Training Schedule

The Heptathlon scoring system uses two types of equation:

For running events, points scored = $a(b - t)^c$
For jumping and throwing events, points scored = $a(x - b)^c$

For the running events, t is the time in seconds.
For the jumping events, x is the distance/height in centimetres.
For the throwing events, x is the distance in metres.

The values for a, b, and c in each event are given below:

Event	a	b	c
200 meters	4.99087	42.5	1.81
800 meters	0.11193	254	1.88
100 metres hurdles	9.23076	26.7	1.835
High Jump	1.84523	75	1.348
Long Jump	0.188807	210	1.41
Shot Put	56.0211	1.5	1.05
Javelin Throw	15.9803	3.8	1.04

In the table below are the best times and distances of an Olympic hopeful in training, as well as the World Records for each heptathlon event (as of April 2011).

Event	Olympic hopeful	World records
200m	25.34s	21.34s
800m	2min 13.00s	1min 53.28s
100m hurdles	13.65s	12.21s
High jump	1.43m	2.09m
Long jump	5.67m	7.52m
Shot put	12.45m	22.63m
Javelin	45.05m	72.28m

In order to work out a suitable training schedule for her, work out her score in each event.

The world record for each event can be taken as a theoretical maximum/minimum. Suppose she could close the gap between her current performance in each event and the world record by 10%. How would that affect her progress towards her target heptathlon score of 6000 points?

Instead, she could put together an alternative training schedule aiming to close the gap by 20% in some events. However, this extra training would have to be at the expense of her training for other events (so for every event she chooses to improve by 20%, she must choose another where she forfeits the 10% gain and instead maintains her current level).

Could this training strategy lead to a better score?
Can she reach the target of 6000 points?