larry Ames, 11/7/17