Ed Glover/AA/USEPA/US
05/22/2009 09:58 AM

To Ron Myers/RTP/USEPA/US@EPA
cc
bcc
Subject Re: Fw: Diesel exhaust, tire and brake wear for low speed stop and go traffic

ron,
From an emissions point of view MOVES has two types of heavy duty trucks - Combination and single unit. The combination truck is the typical big 'semi' pulling a trailer that you see on the highway. I used this for the modeling. You mentioned a 40 ton load of grain. I can't imagine any other type of truck pulling that load.

The other distinction is long haul versus short haul. This relates to the VMT and way the trucks are used. Both Combination and Single unit have long and short haul varieties. Since we fixed the operation in your modeling, the distinction between long and short haul is not important.

-ed

Ron Myers/RTP/USEPA/US

Ron Myers/RTP/USEPA/US
EPA-OAR,OAQPS,SPPD
Received Date:
05/21/2009 02:43 PM
Transmission Date:
05/21/2009 02:43:19 PM

To Ed Glover/AA/USEPA/US@EPA
cc
Subject Re: Fw: Diesel exhaust, tire and brake wear for low speed stop and go traffic

Thanks for the information. I don't think the vehicles in this study were long haul trucks. They were trucks that were hauling corn from some point (the fields or a transportation way point) to a processing plant (elevator or ethanol production plant). In the publication of the draft section (should I re-regress the data) I would indicate that the exhaust, tire wear and break wear emissions be added to the results of the equation. I will also indicate that to determine the equation, an older fleet was used to subtract from the measured emissions.

Ron Myers
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Office of Air Quality Planning and Standards
Sector Policy and Programs Division
Monitoring Policy Group, D243-05
RTP NC 27711
Tel. 919.541.5407
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E-mail myers.ron@epa.gov

Ed Glover ron, the results are in PM2.5 05/21/2009 01:00:01 PM

Ed Glover/AA/USEPA/US
05/21/2009 12:59 PM

To Ron Myers/RTP/USEPA/US@EPA
cc
Subject Re: Fw: Diesel exhaust, tire and brake wear for low speed stop and go traffic

ron,
the results are in PM2.5
according the to model almost all of total PM is PM2.5. I think PM10 is only about 3%-4% higher than PM2.5.

also one reason the PM emissions are higher is that I assumed a 10 year old fleet. The actual in-use fleet is much younger. A ten year old long haul truck has more than 1 million miles and has probably been rebuilt once or more.

Also, as a reference, the 2007+ model years are under the new EPA standard and are an order of magnitude lower in PM emissions. I assumed none of these are in your project.
-ed

Ron Myers/RTP/USEPA/US

Ron Myers/RTP/USEPA/US
EPA-OAR,OAQPS,SPPD

Received Date:
05/21/2009 12:15 PM
Transmission Date:
05/21/2009 12:15:38 PM

To Ed Glover/AA/USEPA/US@EPA

cc Prashanth Gururaja/AA/USEPA/US@EPA, Schell.Bob@epa.gov, Gary Dolce/AA/USEPA/US@EPA, Lula Melton/RTP/USEPA/US@EPA, Roy Huntley/RTP/USEPA/US@EPA, Solomon.Douglas@epamail.epa.gov

Subject Re: Fw: Diesel exhaust, tire and brake wear for low speed stop and go traffic

Ed:
Thanks for the analysis. I assume that these emissions estimates are for PM2.5. Do you have any indication of what the PM10 emissions would be? I would think that PM10 would be about 30% greater than PM2.5.

As I suspected, the exhaust, brake and tire wear emissions are much higher than were previously estimated by the contractor. They used estimates of 0.5 gm/vmt which they derived from the NEI which are for much higher speed traffic and little acceleration. Since they were so low, they did not adjust the baseline emissions for exhaust, tire and break wear. This is also much larger than the existing value of 0.2199 for PM10 and 0.1617 that we use in the existing equation that is used for the NEI. The 8.8 gm/vmt may help with the final outcome of the predictive equation and for use by the industry that paid for this low speed testing. I am not sure how this may play out with conformity issues.

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Ed Glover | ron and prashanth, Please see the attached spr... | 05/20/2009 03:48:38 PM

Ed Glover/AA/USEPA/US

05/20/2009 03:48 PM

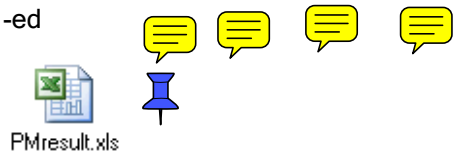
To myers.ron@epa.gov, Prashanth Gururaja/AA/USEPA/US@EPA
cc
Subject Re: Fw: Diesel exhaust, tire and brake wear for low speed stop and go traffic

ron and prashanth,
Please see the attached spreadsheet. Instead of just providing emission rates, I ran a description of your problem in the MOVES Project level model and got a result.

I assumed a low speed (1.25 miles per hour on average with some acceleration and lots of idling).
I assumed all the trucks were 9, 10 or 11 years old.
I calculated a per vehicle emission result in grams per hour and grams per mile.

If you have questions please email. I hope this meets your needs.

-ed



Prashanth Gururaja/AA/USEPA/US

Prashanth Gururaja/AA/USEPA/US
EPA-OAR,OTAQ,ASD
Sent by: Prashanth Gururaja

Received Date:
05/20/2009 10:03 AM
Transmission Date:
05/20/2009 10:03:17 AM

To Ed Glover/AA/USEPA/US@EPA
cc
Subject Fw: Diesel exhaust, tire and brake wear for low speed stop and go traffic

Ed, here is the old email from Ron Myers. Please take care of this issue ASAP. We promised him a response in Feb. But his language it seems like he needs PM rates from idle and low speed VSP bins. I'll also forward you the email he just sent to me yesterday.

Thanks,
Prashanth

----- Forwarded by Prashanth Gururaja/AA/USEPA/US on 05/20/2009 10:01 AM -----

Prashanth Gururaja/AA/USEPA/US

02/04/2009 02:22 PM

To Ron Myers/RTP/USEPA/US, Ed Glover/AA/USEPA/US
cc
Subject Re: Diesel exhaust, tire and brake wear for low speed stop and go traffic

Ron,

Sorry for my sluggish response. I wanted to make sure which data we could and couldn't provide you given that our MOVES work is not yet finalized/public. However, if you're using these numbers for an EPA-internal analysis, we can provide them for you. Ed Glover, who is copied on this email, can give you the proper rates since he developed the PM portion of the HD MOVES model. Otherwise, please use the MOBILE6 estimates for the emission rates you need.

Ed - can you please get in touch with Ron and help him out with his request (below)?

I will be out of the office for one week starting this afternoon, but I think the two of you can figure this out without me.

Thanks,
Prashanth

Ron Myers/RTP/USEPA/US

Ron Myers/RTP/USEPA/US
01/28/2009 02:05 PM

To Prashanth Gururaja/AA/USEPA/US@EPA
cc Bob Schell/RTP/USEPA/US@EPA
Subject Diesel exhaust, tire and brake wear for low speed stop and go traffic

Prashanth:
As we discussed on the phone, I am trying to disagregate emissions that were measured during an evaluation of truck emissions at a corn storage and transfer facility. The trucks are 18 wheel semitrailers of about ten years of age. The trucks are queued for the delivery of their load to a transfer or processing facility. The vehicle speed averages about 1 mph but they are stopped most of the time. About every minute, they move one or two truck/trailer lengths as they advance in the line to deliver their load. They road they are on is paved and is maintained to control the material on the road surface. I have particulate mass (PM10) emissions in grams per vehicle mile traveled but could also detemine hourly emissions. I am adding the emission determined with this test program with the emissions data that was used to generate the paved road emissions factors in AP-42. In the existing AP-42 emissions factor, the emissions associated with vehicle exhaust, tire wear and brake wear are subtracted so that only the emissions associated with resuspension of road dust is calculated. As I mentioned, to be consistent with the earlier work I need to subtract emissions that are estimated for the exhaust, tire wear and brake wear from the measured emissions. So, if you could provide me with a particulate matter (PM10) emissions estimate in gm/vmt (and/or gm/hr) for vehicle exhaust, tire wear and break wear I would appreciate this information.

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pollutantid	processid	emissions (grams)	distance (mi)	time (sec)	PM (g/hour)	PM (g/mile)
Organic Carbon	running	1.231360987	0.20972	600		
Elemental Carbon	running	0.530024089	0.20972	600		
brakePM	brake	0.077805109	0.20972	600		
tirePM	tire	0.004202118	0.20972	600		
Total PM (per vehicle)		1.843392303	0.20972	600	**11.06035**	**8.789778**

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1	4	0	0		1	56	2	0
1	5	0	0		1	57	2	0
1	6	0	0		1	58	2	0
1	7	0	0		1	59	2	0
1	8	0	0		1	60	2	0
1	9	0	0		1	61	2	0
1	10	0	0		1	62	2.55	0
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1	13	0	0		1	65	3	0
1	14	0	0		1	66	3	0
1	15	0	0		1	67	3	0
1	16	0	0		1	68	2.55	0
1	17	0	0		1	69	2	0
1	18	0	0		1	70	1.65	0
1	19	0	0		1	71	1.05	0
1	20	0	0		1	72	0.4	0
1	21	0	0		1	73	0	0
1	22	0	0		1	74	0	0
1	23	0	0		1	75	0	0
1	24	0	0		1	76	0	0
1	25	0	0		1	77	0	0
1	26	0	0		1	78	0.6	0
1	27	0	0		1	79	1	0
1	28	0	0		1	80	0.75	0
1	29	0	0		1	81	0.3	0
1	30	0	0		1	82	0	0
1	31	0	0		1	83	0.45	0
1	32	0	0		1	84	1	0
1	33	0	0		1	85	1.45	0
1	34	0	0		1	86	1.8	0
1	35	0	0		1	87	2	0
1	36	0	0		1	88	1.8	0
1	37	0	0		1	89	1.45	0
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1	39	0	0		1	91	0.65	0
1	40	0	0		1	92	0.25	0
1	41	0	0		1	93	0	0
1	42	0	0		1	94	0.4	0
1	43	0	0		1	95	1	0
1	44	0	0		1	96	1.6	0
1	45	0	0		1	97	2.05	0
1	46	0	0		1	98	2.45	0
1	47	0	0		1	99	2.8	0
1	48	0.8	0		1	100	3	0
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1	50	2	0		1	102	3	0
1	51	2	0		1	103	3	0

linkID	secondID	speed	grade		linkID	secondID	speed	grade
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1	106	2.3	0		1	158	0	0
1	107	2	0		1	159	0	0
1	108	2	0		1	160	0	0
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1	110	2	0		1	162	0	0
1	111	2	0		1	163	0	0
1	112	2	0		1	164	0	0
1	113	2	0		1	165	0.4	0
1	114	2	0		1	166	0.8	0
1	115	2	0		1	167	1	0
1	116	2	0		1	168	1	0
1	117	2.35	0		1	169	1	0
1	118	2.75	0		1	170	1	0
1	119	3	0		1	171	1	0
1	120	2.65	0		1	172	1	0
1	121	2.2	0		1	173	1	0
1	122	1.6	0		1	174	1	0
1	123	0.95	0		1	175	1	0
1	124	0.35	0		1	176	0.75	0
1	125	0	0		1	177	0.3	0
1	126	0.8	0		1	178	0	0
1	127	1.55	0		1	179	0.85	0
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1	129	1.65	0		1	181	2.85	0
1	130	1.05	0		1	182	3.55	0
1	131	0.4	0		1	183	4	0
1	132	0	0		1	184	3.7	0
1	133	0.25	0		1	185	3.3	0
1	134	0.75	0		1	186	2.8	0
1	135	1.3	0		1	187	2.3	0
1	136	1.85	0		1	188	2	0
1	137	2.35	0		1	189	1.8	0
1	138	2.85	0		1	190	1.45	0
1	139	3.25	0		1	191	1.05	0
1	140	3.65	0		1	192	0.65	0
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1	142	4.35	0		1	194	0	0
1	143	4.65	0		1	195	0.4	0
1	144	4.85	0		1	196	1.05	0
1	145	5	0		1	197	1.8	0
1	146	5	0		1	198	2.45	0
1	147	5	0		1	199	3.05	0
1	148	4.7	0		1	200	3.55	0
1	149	4.2	0		1	201	4.05	0
1	150	3.65	0		1	202	4.45	0
1	151	3	0		1	203	4.8	0
1	152	2.3	0		1	204	5	0
1	153	1.55	0		1	205	5	0
1	154	0.9	0		1	206	5	0
1	155	0.3	0		1	207	4.85	0

linkID	secondID	speed	grade		linkID	secondID	speed	grade
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1	211	4	0	|	1	263	0	0
1	212	3.8	0	|	1	264	0	0
1	213	3.45	0	|	1	265	0	0
1	214	3.05	0	|	1	266	0	0
1	215	2.6	0	|	1	267	0	0
1	216	2.1	0	|	1	268	0	0
1	217	1.6	0	|	1	269	0	0
1	218	1.1	0	|	1	270	0	0
1	219	0.6	0	|	1	271	0	0
1	220	0.2	0	|	1	272	0	0
1	221	0	0	|	1	273	0	0
1	222	0	0	|	1	274	0	0
1	223	0	0	|	1	275	0	0
1	224	0	0	|	1	276	0	0
1	225	0	0	|	1	277	0	0
1	226	0	0	|	1	278	0	0
1	227	0	0	|	1	279	0	0
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1	231	0	0	|	1	283	0.8	0
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1	234	0	0	|	1	286	3.9	0
1	235	0	0	|	1	287	4.6	0
1	236	0	0	|	1	288	5	0
1	237	0	0	|	1	289	5	0
1	238	0	0	|	1	290	5	0
1	239	0	0	|	1	291	4.7	0
1	240	0	0	|	1	292	4.2	0
1	241	0	0	|	1	293	3.65	0
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1	243	0	0	|	1	295	2.3	0
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1	316	2	0		1	368	5	0
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1	318	2	0		1	370	4.8	0
1	319	2	0		1	371	4.45	0
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1	321	2	0		1	373	3.65	0
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1	327	1	0		1	379	3	0
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1	330	3	0		1	382	2.75	0
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1	334	1.85	0		1	386	3	0
1	335	1.65	0		1	387	2.9	0
1	336	1.4	0		1	388	2.8	0
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1	339	0.75	0		1	391	2.25	0
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1	341	0	0		1	393	2	0
1	342	0.45	0		1	394	2	0
1	343	1	0		1	395	2	0
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1	345	1.8	0		1	397	2	0
1	346	2	0		1	398	2	0
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1	349	3	0		1	401	2	0
1	350	3.5	0		1	402	2	0
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1	360	4.75	0		1	412	3.1	0
1	361	5	0		1	413	3.65	0
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1	419	5	0	|	1	471	0	0
1	420	4.8	0	|	1	472	0	0
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1	422	4.2	0	|	1	474	0	0
1	423	4	0	|	1	475	0	0
1	424	3.2	0	|	1	476	0	0
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1	439	0.8	0	|	1	491	0	0
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1	441	2	0	|	1	493	0	0
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1	445	0	0	|	1	497	0	0
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1	464	0	0	|	1	516	0	0
1	465	0	0	|	1	517	0.4	0
1	466	0	0	|	1	518	0.8	0
1	467	0	0	|	1	519	1	0

linkID	secondID	speed	grade		linkID	secondID	speed	grade
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1	521	1	0	|	1	561	0	0
1	522	1	0	|	1	562	0	0
1	523	1	0	|	1	563	0	0
1	524	1	0	|	1	564	0	0
1	525	1.3	0	|	1	565	0	0
1	526	1.7	0	|	1	566	0	0
1	527	2.1	0	|	1	567	0	0
1	528	2.45	0	|	1	568	0	0
1	529	2.8	0	|	1	569	0	0
1	530	3	0	|	1	570	0	0
1	531	2.65	0	|	1	571	0	0
1	532	2.2	0	|	1	572	0	0
1	533	1.6	0	|	1	573	0	0
1	534	0.95	0	|	1	574	0	0
1	535	0.35	0	|	1	575	0	0
1	536	0	0	|	1	576	0	0
1	537	0	0	|	1	577	0	0
1	538	0	0	|	1	578	0	0
1	539	0	0	|	1	579	0	0
1	540	0	0	|	1	580	0	0
1	541	0	0	|	1	581	0	0
1	542	0	0	|	1	582	0	0
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1	544	0	0	|	1	584	0	0
1	545	0	0	|	1	585	0	0
1	546	0	0	|	1	586	0	0
1	547	0	0	|	1	587	0	0
1	548	0	0	|	1	588	0	0
1	549	0	0	|	1	589	0	0
1	550	0	0	|	1	590	0	0
1	551	0	0	|	1	591	0	0
1	552	0	0	|	1	592	0	0
1	553	0	0	|	1	593	0	0
1	554	0	0	|	1	594	0	0
1	555	0	0	|	1	595	0	0
1	556	0	0	|	1	596	0	0
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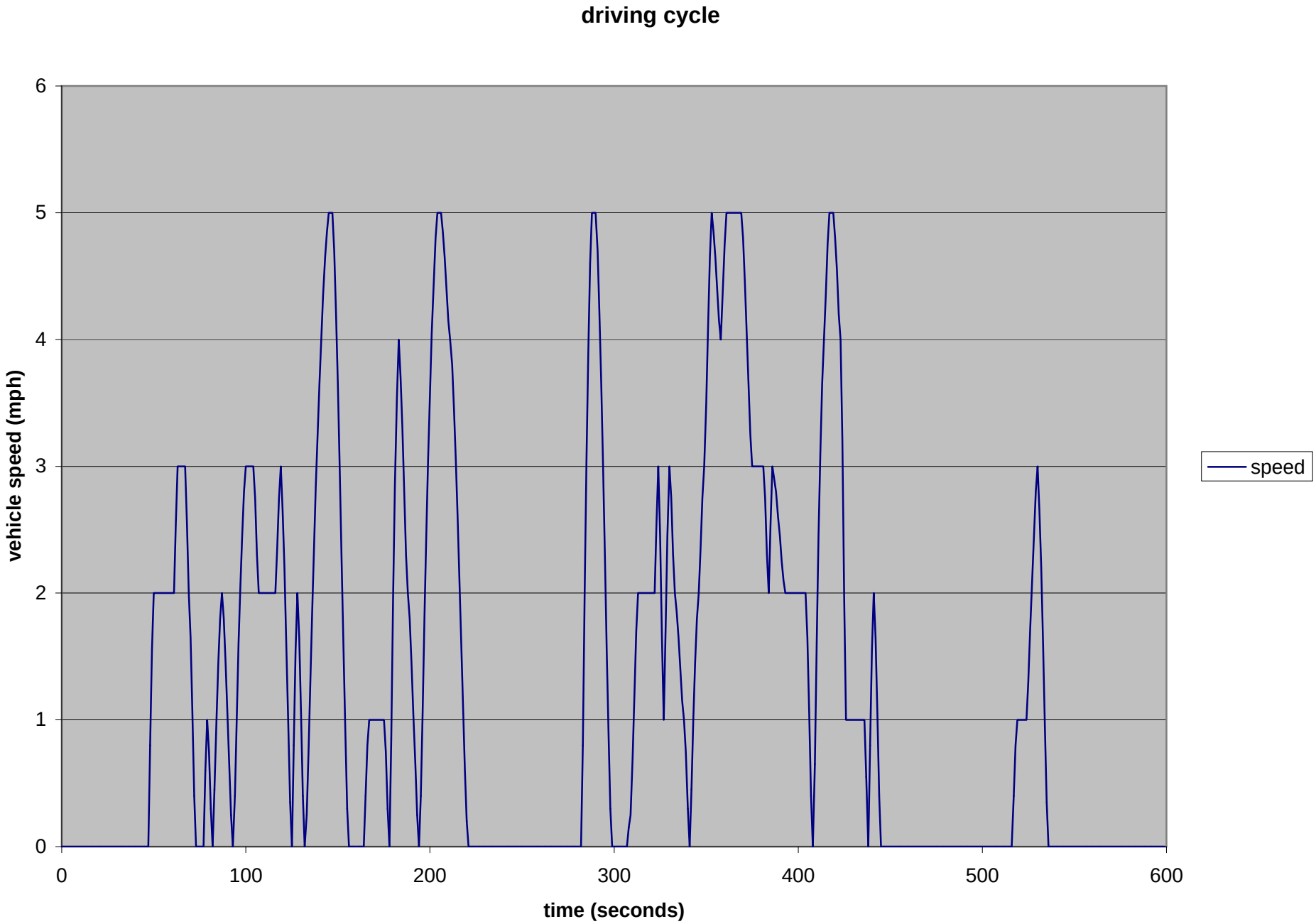
driving cycle
vehicle speed (mph)
0
1
2
3
4
5
6
0
100
200
300
400
500
600
time (seconds)
speed